# HEALTH CARE
# DISPARITIES BRIEFING

US Commission on Civil Rights
Washington, DC

Friday, June 12, 2009

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# Biographies

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# THE HONORABLE LOUIS W. SULLIVAN, M.D.

Louis W. Sullivan, M.D., is chairman of the board of the National Health Museum in Atlanta, Georgia, and is also chairman of the Washington, D.C.-based Sullivan Alliance to Transform America's Health Professions. Additionally, he serves as chair of the President's Commission on Historically Black Colleges and Universities, and was co-chair of the President's Commission on HIV and AIDS from 2001-2006.

Dr. Sullivan is the founding dean and first president of Morehouse School of Medicine (MSM). With the exception of his tenure as secretary of the U.S. Department of Health and Human Services (HHS) from 1989 to 1993, Dr. Sullivan was president of MSM for more than two decades. On July 1, 2002, he retired and was appointed president emeritus. He continues to support the school, including its national fund-raising activities.

A native of Atlanta, Dr. Sullivan graduated magna cum laude from Morehouse College in 1954, and earned his medical degree, cum laude, from Boston University School of Medicine in 1958. He is certified in internal medicine and hematology, holds a mastership from the American College of Physicians and is a member if Phi Beta Kappa and Alpha Omega Alpha academic honor societies.

Dr. Sullivan was instructor of medicine at Harvard Medical School from 1963-64, and assistant professor of medicine at Seton Hall College of Medicine from 1964-66. In 1966, he became co-director of hematology at Boston University Medical Center and, a year later, founded the Boston University Hematology Service at Boston City Hospital. Dr. Sullivan remained at Boston until 1975, holding positions as assistant professor of medicine, associate professor of medicine, and professor of medicine.

Dr. Sullivan became the founding dean and director of the Medical Education Program at Morehouse College in 1975. The program became The School of Medicine at Morehouse College in 1978, admitting its first 24 students to a two-year program in the basic medical sciences. In 1981, the school received provisional accreditation of its four year curriculum leading to the M.D. degree, became independent from Morehouse College and was re-named Morehouse School of Medicine, with Dr. Sullivan as dean and president. In 1983, MSM became a member of the Atlanta University Center (AUC). MSM was fully accredited as a four-year medical school in April 1985 and awarded its first 16 M.D. degrees in May of that year.

Dr. Sullivan left MSM in 1989 to accept an appointment by President George H.W. Bush to serve as secretary of the U.S. Department of Health and Human Services. In this cabinet position, Dr. Sullivan managed the federal agency responsible for the major health, welfare, food and drug safety, medical research and income security programs serving the American people. In January 1993, he returned to MSM and resumed the office of president.

In March 2008, Dr. Sullivan was appointed to the new Grady Hospital Corporation board of Trustees. In June, 2008, Dr. Sullivan accepted appointments to (a) the Health Disparities Technical Expert Panel (HDTEP) of the Centers for Medicare and Medicaid Services (CMS) of the U.S. Department of Health and Human Services (HHS) and (b) an Institute of Medicine Committee, "Improving the Organization of the U.S. Department of Health and Human Services to Advance the Health of Our Population."

He is also a member of the boards of Africare in Washington, D.C. and of Callaway Gardens in Pine Mountain, Georgia.

Dr. Sullivan is the recipient of more than 55 honorary degrees, including an honorary doctor of medicine degree from the University of Pretoria in South Africa.

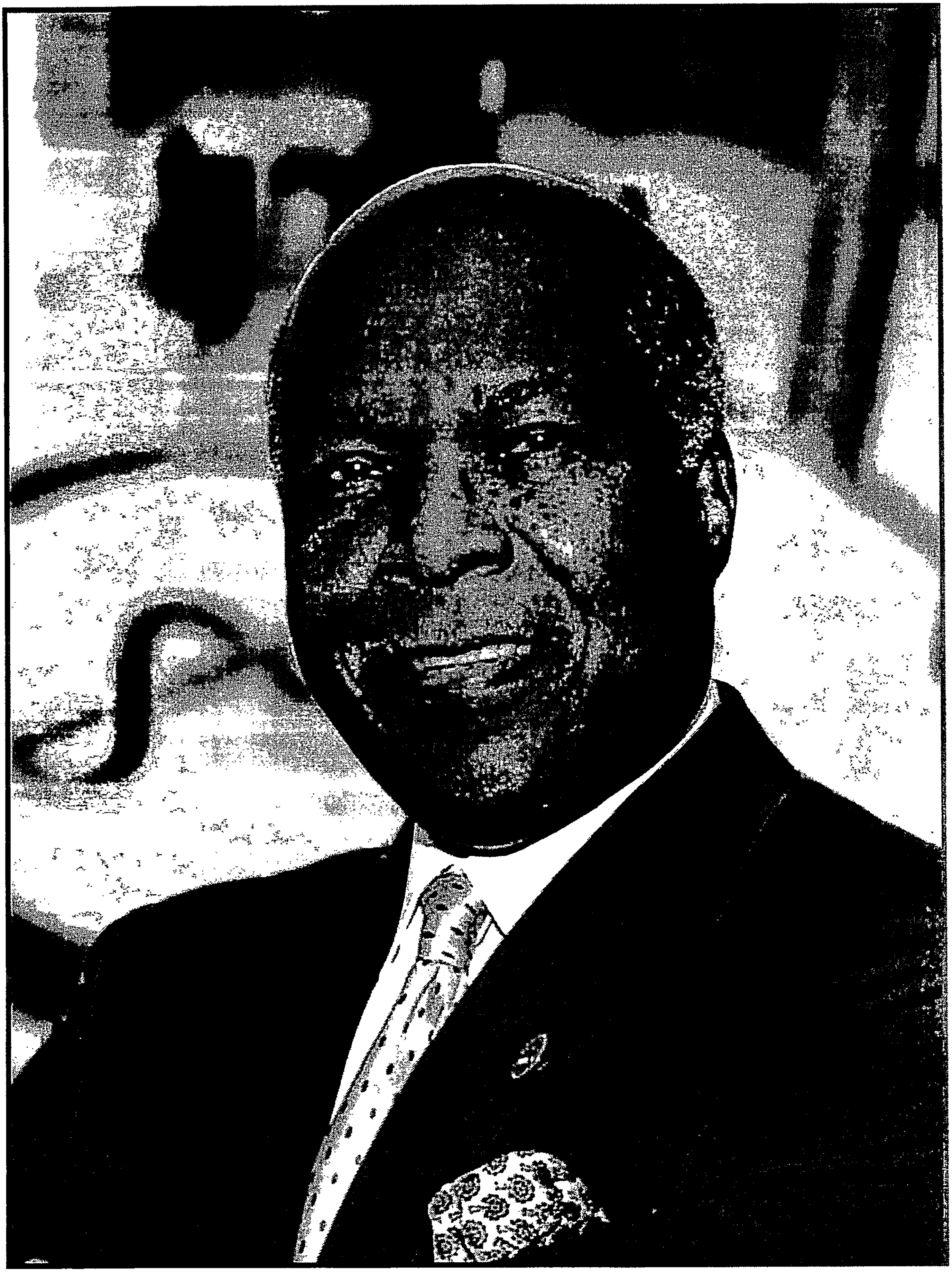
Dr. Sullivan currently serves on the following corporate boards: Henry Schein, United Therapeutics, Emergent Biosolutions, and BioSante Pharmaceuticals. He is retired from the boards of General Motors, 3M, Bristol Myers Squibb, CIGNA, Household International (now HBSC), and Equifax.

A member of numerous medical organizations, including the American Medical Association and the National Medical Association, Dr. Sullivan was the founding president of the Association of Minority Health Professions Schools (AMHPS). He is a former member of the Joint Committee on Health Policy of the Association of American Universities and the National Association of Land Grant Colleges and Universities.

Dr. Sullivan is a member of Alpha Phi Alpha Fraternity, Sigma Pi Phi Fraternity and 100 Black Men of America.

He is married to Ginger, an attorney, and they have three grown children: Paul, a radiologist; Shanta, an actress; and Halsted, a television comedy writer. They have two grandchildren, Paul Jr. and Brent Sullivan.

*Updated April 2009*



Rubens J. Pamies, M.D., FACP
Vice Chancellor for Academic Affairs
Dean for Graduate Studies
Professor of Internal Medicine

University of Nebraska Medical Center

Rubens J. Pamies, M.D., has served as vice chancellor for academic affairs, dean for graduate studies and professor of internal medicine at the University of Nebraska Medical Center (UNMC) since September 2003. Prior to that, Dr. Pamies was chairman of the department of internal medicine and The Edward S. Harkness Professor of Medicine at Meharry Medical College School of Medicine. He also was chief of service in the department of internal medicine at the Metropolitan Nashville General Hospital. While in Nashville, he was a professor of medicine in the School of Medicine at Vanderbilt University Medical Center.

Born in Haiti, Dr. Pamies' family moved to New York when he was six. Dr. Pamies received his baccalaureate degree in 1981 from St. John's University and his medical degree in 1986 from the State University of New York at Buffalo. He completed his residency at Cornell-North Shore University Hospital in the internal medicine primary care track.

Recognized widely for his expertise in health disparities, Dr. Pamies was recently selected as a new member and chair of the Advisory Committee on Minority Health for the U.S. Department of Health and Human Services' Office of Minority Health. In 2005, he collaborated with former United States Surgeon General, Dr. David Satcher, to author and edit one of the first textbooks addressing inequalities in health care titled, "Multicultural Medicine and Health Disparities." Their collaboration began when Dr. Pamies was associate dean for student affairs at Case Western Reserve University School of Medicine. Because of their work, The Dr. David Satcher – Dr. Rubens J. Pamies Scholarship for Academic Excellence for Minority Students was established at Case Western Reserve University School of Medicine.

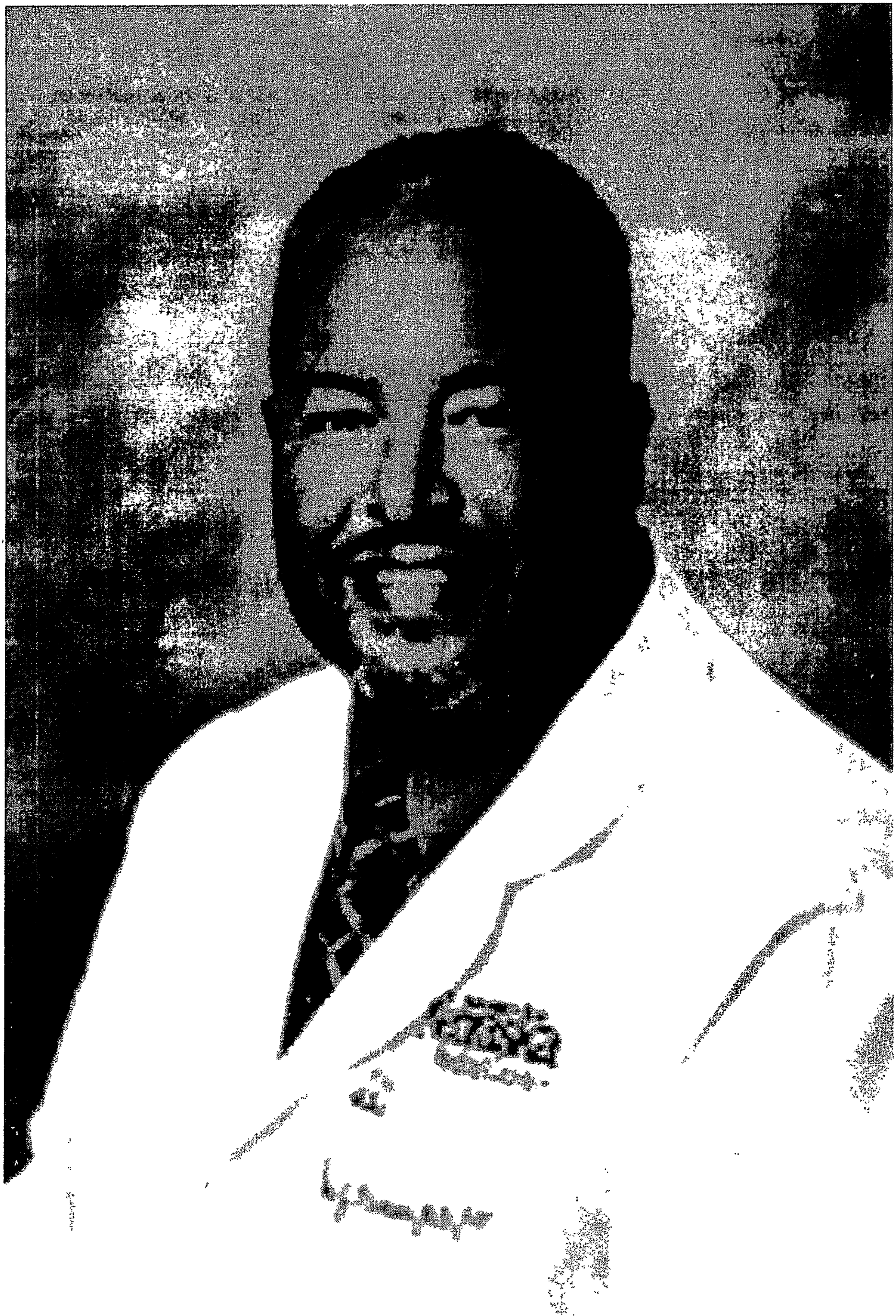
Dr. Pamies served as principal or co-investigator on a number of grants, which include an NIH sponsored Center for Reducing Asthma Disparities, the Agency for Healthcare Research and Quality (AHRQ) Sponsored Center for Improving Patient Safety, the REACH 2010 Project (Meharry component), the NIH planning grant for clinical research in minority institutions and the Robert Wood Johnson Foundation Summer Medical and Dental Education Program (SMDEP), one of 12 sites in the U.S.

His influence spans across the U.S. through his service on a number of national, regional and local boards and community groups. Dr. Pamies is a contributor to the Institute of Medicine's report for research and reducing health disparities. He is a test committee representative for the National Board of Medical Examiners, chairman of the Building Bright Futures adolescent behavioral health task force in Omaha and a former member of the Public Health Advisory Committee for the Congressional Black Caucus Foundation, Inc. In addition, he is a member of Alpha Omega Alpha Medical School Honor Society and the recipient of numerous awards for his community work, including a lifetime achievement award from the Association of Haitian Physicians.

Dedicating his academic medical career to minority health issues, Dr. Pamies created the first office of minority affairs at the University of South Florida College of Medicine in1991. He also served as chief of the general internal medicine division at Mount Sinai Medical Center in Cleveland.

His achievements at UNMC include establishing the Virginia-Nebraska Alliance, a partnership with five Historically Black Colleges/Universities to address the shortage of minority health care professionals; and the successful advancement of a new College of Public Health which includes a Center for Reducing Health Disparities. Dr. Pamies has been featured in more than 100 articles in medical journals, newspapers and magazines including Essence magazine; has presented at numerous national and international conferences on topics such as health disparities, health care, medical education and minority medical workforce trends; and has appeared on local and national news programs including CNN and C-SPAN.

He is married to Michelle Austin Pamies, Esq. She is a senior attorney for Union Pacific Railroad.



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**SCHOLARS AND FELLOWS**

## Sally Satel
Resident Scholar

### Contact Information

Email: ssatel@aei.org
Phone: 202-862-5920
Fax: 202-862-7178
Assistant: Kristin Viswanathan
Assistant Email: kristin.viswanathan@aei.org
Assistant Phone: 202-828-6037

### Biography

Sally Satel, M.D., a practicing psychiatrist and lecturer at the Yale University School of Medicine, examines mental health policy as well as political trends in medicine. She has served on the advisory committee of the Center for Mental Health Services of the Substance Abuse and Mental Health Services Administration and was a member of the Fowler Commission that investigated sexual misconduct at the U.S. Air Force Academy in summer 2003. Her books range from ***PC, M.D.: How Political Correctness Is Corrupting Medicine*** (Basic Books, 2001) and ***One Nation under Therapy*** (St. Martin's Press, 2005), coauthored with Christina Hoff Sommers, to ***When Altruism Isn't Enough: The Case for Compensating Organ Donors*** (AEI Press, 2009). Her interest in transplant policy stems from her experience as the recipient of a donated kidney in 2006.

### Experience

- Staff Psychiatrist, Oasis Drug Treatment Clinic, Washington, D.C., 1997-present
- Lecturer, 1995-present; Assistant Professor of Psychiatry, 1988-95; Resident in Psychiatry, 1985-88, Yale University School of Medicine
- Member, National Advisory Council for the Center for Mental Health Services, 2002-2005
- Member, Panel to Review Sexual Misconduct Allegations at the U.S. Air Force Academy (Fowler Commission), 2003
- Professional Staff Member, Committee on Veteran's Affairs, U.S. Senate, 1996-97
- Consultant, Special Committee on Aging, U.S. Senate, 1995-96
- Staff Psychiatrist, District of Columbia Superior Court Pretrial Program, 1995-96
- Visiting Research Scientist, University of Pennsylvania School of Medicine, 1994-96
- Robert Wood Johnson Health Policy Fellow, Labor and Human Resources Committee, U.S. Senate, 1993-94
- Staff Psychiatrist, West Haven VA Medical Center, 1988-93

### Education

M.D., Brown University
M.S., University of Chicago
B.S., Cornell University

You can find more on this scholar online at http://www.aei.org/scholar/69

Amitabh Chandra is a Professor of Public Policy at the Harvard Kennedy School of Government. He is a Research Fellow at the IZA Institute in Bonn, Germany, and at the National Bureau of Economic Research (NBER) in Cambridge, Massachusetts. His research focuses on productivity and expenditure growth in healthcare, racial disparities in healthcare, and the economics of neonatal health and cardiovascular care. His research has been supported by the National Institute of Aging and the National Institute of Child Health and Development, and has been published in the American Economic Review, the Journal of Political Economy, the Journal of Labor Economics, Journal of Policy Analysis and Management, Circulation, the American Heart Journal, and Health Affairs. He serves as an editor of the Journal of Human Resources, Economics Letters, and the American Economic Journal-Applied. He has been a faculty member at Dartmouth and MIT, and has been a consultant to the National Academy of Science, the Robert Wood Johnson Foundation, and the RAND Corporation. He is the recipient of an Outstanding Teacher Award, the first-prize recipient of the Upjohn Institute's International Dissertation Research Award, the Kenneth Arrow Award for best paper in health economics, and the Eugene Garfield Award for the impact of medical research.

BIO for Peter B. Bach, MD, MAPP

Dr. Bach is a member of the Health Outcomes Research Group in the Department of Epidemiology and Biostatistics, and a pulmonary and critical care physician in the Department of Medicine. His main research interests are in assessing and improving the quality of cancer care. His work has focused particularly on improving the quality of care for African-American patients in Medicare, including cancer care. His work has shown that low quality of care contributes to excess mortality for African Americans with lung cancer, and that limited access to high quality primary care physicians may reduce care quality more generally for African Americans. He also studies the link between cigarette smoking, lung cancer, and early detection, and has developed statistical models that can be used to predict the probability that someone will develop lung cancer based on their age and smoking history. These models were recently used to demonstrate that CT screening for lung cancer may not benefit patients, in that people who are screened appear to die of lung cancer at the same rate as if they had not been screened, despite CT screening detecting many early lung cancers and leading to many diagnostic tests, invasive procedures and surgeries.

Dr. Bach is also engaged in healthcare policy work. In 2005 and 2006 he served as Senior Adviser to the Administrator of the Centers for Medicare and Medicaid Services (CMS) in Washington, DC, where he oversaw the agency's cancer initiatives, evidence development work through conditional coverage, and data policy. In that role, he was a liaison to other health agencies, including the FDA, NIH, and AHRQ. He currently serves as a member of the Institute of Medicine's National Cancer Policy Forum. He is the recipient of the Boyer award for clinical research, was the previous incumbent of the Frederick Adler faculty chair, and has been the recipient of grants from the National Cancer Institute, the National Institute of Aging, and the American Lung Association.

Dr. Bach is a graduate of Harvard College, the University of Minnesota Medical School, and the University of Chicago School for Public Policy. He conducted his medical residency and sub-specialty fellowship at the Johns Hopkins Hospital in Baltimore, MD. During the 1994 Rwandan Civil War, he provided medical care to refugees in Goma Zaire.

Selected Publications:

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Bach PB, Cramer LD, Schrag D, Downey RJ, Gelfand SE, Begg CB. The influence of hospital volume on survival after resection for lung cancer. N Engl J Med. 2001; 345:181-8.

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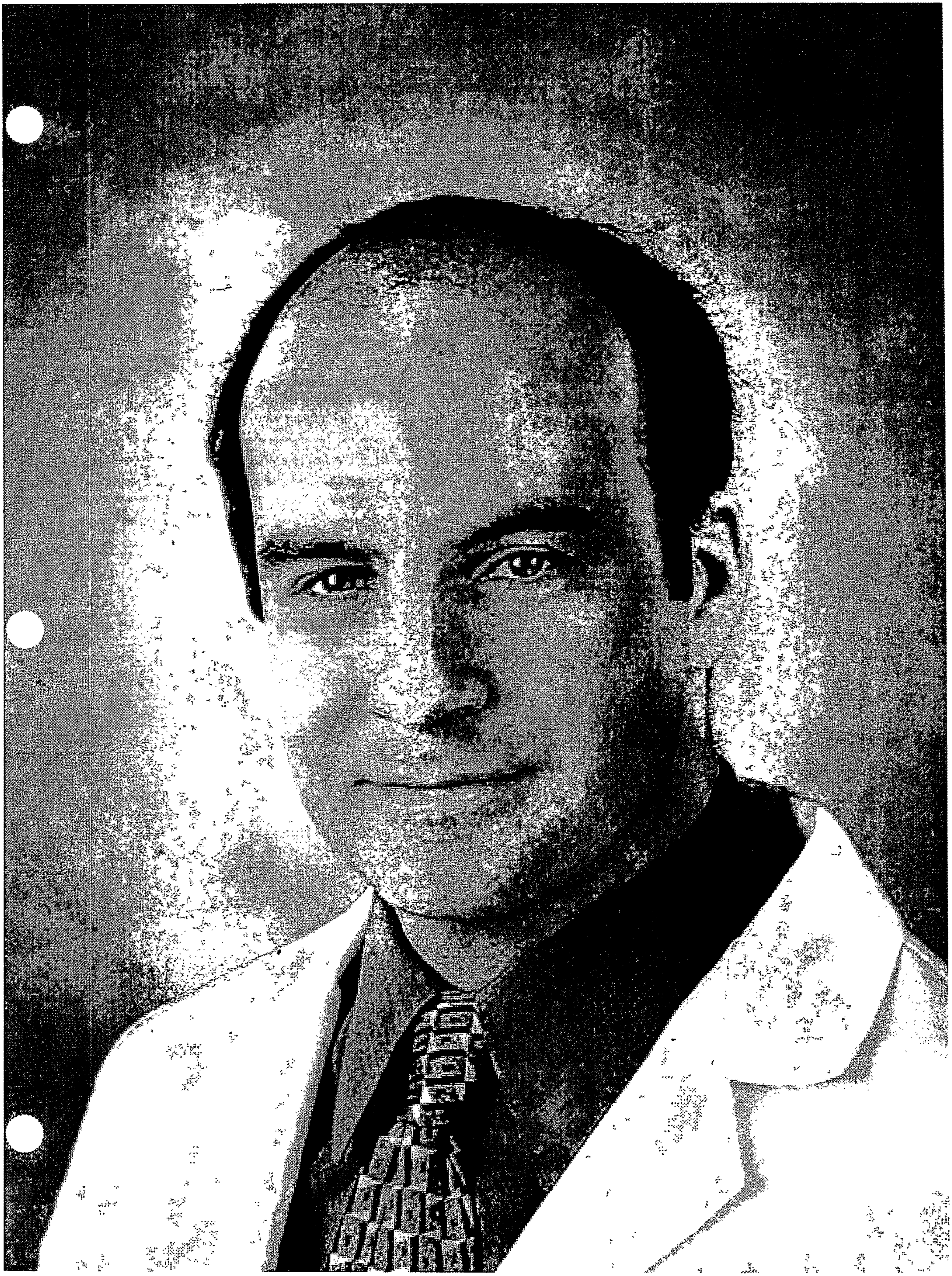


# Garth N. Graham, M.D., M.P.H.

## Deputy Assistant Secretary for Minority Health

r. Garth N. Graham is the Deputy Assistant Secretary for Minority Health in the Office of Minority Health at the Department of Health and Human Services.

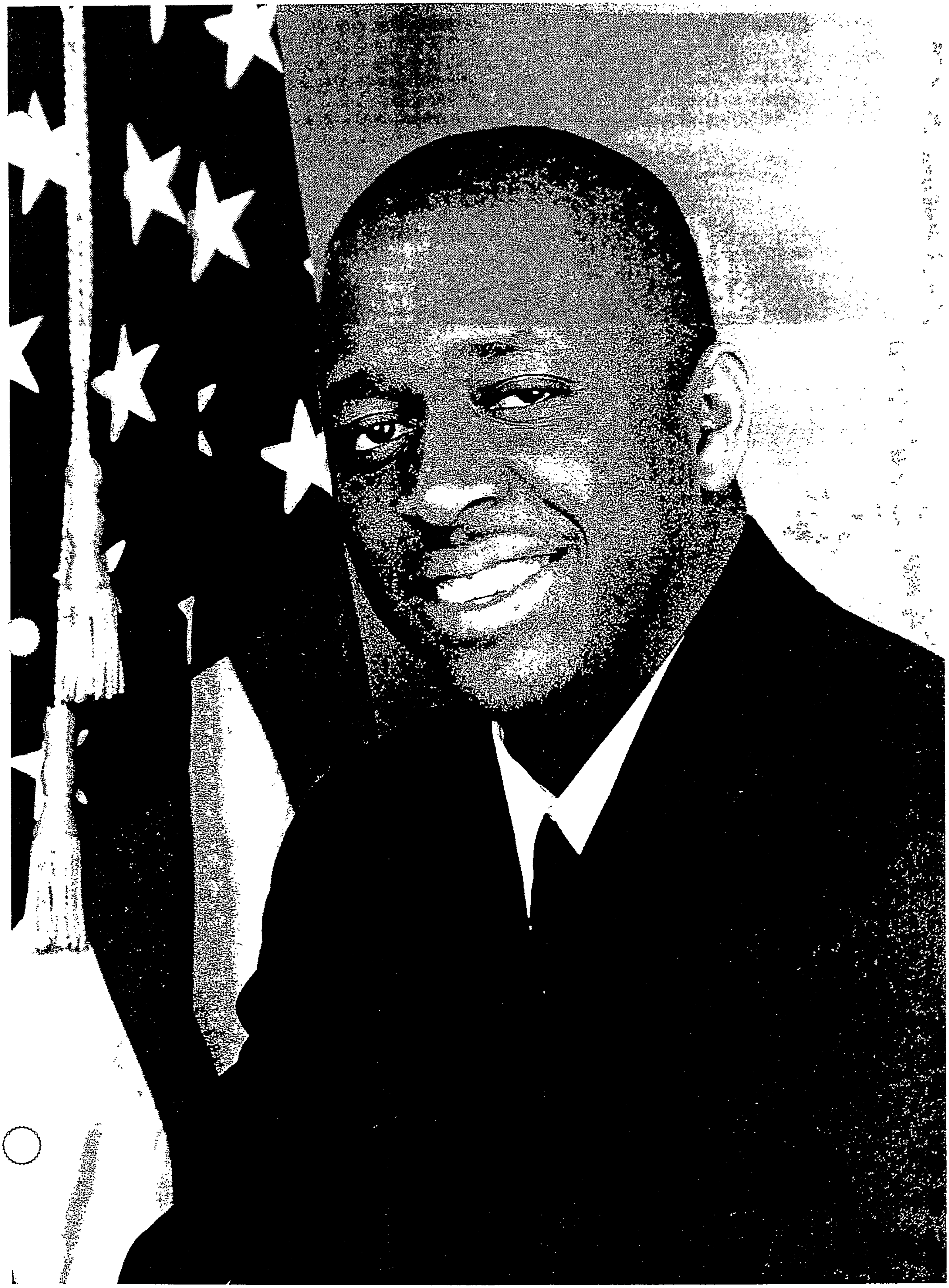
The Office of Minority Health (OMH) was created by the U. S. Department of Health and Human Services (HHS) in 1985 as a result of the Report of the Secretary's Task Force on Black and Minority Health. The office operates under the provisions of the Health Professions Education Partnerships Act of 1998. The mission of the OMH is to improve the health of racial and ethnic populations through the development of effective health policies and programs that help to eliminate health disparities. These populations include Blacks/African Americans, American Indians and Alaska Natives, Asian Americans, Native Hawaiians and Other Pacific Islanders and Hispanics/Latinos.

As the Deputy Assistant Secretary for Minority Health, Dr. Graham reports to the Assistant Secretary for Health and works closely with all agencies throughout the Department. The Office of Minority Health develops and coordinates Federal health policy that addresses minority health concerns and ensures that Federal, State and local health programs take into account the needs of sadvantaged, racial and ethnic populations.

Dr. Graham serves as the Executive Director of the HHS Council on Health Disparities. The Council is comprised of senior leadership across the department, which coordinates and tracks progress on disparities related projects undertaken by the department. He was previously appointed a White House Fellow and special assistant to former Secretary Tommy G. Thompson at the Department of Health and Human Services. The White House Fellows program is America's most prestigious program for leadership and public service.

Dr. Graham has significant experience working in minority communities. He founded the Boston Men's Cardiovascular Health Project, a project designed to identify behavioral explanations for decreased adherence to adequate diet and exercise by African American men. Dr Graham was the Founding Senior Editorial Board Member of the Yale Journal of Health, Law, Policy, and Ethics, served on the Editorial Board of the Yale Journal of Biology and Science, and was a reviewer for the Journal of Health Services Research. He also served on the Public Health Executive Council of the Massachusetts Medical Society, the Board of Directors of Physicians for Human Rights, Chairman of the American Medical Association/MSS National Minority Issues Committee and on the Steering Committee of the Boston Men's Health Coalition. Dr. Graham has taught on the Faculty of the Observed Structured Clinical Exam at Harvard Medical School and has authored scientific articles and presentations on cardiovascular disease, HIV/AIDS, and community medicine and medical education.

Dr. Graham earned an M.D. from the Yale School of Medicine, where he graduated cum laude. He was inducted into the Alpha Omega Alpha medical honor society and named a Yale President Public Service Fellow. He also earned an M.P.H. from the Yale School of Epidemiology and Public Health with a focus in health policy administration. Dr. Graham completed his residency in Internal Medicine at Massachusetts General Hospital and was also a Clinical llow at Harvard Medical School. He has received numerous accolades for his leadership and service in promoting health, including the 2002 American Medical Association Leadership Award, the Partners in Excellence Award and the Miriam Kathleen Dasey Award from Yale Medical School.



**Dr. Herman A. Taylor, Jr., M.D., M.P.H., FACC, FAHA**
**Professor of Medicine and Attending Physician,**
**Division of Cardiology,**
**University of Mississippi Medical Center;**
**Visiting Professor of Biology,**
**Division of Natural Sciences**
**Tougaloo College;**
**Clinical Professor of Epidemiology and Preventive Medicine, Jackson State University;**
**Director/Principal Investigator,**
**Jackson Heart Study,**
**Jackson, Mississippi**

Dr. Herman A. Taylor holds positions at the three institutions that are partners in the Jackson Heart Study (JHS). In 1998, Taylor came to Jackson, Mississippi to lead the landmark JHS, the largest population-based study of heart and related diseases ever undertaken in African Americans. While the study seeks to answer questions about cardiovascular disease risk in the African-American population, it also provides historically black colleges and universities experience in large-scale epidemiological research. In addition, a new generation of African-American students is able to prepare for leadership roles in science and medicine. The JHS is funded by the National Heart, Lung and Blood Institute and the National Center on Minority Health and Health Disparities of the National Institutes of Health.

A native of Birmingham, Alabama, where he was a National Merit Scholar, Taylor attended Princeton University and then Harvard Medical School. After a year's internship at Harvard's Mount Auburn Hospital, he spent the next two years in the Miami, Florida, Liberty City neighborhood with the National Health Service Corps. His experience gave him an intimate view of a neighborhood that had been the scene of riots just the year before and the health issues faced by Haitian and Cuban refugees. The Miami experience convinced him that he should spend his energies making the fruits of American medicine and medical research available to everyone.

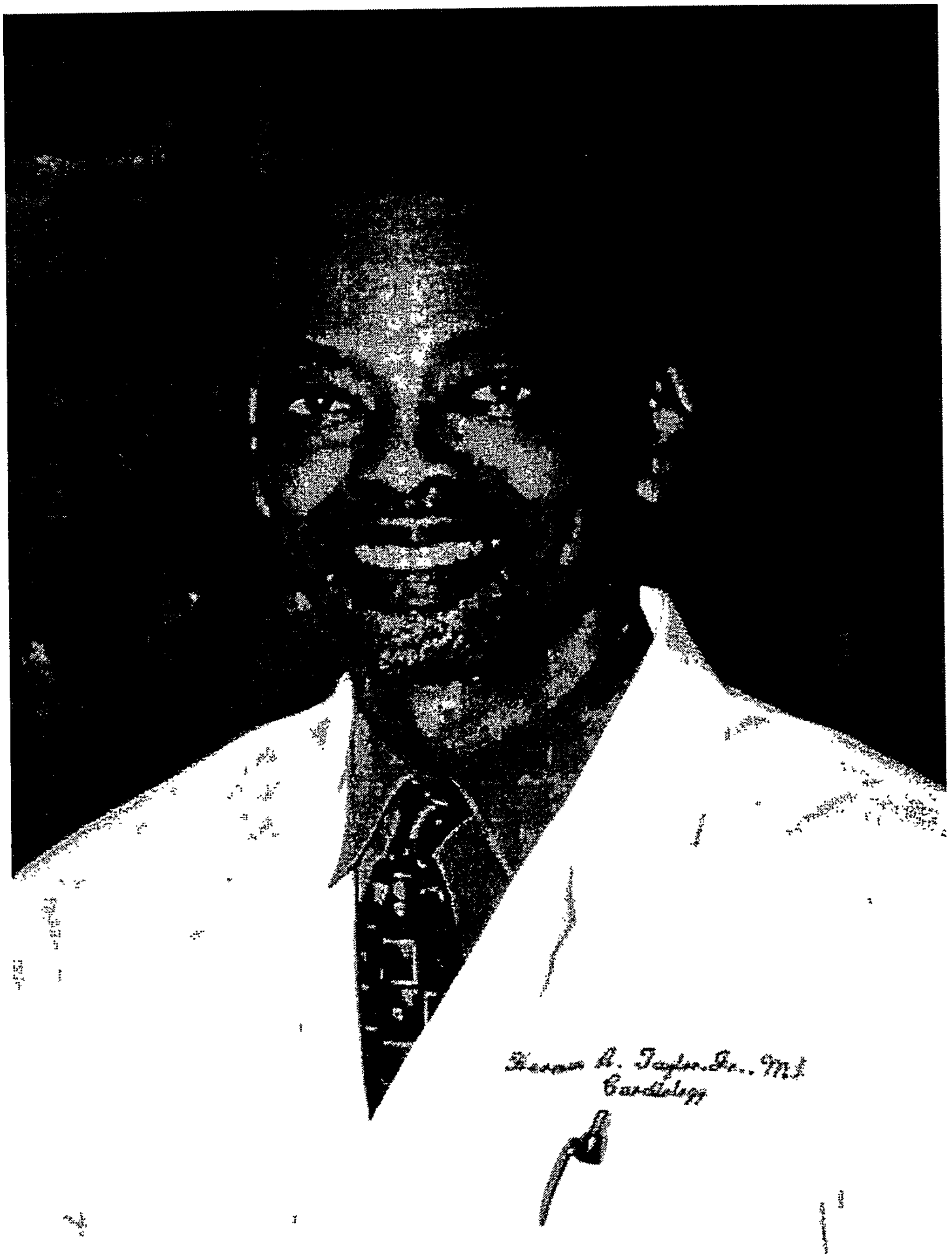
After completing a residency in Internal Medicine at the University of North Carolina at Chapel Hill and a Cardiology Fellowship at the University of Alabama in Birmingham (UAB), he was appointed to the UAB faculty and served as Attending Cardiologist at the University Hospital, the Birmingham Veterans Medical Center, and the Cooper Green Hospital. During his nine (9) years on faculty at UAB, he established clinical and research interests in preventive cardiology, acute coronary syndromes, and ethnic disparities in cardiovascular health. At UAB, Taylor was the first African-American Chief Cardiology Fellow and the first Black Cardiologist on the faculty. He was the founding Medical Director of the UAB Hospital Cardiopulmonary Rehabilitation Service and was lead investigator on several studies funded by the National Institutes of Health (NIH).

Dr. Taylor founded Heart to Heart (HTH), a non-profit organization that provides cardiac surgical services for children from the developing world. HTH, which began as a single act to save one African child with Tetralogy-of-Fallot, evolved into a program changing the lives of scores of children from five (5) continents. His dedication to patient care and research led to his receipt of multiple awards for excellence in research.

Taylor is listed as one of the Best Doctors in America. In 2005, he was named the first Aaron Shirley Chair for the Study of Health Disparities at the University of Mississippi Medical Center. In April 2008, he will be named Physician of the Year by the American Heart Association and will receive the Award of Excellence from the Thurgood Marshall Foundation. In March 2008, he was named Public Health Hero by the UAB School of Public Health, and he spoke at the first New Investigators and Minority Investigators Banquet at the American Heart Association's Council on Epidemiology and Prevention.

Dr. Herman Taylor is married to Dr. Jasmine Pugh Taylor, a Psychiatrist and Associate Vice Chancellor for Multicultural Affairs at the University of Mississippi Medical Center. They have three children: Matthew, Johnathan and Jaylen.

**The Jackson Heart Study is transforming a history of African Americans' Heart disease into a legacy of heart health.**


Herman A. Taylor, Jr., M.D.
Cardiology

# Bruce Siegel MD MPH

Dr. Bruce Siegel is a Research Professor and Director of the Center for Health Care Quality in the Department of Health Policy at the George Washington University School of Public Health and Health Services. There he oversees the Aligning Forces for Quality initiative of the Robert Wood Johnson Foundation. Much of his work has sought to measure and improve the quality of health care received by Americans, with a focus on its most vulnerable populations. His contributions have included developing innovation in reducing crowding and improving hospital patient flow, eliminating ethnic and racial disparities in care, and supporting the safety net. Dr. Siegel's research projects have included work with the Commonwealth Fund, the California Endowment, the Agency for Healthcare Research and Quality, the District of Columbia and others on quality and equity.

Dr. Siegel has previously held the positions of New Jersey Commissioner of Health, President of the New York City Health and Hospitals Corporation and President of Tampa General Healthcare. In addition, he served as a Director of the Accreditation Council for Graduate Medical Education, as a Senior Fellow at New School University, and as an advisor to the Institute of Medicine, the World Bank, hospitals, hospital associations, philanthropies, county and state governments, and pharmaceutical firms. He is a member of the Board of Stewardship Trustees of Catholic Health Initiatives.

Dr. Siegel received his AB degree from Princeton University, MD from Cornell University Medical College, and MPH from the Johns Hopkins School of Hygiene and Public Health. He is board certified in Preventive Medicine. He has written and spoken extensively on health care management, policy and public health issues. He and his wife, Dr. Maura Cooper, reside with their two daughters in Bethesda, Maryland.

# BIOGRAPHY

## Barbara V. Howard, Ph.D.

Barbara V. Howard, Ph.D. is the Senior Scientist and former president of MedStar Research Institute. She received her Ph.D. in Microbiology from the University of Pennsylvania in 1968, and currently holds faculty appointments in the Department of Medicine at Georgetown University and the Department of Biochemistry at Howard University. Formerly, she was the Associate Chief of the Phoenix Clinical Diabetes and Nutrition Section, NIDDK, National Institutes of Health. She is the past chair of the American Heart Association Council on Nutrition, Physical Activity, and Metabolism, and past Chair of the Nutrition Committee of the American Heart Association, past Chair of the Nutrition Study Section of the National Institutes of Health. She has served as a member of the NIH Expert Panel on Obesity that developed guidelines for the treatment and prevention of obesity, on ADA advisory panels to develop recommendations for management of lipids and glucose, and as a member of editorial boards for several scientific journals.

She has received the Bolton Corson Medal from the Franklin Institute for research in nutrition and atherosclerosis and the Special Recognition Award from the Arteriosclerosis Council of the American Heart Association. She was a Bierman lecturer for the American Diabetes Association, a Levy lecturer for the American Heart Association, and has received the Kelly West Award from the American Diabetes Association. Her major research interests are in cardiovascular disease, particularly in relation to diabetes and its occurrence in diverse ethnic groups. Her current research projects include the Strong Heart Study, a multi-center study of cardiovascular disease and its risk factors in American Indians; the Women's Health Initiative, a multi-center study of postmenopausal women and their health; GOCADAN, a study of the genetics of coronary artery disease in Alaska Eskimos and the SANDS study, a multi-center study to examine strategies for reducing atherosclerosis in people with diabetes.

# PANEL 1

# Disparities in Health Care

# Heart Disease 101

*What is Heart Disease and Why Does it Occur?*

Coronary heart disease is the most common form of heart disease. It is a disorder of the blood vessels of the heart that can lead to heart attack. A heart attack occurs when an artery becomes blocked, preventing oxygen and nutrients from getting to the heart. Often referred to simply as heart disease, it is one of several cardiovascular diseases, which are diseases of the heart and blood vessel system. Other cardiovascular diseases include stroke, high blood pressure, angina (chest pain), and rheumatic heart disease.

One reason some people aren't too concerned about heart disease is that they think it can be "cured" with surgery. This is a myth. Heart disease is a lifelong condition—once you get it, you'll always have it. Procedures such as bypass surgery and angioplasty can help blood and oxygen flow to the heart more easily, but the arteries remain damaged, which means you are more likely to have a heart attack. What's more, the condition of your blood vessels will steadily worsen unless you make changes in your daily habits. Many die of complications from heart disease, or become permanently disabled.

*What Are the Risk Factors?*

Risk factors are conditions or habits that make a person more likely to develop a disease. They can also increase the chances that an existing disease will get worse. Important risk factors for heart disease that you can do something about are high blood pressure, high blood cholesterol, diabetes, smoking, being overweight, being physically inactive, having a family history of early heart disease, and age.

Some risk factors, such as age and family history of early heart disease, can't be changed. For women, age becomes a risk factor at 55. After menopause, women are more apt to get heart disease, in part because their body's production of estrogen drops.

While certain risk factors cannot be changed, it is important to realize that you do have control over many others. Regardless of your age, background, or health status, you can lower your risk of heart disease—and it doesn't have to be complicated. Protecting your heart can be as simple as taking a brisk walk, whipping up a good vegetable soup, or getting the support you need to maintain a healthy weight.

*General Signs and Symptoms of Heart Disease*

The first step toward heart health is becoming aware of your own personal risk for heart disease. Some risks, such as smoking cigarettes, are obvious. But other risk factors, such as high blood pressure or high blood cholesterol, generally don't have obvious signs or symptoms. So you'll need to gather some information to create your personal "heart profile."

*Screening*

Besides keeping track of your own risks factors, you need to have all your "numbers", such as cholesterol, and blood pressure. A cardiac risk assessment is a group of tests and health factors that have been proven to indicate your chance of having a coronary event. They have been refined to indicate the degree of risk: slight, moderate, or high.

*How is Heart Disease Treated?*
Treatment will be based on many factors - including the results of the above tests and your family and personal medical and lifestyle history. The course of treatment may include surgery, catheterization, anticoagulants and other medications, among many other options.

For more information about heart disease:

National Heart, Lung, and Blood Institute

The Heart Truth

CDC's Cardiovascular Health Program

American Heart Association

U.S. Department of Health & Human Services www.hhs.gov

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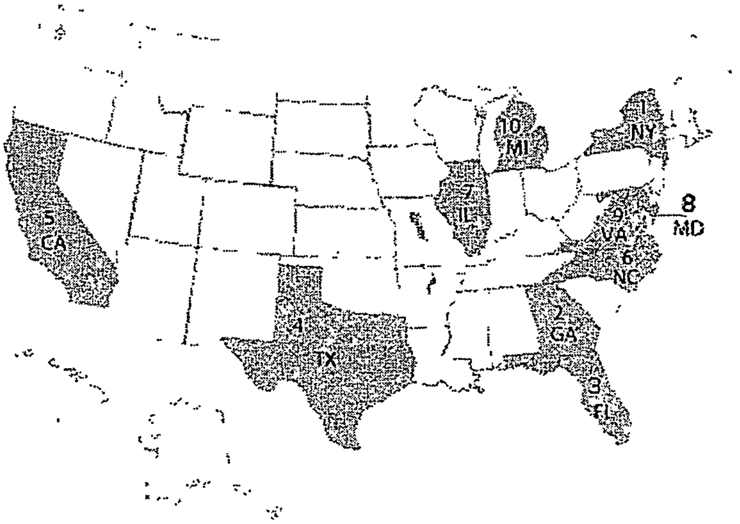
## African American Profile



(Map of the US with the top 10 states displaying the largest African American population according to the Census Bureau)

NY - CA - TX - GA - FL - NC - IL - MI - MD - VA

**Overview (Demographics):** In July 2007, 40.7 million people in the United States, or 13.5 percent of the civilian noninstitutionalized population, were Black. They are the second largest minority population, following the Hispanic/Latino population. In 2004, the majority of Blacks lived in the South (54 percent). In comparison, 67 percent (198.3 million) of the United States population was non-Hispanic White: 34 percent lived in the South. The ten states with the largest Black population in 2007 were New York, Florida, Texas, Georgia, California, Illinois, North Carolina, Maryland, Virginia, Michigan. Louisiana is no longer in the top 10, as a result of the Hurricane Katrina disaster. Combined, these 10 states represented 58% of the total Black population. Of the ten largest places in the United States with 100,000 or more population, Detroit had the largest proportion of Blacks, 83%, followed by Philadelphia (44%), and Chicago (38%).

**Educational Attainment:** In 2006, as compared to Whites 15 years and over, a lower percentage of Blacks had earned at least a high school diploma (74 percent and 85 percent, respectively). More Black women than Black men had earned at least a bachelor's degree (16 percent compared with 14 percent), while among non-Hispanic Whites, a higher proportion of men than women had earned at least a bachelor's degree (25 percent and 24 percent, respectively).

**Economics:** According to the 2007 Census Bureau report, the average African-American family median income was $33,916 in comparison to $54,920 for non-Hispanic White families. In 2007, the U.S. Census bureau reported that 24.5 percent of African-Americans in comparison to 8.2 percent of non-Hispanic Whites were living at the poverty level. In 2007, the unemployment rate for Blacks was twice that for non-Hispanic Whites (8 percent and 4 percent, respectively). This finding was consistent for both men (9 percent compared with 4 percent) and women (8 percent compared with 4 percent).

**Insurance Coverage:** In 2007, 49 percent of African-Americans in comparison to 66 non-Hispanic Whites used employer-sponsored health insurance. Also in 2007, 23.8 percent of African-Americans in comparison to 9 percent of non-Hispanic Whites relied on public health insurance. Finally, in 2007, 19.5 percent of African-Americans in comparison to 10.4 percent of non-Hispanic whites were uninsured.

**Full Census Reports:**

The Black Population: 2000 [PDF, 510KB]

The Black Population in the United States: March 2002 [PDF, 71KB]

The American Community Survey - Blacks: 2004 [PDF, 915KB]

Census Bureau, 2008. Income, Poverty, and Health Insurance Coverage in the United States: 2007 [PDF, 3MB]

**Health Conditions:** In 2005, the death rate for African Americans was higher than Whites for heart diseases, stroke, cancer, asthma, influenza and pneumonia, diabetes, HIV/AIDS, and homicide.

***Quick Facts***
**Cancer**

- In 2004, African American men were 1.4 times as likely to have new cases of lung and prostate cancer, compared to non-Hispanic white men.
- African American men were twice as likely to have new cases of stomach cancer as non-Hispanic white men.
- African Americans men had lower 5-year cancer survival rates for lung and pancreatic cancer, compared to non-Hispanic white men.
- In 2005, African American men were 2.4 times as likely to die from prostate cancer, as compared to non-Hispanic white men.
- In 2005, African American women were 10% less likely to have been diagnosed with breast cancer, however, they were 34% more likely to die from breast cancer, compared to non-Hispanic white women.
- African American women are twice as likely to be diagnosed with stomach cancer, and they were 2.4 times as likely to die from stomach cancer, compared to non-Hispanic white women.
  *For more statistics on African Americans and cancer, please click here*

**Diabetes**

- African American adults were 1.9 times more likely than non-Hispanic white adults to have been diagnosed with diabetes by a physician.
- In 2002, African American men were 2.1 times as likely to start treatment for end-stage renal disease related to diabetes, compared to non-Hispanic white men.
- In 2003, diabetic African Americans were 1.7 times as likely as diabetic Whites to be hospitalized.
- In 2005, African Americans were 2.2 times as likely as non-Hispanic Whites to die from diabetes.
  *For more statistics on African Americans and diabetes, please click here*

**Heart Disease**

- In 2005, African American men were 30% more likely to die from heart disease, as compared to non-Hispanic white men.
- African Americans were 1.4 times as likely as non-Hispanic whites to have high blood pressure.
- African American women are 1.7 times as likely as non-Hispanic white women to be obese.
  *For more statistics on African Americans and heart disease, please click here*

**HIV/AIDS**

- Although African Americans make up only 13% of the total U.S. population, they accounted for 47% of HIV/AIDS cases in 2006.
- African American males had more than 7 times the AIDS rate of non-Hispanic white males.
- African American females had more than 21 times the AIDS rate of non-Hispanic white

females.

- African American men were more than 9 times as likely to die from HIV/AIDS as non-Hispanic white men.
- African American women were more than 20 times as likely to die from HIV/AIDS as non-Hispanic white women.
  *For more statistics on African Americans and HIV/AIDS, please click* here

**Immunization**

- In 2005, African Americans aged 65 and older were 40% less likely to have received the influenza (flu) shot in the past 12 months, compared to non-Hispanic whites of the same age group.
- In 2005, African American adults aged 65 and older were 30% less likely to have ever received the pneumonia shot, compared to non-Hispanic white adults of the same age group.
- Although African American children aged 19 to 35 months had comparable rates of immunization for hepatitis, influenza, MMR, and polio, they were slightly less likely to be fully immunized, when compared to non-Hispanic white children.
  *For more statistics on African Americans and immunization, please click* here

**Infant Mortality**

- In 2005, African Americans had 2.3 times the infant mortality rate of non-Hispanic whites.
- African American infants were almost four times as likely to die from causes related to low birthweight, compared to non-Hispanic white infants.
- African Americans had 1.8 times the sudden infant death syndrome mortality rate as non-Hispanic whites.
- African American mothers were 2.6 times as likely as non-Hispanic white mothers to begin prenatal care in the 3rd trimester, or not receive prenatal care at all.
- The infant mortality rate for African American mothers with over 13 years of education was almost three times that of Non-Hispanic White mothers in 2004.
  *For more statistics on African Americans and infant mortality, please click* here

**Stroke**

- African American adults are twice as likely than their White adult counterparts to have a stroke.
- African American males were 60% more likely to die from a stroke than their White adult counterparts.
- Analysis from a CDC health interview survey reveals that African American stroke survivors were more likely to become disabled and have difficulty with activities of daily living than their non-Hispanic white counterparts.
  *For more statistics on African Americans and stroke, please click* here

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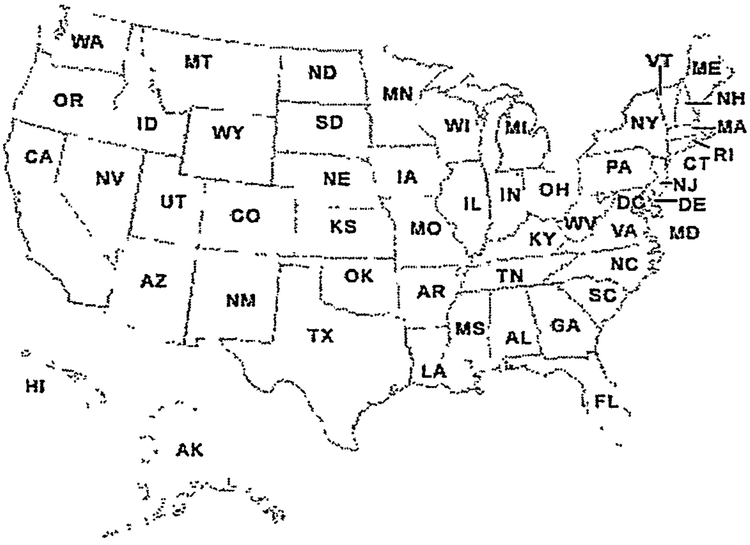
## American Indian/Alaska Native Profile



1. Aberdeen Area
2. Alaska Area
3. Albuquerque Area
4. Bemidji Area
5. Billings Area
6. California Area
7. Nashville Area
8. Navajo Area
9. Oklahoma City Area
10. Phoenix Area
11. Portland Area
12. Tucson Area

**Overview (Demographics):** This racial group includes people having origins in any of the original peoples of North, South America, and Central America, who maintain tribal affiliation or community attachment. As of 2007, there were an estimated 4.5 million people who were classified as American Indian and Alaska Native alone or American Indian and Alaska Native in combination with one or more other races. This racial group comprises 1.5 percent of the total U.S. population.

1.9 million American Indians and Alaska Natives live on reservations or other trust lands. 60 percent of American Indians and Alaska Natives live in metropolitan areas; this is the lowest metropolitan percentage of any racial group. 1.2 million American Indian and Alaska Natives are under the age of 18, which comprises 27% of this racial group.

Currently, there are 562 federally recognized (AI/AN) tribes, and more than 100 state recognized tribes. There are also tribes that are not state or federally recognized. Federally recognized tribes are provided health and educational assistance through a government agency called Indian Health Service (IHS), U.S. Department of Health and Human Services. The IHS operates a comprehensive health service delivery system for approximately 1.9 million American Indians and Alaska Natives. The majority of those who receive IHS services live mainly on reservations and in rural communities in 36 states, mostly in the western United States and Alaska. 36 percent of the IHS service area population resides in non-Indian areas, and 600,000 are served in urban clinics. Typically, this urban clientele has less accessibility to hospitals; health clinics or contract health services implanted by the IHS and tribal health programs. Studies on the urban American Indian and Alaska Native population has documented a frequency of poor health and limited health care options for this group.

Since 1972, IHS has embarked upon a series of initiatives to fund health-related activities in off-reservation settings, which will make health care services accessible to urban American Indians and Alaska Natives. Currently, the IHS funds 34 urban Indian health organizations, which operate at 41 sites located in cites throughout the United States. Approximately 600,000 American Indians and Alaska Natives are eligible to utilize this program. The thirty-four programs administer: medical services, dental services, community services, alcohol and drug abuse prevention, education and treatment, AIDS and sexually transmitted disease education and prevention services, mental health services, nutrition education and counseling services, pharmacy services, health education, optometry services, social services, and home health care.

For more information about tribal health issues:
Indian Health Service
National Indian Health Board

**Educational Attainment:** 76 percent of American Indians and Alaska Natives age 25 and over have at least a high school diploma.14 percent of American Indians and Alaska Natives age 25 and over have at least a bachelor's degree. 50,500 American Indians and Alaska Natives age 25 and over have at least an advanced graduate degree (i.e., master's, Ph.D., medical, or law).

**Economics:** The median family income for American Indian and Alaska Natives is $33,627. 26 percent of American Indians and Alaska Natives age 16 and over, work in management and professional occupations. 25 percent of this racial group lives at the poverty level.

**Insurance Coverage:** In 2006, 36 percent of American Indians and Alaska Natives had private health insurance coverage. 24 percent of AI/ANs relied on Medicaid coverage. 33 percent of AI/ANs had no health insurance coverage in 2006.

**Full Census Reports:**

The American Community Survey - American Indians and Alaska Natives: 2004 [PDF, 3.5MB]

We the People: American Indians and Alaska Natives in the United States, February 2006 [PDF, 755KB]

American Indian and Alaska Native Tribes for the United States, Regions, Divisions, and States

Census Bureau, 2008. Income, Poverty, and Health Insurance Coverage in the United States: 2007 [PDF, 3MB]

**Health:** It is significant to note that American Indians/Alaska Natives frequently contend with issues that prevent them from receiving quality medical care. These issues include cultural barriers, geographic isolation, inadequate sewage disposal, and low income.

Some of the leading diseases and causes of death among AI/AN are heart disease, cancer, unintentional injuries (accidents), diabetes, and stroke. American Indians/Alaska Natives also have a high prevalence and risk factors for mental health and suicide, obesity, substance abuse, sudden infant death syndrome (SIDS), teenage pregnancy, liver disease, and hepatitis.

**Other Health Concerns:** American Indians and Alaska Natives have an infant death rate 40 percent higher than the rate for Caucasians. AI/ANs are twice as likely to have diabetes than Caucasians. An example is the Pima of Arizona, who have one of the highest diabetes rates in the world. AI/ANs also have disproportionately high death rates from unintentional injuries and suicide. In 2007, the tuberculosis rate for AI/NAs was 5.9, as compared to 1.1 for the White population.

***Quick Facts***

**Cancer**

- From 2001-2005, American Indian/Alaska Native men are twice as likely to have liver & IBD cancer as non-Hispanic White men.
- American Indian/Alaska Native men are 1.8 times as likely to have stomach cancer as non-Hispanic White men, and are over twice as likely to die from the same disease.
- American Indian/Alaska Native women are 2.4 times more likely to have, and to die from, liver

& IBD cancer, as compared to non-Hispanic White women.

- American Indian/Alaska Native women are 40% more likely to have kidney/renal pelvis cancer as non-Hispanic White women.

*For more statistics on American Indians/Alaska Natives and cancer, please click* here

**Diabetes**

- American Indian/Alaska Native adults were 2.3 times as likely as white adults to be diagnosed with diabetes.
- American Indians/Alaska Natives were twice as likely as non-Hispanic whites to die from diabetes in 2005.
- American Indian/Alaska Native adults were 1.6 times as likely as White adults to be obese.
- American Indian/Alaska Native adults were 1.3 times as likely as White adults to have high blood pressure.

*For more statistics on American Indians/Alaska Natives and diabetes, please click* here

**Heart Disease**

- American Indian/Alaska Native adults are 1.2 times as likely as White adults to have heart disease.
- American Indian/Alaska Native adults are 1.4 times as likely as White adults to be current cigarette smokers.
- American Indian/Alaska Native adults are 1.6 times as likely as White adults to be obese.
- American Indian/Alaska Native adults are 1.3 times as likely as White adults to have high blood pressure.

*For more statistics on American Indians/Alaska Natives and heart disease, please click* here

**HIV/AIDS**

- American Indian/Alaska Natives have a 30% higher AIDS rates than non-Hispanic white counterparts.
- American Indian/Alaska Native men have a 20% higher AIDS rate compared to non-Hispanic white men.
- American Indian/Alaska Native women have twice the AIDS rate of non-Hispanic white women.

*For more statistics on American Indian/Alaska Natives and HIV/AIDS, please click* here

**Immunization**

- In 2005, American Indian/Alaska Native children ages 19 to 35 months received the recommended doses of vaccines for measles, mumps, rubella, Hib, polio, and chicken pox at the same rate as non-Hispanic white children.
- In 2005, American Indian/Alaska Native adults ages 18 to 64 years were slightly more likely than their non-Hispanic white counterparts to have received the influenza (flu) shot in the past 12 months.

*For more statistics on American Indian/Alaska Natives and immunization, please click* here

**Infant Mortality**

- American Indian/Alaska Natives have 1.4 times the infant mortality rate as non-Hispanic whites.
- American Indian/Alaska Native babies are twice as likely as non-Hispanic white babies to die from sudden infant death syndrome (SIDS), and they are 1.3 times as likely to die from complications related to low birthweight or congenital malformations compared to non-Hispanic whites babies.
- American Indian/Alaska Native infants are 3.6 times as likely as non-Hispanic white infants to have mothers who began prenatal care in the 3rd trimester or did not receive prenatal care at all.

*For more statistics on American Indian/Alaska Natives and infant mortality, please click* here

**Stroke**

- In general, American Indian/Alaska Native adults are 60% more likely to have a stroke than their White adult counterparts.
- American Indian/Alaska Native women have twice the rate of stroke than White women.
- American Indian/Alaska Native adults are more likely to be obese than White adults and they

are more likely to have high blood pressure, compared to White adults.
*For more statistics on American Indian/Alaska Natives and stroke, please click here*

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## Asian American/Pacific Islander Profile

(Map of the US with the top 10 states displaying the largest Asian American population according to the Census Bureau)

CA - NY - HI - TX - NJ - IL - WA - FL - VA - MA

**Overview (Demographics):** This racial group is defined as people having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent. According to the 2007 Census Bureau population estimate, there are 15.2 million Asian Americans living in the United States. Asian Americans account for 5 percent of the nation's population. This number represents an increase of 63 percent from the 1990 census, thus making Asian-Americans the fastest growing of all major racial/ethnic groups. In 2007, the following states have the largest Asian-American populations: California, New York, Hawaii, Texas, New Jersey and Illinois.

**Language Fluency:** The percentage of persons 5 years or older who do not speak English at home varies among Asian American groups: 62 percent of Vietnamese, 50 percent of Chinese, 24 percent of Filipinos and 23 percent of Asian Indians are not fluent in English.

**Educational Attainment:** According to the 2006 U.S. Census data, roughly 83 percent of both all Asians and all people in the United States 25 and older had at least a high school diploma. However, 42 percent of Asian Americans in comparison to 27 percent of the total U.S. population had earned at least a bachelor's degree. Among Asian subgroups, Asian Indians had the highest percentage of bachelor's degree attainment at 64 percent. In regards to employment, about 45 percent of Asian Americans were employed in management, professional and related occupations, compared with 34 percent of the total population. In addition, the proportions employed in high-skilled and managerial sectors varied from 13 percent for Laotians to 60 percent for Asian Indians.

**Economics:** According to 2007 Census data, the median family income of Asian American families is $15,600 higher than the national median income for all households. 10 percent of Asian Americans compared to 8.2 percent of non-Hispanic Whites live at the poverty. 2.2 percent of Asian Americans compared to 1.3 percent of Caucasians live on public assistance.

**Insurance Coverage:** By 2003, insurance coverage among Asian American subgroups varied. Private insurance coverage rates: 75.8 percent for Vietnamese, 81.5 percent for Filipino, 84.2 percent for Chinese and 81.3 percent for other Asian groups. Public insurance coverage rates : 11.2 percent for Vietnamese, 4.9 percent for Filipino, 3.8 percent for Chinese and 5.5 percent for other Asian groups. Asian subgroups also varied within uninsured status: 13.0 percent for Vietnamese, 13.6 percent for Filipino, 12.0 percent for Chinese and 13.2 percent for other Asian groups.

In 2007, the overall insurance coverage for Asian Americans was 83.9%, as compared to 89.6% for the non-Hispanic White population.

**Full Census Reports:**

The Asian Population: 2000 [PDF, 420KB]

We the People: Asians in the United States, December 2004 [PDF, 480KB]

The American Community Survey - Asians: 2004 [PDF, 1.1MB]

The American Community Survey - Pacific Islanders: 2004 [PDF, 3.5MB]

Language Use and English-Speaking Ability: 2000 [PDF, 482KB]

Census Bureau, 2008. Income, Poverty, and Health Insurance Coverage in the United States: 2007 [PDF, 3MB]

**Health:** It is significant to note that Asian American women have the highest life expectancy (85.8 years) of any other ethnic group in the U.S. Life expectancy varies among Asian subgroups: Filipino (81.5 years), Japanese (84.5 years), and Chinese women (86.1 years). However, Asian Americans contend with numerous factors which may threaten their health. Some negative factors are infrequent medical visits due to the fear of deportation, language/cultural barriers, and the lack of health insurance. Asian Americans are most at risk for the following health conditions: cancer, heart disease, stroke, unintentional injuries (accidents), and diabetes. Asian Americans also have a high prevalence of the following conditions and risk factors: chronic obstructive pulmonary disease, hepatitis B, HIV/AIDS, smoking, tuberculosis, and liver disease.

**Other Health Concerns:** In 2007, tuberculosis was 24 times more common among Asians, with a case rate of 26.3 as compared to 1.1 for the White population. In 2006, Asian Americans were 1.2 times more likely to have Hepatitis B than Whites.

### *Quick Facts*

### Cancer

- Asian/Pacific Islander men were 40% less likely to have prostate cancer as non-Hispanic white men.
- Asian/Pacific Islander women were 30% less likely to have breast cancer as non-Hispanic white women.
- Both Asian/Pacific Islander men and women have three times the incidence of liver & IBD cancer as the non-Hispanic white population.
- Asian/Pacific Islander men are twice as likely to die from stomach cancer as compared to the non-Hispanic white population, and Asian/Pacific Islander women are 2.6 times as likely to die from the same disease.
  *For more statistics on Asian/Pacific Islanders and cancer, please click here*

### Diabetes

- In Hawaii, Native Hawaiians have more than twice the rate of diabetes as Whites.
- Asians are 20% less likely than non-Hispanic whites to die from diabetes.
- In Hawaii, Native Hawaiians are more than 5.7 times as likely as Whites living in Hawaii to die from diabetes.
- Filipinos living in Hawaii have more than 3 times the death rate as Whites living in Hawaii.
  *For more statistics on Asian/Pacific Islanders and diabetes, please click here*

### Heart Disease

- Overall, Asian/Pacific Islander adults are less likely than white adults to have heart disease and they are less likely to die from heart disease compared to non-Hispanic whites.
  *For more statistics on Asian/Pacific Islanders and heart disease, please click* here

### HIV/AIDS

- Asian/Pacific Islanders have lower AIDS rates than non-Hispanic white counterparts and they are less likely to die of HIV/AIDS.
- One Asian/Pacific Islander child was diagnosed with AIDS in 2006.
  *For more statistics on Asian/Pacific Islanders and HIV/AIDS, please click* here

### Immunization

- In 2005, Asian/Pacific Islander adults aged 65 years and older were 40% less likely to have ever received the pneumonia shot, compared to non-Hispanic white adults of the same age group.
- In 2005, Asian/Pacific Islander children aged 19 to 35 months reached the Healthy People goal for immunizations for Hib (haemophilus influenzae type b), hepatitis B, MMR (measles-mumps-rubella), polio and chicken pox.
  *For more statistics on Asian/Pacific Islanders and immunization, please click* here

### Infant Mortality

- Among Asian/Pacific Islanders, sudden infant death syndrome (SIDS) is the fourth leading cause of infant mortality.
- The infant mortality rate for Asian/Pacific Islanders was 40% greater for mothers under 20 years old, as compared to mothers, ages 25-29 years old.
  *For more statistics on Asian/Pacific Islanders and infant mortality, please click* here

### Stroke

- In general, Asians/Pacific Islander adults are less likely to die from a stroke.
- In general, Asian/Pacific Islander adults have lower rates of being overweight or obese, lower rates of hypertension, and they are less likely to be current cigarette smokers, as compared to white adults.
  *For more statistics on Asian/Pacific Islanders and stroke, please click* here

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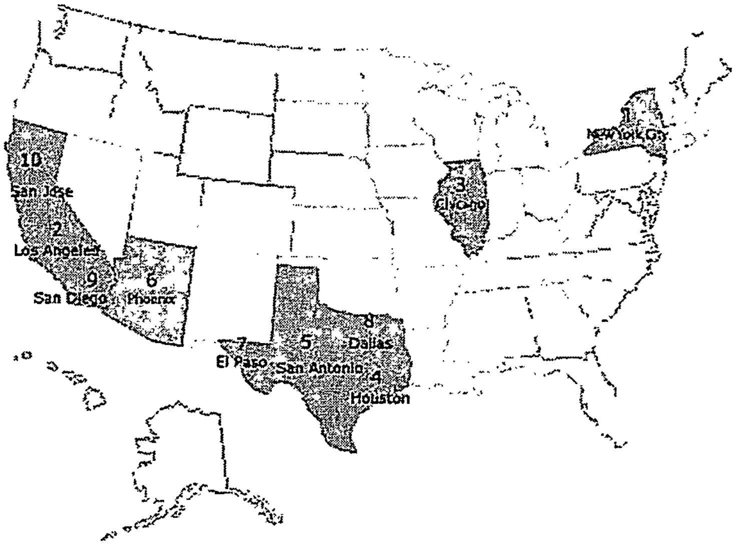
# Hispanic/Latino Profile



(Map of the US with the top 10 cities displaying the largest Hispanic/Latino population according to the Census Bureau)

New York City, NY - Los Angeles, CA - Chicago, IL - Houston, TX - San Antonio, TX - Phoenix, AZ - El Paso, TX - Dallas County, TX - San Diego, CA - San Jose, CA

**Overview (Demographics):** This ethnic group includes any person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. According to the 2007 U.S. Census Bureau population estimate, there are roughly 45.5 million Hispanics living in the United States. This group represents 15 percent of the U.S. total population. In 2004, among Hispanic subgroups, Mexicans rank as the largest at 66 percent. Following Mexicans are: Central and South Americans (13 percent), Puerto Ricans (9.4 percent), Cubans (3.9 percent) and the remaining 7.5 percent are people of other Hispanic origins. In 2007, States with the largest Hispanic populations are California (13 million), Texas (8.6 million), New York (3 million), Florida (3.8 million), and Illinois (1.9 milion). Another significant point is that in 2004, 34.3 percent of Hispanics were under the age 18 in comparisons to 22.3 percent of non-Hispanic Whites. Among Hispanics, Mexicans have the largest proportion of people under age 18, at 36 percent.

**Language Fluency:** A 2002 study conducted by the Pew Hispanic Center concluded that language fluency varies among Hispanic subgroups who reside within the mainland United States. The number of Hispanics who speak only English at home: 3.9 million for Mexicans, 763,875 for Puerto Ricans, 163,599 for Cubans and 1.8 million for other Hispanic/Latino groups. The number of Hispanics who speak Spanish at home: 14.5 million for Mexicans, 2.3 million for Puerto Ricans, 1 million for Cubans and 6.7million for other Hispanic/Latino groups. Nationally, 12 percent of the population spoke Spanish at home in 2006.

**Educational Attainment:** According to a 2006 U.S. Census Bureau report, 55 percent of Hispanics in comparison to 85 percent non-Hispanic Whites have a high school diploma. 10 percent of Hispanics in comparison to 24.6 percent of non-Hispanic whites have a bachelor's degree.

**Economics:** According to a 2006 U.S. Census Bureau report, 24.4 percent of Hispanics, in comparison to 13.7 percent non-Hispanic Whites, work within service occupations. 16.6 percent of Hispanics in comparison to 39.9 percent of Whites work in managerial or professional occupations. Among full-time year-round workers in 2007, 55 percent of Hispanic households, in comparison to 68.2 percent of non-Hispanic White households earned $35,000 or more. According to the same 2007 study, 21.5 percent of Hispanics in comparison to 8.2 percent of non-Hispanic Whites were living at the poverty level.

**Insurance Coverage:** It is significant to note that Hispanics have the highest uninsured rates of any racial or ethnic group within the United States. In 2004 the Centers for Disease Control and Prevention reported that private insurance coverage among Hispanic subgroups varied as follows: 39.1 percent of Mexicans, 47.3 percent of Puerto Ricans, 57.9 percent of Cubans, 45.1 percent of other Hispanic and Latino groups. 2004 Medicaid coverage varied among Hispanic subgroups: 22.4 percent of Mexicans, 29.1 percent of Puerto Ricans, 17.9 of Cubans, and 20.8 percent of other Hispanic or Latino groups. Those without health insurance coverage varied among Hispanic subgroups: 37.6 percent of Mexicans, 20.4 percent of Puerto Ricans, 22.8 percent of Cubans and 32.3 percent of other Hispanic or Latino groups. In 2007, 32.1 percent of the Hispanic population was not covered by health insurance, as compared to 10.4 percent of the non-Hispanic White population.

**Full Census Reports:**

We the People: Hispanics in the United States [PDF, 421KB]

The American Community Survey - Hispanics: 2004 [PDF, 1MB]

Language Use and English-Speaking Ability: 2000 [PDF, 482KB]

Census Bureau, 2008. Income, Poverty, and Health Insurance Coverage in the United States: 2007 [PDF, 3MB]

**Pew Hispanic Center Reports**

State and Country databases
http://pewhispanic.org/states/

Interactive Maps
http://pewhispanic.org/data/maps/

Demographic Profiles
http://pewhispanic.org/data/profiles/

**Health:** Hispanic health is often shaped by factors such as language/cultural barriers, lack of access to preventive care, and the lack of health insurance. The Centers for Disease Control and Prevention has cited some of the leading causes of illness and death among Hispanics, which include heart disease, cancer, unintentional injuries (accidents), stroke, and diabetes. Some other health conditions and risk factors that significantly affect Hispanics are: asthma, chronic obstructive pulmonary disease, HIV/AIDS, obesity, suicide, and liver disease.

**Other Health Concerns:** Hispanics have higher rates of obesity than non-Hispanic Caucasians. There are also disparities among Hispanic subgroups. For instance, while the rate of low birth weight infants is lower for the total Hispanic population in comparison to non-Hispanic Caucasians, Puerto Ricans have a low birth weight rate that is 50 percent higher than the rate for non-Hispanic Caucasians. Also Puerto Ricans also suffer disproportionately from asthma, HIVAIDS and infant mortality. Mexican-Americans suffer disproportionately from diabetes.

***Quick Facts***

**Cancer**

- In 2004, Hispanic men were 13% less likely to have prostate cancer as non-Hispanic white men.
- In 2004, Hispanic women were 33% less likely to have breast cancer as non-Hispanic white women.
- Hispanic men and women have higher incidence and mortality rates for stomach and liver cancer.
- In 2004, Hispanic women were twice as likely as non-Hispanic white women to be diagnosed

with cervical cancer.
*For more statistics on Hispanics and cancer, please click here*

### Diabetes

- Mexican American adults were 2 times more likely than non-Hispanic white adults to have been diagnosed with diabetes by a physician.
- In 2002, Hispanics were 1.5 times as likely to start treatment for end-stage renal disease related to diabetes, as compared to non-Hispanic white men.
- In 2005 Hispanics were 1.6 times as likely as non-Hispanic Whites to die from diabetes.
  *For more statistics on Hispanics and diabetes, please click here*

### Heart Disease

- In 2006, Hispanics were 10% less likely to have heart disease, as compared to non-Hispanic whites.
- In 2005 Mexican American men were 30% less likely to die from heart disease, as compared to non-Hispanic white men.
- Mexican American women were 1.2 times more likely than non-Hispanic white women to be obese.
  *For more statistics on Hispanics and heart disease, please click here*

### HIV/AIDS

- Hispanics accounted for 18% of HIV/AIDS cases in 2006.
- Hispanic males had over 3 times the AIDS rate as non-Hispanic white males.
- Hispanic females had over 5 times the AIDS rate as non-Hispanic white females.
- Hispanic men were 2.5 times as likely to die from HIV/AIDS as non-Hispanic white men.
- Hispanic women were 3 times as likely to die from HIV/AIDS as non-Hispanic white women in 2005.
  *For more statistics on Hispanics and HIV/AIDS, please click here*

### Immunization

- In 2005 Hispanic adults aged 65 and older were 10% less likely to have received the influenza (flu) shot in the past 12 months, as compared to non-Hispanic whites of the same age group.
- In 2005, Hispanic adults aged 65 and older were 50% less likely to have ever received the pneumonia shot, as compared to non-Hispanic white adults of the same age group.
- Although Hispanic children aged 19 to 35 months had comparable rates of immunization for hepatitis, influenza, MMR, and polio, they were slightly less likely to be fully immunized, when compared to non-Hispanic white children.
  *For more statistics on Hispanics and immunization, please click here*

### Infant Mortality

- In 2005, infant mortality rates for Hispanic subpopulations ranged from 4.4 per 1,000 live births to 8.3 per 1,000 live births, compared to the non-Hispanic white infant mortality rate of 5.8 per 1,000 live births.
- In 2005, Puerto Ricans had 1.4 times the infant mortality rate of non-Hispanic whites.
- Puerto Rican infants were twice as likely to die from causes related to low birthweight, as compared to non-Hispanic white infants.
- Mexican American mothers were 2.5 times as likely as non-Hispanic white mothers to begin prenatal care in the 3rd trimester, or not receive prenatal care at all.
  *For more statistics on Hispanics and infant mortality, please click here*

### Stroke

- In 2005, Hispanic men were 15% less likely to die from a stroke than non-Hispanic white men.
- In 2005 Hispanic women were 25% less likely to die from a stroke than non-Hispanic white women.
  *For more statistics on Hispanics and stroke, please click here*

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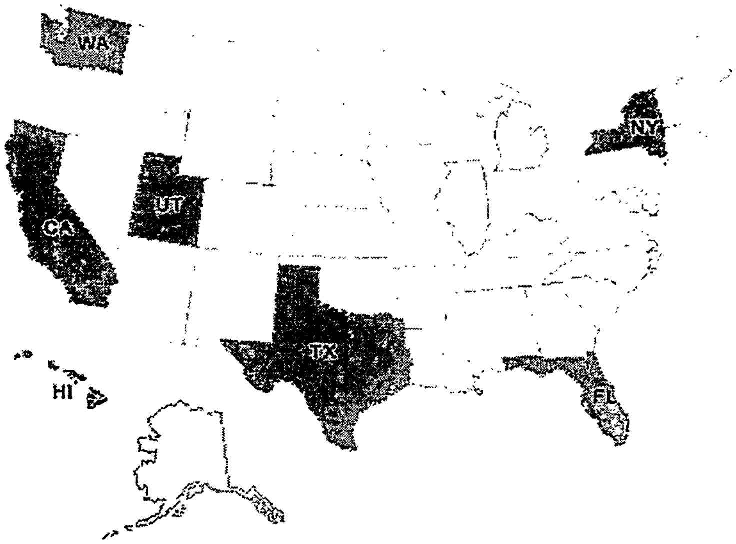
**Content Browser**

Content Index > Data/Statistics > Native Hawaiian and Other Pacific Islanders

## Native Hawaiians/Other Pacific Islanders Profile



(Map of the US with the states that have significant
Native Hawaiian/Pacific Islander populations according to the Census Bureau)

**Overview (Demographics):** This racial group refers to people having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands. According to the 2007 U.S. Census Bureau estimate, there are roughly 1,118,000 Native Hawaiians/Pacific Islanders who reside within the United States. This group represents about 0.1 percent of the U.S. population. Out of that number, 269,306 Native Hawaiians or Pacific Islanders reside in Hawaii. Some other states that have a significant Native Hawaiian/Pacific islander population are: California, Washington, Texas, New York, Florida, and Utah. It is also significant to note that 30 percent of this group is under the age 18.

**Educational Attainment:** 84 percent of Native Hawaiians/Pacific Islanders have high school diplomas. 10 percent of Native Hawaiians/Pacific Islanders have a bachelor's degree in comparison to 27 percent of Caucasians. 4 percent of Native Hawaiians/Pacific Islanders have obtained graduate degrees in comparison to 11 percent of Caucasian Americans. 42 percent of Native Hawaiians/Pacific Islanders speak a language other than English at home.

**Economics:** Native Hawaiian/Pacific Islander average family size is 4. The median household income for this group is $50,992.

**Full Census Reports:**

We the People: Pacific Islanders in the United States [PDF, 651KB]

The American Community Survey - Pacific Islanders: 2004 [PDF, 3.5MB]

Census Bureau, 2008. Income, Poverty, and Health Insurance Coverage in the United States: 2007 [PDF, 3MB]

**Health:** It is significant to note that in comparison to other ethnic groups, Native Hawaiians/ Pacific Islanders have higher rates of smoking, alcohol consumption, and obesity. This group also has little access to cancer prevention and control programs. Some leading causes of death among Native Hawaiians/Pacific Islanders include: cancer, heart disease, unintentional injuries (accidents), stroke and diabetes. Some other health conditions and risk factors that are prevalent among Native Hawaiians and Pacific Islanders are hepatitis B, HIV/AIDS, and tuberculosis.

**Other Health Concerns:** The infant mortality rate(deaths per 1,000 live births) for Native Hawaiians in 2002 was 9.6, higher than the rate for all Asian-American/Pacific Islander groups combined (4.8) and for all population(7.0).The tuberculosis rate(cases per 100,000) in 2007 was 21 times higher for Native Hawaiian/Pacific Islanders, with a case rate of 23.0, as compared to 1.1 for the White population.

### *Quick Facts*

### Cancer

- Asian/Pacific Islander men are 40% less likely to have prostate cancer as non-Hispanic white men.
- Asian/Pacific Islander women are 30% less likely to have breast cancer as non-Hispanic white women.
- Both Asian/Pacific Islander men and women have three times the incidence of liver & IBD cancer as the non-Hispanic white population.
- Asian/Pacific Islander men are twice as likely to die from stomach cancer as compared to the non-Hispanic white population, and Asian/Pacific Islander women are 2.6 times as likely to die from the same disease.
  *For more statistics on Asian/Pacific Islanders and cancer, please click* here

### Diabetes

- In Hawaii, Native Hawaiians have more than twice the rate of diabetes as Whites.
- Asians are 20% less likely than non-Hispanic whites to die from diabetes.
- In Hawaii, Native Hawaiians are more than 5.7 times as likely as Whites living in Hawaii to die from diabetes.
- Filipinos living in Hawaii have more than 3 times the death rate of Whites living in Hawaii.
  *For more statistics on Asian/Pacific Islanders and diabetes, please click* here

### Heart Disease

- Overall, Asian/Pacific Islander adults are less likely than white adults to have heart disease and they are less likely to die from heart disease.
- Asian/Pacific Islanders are 40% more likely to be diagnosed with heart disease compared to non-Hispanic whites.
  *For more statistics on Asian/Pacific Islanders and heart disease, please click* here

### HIV/AIDS

- While Native Hawaiians and Other Pacific Islanders (NHOPI) represent 0.3% of the total population in the United States, the AIDS case rate for NHOPI was twice that of the White population in 2007.
- The total number or reported AIDS cases has declined over the past five years for the White population, however it has continued to increase in the Native Hawaiian/Pacific Islander populations.
  *For more statistics on Native Hawaiian/Pacific Islanders and HIV/AIDS, please click* here

### Immunization

- In 2005, Asian/Pacific Islander adults aged 65 years and older were 40% less likely to have ever received the pneumonia shot, compared to non-Hispanic white adults of the same age group.
- In 2005, Asian/Pacific Islander children aged 19 to 35 months reached the Healthy People goal for immunizations for Hib (haemophilus influenzae type b), hepatitis B, MMR (measles-mumps-rubella), polio and chicken pox.
  *For more statistics on Asian/Pacific Islanders and immunization, please click* here

**Infant Mortality**

- Among Asian/Pacific Islanders, sudden infant death syndrome (SIDS) is the fourth leading cause of infant mortality.
- The infant mortality rate for Asian/Pacific Islanders was 40% greater for mothers under 20 years old, as compared to mothers, ages 25-29 years old.
  *For more statistics on Asian/Pacific Islanders and infant mortality, please click* here

**Stroke**

- In general, Asians/Pacific Islander adults are less likely to die from a stroke.
- In general, Asian/Pacific Islander adults have lower rates of being overweight or obese, lower rates of hypertension, and they are less likely to be current cigarette smokers, as compared to white adults.
  *For more statistics on Asian/Pacific Islanders and stroke, please click* here

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## Heart Disease Data/Statistics

Heart disease is the leading killer across most racial and ethnic minority communities in the United States, accounting for 27% of all deaths in 2005.

African American men are 30% more likely to die from heart disease than non-Hispanic white males. This occurs despite the fact that 10% of African Americans have heart disease vs. 12% of whites. Some 31.6% of African Americans have hypertension compared to 22.4% of whites, in 2006.

Mexican Americans, who make up the largest share of the U.S. Hispanic population, suffer in greater percentages than Whites from overweight and obesity, two of the leading risk factors for heart disease. Premature death was higher for Hispanics (23.5%) than non-Hispanics (16.5%). In 2005, the Asian and Pacific Islander community, 29.5 percent of deaths are caused by heart disease. In 2001, the number of premature deaths (<65 years) from heart disease was greatest among American Indians or Alaska Natives (36%) and lowest among whites.

### Quick Facts

- African Americans are 1.4 times as likely as non-Hispanic whites to have high blood pressure.
- American Indian/Alaska Native adults are 1.3 times as likely as White adults to have high blood pressure.
- Overall, Asian/Pacific Islander adults are less likely than white adults to have heart disease and they are less likely to die from heart disease.
- Mexican American women are 1.2 times more likely than non-Hispanic white women to be obese.

For more statistics on **African Americans** and heart disease, please click here

For more statistics on **American Indians/Alaska Natives** and heart disease, please click here

For more statistics on **Asian Americans/Pacific Islanders** and heart disease, please click here

For more statistics on **Hispanic Americans** and heart disease, please click here

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# LAWS

*Emergency Medical Treatment and Active Labor Act* - The Emergency Medical Treatment and Active Labor Act, also known as the Patient Anti-dumping Act, requires hospitals that participate in the Medicare program that have emergency departments to treat all patients (including women in labor) in an emergency without regard to their ability to pay. Hospitals that fail to provide language assistance to persons of limited-English proficiency are potentially liable to Federal authorities for civil penalties, as well as relief to the extent deemed appropriate by a court.

*The Hill-Burton Act* - The Hill-Burton Act, enacted by Congress in 1946, encouraged the construction and modernization of public and nonprofit community hospitals and health centers. In return for receiving these funds, recipients agreed to comply with a "community service obligation," one of which is a general principle of non-discrimination in the delivery of services. The Office of Civil Rights has consistently interpreted this as an obligation to provide language assistance to those in need of such services.

*Medicaid* - Medicaid regulations require Medicaid providers and participating agencies, including long-term care facilities, to render culturally and linguistically appropriate services. The Health Care Financing Administration, the Federal agency that oversees Medicaid, requires that states communicate both orally and in writing "in a language understood by the beneficiary" and provide interpretation services at Medicaid hearings.

*Medicare* - Medicare addresses linguistic access in its reimbursement and outreach education policies. Medicare "providers are encouraged to make bilingual services available to patients wherever the services are necessary to adequately serve a multilingual population." Medicare reimburses hospitals for the cost of the provision of bilingual services to patients.

*Title VI of the Civil Rights Act of 1964* - "No person in the United States shall, on ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

# UNEQUAL TREATMENT

## CONFRONTING RACIAL AND ETHNIC DISPARITIES IN HEALTH CARE

Brian D. Smedley, Adrienne Y. Stith, and
Alan R. Nelson, Editors

Committee on Understanding and Eliminating
Racial and Ethnic Disparities in Health Care

Board on Health Sciences Policy

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# 1

# Introduction and Literature Review

Despite steady improvement in the overall health of the U.S. population, racial and ethnic minorities, with few exceptions, experience higher rates of morbidity and mortality than non-minorities. African Americans, for example, experience the highest rates of mortality from heart disease, cancer, cerebrovascular disease, and HIV/AIDS than any other U.S. racial or ethnic group. American Indians disproportionately die from diabetes, liver disease and cirrhosis, and unintentional injuries. Hispanic Americans are almost twice as likely as non-Hispanic whites to die from diabetes. In addition, some Asian-American subpopulations experience rates of stomach, liver, and cervical cancers that are well above national averages. The reasons for these health status disparities are complex and poorly understood, but may largely reflect socioeconomic differences, differences in health-related risk factors, environmental degradation, and direct and indirect consequences of discrimination (Williams, 1999).

Differences in access to healthcare are also likely to play a role in these health disparities. Hispanics, Asian Americans, American Indians and Alaska Natives, and African Americans are less likely than whites to have health insurance, have more difficulty getting healthcare, and have fewer choices in where to receive care. Hispanic and African-American patients are also more likely to receive care in hospital emergency rooms, and are less likely than whites to have a regular primary care provider (Collins, Hall, and Neuhaus, 1999).

Concern is growing, however, that even at equivalent levels of access to care, racial and ethnic minorities experience a lower quality of health services and are less likely to receive even routine medical procedures than whi[illegible]mericans. For example, relative to whites, African Americans and Hispanics are less likely to receive appropriate cardiac medication (e.g., thrombolytic therapy, aspirin and beta blockers) or to undergo coronary artery bypass surgery, even when variations in such factors as insurance status, income, age, co-morbid conditions, and symptom expression are taken into account (Ayanian et al., 1993; Hannan et al., 1999; Ramsey et al., 1997; Johnson et al., 1993; Canto et al., 2000). African Americans with end-stage renal disease are less likely to receive peritoneal dialysis and kidney transplantation (Kasiske, London, and Ellison, 1998; Barker-Cummings, McClellan, Soucie, and Krisher, 1995; Gaylin et al., 1993), and African-American and Hispanic patients with bone fractures seen in hospital emergency departments are less likely than whites to receive analgesia (Todd et al., 2000; Todd, Samaroo, and Hoffman, 1993). In terms of quality of care, a recent study of Medicare patients revealed that African-American patients with congestive heart failure or pneumonia received poorer quality care than whites, using explicit process criteria and implicit review by physicians (Ayanian, Weissman, Chasen-Taber, and Epstein, 1999). Further, these differences are associated with greater mortality among African-American patients (Peterson et al., 1997).

## STUDY CHARGE AND COMMITTEE ASSUMPTIONS

These disparities prompted Congress in 1999 to request an Institute of Medicine (IOM) study to assess disparities in the kinds and quality of healthcare received by U.S. racial and ethnic minorities and non-minorities. Specifically, Congress requested that the IOM:

- Assess the extent of racial and ethnic differences in healthcare that are not otherwise attributable to known factors such as access to care (e.g., ability to pay or insurance coverage);
- Evaluate potential sources of racial and ethnic disparities in healthcare, including the role of bias, discrimination, and stereotyping at the individual (provider and patient), institutional, and health system levels; and
- Provide recommendations regarding interventions to eliminate healthcare disparities.

In its interpretation of the charge, the study committee assumes responsibility for assessing variation in the quality of healthcare services provided to individuals of different racial and ethnic backgrounds, independently of patients' insurance status, education, income, or other factors that are known to affect access to care. This is a somewhat artificial and difficult distinction, as many access-related factors, such as the type

of health insurance coverage that healthcare consumers purchase or ar provided, as well as their level of education and other unmeasured a pects of socioeconomic status (e.g., assertiveness in seeking care) signifi cantly affect the quality and intensity of healthcare that they receive, an are highly correlated with race and ethnicity. The relationship of thes variables to healthcare quality is therefore highlighted where appropriat in this report. For purposes of addressing the study charge, however, th committee's focus extends only to the direct and indirect effects of rac and ethnicity in the process, structure, and outcomes of healthcare.

Further, the committee assumes that *healthcare* refers to the continuu of services provided in traditional healthcare settings—including public and private clinics, hospitals, community health centers, nursing homes, and other healthcare facilities—as well as home-based care. These include services provided by a range of healthcare professionals, including physicians, nurses, physician assistants, psychologists, and other licensed professionals. The term *healthcare services* refers to the provision of preventive, diagnostic, rehabilitative and/or therapeutic medical or health services to individuals or populations. *Quality of care* refers to the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. These definitions, and their interrelationship, are best summarized in the 1999 IOM report, *Measuring the Quality of Health Care*:

> The IOM stated . . . that "quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (IOM, 1990, p. 21). This definition has been widely accepted and has proven to be a robust and useful reference in the formulation of practical approaches to quality assessment and improvement (Blumenthal, 1996). Several ideas in this definition deserve elaboration.
>
> The term *health services* refers to a wide array of services that affect health, including those for physical and mental illnesses. Furthermore, the definition applies to many types of healthcare practitioners (physicians, nurses, and various other health professionals) and to all settings of care (from hospitals and nursing homes to physicians' offices, community sites, and even private homes). . . .
>
> The inclusion in the definition of both *populations* and *individuals* draws attention to the different perspectives that need to be addressed. On the one hand, there is concern with the quality of care that individual organizations, health plans, and clinicians deliver. On the other hand, attention must be paid to the quality of care across the entire system. In particular, one must ask whether all parts of the population have access to needed and appropriate services, whether services meet or exceed their expectations, and whether their health status is improving. That focus embraces all groups, whether or not they have access to care and whether they are

defined by cultural heritage, sociodemographic characteristics, geography (e.g., a state or a region), or diagnosis. It recognizes that such individuals will include the most vulnerable, whether the source of vulnerability is economic, the rarity or severity of the health problem, physical frailty, or physical or emotional impairment. (Institute of Medicine, 1999a; emphasis in text).

The study committee defines *disparities* in healthcare as racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences,[1] and appropriateness of intervention (Figure 1-1). The committee's analysis is focused at two levels: 1) the operation of healthcare systems and the legal and regulatory climate in which health systems function; and 2) discrimination at the individual, patient-provider level. Discrimination, as the committee uses the term, refers to differences in care that result from biases, prejudices, stereotyping, and uncertainty in clinical communication and decision-making. It should be emphasized that these definitions are not legal definitions. Different sources of federal, state and international law define discrimination in varying ways, some focusing on intent and others emphasizing disparate impact.

Finally, in defining *racial and ethnic minority groups*, the committee uses the definitions provided by the federal Office of Management and Budget in its proposed Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (Office of Management and Budget, 2001). The revised standards (see Box 1-1) establish five categories for "racial" groups (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, and White), and two categories for "ethnic" groups (Hispanic or Latino and Not Hispanic or Latino).[2] It should be noted that these definitions have been subject to considerable criticism, including:

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[1] The committee defines patient *preferences* as patients' choices regarding healthcare that are based on a full and accurate understanding of treatment options. As discussed in Chapter 3 of this report, patients' understanding of treatment options is often shaped by the quality and content of provider-patient communication, which in turn may be influenced by factors correlated with patients' and providers' race, ethnicity, and culture. Patient preferences that are not based on a full and accurate understanding of treatment options may therefore be a source of racial and ethnic disparities in care. The committee recognizes that patients' preferences and clinicians' presentation of clinical information and alternatives influence each other, but found separation of the two to be analytically useful.

[2] Consistent with the OMB classification scheme, the terms "African American" and "black" are used interchangeably throughout this report, as are the terms "Hispanic" and "Latino."

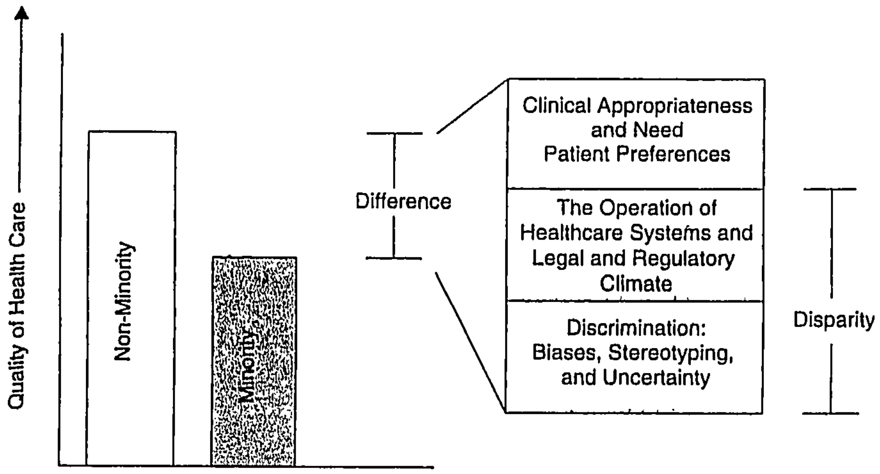

FIGURE 1-1 Differences, disparities, and discrimination: Populations with equal access to healthcare. SOURCE: Gomes and McGuire, 2001.

- reinforcement of the concept of "race" as reflecting genetic or biologic differences between population groups;
- failure to reflect the fluid and dynamic nature of sociopolitical identity, and
- failure to reflect the way many Americans choose to define themselves (Institute of Medicine, 1999b).

Nonetheless, the committee adopts these racial and ethnic definitions because they are commonly accepted among researchers, and most federally funded research utilizes these terms. Further, as will be noted below, access to and the allocation of healthcare resources differ with striking consistency across these population groups, making them useful in tracking disparities in care.

To summarize, racial and ethnic minorities are less likely than whites to posses health insurance (Collins, Hall, and Neuhaus, 1999), are more likely to be beneficiaries of publicly funded health insurance (e.g., Medicaid [The Henry J. Kaiser Family Foundation, 2000b]), and even when insured, may face additional barriers to care due to other socioeconomic factors, such as high co-payments, geographic factors (e.g., the relative scarcity of healthcare providers and healthcare facilities in minority communities), and insufficient transportation. These access-related factors are likely the most significant barriers to equitable care, and must be addressed as an important first step toward eliminating healthcare disparities. The

### BOX 1-1
### Revised Standards for the Classification of Federal Data on Race and Ethnicity

Categories for Race:
**American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
**Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
**Black or African American.** A person having origins in any of the black racial groups of Africa. Terms such as "Haitian" or "Negro" can be used in addition to "Black or African American."
**Native Hawaiian or Other Pacific Islander.** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
**White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

Categories for Ethnicity:
**Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. The term "Spanish origin" can be used in addition to "Hispanic or Latino."
**Not Hispanic or Latino.**

SOURCE: Office of Management and Budget, 2001.

committee is asked, however, to assess whether other factors may contribute to health-care disparities once these "threshold" factors (i.e., racial and ethnic differences in income, health insurance status, and geography) are held constant, and to specifically address whether bias, discrimination, or stereotyping at the individual, institutional, and health systems levels may explain some part of these disparities. To a great extent, attempts to separate the relative contribution of these factors risks presenting an incomplete picture of the complex interrelationship between racial and ethnic minority status, socioeconomic differences, and discrimination in the United States. For example, as will be discussed in Chapter 2, racial and ethnic housing segregation is a by-product of both historic and contemporary racism and discrimination, as well as socioeconomic differences (itself the legacy of poorer opportunities for many minority groups). The committee therefore stresses that attempts to "parcel out" access-related factors from the quality of healthcare for minorities remains an artificial exercise, and that policy solutions must consider the historic and contemporary forces that contribute to differences in access to and quality of healthcare.

## THE RELATIONSHIP BETWEEN RACIAL AND ETHNIC DISPARITIES IN HEALTH STATUS AND HEALTHCARE

The health gap between minority and non-minority Americans has persisted, and in some cases, has increased in recent years. African-American men, for example, experienced an average life expectancy of 61 years in 1960, compared with 67 years for their white male peers; in 1996, this gap increased to 8 years, as white males enjoyed an average life expectancy of 74 years, relative to 66 years for African-American males. American-Indian men in some regions of the country can expect to live only into their mid-fifties. Further, African-American and American-Indian infant mortality rates remain approximately 2.5 and 1.5 times higher, respectively, than rates for whites (Collins, Hall, and Neuhaus, 1999).

As noted above, the reasons for these health status disparities are complex. Individual risk factors for poor health are pronounced among many racial and ethnic minorities, yet these risks are confounded by the disproportionate representation of minorities in the lower socioeconomic tiers. Moreover, socioeconomic position in and of itself is correlated with health status, independently of individual risk factors, as people in each ascending step along the socioeconomic gradient tend to have better health, even when individual health risk factors are accounted for (Kaplan, Everson, and Lynch, 2000). Cultural factors also play an important role in health disparities; among some immigrant Hispanic populations, for example, birth outcomes have been found to be better than among those of their U.S.-born peers, suggesting that sociocultural risk *increases* with subsequent generations living in the United States (Korenbrot and Moss, 2000). Further, environmental health risks, such as degradation, air, water, and soil pollution, and other physical health hazards are more prevalent in low-income racial and ethnic minority communities. These and other risk factors associated with health and poor health illustrate that racial and ethnic disparities in health status largely reflect differences in social, socioeconomic, and behavioral risk factors and environmental living conditions (House and Williams, 2000). Healthcare is therefore necessary but insufficient in and of itself to redress racial and ethnic disparities in health status (Williams, 1999). A broad and intensive strategy to address socioeconomic inequality, concentrated poverty in many racial and ethnic minority communities, inequitable and segregated housing and educational facilities, individual behavioral risk factors, as well as disparate access to and use of healthcare services is needed to seriously address racial and ethnic disparities in health status.

## WHY ARE RACIAL AND ETHNIC DISPARITIES IN HEALTHCARE IMPORTANT?

The preceding discussion should not be interpreted as suggesting that racial and ethnic disparities in healthcare are unimportant, either to individuals in need of care or to a society that prides itself on equality of opportunity. To the contrary, disparities in healthcare are problems that have significant implications for health professionals, administrators and policymakers, and healthcare consumers of all backgrounds.

For the health professions, racial and ethnic disparities in healthcare pose moral and ethical dilemmas that will be among the most significant challenges of today's rapidly changing health systems. Increasingly, physicians and other health professionals are faced with a complex set of societal expectations. On one hand, they are expected to adhere to the highest ethical standards of service that mandate fairness and compassion. On the other hand, physicians are placed in the position of serving as managers of vital, yet limited healthcare resources. Their decisions may result in the allocation of more resources to some individuals than to others, resulting in the unequal distribution of healthcare across population groups. These challenges occur in the context of increasing financial and bureaucratic pressures on healthcare providers, which may exacerbate the problem of inequitable care. Yet the public's trust in the health professions may be irrevocably harmed should the healthcare industry be engaged, even inadvertently, in "social triaging." It is vitally important to preserve this trust, which is already fragile in many racial and ethnic minority communities, as it can significantly affect patients' willingness to seek care and adhere to treatment regimens.

Health professionals and policymakers must also be cognizant of the importance of healthcare as a resource that is tied to social justice, opportunity, and the quality of life for individuals and groups. The productivity of the workforce is closely linked with its health status, yet if some segments of the population, such as racial and ethnic minorities, receive a lower quality and intensity of healthcare, then these groups are further hindered in their efforts to advance economically and professionally. It is therefore important from an egalitarian perspective to expect equal performance in healthcare, especially for those disproportionately burdened with poor health.

From a public health standpoint, racial and ethnic disparities in healthcare threaten to hamper efforts to improve the nation's health. As will be discussed in Chapter 3, the United States is becoming increasingly diverse; while white Americans currently constitute 71% of the population, by the year 2050 nearly one in two Americans will be a person of color (U.S. Bureau of the Census, 2000). These groups, as noted earlier, experience a poorer overall health status and lower levels of access to heathcare than white Americans, and experience a disproportionate burden of chronic and infectious illness. This higher burden of disease and mortality among minorities has profound implications for all Americans, as it results in a less healthy nation and higher costs for health and rehabilitative care. All members of a community are affected by the poor health status of its least healthy members—infectious diseases, for example, know no racial/ethnic or socioeconomic boundaries. For this reason, the federal *Healthy People 2010* initiative has established an overarching goal of eliminating health disparities, noting that "the health of the individual is almost inseparable from the health of the larger community, and . . . the health of every community in every State and territory determines the overall health status of the Nation" (U.S. Department of Health and Human Services, 2000a, p. 15).

From an economic standpoint, the costs of inadequate care may have significant implications for overall healthcare expenditures. Poorly managed chronic conditions or missed diagnoses can result in avoidable, higher subsequent healthcare costs. For example, inadequately treated and managed diabetes can result in far more expensive complications, such as kidney disorder requiring dialysis or transplantation. To the extent that minority beneficiaries of publicly funded health programs are less likely to receive high quality care, these beneficiaries—as well as the taxpayers that support public healthcare programs—may face higher future healthcare costs.

Further, the problem of racial and ethnic disparities in healthcare poses a significant dilemma for a society that is still wrestling with a legacy of racial discrimination (Byrd and Clayton, this volume). Public opinion polls indicate that the vast majority of Americans abhor any form of racial discrimination and believe that all Americans should—and do—enjoy equal opportunities in accessing educational and job opportunities, as well as healthcare (Morin, 2001). Yet this ideal falls far from reality in many sectors of American life, including healthcare, as will be discussed in later sections of this report. The discrepancy between Americans' widely held values and beliefs regarding the importance of equality and the reality of persistent racial inequities tears at the social fabric of the nation and contributes to the gulf of understanding between racial, ethnic and socioeconomic groups.

Finally, for the population at large, racial and ethnic disparities in healthcare raise concerns about the overall quality of care in the United States. Given that racial and ethnic minority groups experience greater challenges and barriers to high quality care, their experiences expose healthcare systems' greatest weaknesses and problems—problems that any American may face in attempting to access healthcare. In this context, the extent to which minorities are well or poorly served provides an important indicator of the state of healthcare in the nation. The provision of equitable care that does not vary by patient race, ethnicity, gender, and age is therefore among one of the six overarching goals identified in the Institute of Medicine's *Crossing the Quality Chasm* report (IOM, 2001a). As the *Chasm* report suggests, evidence of unequal or substandard care for some segments of the population, particularly on the basis of group membership, should raise the concern that the provision of care may be inconsistently and subjectively administered. Inequities in care, therefore, expose a threat to quality care for all Americans.

For all of these reasons, should evidence be available to suggest that racial and ethnic disparities in care are widespread, these disparities would be unacceptable.

## EVIDENCE OF RACIAL AND ETHNIC DISPARITIES IN HEALTHCARE

The literature review that follows summarizes articles published in peer-reviewed journals within the last 10 years, with an emphasis on the most recent publications. In selecting literature to review, the committee identified studies that assess racial and ethnic variation in healthcare while controlling for differences in access to healthcare (e.g., by studying similarly insured patients or by statistically adjusting for differences in insurance status) and/or socioeconomic status. To ensure that the committee's search was not limited to studies with "positive" findings of racial and ethnic differences in care, searches were conducted for studies that attempted to assess variations in care by patient socioeconomic status and geographic region. These studies were included if the researchers assessed racial or ethnic differences in care while controlling, as noted above, for patient access-related factors. In addition, the committee focused its review on those studies that attempt to assess the contribution of a range of other potential confounding variables, such as racial and ethnic differences in disease severity, stage of illness progression, patient preferences for non-invasive procedures or to avoid complex treatments, types of settings where care is received (e.g., public vs. private clinics, teaching vs. non-teaching hospitals), availability of procedures (e.g., whether catheterization is offered on-site), suitability of intervention (e.g., whether subtle racial differences in response to treatments may counter-indicate use), as well as other factors. Further, the committee paid particular attention to studies that assessed the appropriateness of services relative to established clinical guidelines. To the extent that these studies shed light on potential sources of disparities in care, they are summarized in this review. The committee's criteria for selecting literature to review are listed in Box 1-2.

Almost all of the studies reviewed by the committee contained one or more weaknesses of study design, methodology, or data analysis that limited the committee's ability to draw findings and conclusions. These weaknesses are noted below, where appropriate. The majority of studies of racial and ethnic disparities in care, for example, use odds ratios, which is a consequence of using logistic regression models, rather than risk ratios to assess the extent of disparities in care. Relative to risk ratios, odds ratios exaggerate the apparent effect of a co-variable when the prevalence of the dependent variable is above 5%-10%. The committee therefore cautions that in some instances, the magnitude of racial and ethnic disparities as reported in the literature may be exaggerated. In addition, as will be discussed below, no single study adequately controlled for all potential confounding factors (e.g., patient preferences, racial differences in disease severity or presentation, geographic availability of specific services or procedures) simultaneously. The committee therefore considered findings in light of the preponderance of evidence and the merits of each individual study. Noting the importance of assessing study strengths and limitations in context, Mayberry and colleagues (2000) write, "[t]he methodological inadequacy of an individual study may be a relatively moot point in the context of the body of literature that gives consistent findings and in which one study, often the more recent study, may overcome the specific failing of a previous investigation" (Mayberry, Mili, and Ofili, 2000, p. 116).

This review yielded over 100 studies (summarized in Appendix B) that assessed racial and ethnic variation in a range of clinical procedures, including the use of diagnostic and therapeutic technologies. This body of literature, however, represents only a fraction of the published studies that investigate racial and ethnic differences in access to and use of healthcare services. Geiger (this volume), for example, has identified over 600 such articles published over the last three decades. For a more comprehensive review of this literature, the reader is referred to Geiger (this volume) or the reviews of Mayberry and colleagues (Mayberry, Mili, and Ofili, 2000); Kressin and Petersen (2001); Sheifer, Escarce, and Schulman (2000); Ford and Cooper (1995); and the AMA Council on Ethical and Judicial Affairs (1990).

### Cardiovascular Care

Some of the strongest and most consistent evidence for the existence of racial and ethnic disparities in care is found in studies of cardiovascu-

## BOX 1-2
## Criteria for Literature Review

To assess the evidence regarding racial and ethnic differences in healthcare, the committee conducted literature searches via PUBMED and MEDLINE databases to identify studies examining racial and ethnic differences in medical care for a variety of disease categories and clinical services. Searches were performed using combinations of following keywords:

- *Race, racial, ethnicity, ethnic, minority/ies, groups, African American, Black, American Indian, Alaska Native, Native American, Asian, Pacific Islander, Hispanic, Latino.*
- *Differences, disparities, care*
- *Cardiac, coronary, cancer, asthma, HIV, AIDS, pediatric, children, mental health, psychiatric, eye, ophthalmic, glaucoma, emergency, diabetes, renal, gall bladder, ICU, peripheral vascular, transplant, organ, cesarean, prenatal, hip, hypertension, injury, surgery/surgical, knee, pain, procedure, treatment, diagnostic.*

This search yielded over 600 citations. To further examine this evidence base and address the study charge that called for an analysis of "the extent of racial and ethnic differences in healthcare that are not otherwise attributable to known factors such as access to care," only studies that provided some measure of control or adjustment for racial and ethnic differences in insurance status (e.g., ability to pay/insurance coverage or co-morbidities) were included in the literature review. Other "threshold" criteria included:

- Publication in past 10 years (1992-2002; this criterion was established because more recent studies tend to employ more rigorous research methods and present a more accurate assessment of contemporary patterns of variation in care);
- Publication in peer-reviewed journals;
- Elimination of studies focused on racial and ethnic differences in health status (except as it is affected by the quality of healthcare) and healthcare access, as well as publications that were editorials, letters, published in a foreign language, were non-empirical, or studies that controlled for race or ethnicity; and
- Inclusion only of studies whose primary purpose was to examine variation in medical care by race and ethnicity, contained original findings, and met generally established principles of scientific research (e.g., studies that stated a clear research question, provided a detailed description of data sources, collection, and analysis methods, included samples large enough to permit statistical analysis, and employed appropriate statistical measures).

In addition, to ensure the comprehensiveness of the review, the committee examined the reference lists of major review papers that summarize this literature (e.g., Geiger, this volume; Kressin and Petersen, 2001; Bonham, 2001; Sheifer, Escarce, and Schulman, 2000; Mayberry, Mili, and Ofili, 2000; Ford and Cooper, 1995). Articles not originally identified in the initial search were retrieved and analyzed for appropriateness of inclusion in the committee's review. Finally, to ensure that the committee's search was not limited to studies with "positive" findings of racial and ethnic differences in care, searches were conducted for studies that attempted to assess variations in care by patient socioeconomic status and geographic region. These studies were included if the researchers assessed racial or ethnic differences in care while controlling, as noted above, for patient access-related factors.

To assess the quality of this evidence base, the committee ranked studies on several criteria:

- Adequacy of control for insurance status (studies of patients covered under the same health system or insurance plan were considered to be more rigorous than studies that merely assessed the availability of health insurance among the study population);
- Use of appropriate indicators for patient socioeconomic status (e.g., studies that measured patients' level of income, education, or other indicators of socioeconomic status);
- Analysis of clinical data, as opposed to administrative claims data (see limitations of administrative claims data noted below);
- Prospective or retrospective data collection (prospective studies were considered to be more rigorous than retrospective analyses);
- Appropriate control for patient co-morbid conditions;
- Appropriate control for racial differences in disease severity or stage of illness at presentation;
- Assessment of patients' appropriateness for procedures (e.g., studies that provide primary diagnosis and include well-defined measures of disease status, as in studies of cardiovascular care that assess racial differences in care following angiography) or that compare rates of service use relative to standardized, widely accepted clinical guidelines; and
- Assessment of racial differences in rates of refusal or patient preferences for non-invasive treatment.

Studies that met the committee's "threshold" criteria are summarized in Appendix B. Many of these studies are summarized in this chapter, with an emphasis on more rigorous studies, as defined by the committee's quality criteria, above.

lar care. The most rigorous studies in this area assess both potential underuse and overuse of services and appropriateness of care using well-established clinical and diagnostic criteria. Several studies, for example, have assessed racial and ethnic differences in cardiovascular care relative to RAND criteria for the necessity of revascularization procedures. These studies have therefore been able to demonstrate that differences in treatment are not due to factors such as racial differences in the severity of coronary disease.

No one study reviewed by the committee simultaneously controlled for all of the variables likely to confound the relationship between race/ethnicity and receipt of care. In addition, in almost all cases, studies that employ rigorous measures of potential confounding variables find that racial and ethnic disparities diminish once these variables are included in multivariate analysis. The preponderance of studies, however, find that even after adjustment for many potentially confounding factors—including racial differences in access to care, disease severity, site of care (e.g., geographic variation or type of hospital or clinic), disease prevalence, comorbidities or clinical characteristics, refusal rates, and overuse of services by whites—racial and ethnic disparities in cardiovascular care remain. This conclusion was also reached by authors of all major review articles that the committee identified in its search, including Kressin and Petersen (2001); Mayberry, Mili, and Ofili (2000); Sheifer, Escarce, and Schulman, (2000); Ford and Cooper (1995); Gonzalez-Klayman and Barnhart (1998); the AMA Council on Ethical and Judicial Affairs (1990); and Geiger (this volume).

> The preponderance of studies . . . find that even after adjustment for many potentially confounding factors—including racial differences in access to care, disease severity, site of care (e.g., geographic variation or type of hospital or clinic), disease prevalence, comorbidities or clinical characteristics, refusal rates, and overuse of services by whites—racial and ethnic disparities in cardiovascular care remain.

### *Studies Using Administrative Databases*

Data from several large, national datasets have been analyzed and demonstrate both national and regional patterns of disparities in care. These datasets typically rely on administrative claims data to assess differences in receipt of services. A variety of limitations should be noted regarding administrative claims data. One, these data provide little or no information regarding co-morbid illnesses, the severity of disease, or the stage at which illness was detected. Findings of racial differences in these studies therefore cannot rule out the possibility that minority patients

might be less appropriate for specific clinical services. Second, admini
trative data provide little indication as to whether patients were presente
with all clinical options, whether patients accepted or refused recommen
dations, or whether the physician did not recommend clinical procedure
Third, these data typically provide no information regarding patient
education level or other socioeconomic background information. Give
that whites generally enjoy higher socioeconomic and educational statu
and given the correlation between these attributes and care-seeking be
havior (e.g., greater assertiveness in seeking care), socioeconomic status i
potentially a significant confounding factor. Fourth, administrative dat
typically provide no information regarding the appropriateness of ser
vices relative to patients' needs, and therefore overuse of services amon
whites and/or underuse among minorities cannot be ruled out.

Nonetheless, the consistency of findings from these studies, many using large sample sizes, is striking. Ford et al. (1989), for example, assessed rates of coronary arteriography and coronary artery bypass graft surgery (CABG) among nearly 4 million patients with acute myocardial infarction sampled in the National Hospital Discharge Survey (NHDS). The authors found that African-American men and women were significantly less likely to undergo CABG or angiography than whites. Escarce et al. (1993), McBean et al. (1994), and Gornick et al. (1996) found significant racial differences in rates of cardiovascular procedures among Medicare patients, with African-American patients approximately one-half to one-third less likely to receive services. Similarly, Goldberg et al. (1992), in an analysis of over 86,000 Medicare patients, found that whites were nearly four times more likely than African Americans to receive CABG, after adjusting for age- and gender-related differences in rates of myocardial infarction (MI). When data were analyzed by state, the authors found greater racial differences in CABG rates in the Southeast, particularly in non-metropolitan areas. For whites, CABG rates were significantly associated with the availability of thoracic surgeons and location in the Southeast, but physician availability and location were not correlated with CABG rates for African Americans.

To address some of the deficiencies of studies using administrative data, several studies have adjusted for the influence of variables such as site of care (e.g., geographic location or type of hospital or clinic) to assess racial differences in the receipt of coronary revascularization procedures. Ayanian et al. (1993) assessed racial differences in rates of revascularization following angiography and the relationship of these differences to hospital characteristics among more than 27,000 Medicare patients. Controlling for age, sex, region, Medicaid eligibility, and principal and secondary diagnoses, the authors found that whites were 78% more likely than African Americans to receive a revascularization procedure. These differences were apparent in public, private, teaching, non-teaching, and urban/suburban hospitals, as well as in hospitals where patients were referred to other facilities for revascularization procedures and those that offer such procedures in-house. Similarly, Weitzman et al. (1997) assessed rates of performance of cardiac procedures in relation to gender, race, and geographic location among 5,462 patients in four states (North Carolina, Mississippi, Maryland, and Minnesota) hospitalized for MI. After controlling for the severity of MI and co-morbid conditions, blacks admitted to teaching hospitals in this study were significantly less likely to receive percutaneous transluminal coronary angiography (PTCA), CABG, or thrombolytic therapy. Similarly, blacks admitted to non-teaching hospitals were significantly less likely to receive these procedures.

Giles et al. (1995) used data from NHDS to assess race and sex differences in the rate of receipt of catheterization, PTCA, or coronary artery bypass surgery (CABS), while adjusting for differences in the type of hospital admission, insurance status, and disease severity among 10,348 patients hospitalized with acute myocardial infarction (AMI). Significant differences by race and gender were found after statistical adjustment and a patient matching procedure, which matched individuals admitted to the same hospital and who underwent a cardiac procedure with individuals who did not undergo a procedure. With white males as the referent, black men were less likely to receive catheterization or CABS, while black women were less likely to receive catheterization, PTCA, or CABS. Among only those patients who underwent catheterization (and therefore had access to a cardiologist), black women were less likely to receive subsequent PTCA or CABS.

Similarly, Allison et al. (1996) assessed the rate of receipt of thrombolysis, beta-adrenergic blockade and aspirin in a retrospective medical record review of 4,052 patients hospitalized in all acute care hospitals in Alabama with principle discharge diagnosis of AMI. After controlling for patient age, gender, clinical factors, severity of illness, algorithm-determined candidacy for therapy, and hospital characteristics (e.g., rural vs. urban, teaching vs. non-teaching), the authors found that white patients were 50% more likely to receive thrombolytics than black patients. No differences were found in receipt of beta-blockers or aspirin by patient race.

In one of the few studies to assess rates of revascularization procedures among a multiethnic sample of patients, Carlisle et al. (1995) found that African Americans, Hispanics, and Asian Americans were significantly less likely than whites to receive coronary angiography, CABG, and/or angioplasty, controlling for primary diagnosis, age, gender, insurance type, income, and co-morbid factors. When differences in the volume of revascularization procedures among hospitals were controlled,

However, Asian Americans did not differ from whites in the rates of ca diac procedures. African-American and Hispanic patients remained les likely than whites to receive angioplasty, and African Americans wer less likely to receive CABG when hospital characteristics were controlled Similarly, Herholz et al. (1996) analyzed discharge data for 982 Mexican American and white patients hospitalized for definite or possible myocar dial infarction. Mexican Americans received 38% fewer medications than whites, even after adjusting for clinical and demographic characteristics Mexican Americans were less likely to receive almost all major medications, especially antiarrhythmics, anticoagulants, and lipid-lowering therapy. Using data from the same study as Herholz et al. (1996), Ramsey et al. (1997) found that after adjusting for age, sex, previous diagnosis of coronary heart disease, MI, diabetes mellitus, hypertension, occurrence of congestive heart failure during MI, and location and type of MI, Mexican Americans were less likely to receive PTCA, but not aortocoronary bypass surgery, than whites.

Other studies indicate that the likelihood of receiving revascularization procedures varies by the stage or typical sequence of events leading to care. Blustein, Arons, and Shea (1995), for example, found that among patients hospitalized for acute myocardial infarction, race and insurance status significantly predicted the likelihood of 1) gaining initial admittance to a hospital that offers revascularization services; 2) actually receiving revascularization following initial admission; or 3) receiving revascularization services following transfer or subsequent readmission. Whites, those with private insurance, and those with more severe heart disease were more likely to gain initial admittance to hospitals providing revascularization services. Once hospitalized, whites, males, those with private insurance, and those with more severe disease were more likely to actually receive revascularization. Racial disparities grew larger as patients "progressed" though the phases leading to revascularization.

*Studies of the Role of Financial and Institutional Characteristics*

Several studies suggest that financial and institutional characteristics may mediate the relationship between the use of cardiac procedures and patient race, in some cases significantly attenuating or eliminating racial and ethnic disparities. Leape et al. (1999) explored racial differences in revascularization procedures as a function of demographic characteristics and type of hospital among 631 patients at 13 New York City hospitals for whom revascularization procedures were deemed clinically necessary according to RAND criteria. The authors found no racial differences in rates of revascularization procedures among African-American patients (72%), Hispanic patients (67%) and white patients (75%). Rates of revascularization were significantly lower, however, among patients initially seen in hospitals that did not provide revascularization services (and therefore had to refer patients to other hospitals) than those treated in settings that did provide revascularization (59% to 76%, respectively). Subsequent criticism of the study noted that the limited sample and geographic setting, coupled with the fact that most of the facilities studied offered both angiography and revascularization on-site, may have limited the study's ability to detect group differences in procedure use (Kressin and Peterson, 2001).

Similarly, Gregory et al. (1999) studied the relationship between the availability of hospital-based invasive cardiac procedures and racial differences in the use of these services. The authors studied records of 13,690 black and white New Jersey residents hospitalized with a primary diagnosis of AMI. For all patients, the likelihood of receiving catheterization within 90 days of AMI was significantly greater among those hospitalized in facilities that provided cardiac services. Black patients in this sample were more likely to be admitted first to hospitals equipped to perform cardiac catheterization and/or PTCA or CABG. Despite this, blacks were less likely to receive catheterization than whites within 90 days of admission, even after controlling for age, sex, health insurance status (for those younger than age 65), anatomic location of primary infarct, co-morbidities, and the availability of cardiac services. Similarly, blacks were less likely than whites to receive revascularization procedures within 90 days of admission, again after controlling for patient demographic and clinical factors and availability of cardiac services.

Other researchers have assessed whether racial and ethnic disparities in healthcare are mediated by the type of health system in which care is delivered. Taylor et al. (1997), for example, abstracted chart reviews from 1,441 patients with principal or secondary diagnosis of AMI receiving care in one of 125 military hospitals. The authors found no differences in rates of catheterization procedures between white and "non-white" patients (all patients who described their race or ethnicity as other than white or Caucasian, including African Americans) during AMI admission or between white and black patients. Similarly, no differences were found in rates of revascularization (PTCA or CABG) between white and "non-white" patients or between white and black patients. No differences were found in mortality or rates of readmission within 180 days following initial discharge. However, white patients were significantly more likely than non-white patients to be considered for future catheterization. Among studies of disparities in Veterans Administration hospitals, which significantly reduce financial barriers to care, findings are mixed. Mickelson et al. (1997) found no differences between white and Hispanic VA patients in receipt of cardiovascular procedures following AMI. In contrast, Peterson et al. (1994), Mirvis et al. (1994), Whittle et al. (1993), and Mirvis and Graney (1998) all found that African-American VA patients were less likely to receive cardiovascular procedures. Sedlis et al. (1997) found that therapeutic cardiac procedures (surgery or PTCA) were offered more frequently for white VA patients (72.9%) than African-American VA patients (64.3%). This difference could not be explained by simple clinical differences between the two groups. Even though they were offered care at lower rates, however, African-American patients were more than twice as likely as whites to refuse invasive procedures. In contrast, Petersen et al. (2002) found significant differences in rates of thrombolytic therapy and bypass surgery among a sample of African-American and white VA patients with a confirmed diagnosis of acute myocardial infarction, with black patients receiving lower rates of these invasive procedures. Like Sedlis et al. (1997), Petersen et al. assess racial differences in rates of refusal for these procedures, but found no differences in rates of refusal when angiography, PTCA, or bypass surgery were offered.

Daumit et al. (1999), in one of the few studies to longitudinally assess receipt of cardiovascular procedures among a cohort of patients, followed nearly 5,000 African-American and white patients with end-stage renal disease (ESRD) to determine whether the acquisition of health insurance (ESRD patients are eligible for Medicare and generally enter a comprehensive system of care, if not already enrolled in one, upon diagnosis) would reduce racial and ethnic disparities in receipt of cardiovascular procedures (ESRD patients are at high risk for cardiovascular disease). Prior to development of ESRD, white patients were nearly three times more likely than African-American patients to receive catheterization, angioplasty, or CABG, even after controlling for clinical and socioeconomic variables. At follow-up, this disparity diminished to the point where whites were only 40% more likely to receive a cardiovascular procedure. Significantly, among patients who were already enrolled in Medicare at baseline, racial disparities in cardiovascular procedures disappeared at follow-up. Daumit et al. caution, however, that "a substantial baseline disparity between black and white patients . . . exists in the privately insured and Medicare subgroups, providing evidence against acquisition of health insurance as the only factor in narrowing the ethnic gap" (Daumit et al., 1999, p. 179). As with many of the studies reviewed above, however, this study did not obtain detailed clinical data or information on patient preferences, which could explain some of the observed differences (Kravitz, 1999).

These studies strongly suggest that addressing racial and ethnic gaps in insurance coverage is one of the most important factors in narrowing the racial and ethnic gap in cardiovascular services. Health insurance alone does not completely eliminate disparities, however, as the studies above illustrate. This finding is confirmed in a study of cardiovascular care in the United Kingdom, which offers universal access and free care at the point of use. In a prospective study of 2,552 patients seen in London hospitals who were deemed "appropriate" for cardiovascular procedures according to standardized criteria, Hemingway et al. (2001) found that "non-white" patients were more likely to receive only medical treatment (received by 20% of these patients), rather than CABG (received by 14% of these patients), after controlling for demographic and clinical variables. These differences were not found among white patients similarly deemed appropriate for invasive treatment.

*Studies to Assess Appropriateness of Services*

Critics of many of the studies reviewed above charge that comparisons of minority patients' receipt of revascularization procedures with that of whites' may identify differences caused by overuse of procedures by whites, rather than clinical necessity. To address this concern, several studies have examined use of coronary procedures relative to established criteria for necessity. Hannan et al. (1999) assessed rates of CABG among 1,261 post-angiography patients who would benefit from CABG according to RAND appropriateness and necessity criteria. Controlling for age, gender, severity of disease, patient risk status, type of insurance, and other clinical characteristics, the authors found that African-American and Hispanic patients were significantly less likely than whites to undergo CABG. Similarly, Laouri et al. (1997), using RAND/UCLA criteria for necessity of revascularization procedures, found that African Americans were half as likely as whites to undergo necessary CABG and one-fifth as likely to undergo PTCA. In this study, patients at public hospitals were less likely to undergo PTCA than those at private hospitals. Conigliaro et al. (2000) also assessed racial variation in coronary revascularization relative to RAND appropriateness criteria at six hospital sites that offered CABG on site or at an adjacent university hospital. This was a VA patient population with few financial barriers to care. Further, all patients had unstable angina or acute myocardial infarction and had undergone coronary angiography. Overall, African-American patients were found to be less likely then whites to undergo CABG and PTCA, but when RAND appropriateness criteria were considered, African Americans were still less likely to receive CABG when deemed "necessary."

In a larger study, Canto et al. (2000) studied the use of reperfusion therapy among more than 26,000 patients meeting eligibility criteria as a result of acute myocardial infarction. After controlling for clinical and demographic characteristics, the authors found that African Americans were slightly less likely than whites to undergo reperfusion therapy. Further, Schneider et al. (2001) used RAND criteria to assess whether overuse of PTCA or CABG by whites explained racial differences in revascularization rates among 3,960 African-American and white Medicare patients. As with other studies cited above, Schneider et al. found that whites were more likely than African Americans to receive PTCA and CABG. When assessed relative to RAND appropriateness criteria, white males were found to be nearly 2.5 times more likely to receive PTCA than African Americans when the procedure was judged to be "inappropriate;" no other racial or gender differences were found in rates of inappropriate CABG. The authors conclude, however, that the racial difference in rates of inappropriate PTCA "was not sufficiently large to account for more than a small fraction of the substantial disparities in rates of revascularization between white patients and African-American patients" (Schneider et al., 2001b, p. 334).

These studies of disparities in cardiovascular care relative to appropriateness criteria offer an important means of assessing whether observed racial and ethnic differences in care may be "explained" by differences in clinical necessity. It should be noted, however, that even among studies employing objective criteria to assess racial and ethnic differences in care relative to clinical necessity, "there may not always be a perfect fit between the clinical indications considered by the [panel evaluating appropriateness] and the characteristics of real patients" (Kravitz, 1999).

In a more comprehensive study of whether racial disparities in receipt of revascularization procedures reflect clinical necessity or merely overuse among whites, Peterson et al. (1997) assessed racial differences in receipt of coronary angioplasty and CABG among patients with documented coronary disease, and assessed whether differences were associated with survival. Peterson et al. followed 12,402 patients seen annually at Duke University Medical Center for an average of five and a half years, and found that African Americans were 13% less likely than whites to undergo angioplasty and 32% less likely to undergo CABG during the study period. Racial differences in procedure rates were more marked among patients with severe disease. Analysis of survival benefit of surgery also revealed racial differences; among patients expected to survive more than one year, 42% of African Americans underwent surgery, compared with 61% of whites. Finally, analysis of the adjusted five-year mortality rate among patients revealed that African-American patients were 18% more likely than whites to die. The Peterson et al. study can be criticized on the grounds that the findings may not generalize beyond the single study setting. Nevertheless, the study provides strong evidence that lower rates of intervention among this sample of African-American patients were associated with lower rates of survival.

### *Summa[illegible] Literature on Racial and Ethnic Disparities in Cardiovascular Care*

The literature reviewed above illustrates that racial and ethnic disparities in cardiovascular care are robust and consistent across a range of studies conducted in different geographic regions with diverse patient populations seen in a range of clinical settings. This literature does not, however, provide a clear account of the sources of these disparities; rather, these studies provide clues regarding the types of factors that are *not* likely to fully explain disparities in cardiovascular care. Racial differences in clinical presentation or disease severity do not fully explain differences in receipt of services (Hannan et al., 1999; Lauori et al., 1997; Conigliaro et al., 2000; Canto et al., 2000), although minority and non-minority patients may not respond equally well to some therapeutic interventions, as will be discussed in Chapter 3. White patients have been found to use some clinical services at higher rates than minorities, even when not necessarily indicated. Therefore, when minority patients' use of services is compared with that of whites, differences may be observed. But this "overuse" of cardiovascular procedures by whites does not fully explain disparities in care (Schneider et al., 2001), and studies that assess racial differences in care relative to established clinical criteria still find significant differences (Conigliaro et al., 2000b; Hannan et al., 1999; Laouri et al, 1997). Racial and ethnic disparities in cardiovascular services are found among patients insured by Medicare (Gornick et al., 1996; McBean et al., 1994; Escarce et al., 1993), and among patients in VA settings (Peterson et al., 1994; Mirvis et al., 1994; Whittle et al., 1993; Mirvis and Graney, 1998; Sedlis et al., 1997; Petersen et al., 2002), although these findings are not consistent (Mickelson et al., 1997). Significantly, however, even among patients whose care is covered by nationalized health plans (e.g., Great Britain), minority racial and ethnic groups are found to receive fewer clinical services (Hemingway et al., 2001).

Several studies find that African-American patients are more likely than whites to refuse invasive procedures (e.g., Hannan et al., 1999; Oddone et al., 1998; Sedlis et al., 1997), but when the relative contribution of patient refusal to racial differences in care is assessed, this factor is not found to account completely for these disparities. Further, physician recommendation appears to be the major factor in determining whether patients receive invasive cardiac procedures (Hannan et al., 1999). These factors as potential sources of disparities will be assessed in greater detail in Chapter 3.

Almost all of the studies reviewed here find that as more potentially confounding variables are controlled, the magnitude of racial and ethnic disparities in care decreases. In a few studies, disparities disappeared

entirely when appropriate confounding variables were included in multivariate analysis. In general, these findings are limited to studies of patients seen in universally accessible care settings, such as the U.S. Department of Defense healthcare systems (e.g., Taylor et al., 1997), or studies employing small samples in one or a handful of clinical settings (e.g., Leape et al., 1999). These findings strongly suggest that access-related factors, such as insurance status, ability to pay, and characteristics of institutional and clinical settings are the largest contributors to observed racial and ethnic disparities in cardiovascular care. The vast majority of studies assessing disparities in cardiac care, however, find that racial and ethnic disparities persist even after variations in insurance status are controlled.

As a "second level" analysis of the quality of evidence regarding racial and ethnic disparities in cardiovascular care, the committee identified a subset of studies that permit a more detailed analysis of the relationship between patient race or ethnicity and quality of care, while considering potential confounding variables such as clinical differences in presentation and disease severity. Several criteria were established to identify these studies, using generally accepted criteria of research rigor and quality. To begin, the committee identified only studies using clinical, as opposed to administrative data, for the reasons cited above. Secondly, the committee identified studies that provided appropriate controls for likely confounding variables, and/or employed other rigorous research methods. These criteria included the use of adequate control or adjustment for racial and ethnic differences in insurance status; prospective, rather than retrospective data collection; adjustment for racial and ethnic differences in co-morbid conditions; adjustment for racial and ethnic differences in disease severity; comparison of rates of cardiovascular services relative to measures of appropriateness; and assessment of patient outcomes.

Several caveats should be noted in undertaking this approach. One, studies using clinical data allow researchers to better assess whether disparities in care exist and are significant after potential confounding factors such as clinical variation and the appropriateness of intervention are taken into account. However, these studies often are limited to small patient samples in one or only a few clinical settings, therefore sacrificing statistical power and potentially underestimating the role of institutional variables as contributing to healthcare disparities. Second, assessments of racial and ethnic differences in patients' clinical outcomes following intervention must be made with caution. Patients' outcomes following medical intervention reflect a wide range of factors, some of which are unrelated to the intervention itself (e.g., the degree of social support available to patients following treatment) and may vary systematically by race or ethnicity. In addition, a finding of no racial or ethnic differences in patient outcomes (e.g., survival) despite disparate rates of treatment should not be interpreted as demonstrating that disparities in the use of medical intervention are inconsequential. In such instances, researchers should ask whether equivalent rates of intervention might be associated with *better* patient outcomes among minorities. Finally, this second level of analysis should not be interpreted as suggesting that the larger literature presented above is insufficient to draw conclusions regarding disparities in healthcare. Almost all of the individual studies reviewed earlier possess limitations, but the collective body of this evidence is robust. Despite these caveats, this second review afforded an opportunity to assess whether racial and ethnic disparities in care remain when racial differences in clinical presentation and other potentially confounding variables are controlled. Studies were considered in this second review only if they met four of six criteria noted above, in addition to the "threshold" criteria that studies employ clinical databases. Thirteen studies were identified through this process (see Table B-2 in Appendix B). Of these, only two (Leape et al., 1999; Carlisle et al., 1999) found no evidence of racial and ethnic disparities in care after adjustment for racial and ethnic differences in insurance status, co-morbid factors, disease severity, and other potential confounders as noted above. The remaining studies found racial and ethnic disparities in one or more cardiac procedures, following multivariate analysis. Almost all studies found that adjustment for one or more confounding factors reduced the magnitude of unadjusted racial and ethnic differences in care. Among the five studies that collected data prospectively, however, all found racial and ethnic disparities remained after adjustment for confounding factors.

## Cancer

Studies of racial disparities in cancer diagnosis and treatment are less clear and consistent than studies of cardiac care, in part because many studies rely on data that use crude or incomplete indicators of the type of treatment provided and/or do not control for co-morbid factors. Variations in the extent of disease among patients are rarely well controlled, and the comprehensiveness of treatment cannot be evaluated. In addition, many studies indicate that ethnic minorities are diagnosed at later stages of cancer progression, further confounding efforts to assess the quality of treatment. Nonetheless, several studies demonstrate significant racial differences in the receipt of appropriate cancer treatments and analgesics.

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In one of the largest early studies of racial disparities in cancer care, Diehr et al. (1989) assessed the quality of care for 7,781 women treated for breast cancer in 107 hospitals relative to 10 dimensions of breast cancer care established by a panel of experts convened by the National Cancer Institute (NCI). While African Americans were less likely than whites to have health insurance, were less likely to be treated by an experienced, board-certified physician, and were more likely to be treated in large, public hospitals, racial differences in care persisted when these and other clinical and demographic factors were controlled. African-American women were less likely than white women to receive progesterone receptor assays (a prognostic test), were less likely to receive radiation therapy in combination with radical/modified mastectomy, and were less likely to receive rehabilitation support services following mastectomy.

Similarly, Harlan et al. (1995) assessed variations in the use of radical prostatectomy and radiation to treat prostate cancer by geographic area, age, and race. Data for 67,693 men with localized and regional cancer, obtained from Surveillance, Epidemiology, and End Results (SEER) program database, revealed that black men aged 50 to 69 years were less likely than similarly aged white men to undergo prostatectomy. For black and white men aged 70 to 79 years, rates of prostatectomy were similar in 1984, but became significantly divergent by 1991, as a larger proportion of white men underwent the procedure. In 1991, a significantly higher proportion of black men aged 50 to 59 years received radiation. For all age groups in 1991, twice as many blacks as whites (12.5% vs. 6.6%) received no treatment. In a similar analysis of 4,154 Medicare claims for radical prostatectomy to treat prostate cancer, Imperato et al. (1996), found that rates of prostatectomy were lower among African Americans than among whites, with the black/white ratio ranging from 0.59 in 1991 to 0.86 in 1993.

McMahon et al. (1999) assessed the contribution of patient age, sex, race, urbanicity, per capita income, and education level of patients' com-availability of physicians, internists, and gastroenterologists per 1[illegible]0 population to predict use of diagnostic procedures for colon cancer among all Medicare Part B transactions in the state of Michigan from 1986 to 1989. African Americans were more likely than whites to receive a barium enema only, were less likely to receive a combination of barium enema and sigmoidoscopy, and were less likely to undergo colonoscopy. While this study could not control for stage of disease and the reason for performing diagnostic procedures, it suggests that African Americans received less effective diagnostic evaluations. Relative to whites, African Americans in this study received 28% fewer sigmoidoscopic examinations—which are generally considered to be more technically advanced diagnostic procedures than barium enema— despite a 20% higher incidence of colon cancer.

African-American cancer patients are also less likely to receive post-treatment surveillance care. Elston Lafata et al. (2001) assessed colorectal cancer surveillance care among 251 patients enrolled in a managed care organization at diagnosis, and found that within 18 months of treatment, over half of the total cohort received a colon examination (55%), nearly three-fourths had received carcinoembryonic antigen (CEA) testing, and nearly six in ten (59%) received metastatic disease testing. Whites were more likely than African Americans, however, to receive CEA testing and displayed a slight but non-significant trend toward higher rates of colonic examination. The small sample size and single setting of this study, however, may limit these findings.

In one of the few studies to analyze the effect of both stage of illness at the time of diagnosis and reasons for no receipt of treatment, Merrill, Merrill, and Mayer (2000) assessed the receipt of surgery or radiation therapy among 8,119 white and African-American women with invasive cervical cancer. Overall, 8.03% of whites and 11.64% of blacks did not receive either radiation therapy or surgery. For both blacks and whites, the odds of not receiving treatment increased with older age, distant and unstaged disease (vs. localized disease), unknown grade (vs. well-differentiated disease), and unknown lymph node (vs. no lymph node) status. Blacks were more likely to be diagnosed unstaged and were less likely to have localized disease; once stage was accounted for, racial differences in treatment status became insignificant. However, among those not treated, blacks were more likely than whites to have treatment not recommended (53.68% vs. 40.32%). Of those cases not receiving therapy, few were due to patient refusal (3.76% among whites, 5.88% among blacks).

Similarly, Howard, Penchansky, and Brown (1998) assessed racial differences in of breast cancer survival among 246 black and white women who sought care for breast cancer in one of three health maintenance organizations (HMOs). No significant racial differences were found in stage of disease, utilization of health services before diagnosis of breast cancer, or receipt of breast examination. However, African-American patients were more likely to die than whites (30% vs. 18%, respectively) and experienced shorter average survival (1.63 years vs. 2.77 years, respectively). Two percent of whites and eight percent of African Americans missed two or more appointments following diagnosis; after adjusting for the number of appointments made, African Americans were more likely than whites to miss appointments. Missed appointments and stage of diagnosis were strongly associated with survival, and reduced the impact of race on survival. As with the study by Elston Lafata et al. (2001), however, findings of this study are limited by the small sample size and study setting.

In a larger study, Ball and Elixhauser (1996) assessed racial differences in treatment for colorectal cancer among over 20,000 patients in a national sample. Among patients with primary tumor and no metastasis, African Americans were 41% less likely than whites to receive a major procedure for treatment of colorectal cancer (i.e., colon resection, total cholecystectomy, colonoscopy, or bronchoscopy), after controlling for patient demographic characteristics, comorbidities, therapeutic complications, and hospital characteristics. Among patients with metastasis, African-American patients were 27% less likely to receive a major treatment. Bach et al. (1999) found similar results in a study of nearly 11,000 Medicare patients with a diagnosis of resectable non-small-cell lung cancer. The authors found that African-American and white patients who underwent surgery had similar rates of survival at five years (39.1% and 42.9%, respectively). No racial differences were found in survival rates at five years for those patients who did not undergo surgery (4% among African Americans and 5% among whites). African Americans, however, were 12.7% less likely to undergo resection, a difference that was not due to comorbid factors, age, gender, income, geographic region, or type of Medicare insurance. Further, using survival analysis, the authors estimate that 308 African-American patients would have been alive at five years if black patients had undergone surgery at a rate similar to that of white patients.

Racial and ethnic differences are also found in the use of analgesics to manage pain due to cancer. Bernabei et al. (1998) assessed the adequacy of pain management among 13,625 elderly and minority cancer patients admitted to nursing homes following treatment. More than a quarter of patients who experienced daily pain (26%), as assessed by self-report and independent raters, received no pain medication. After adjusting for gender, cognitive status, communication skills, and indicators of disease severity (e.g., explicit terminal prognosis), being bedridden, number of diagnoses, and use of other medications, the authors found that African Americans had a 63% greater probability of being untreated for pain relauve to v s. Older age, low cognitive performance, and increased number of o medications were also associated with failure to receive any analgesic agent. Similarly, Cleeland et al. (1997) assessed the adequacy of pain management among minority patients receiving care in settings that primarily serve minorities vs. patients who receive care in settings where few minority patients are treated. In addition, the authors compared the adequacy of analgesia received by minority patients vs. that received by non-minority patients, as determined by independent, widely accepted pain assessment criteria. Sixty-five percent of patients in this study who reported pain received inadequate pain medication. Patients treated in settings where the patient population was primarily black or Hispanic and those who were treated at university medical centers were more likely to receive inadequate analgesia (77%) than those who received treatment in settings where the patient population was primarily white (52%). In addition, minority patients were more likely to be undermedicated for pain than white patients (65% vs. 50%, respectively), and were more likely to have the severity of their pain underestimated by physicians.

As is the case with some studies of cardiovascular care, the type of health system in which minority patients access care may influence the quality of cancer care received. Optenberg and colleagues, for example (Optenberg et al., 1995), assessed the long-term survival of 1,606 black and white prostate cancer patients who were active duty personnel, dependents, or retirees eligible for care in the military medical system. Black patients in this study presented at a significantly higher stage of cancer development than whites (26.4% of blacks presenting with distant metastases compared to 12.3% of whites), and demonstrated a greater percentage of recurrence (30.6% vs. 21.4%, respectively). There were no significant racial differences in wait time to receive treatment, and no significant differences were found in the type of treatment when stratified by stage of presentation. Overall, stage, grade, and age were found to affect survival, but not race. When analyzed by stage, blacks demonstrated longer survival for distant metastatic disease. Similarly, Dominitz et al. (1998) assessed racial differences in receipt of treatment and survival among 3,176 patients with colorectal cancer treated in the "equal access" Veterans Administration (VA) health system. After adjusting for patient demographic characteristics, co-morbidities, distant metastases, and tumor location, no significant racial differences were found in rates of receipt of surgical resection (70% among blacks, 73% among whites), chemotherapy (23% for both black and whites), or radiation therapy (17% among blacks, 16% among whites). Five-year relative survival rates were similar for black and white patients (42% vs. 39% respectively). These findings are not consistent, however; Dominitz et al. (2002), for example, assessed rates of surgical intervention versus chemotherapy and radiation therapy among a sample of African-American and white male veterans diagnosed with esophageal cancer and treated at VA hospitals. The authors found that after controlling for a variety of patient demographic and clinical characteristics, African-American patients with esophageal adenocarcinoma were less likely to undergo surgery than whites, but had similar rates of chemotherapy and radiation therapy. Similarly, black patients with squamous cell carcinoma were less likely than whites to undergo surgical resection, but were more likely to receive radiation therapy and chemotherapy. Further, in contrast to Optenberg et al. (1995) and his earlier study (Dominitz et al., 1998), in this study Dominitz and colleagues (2002) found that post-treatment mortality was higher for African-American than white patients with squamous cell carcinoma.

### Cerebrovascular Disease

Racial and ethnic variation in the rates of diagnostic tests and clinical procedures for cerebrovascular disease have not been studied as extensively as variation in cardiac procedures, despite the relatively higher risk among African Americans for stroke (Mitchell et al., 2000). Moreover, few studies have compared rates of procedures conditional upon angiography or other diagnostic testing. The preponderance of studies, however, finds generally lower rates of diagnostic and therapeutic procedures among African Americans with cerebrovascular disease.

Oddone et al. (1999) studied racial differences in rates of carotid artery imaging among patients diagnosed with transient ischemic attack, ischemic stroke, or amaurosis fugax seen at one of four VA Medical Centers. After controlling for patients' age, co-morbid factors, clinical presentation, anticipated operative risk, and hospital, African-American patients were found to be half as likely as whites to receive carotid imaging. White patients in this study, however, were more likely to be assessed as appropriate candidates for surgery using RAND criteria because of a higher prevalence of significant carotid artery stenosis among blacks.

Mitchell and colleagues (Mitchell et al., 2000) assessed rates of tests and treatment (including noninvasive cerebrovascular tests, cerebral angiography, carotid endarterectomy, and anticoagulant therapy) for cerebrovascular disease among a sample of Medicare patients admitted to hospitals with a principal diagnosis of transient ischemic attack (TIA). Further, they assessed the relative probability of receiving care from a neurologist. After adjusting for comorbid illness (including hypertension and prior history of stroke), ability to pay (using a proxy based on dual Medicaid-Medicare eligibility and area of residence), and other clinical and demographic variables, the authors found that African Americans were 83% less likely than whites to receive noninvasive cerebrovascular those receiving noninvasive testing, African Americans were 5 likely to receive cerebral angiography, and among those receiving angiography, the odds of African Americans receiving carotid endarterectomy was 0.27. African Americans were 62% less likely than whites to receive anticoagulant therapy, but this difference was not statistically significant given the small number of African-American subjects. African-American patients were 21% less likely than whites to receive care from a neurologist. Overall, patients who received care from a neurologist were more likely to receive both noninvasive and invasive cerebrovascular testing, but were significantly less likely to undergo surgery. The authors note that while the findings could have been affected by unmeasured differences in the severity of carotid artery stenosis that could explain the lower rates of carotid endarterectomy among African Americans (African Americans are less likely to have extracranial disease that is most amenable to carotid endarterectomy), this difference would not explain the disparity in rates of testing (Mitchell et al., 2000).

### Renal Transplantation

African Americans are at greater risk for end-stage renal disease (ESRD) than white Americans. Although African Americans constitute 12% of the U.S. population, they represent almost one-third of those with ESRD. Kidney dialysis was once considered the optimal treatment for ESRD, but recent advancements in kidney transplantation techniques have made transplantation more cost-effective than dialysis. African-American patients with ESRD , however, are less likely than similar white patients to receive a kidney transplant (Epstein et al., 2000). African-American patients are also less likely than white patients to be referred for transplantation and to appear on waiting lists within the first year of Medicare eligibility (Kasiske, London, and Ellison, 1998). In addition, average waiting time for African-American patients awaiting kidney transplantation is almost twice as long as that for white patients, a difference that is not apparent for transplantation of other solid organs (Young and Gaston, 2000). These findings, however, must be interpreted with caution, as many clinical considerations complicate interpretation of these data. For example, in general, fewer African Americans than whites desire or are appropriate for transplantation, and immunologic matching criteria result in fewer donor matches for African Americans than whites.

Several studies are consistent in finding that African-American patients (and in some instances, other ethnic minority patients) are less likely to be judged as appropriate for transplantation, are less likely to appear on transplantation waiting lists, and are less likely to undergo transplantation procedures, even after patients' insurance status and other factors

are considered. Garg, Diener-West, and Powe (2001) longitudinally followed adult ESRD patients to assess racial differences in rates of placement on transplantation waiting lists over time. The authors found that lower rates of placement on the waiting list for blacks than whites persisted after adjustment for differences in both sociodemographic characteristics and health status, and that the gap between blacks and whites did not narrow over time. Epstein and colleagues (2000), in a study of patients with end-stage renal disease from four regional networks in geographically diverse areas, found that African-American patients were less likely than white patients to be rated as appropriate candidates for transplantation, according to expert-identified criteria (9.0% vs. 20.9%, respectively). Among patients considered appropriate for transplantation, however, African-American patients were less likely than whites to be referred for evaluation (90.1% vs. 98.0% respectively), were less likely to be placed on a waiting list (71.0% vs. 86.7% respectively), and were less likely to ultimately undergo transplantation (16.9% vs. 52.0%, respectively). Similarly, in a study of over 41,000 patients awaiting transplantation, Kasiske, London, and Ellison (1998) found that white patients were more likely to be placed on waiting lists before initiating maintenance dialysis than African-American, Hispanic, or "Asian/other" patients. Other factors predicting being placed on waiting lists before dialysis included patients' age, receipt of a prior transplant, level of education, employment status, insurance status, receiving insulin, listing for kidney and pancreas transplant vs. kidney only, and listing through a center that performs a high volume of procedures.

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African-American patients are also found to be less likely to receive dialysis as an initial treatment for ESRD. Barker-Cummings, McClellan, Soucie, and Krisher (1995) found that after controlling for patients' sociodemographic and clinical characteristics (including age, education, social support, home ownership, functional status, albumin level, presence of hypertension, history of MI, peripheral neuropathy, and comorbid diabetes), African Americans were half as likely as white patients to be initially treated with peritoneal dialysis.

Some evidence suggests that African-American patients are less likely than whites to desire kidney transplantation. Ayanian, Cleary, Weissman, and Epstein (1999) found that African-American male patients were sig-

[illegible]s likely than white males to report wanting a transplant. This differen[illegible]as not significant among female patients. However, even when differences in preference were taken into account, African-American patients were much less likely than white patients to have been referred to a transplant center for evaluation (50.5% of African-American women vs. 70.7% of white women, and 53.9% of African-American men vs. 76.2% of white men), and to have been placed on a waiting list or to have received a transplant within 18 months after initiating dialysis (31.9% of African-American women vs. 56.5% of white women, and 35.3% for African-American men vs. 60.6% of white men). Similarly, Alexander and Sehgal (1998) found that African-American patients were less likely than white patients to be "definitely interested" in receiving a transplant, to complete pre-transplant workup, and finally, to progress on waiting lists to receive a transplant. These analyses controlled for patient age, gender, cause of renal failure, years receiving dialysis, and median income of patients' zip code area. Ozminkowski et al. (1997) surveyed 456 ESRD patients to assess the effects of patient sociodemographic characteristics, health and functional status, and attitudes about dialysis or transplantation on waiting list entry and receipt of a cadaver kidney transplant. The authors found that approximately 60% of the differences between African-American and white waiting list entry rates and 52% of the black-white differences in transplantation rates were due to race-related differences in socioeconomic status, health and functional status, severity of illness, biological factors, the existence of contraindications to transplantation, transplant center characteristics, and patients' attitudes about dialysis and transplantation.

At least one study has assessed the influence of patients' clinical and non-clinical factors, including race, on physicians' recommendations for renal transplantation. Thamer et al. (2001) surveyed 271 nephrologists who were presented with scenarios that varied the age, race, gender, living situation (alone or with family), history of compliance with treatment, diabetic status, residual renal function status, HIV status, weight, and cardiac ejection fraction of hypothetical patients. Asian-American males were less likely than white males to be recommended for transplantation, as were women, those with a history of non-compliance, low cardiac ejection fraction, overweight, or positive HIV status. The fact that African-American and white "patients" were recommended for transplantation at similar rates suggests that the observed black-white differences may emerge at other steps in the transplantation process, according to the authors. The low rate of recommendation for Asian-American males, however, is inconsistent with the fact that Asians have the highest cadaveric allograft survival rates of all racial and ethnic groups, the authors note.

## HIV/AIDS

HIV infection continues to spread more rapidly among African-American and Hispanic populations than any other racial/ethnic group in the United States. While federal programs have been expanded in recent years to increase the availability of antiretroviral therapies, especially among low-income and ethnic minority populations, minorities face greater barriers than whites to appropriate care. African Americans with HIV infection are less likely to receive antiretroviral therapy, less likely to receive prophylaxis for pneumocystic pneumonia, and less likely to receive protease inhibitors than non-minorities with HIV. These disparities remain even after adjusting for age, gender, education, and insurance coverage (Shapiro et al., 1999). Differences in the quality of HIV care may be related to survival rates, even at equivalent levels of access to care. Cunningham et al. (2000), for example, in a study of relative risk of six-year mortality for Hispanic, African-American, and white patients hospitalized as a result of HIV-related illness, found that Hispanics experience twice the risk of dying as whites, after controlling for sociodemographic characteristics, (e.g., access to care and insurance) and clinical characteristics (e.g., severity of illness and disease stage). Use of antiretroviral drugs prior to hospitalization did not diminish the impact of ethnicity on survival.

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Shapiro et al. (1999) assessed racial/ethnic, gender, and other sociodemographic variations in care (number of care-seeking visits and use of protease inhibitors [PI] or nonnucleoside reverse transcriptase inhibitors [NNRTI]) for persons infected with HIV. Adjusting for insurance status, CD4 cell count, sex, age, method of exposure to HIV, and region of country, African-American and Hispanic patients were 24% less likely than whites to receive PI or NNRTI at initial assessment. This disparity declined to 8% at the final assessment stage, a difference that remained statistically significant. On average, blacks waited 13.5 months to receive these medications, compared with 10.6 months for whites.

Moore et al. (1994) assessed use of anti-retroviral drugs and prophylactic therapy to treat Pneumocystis carinii pneumonia (PCP) in an urban population infected with HIV. No racial differences were found in the stage of HIV disease at the time of presentation. However, 63% of eligible of eligible blacks received antiretroviral therapy, and PC[illegible]phylaxis was received by 82% of eligible whites and only 58% of eligible blacks. African-American patients were significantly less likely than whites to receive antiretroviral therapy or PCP prophylaxis. Noting that whites were more likely to report a usual source of care (59%) than African Americans (34%), the authors suggested that increased access to regular healthcare providers among minorities might reduce disparities in HIV treatment.

Bennett et al. (1995) assessed quality of care for Pneumocystis carinii pneumonia (PCP) among white, Hispanic and African-American patients with HIV receiving care in either Veterans Administration (VA) hospitals or non-VA systems. For all patients, regardless of the type of hospital in which they were treated, anti-PCP medications were initiated within two days of admission for 70% to 77% of patients. Approximately 60% of patients underwent a bronchoscopy at some point during hospitalization. Black and Hispanic patients at non-VA hospitals, however, were more likely to die during hospitalization, and were less likely to undergo bronchoscopy in the first two days of admission. No racial differences were found in use of bronchoscopy, receipt of anti-PCP medications within two days of admission, or mortality in VA hospitals.

### Asthma

African Americans, particularly those living in urban areas characterized by concentrated poverty, are at greater risk of morbidity and mortality due to asthma. It is unclear if the greater prevalence of asthma among African Americans is due to biologic or genetic predisposition, socioeconomic factors, or environmental living conditions, although high rates of air pollutants in urban communities is likely a key factor (Institute of Medicine, 1999c). Management and control of the disease is affected by socioeconomic as well as cultural considerations; African Americans are more likely to receive treatment for asthma in emergency rooms, and are more likely to use inhaled bronchodilator medications than inhaled corticosteroids, suggesting that management of the disease in this population has been focused more on acute symptom control as opposed to suppression of chronic airway inflammation. These patterns are not fully explained by socioeconomic differences between blacks and whites (Zoratti et al., 1998).

Zoratti and colleagues (Zoratti et al., 1998), in a study of African-American and white patients enrolled in a managed care system, found that after controlling for income, marital status, gender, and age, African-American patients were more likely than whites to access care in emergency rooms, were hospitalized more often, and were less likely to be seen by an asthma specialist. African Americans were also more likely to use oral corticosteroids and were less likely to be prescribed inhaled anticholinergic medications. The authors note that the population at highest risk for the most severe asthma and the poorest management of the disease had the least access to specialists and the appropriate medications to manage chronic symptoms. While this study was unable to assess the severity of disease in the patient population and could not assess long-term follow-up, African Americans seen in emergency rooms appeared not to receive appropriate rates of referral to specialty care. The authors speculate that several barriers to referral may exist, particularly for low-income African Americans, including geographic distance from specialists (who are primarily located in suburban and higher-income communities), the presence of other life demands and challenges, and assumptions on the part of primary care physicians that low-income patients would be unable to maintain compliance with treatment regimens.

A combination of poor patient understanding of asthma management and inadequate physician monitoring may contribute to disparities in asthma care. Blixen et al. (1997) surveyed 24 African-American patients with asthma who were treated in an emergency department for acute asthma symptoms, and found that despite having relatively high levels of access to care (half reported belonging to an HMO, 54% lived within 10 minutes away from a regular source of healthcare, and 70.8% reported having a regular physician to treat their asthma), the disease was typically poorly managed. Overall disease-related quality of life scores suggested that these respondents experienced poorer quality of life related to asthma than white patients assessed with the same instrument in prior studies. Fewer than half (45.8%) used NIH-recommended prophylactic anti-inflammatory medication, and a majority (70.8%) managed symptoms with an inhaled beta agonist inhaler. Over half (58.3%) knew what a home peak flow meter was, but fewer than half reported that their doctor had recommended its use and only 29.2% had one in the home. A majority (62.5%) made one to three visits to the emergency departments within the past three months, and fewer than half reported speaking with their physician or nurse about asthma-related problems.

In contrast, in a study of over 5,000 patients to assess the consistency of asthma care in relation to national guidelines, Krishnan et al. (2001) found that after controlling for patient age, education, employment, and symptom frequency, no significant differences existed between African-American and white patients in use of medication regimens and asthma specialty care. Findings of racial or ethnic differences in asthma care are therefore somewhat mixed, and may vary as a function of the educational level of patient populations studied.

## Diabetes

African Americans, Hispanics, and Native Americans experience a 50%-100% higher burden of illness and mortality due to diabetes than white Americans, yet the disease appears to be more poorly managed among minority patients. In a study of nearly 1,400 Medicare beneficiaries with a diagnosis of diabetes, Chin, Zhang, and Merrell (1998) found that even after controlling for patients' gender, education, and age, African-American patients were less likely to undergo a measurement of glycosylated hemoglobin, lipid testing, ophthalmologic visits, and influenza vaccinations than white patients. African-American patients with diabetes were also more likely to use hospital emergency departments and had fewer physician visits. Similarly, Cowie and Harris (1997) found that African-American non-insulin dependent diabetes patients were more likely to be treated with insulin than whites and Mexican Americans. No significant differences were found among the racial and ethnic groups, however, in rates of visits to specialists for diabetes complications, physician testing of blood glucose, and screening for hypertension, retinopathy, and foot problems. In addition, a higher proportion of African-American patients than non-Hispanic whites and Mexican Americans were found to receive patient education, but the median number of hours of instruction was lower for African Americans. Harris et al. (1999) found that while the majority of subjects in a nationwide study of adults with type 2 diabetes used pharmacologic treatment to manage the disease, a higher proportion of African-American patients were treated with insulin and a higher proportion of Mexican-American patients were treated with oral agents when compared with non-Hispanic whites. Multiple daily insulin injections were also more common among whites. Further, a larger percentage of African-American women and Mexican-American men were found to have poor glycemic control (HbA1c > 8%) when compared with other groups. There was no relationship between glycemic control and patient socioeconomic status or access to care for any racial or ethnic group.

## Analgesia

Given the role of cultural and linguistic factors in both patients' perceptions of pain and in physicians' ability to accurately assess patients' pain (to be discussed in greater detail in Chapter 3), it is reasonable to suspect that healthcare disparities might be greater in pain treatment and other aspects of symptom management than in treatment of objectively verifiable disease. Several studies have documented underuse of analgesics among minority patients, both in in-patient and outpatient settings. Todd, Samaroo, and Hoffman (1993), for example, found that among Hispanic and non-Hispanic white patients with long-bone fracture treated at the UCLA Medical Center emergency department, Hispanic patients were twice as likely as white patients to receive no pain medication, even after controlling for patient, injury, and physician characteristics. A follow-up study (Todd, Lee, and Hoffman, 1994) revealed that physicians' assessments of pain severity did not differ among Hispanic and non-Hispanic white patients presenting to the emergency department with extremity trauma, ruling out physicians' ability to assess pain as a possible explanation for disparities in analgesic use. Todd and colleagues (Todd et al., 2000) also found that after controlling for time since injury, time in the emergency department, need for fracture reduction, and payer status, African-American patients with long-bone fractures seen in emergency rooms were less likely than whites to receive analgesia. Similarly, as noted above, Bernabei et al. (1998), in a study of elderly nursing home residents with cancer, found that African Americans were 63% more likely than whites to receive no pain medication, after accounting for patients' gender, marital status, severity of illness, and cognitive status. Cleeland et al. (1997) found that minority cancer patients were more likely than whites to receive inadequate pain medication.

Study findings regarding use of analgesia, however, are not entirely consistent. Ng et al. (1996), for example, found that white and African-American post-operative patients were prescribed more narcotics than Asian-American and Hispanic patients. This difference persisted after adjustment for age, gender, preoperative use of narcotics, health insurance, and pain site. These findings suggest that cultural and linguistic barriers, which may have been more pronounced among Hispanic and Asian-American patients, may indeed play a significant role in physicians' ability to detect pain symptoms. These findings are in contrast to that of Todd and colleagues (Todd, Lee, and Hoffman, 1994; Todd, Samaroo, and Hoffman, 1993), who controlled for patient characteristics such as language in finding that Hispanic patients seen in emergency care settings were less likely to receive analgesia. In addition, Weisse et al. (2001) used an experimental design to assess primary care physicians' recommendations regarding treatment of hypothetical patients presenting with pain (kidney stone pain or lower back pain) or a control condition (sinusitis). Symptom presentation and severity were held constant, but the investigators varied the "patients'" race (African American or white) and gender. No overall racial or gender differences were found in treatment recommendations. However, when the physicians' recommendations were analyzed by gender, a significant interaction was observed. Male physicians prescribed higher doses of pain treatment to white than African-American patients and to male than female patients. Female physicians, on the other ha prescribed higher doses to African Americans than whites and fem than males. Among "patients" presenting with sinusitis, no overall differences were observed in physicians' decisions to treat patients with antibiotics, but white patients were prescribed a longer course of antibiotics and were prescribed refills more often than African-American patients. These findings lead the authors to conclude that male and female physicians respond differently to patients' gender and race.

### Rehabilitative Services

Studies of racial differences in the use of rehabilitative services, such as occupational or physical therapy, yield mixed results. Hoenig, Rubenstein, and Kahn (1996) assessed racial and other sociodemographic and geographic differences in the use of physical and occupational therapy among elderly Medicare patients with acute hip fracture. Assessing records of 2,762 Medicare patients treated in 297 randomly selected hospitals from five states, the authors found that after controlling for patient clinical characteristics, African-American patients (63%) were more likely to receive a lower intensity of physical or occupational therapy than non-African Americans (43%). Similarly, Harada et al. (2000) assessed use of physical therapy among patients hospitalized in acute and/or postacute settings following hip fracture, and found that African-American patients were less likely than whites to receive acute physical therapy only, were less likely to receive therapy in both acute care and skilled nursing facilities, and were more likely to receive no physical therapy at all.

In contrast, Horner et al. (1997), in a study of inpatient utilization of physical and occupational therapy following stroke, found that a larger proportion of African American patients received physical or occupational therapy during hospitalization. After adjusting for clinical and socioeconomic factors associated with the use of physical and occupational therapy, however, no racial differences were found in the likelihood of use of therapy or time to initiate therapy (African Americans = 6.6 days, whites = 7.4). Similarly, no racial differences were found in length of physical or occupational therapy in days or as a proportion of hospital stay.

### Maternal and Child Health

In recent years, several federal and state initiatives have been implemented to promote access to appropriate prenatal, perinatal and postnatal care for pregnant women and their children. Despite these efforts,

many of which have been directed at low-income and uninsured women, racial and ethnic disparities have been found with modest consistency in a range of maternal and child health services.

Aron et al. (2000) assessed differences in rates of cesarean delivery by patient race and insurance status among over 25,000 women seen in 21 hospitals in northeastern Ohio. While the unadjusted overall rate of cesarean delivery was similar in white and non-white (over 90% African-American and other racial and ethnic groups) patients, adjusted analyses that controlled for clinical risk factors revealed that non-white patients were more likely to receive cesarean delivery. In contrast, Braveman et al. (1995) found that after adjusting for insurance status and personal, community, medical, and hospital characteristics, black women were 24% more likely to undergo cesarean than whites. Latino women were also at a slightly elevated risk for cesarean delivery compared with whites. Among women who delivered high-birth-weight babies, gave birth at for-profit hospitals, or resided in communities where 25% or more of the population were non-English speaking, cesarean delivery was more likely among non-whites and was more than 40% more likely among black women than white women.

Brett, Schoendorf, and Kiely (1994) assessed use of prenatal care technologies (i.e., ultrasonography, tocolysis, amniocentesis) among African-American, Hispanic, and white women, and found inconsistent racial differences in these services, after controlling for maternal age, education, marital status, location of residence, birth order, timing of first prenatal care visit, and plural births. Amniocentesis was used substantially less frequently by black women, while black women underwent ultrasonography slightly less frequently than white women. Black women with singleton births were slightly more likely to receive tocolysis than white women, although the risk of idiopathic pre-term delivery is estimated to be three times higher in black women. Black women with plural births received tocolysis two-thirds as often as white women.

In a study of civilian vs. military outcomes in prenatal care utilization, birth weight distribution, and fetal and neonatal mortality rates, Barfield et al. (1996) found that prenatal care utilization was lower for black patients than white patients in both military and civilian populations. The magnitude of the disparity was lower, however, in the military population. Similarly, Kogan et al. (1994) assessed self-reported receipt of prenatal care advice from providers among over 8,300 white and African-American women. After adjusting for age, marital status, education, income, site of prenatal care, type of payment, maternal health behaviors, when trimester care began, and prior adverse pregnancy outcomes, the authors found that white women were more likely to report receiving advice for alcohol and smoking cessation than African-American women.

promotion narrowly missed significance with a trend toward mo[illegible]lvice for white women. A significant interaction between race and marital status emerged, such that black single women were 1.4 times more likely than single white women to not receive advice on drug cessation, while there were no racial differences among married women.

## Childrens' Health Services

As is the case with maternal and infant health services, several federal and state initiatives have been initiated to improve access to healthcare among low-income children and adolescents (most notably, the federal State Child Health Insurance Program [SCHIP]). Several studies note racial and ethnic disparities in hospital-based and outpatient child health services. However, no studies to date have assessed the effectiveness of SCHIP in reducing racial and ethnic disparities in care.

Furth et al. (2000) assessed access to kidney transplantation among over 3,000 African-American and white youth under age 20 with ESRD. Controlling for factors such as age, gender, cause of ESRD, family socioeconomic status (SES), incident year of ESRD, ESRD network, and facility characteristics, the authors found that African-American youth were 12% less likely than white patients to be activated on the kidney transplant wait list. Family socioeconomic characteristics, however, reduced this disparity; the relative hazard for black patients in the lowest SES quartile being activated on the wait list was .84, compared with relative hazard of 1.0 for black patients in the highest SES quartile.

Hahn (1995) assessed use of prescription medications between two samples of children (ages 1 to 5 and ages 6 to 17) who had at least one ambulatory care visit in 1987. Among children aged one to five, African-American children were half as likely to receive prescription medication compared with white children. Adding health factors to the model did not change this relationship. However, the addition of numbers of physician visits reduced these differences, such that they were no longer significant. There was no difference in the probability of receiving medication for Hispanic children compared with white children. After controlling for age, maternal education, insurance, poverty status, source of care, geographic location, health status, number of bed days, number of reduced activity days, and physician visits, black children received the fewest number of medications. The average number of medications for black children was 86.5% compared to that of white children, while Hispanic children averaged 94.1% of medications compared to that of white children. Among children aged 6 to 17 years, African-American and Hispanic children were 46% and 38% less likely, respectively, to receive any prescription medication compared with white children. The addition of

health factors and numbers of physician visits did not change these relationships, and they remained after controlling for age, maternal education, insurance, poverty status, source of care, geographic location, health status, number of bed days, number of reduced activity days, and physician visits. Similarly, Zito et al. (1998) found that white children were twice as likely to receive psychotropic prescriptions compared with African-American children.

A study examining parents' perceptions of pediatric care found striking racial and ethnic differences. Weech-Maldonado et al. (2001) used data from the National Consumer Assessment of Health Plans (CAHPS) Benchmarking database and found that minority parents, particularly non-English speakers, were less satisfied than white parents with pediatric services, after controlling for parents' gender, age, education, and their children's health status. African-American and American-Indian parents were found to be less satisfied than whites in getting needed care, the timeliness of care, provider communication, and health plan services. Among Asian-American and Hispanic parents, parental satisfaction was lower than for whites only among those who were non-English speakers. Asian-American and Hispanic non-English speakers rated staff helpfulness, timeliness of care, provider communication, health plan services, and getting needed care lower than did white parents, while Asian-American and Hispanic parents who were proficient in English did not differ significantly from whites on any reports of care.

## Mental Health Services

Several studies document racial and ethnic variation in receipt of mental health services. Significantly, the U.S. Surgeon General recently completed a major report assessing racial and ethnic disparities in mental health and mental healthcare that reviews much of the available literature. That report finds that more so than in other areas of health and medicine, mental health services are "plagued by disparities in the availability of and access to its services," and that "these disparities are viewed readily through the lenses of racial and cultural diversity, age, and gender" (U.S. DHHS, 2001a, p. vi). Major findings of the report include that: mental illnesses are real and disabling conditions that affect all populations (regardless of race/ethnicity); striking disparities are found for racial and ethnic minorities; and these disparities impose a greater disability burden on racial and ethnic minorities. In addition to universal barriers to quality care (e.g., cost, fragmentation of services), the report notes that other barriers, such as mistrust, fear, discrimination, and language differences carry special significance for minorities in mental health treatment, as these barriers affect patients' thoughts, moods, and behavior. Communication and trust are particularly critical in treatment, the report notes, and differences in the cultural perspectives of the patient and clinician/healthcare system must be acknowledged and addressed (U.S. DHHS, 2001a).

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Several studies have examined disparate use of psychotropic medications and mental health services and find disparities, with minorities in some cases receiving *higher* quantities of medications. For example, in a study examining prescriptions of antipsychotic medications by physicians in psychiatric emergency services, Segal, Bola, and Watson (1996) found that African-American patients received more oral doses and injections of antipsychotic medications. The 24-hour dosage of antipsychotic medication given to African Americans was also significantly higher that for other patients. Analyses controlled for several clinical factors including presence of psychotic disorder, severity of disturbance, dangerousness, psychiatric history, if physical restraints were used, hours spent in the emergency service, clinician's efforts to engage patient in treatment, and whether optimum time was spend on the evaluation. The study also found that the tendency to overmedicate African-American patients was lower when a clinician's efforts to engage the patients in treatment were rated as being higher. Models predicting number of medications, number of oral and injected antipsychotic and 24-hour dosage became non-significant.

In contrast, a study examining medication prescribed for depression yielded different results. Melfi and colleagues (2000) assessed antidepressant treatment in a population of Medicaid beneficiaries diagnosed with depression. Analyses controlled for age, gender, Medicaid eligibility status, and several clinical factors. Forty-four percent of whites and 27.8% of blacks received antidepressant treatment within 30 days of the first indicator of depression. White patients were more likely to receive antidepressants than black patients and patients in the other/unknown racial category.

An examination of privately insured federal employees, conducted by Padgett and colleagues (1994), assessed racial and ethnic differences in use of inpatient psychiatric services. Analyses controlled for a variety of predisposing factors (e.g., education, family size, racial/ethnic composition of residing county), enabling factors (region of country, salary, high

or low option selected for insurance coverage), and need factors (annual medical expenses, family's annual medical expenses, other family member receipt of inpatient psychiatric care, sum of outpatient mental heath visits by other family members). No significant differences were found among blacks, whites and Hispanics as to the probability of a psychiatric hospitalization or in number of inpatient psychiatric days.

### Racial and Ethnic Differences in Other Clinical and Hospital-Based Services

Several studies document racial and ethnic disparities in other clinical and hospital-based services. Ebell et al. (1995) assessed the rate of survival by patient race following in-hospital cardiopulmonary resuscitation (CPR) of 656 patients at one of three teaching hospitals. Black patients in this study were less likely than non-black patients to have an admitting diagnosis of myocardial infarction (MI), were less likely to have a history of coronary artery disease, but had a higher severity of illness according to a standard screening instrument. Controlling for these variables, black patients were found to have poorer survival to discharge than non-black patients. Because resuscitation was provided in-hospital, differences in ambulance response time, access to telephones, or other community factors could not account for this difference. Further, because there were no significant racial differences in the success of the resuscitation effort, the difference in survival appears to be related to the quality of care after resuscitation, or to other unmeasured factors.

Devgan et al. (2000) assessed surgical treatment for glaucoma among large samples of African-American and white Medicare patients, and found that African-American patients received argon laser trabeculoplasty or trabeculectomy surgery at nearly half of expected rates, once the age-race prevalence of glaucoma was considered. Arozullah et al. (1999) assessed rates of laparoscopic cholecystectomy among more than 16,000 Veterans Administration (VA) patients diagnosed with gall bladder or biliary disease. After controlling for patient age, marital status, co-morbid illness, year of surgery, and hospital geographic location, the investigators found that African-American patients who underwent cholecystectomy were less likely than white patients to undergo the laparoscopic procedure. In contrast, another study of VA patients (Selim et al., 2001) found that among patients presenting with low-back pain, "non-white" patients in higher levels of pain were more likely to receive lumbar spine radiographs than white patients experiencing similar pain levels, although this racial difference disappeared after controlling for clinical characteristics.

Fewer studies have assessed the quality of basic healthcare services.

In one such study, Ayanian et al. (1999) utilized explicit process criteria and implicit review by physicians to assess the quality of care for patients hospitalized with congestive heart failure and pneumonia. Using records from a stratified random sample of over 2,000 Medicare beneficiaries, the authors found that among patients with congestive heart failure, African Americans received a lower overall quality of care than other patients by implicit review, but not explicit review. Among patients with pneumonia, African-American patients received a lower quality of care by explicit criteria, but not explicit review. These differences persisted in analyses adjusting for patient and hospital characteristics. Adjusted analyses also revealed no significant differences in quality of care for patients from poor communities, as compared with other patients. Similarly, in a review of discharge data from over 1.7 million patients assessed via the Hospital Cost and Utilization Project (HCUP-2), Harris, Andrews, and Elixhauser (1997) found that African Americans were less likely than whites to receive major therapeutic procedures for 37 of 77 conditions, and more likely than whites to receive a major therapeutic procedure in 9.1% of conditions studied. These differences persisted even after controlling for patients' age, expected pay source, indicators of clinical condition, and hospital-level characteristics (e.g., bed size, public ownership, teaching status, and urban location).

In a study of racial differences in mortality and resource use among patients admitted to intensive care units, Williams et al. (1995) found no significant differences in risk-adjusted in-hospital mortality. The authors did find, however, that African-American patients had a shorter length of stay and lower resource use in the first seven days compared with white patients. For example, whites received more technological monitoring (arterial and pulmonary artery catheters, pulse oximetry), more laboratory testing, and a greater proportion of life-saving treatments. These differences persisted after adjusting for patient characteristics and insurance status, leading the researchers to conclude that these differences could reflect undertreatment for African Americans or overutilization of services by whites.

In another study of Medicare patients, Wilson, May, and Kelly (1994) assessed racial differences in receipt of total knee arthroplasty among older adults with osteoarthritis. The authors found that while osteoarthritis was slightly, but not significantly, more common among African Americans, whites were more likely to receive total knee arthroplasty. This relationship held true at all income levels and could not be explained by prior procedures or the use of alternative procedures.

White-Means (2000) assessed the use of long-term care services (paid caregiver, therapist, mental health, dentist, foot doctor, optometrist, chiropractor, ER visit, doctor visits, prescription medications) by disabled

elderly Medicare patients, as a function of medical conditions and disabilities, income, insurance status, regional and rural residence, whether unpaid caregivers provide in-home services, and sociodemographic characteristics (e.g., gender, education). Given similar medical conditions, African-American patients were found to be less likely to use long-term care services, particularly prescription medications and physician services. African-American patients who lived in rural areas, small cities, and western states or who had more joint and breathing problems were more likely to use services. Differences in personal attributes (e.g., income, health) did not fully explain racial differences in use of prescriptions and physician services. Similarly, Khandker and Simoni-Wastila (1998) assessed racial differences in use and level of use of prescription drugs among a sample of Medicaid patients, controlling for age, sex, and Medicaid eligibility characteristics. African-American children were found to use 2.7 fewer prescriptions compared with white children. African-American adults used 4.9 fewer prescriptions, and African-American elders used 6.3 fewer prescriptions than white elders. White Medicaid enrollees had higher use and spending than black enrollees across most high-volume therapeutic drug categories.

In a study of primary care, Shi (1999) assessed patients' perceptions of intake, service delivery, referral, and follow-up among nearly 15,000 white, African-American, Hispanic, and Asian respondents to the Medical Expenditure Panel Survey (MEPS). Controlling for patients' perceived need for care, ability to obtain services, and frequency of use of care, Shi found that African-American, Hispanic, and Asian-American patients tended to experience greater barriers to receiving primary care. Hispanic patients were over 40% less likely to have a usual source of care, while those African-American and Hispanic patients who did report a regular primary care provider tended to reference a facility (hospital or clinic) rather than an individual provider. African Americans were less likely to have a primary care specialist as a regular provider. All three minority groups were 39% to 48% more likely than whites to report long waiting periods before seeing their care provider, but Asian-American patients were more likely than any racial/ethnic groups to report that getting an appointment was "very difficult." On an encouraging note, this study also found that overwhelming numbers of whites and minority patients reported confidence in their provider and that their usual care provider "listened to them"—over 90% agreement for all groups.

A small number of studies have assessed racial and ethnic differences in preventable hospitalizations. Preventable hospitalizations are those that might not have occurred had patients received timely and appropriate preventive care in the case of acute conditions, as well as effective and continuous care for chronic conditions. Gaskin and Hoffman (2000) assessed rates [illegible]reventable hospitalizations among children, working-age adults, and the elderly, while adjusting for a range of sociodemographic (e.g., age, income, insurance status), community-level (e.g., neighborhood characteristics, physicians, and hospital beds per capita), and health status (e.g., co-morbidities) variables. Results indicated that African Americans and Hispanics were significantly more likely to be hospitalized for preventable conditions than whites, even after adjusting for patient differences in healthcare needs, socioeconomic status, insurance coverage, and the availability of primary care providers. Subsequent analyses of individuals within similar health insurance plans confirmed that these differences exist independently of insurance status. The findings were limited by the lack of information on the competency of providers seen by minority patients, the adequacy of insurance plans, and personal health-seeking behavior.

Minority patients are more likely to undergo amputation than white patients. Such is the case with limb amputation, where more than 50,000 procedures are performed each year among patients with diabetes. Guadagnoli et al. (1995) assessed racial differences in the use of amputation and leg-sparing surgery among a random sample of Medicare patients. The authors found that African-American patients were nearly twice as likely as whites to undergo above-knee amputation, and were slightly more likely than whites to undergo toe and/or foot amputation, controlling for co-morbid disease, prior hospitalizations, geographic region, hospital teaching status, and other factors. Whites, on the other hand, were more likely to undergo lower-extremity arterial revascularization and percutaneous transluminal angioplasty than African-American patients. The study did not, however, control for disease severity, although the authors note that controls for co-morbid disease and prior hospitalizations may attenuate this potential confounding factor. Similarly, Gornick et al. (1996), in a study of 26.3 million Medicare beneficiaries, found that African Americans were more likely than whites to undergo bilateral orchiectomy or amputation of the lower limbs, even after controlling for income differences. Finally, Collins et al. (2002) assessed racial and ethnic differences in rates of lower extremity amputation versus lower extremity bypass revascularization among a sample of VA patients with peripheral arterial disease. In this prospective study, the authors statistically adjusted for a range of factors that may be associated with the use of amputation versus revascularization (e.g., presence of diabetes, hypertension, heart disease, or other co-morbid conditions, behavioral risk factors such as smoking or alcohol use, geographic location of the VA hospital), and found that African-American and Hispanic patients were 1.5 and 1.4 times, respectively, more likely than white patients to undergo amputation than revascularization (Collins et al., 2002).

## Gaps in Existing Research

While the research reviewed here points to significant variation in access to and use of services by race and ethnicity, several gaps exist that must be addressed to develop a more comprehensive understanding of racial and ethnic disparities in healthcare. The most significant gap in this research is the failure to identify mechanisms by which these disparities occur. A robust research agenda is needed to better understand how the process and structure of care may vary by patient race (see chapter on "Needed Research"). Such research must consider the range of influences on patients' and providers' attitudes and expectations in the clinical encounter, clinical decision-making processes employed by healthcare providers and the influence of patient race in these processes, the nature and quality of communication between patients and providers (particularly as it occurs across cultural and/or linguistic lines), the environments and settings in which care is delivered, and other factors that will be discussed later in this report. In addition, as noted below, no research has yet illuminated the relative contribution of these factors to the healthcare disparities observed in the literature.

Assessing sources of disparities in care in the current literature is also complicated by many methodological considerations. Attempts to control for SES differences are inconsistent, with some researchers employing patient income or education as sole indicators of SES, and others using proxy variables such as estimates of income on the basis of patients' zip code information. Most studies control for insurance status, but some combine data from patients insured via different types of health systems (e.g., HMO or fee-for-service) or different sources of insurance coverage (e.g., public vs. private).

Some studies have explicitly examined differences in where racial and ethnic groups receive care (e.g., public vs. private healthcare settings), and clinical factors such as stage of illness progression at presentation (e.g., on average, ethnic minority cancer patients present at later stages of disease progression, thereby limiting treatment options) or other co-morbid factors that may limit treatment options. Other studies have attempted to control for the quality of diagnostic evaluation and disease severity. Adequate assessment of these factors, however, is often limited by a lack of sufficient information in administrative claims data upon which many studies are based. These datasets often rely on crude or incomplete measures of disease severity and the types of treatment provided, and contain limited information on prior diagnoses or treatments. Further, most studies (with the exception of several studies of cardiovascular care) lack comparison to standards for the appropriateness of care, leaving open the question of whether care received was sufficient given the type and severity of disease.

Finally, one of the most significant limitations of existing research is the failure to analyze differences in care beyond comparisons of African-American and white patients. With the exception of a few large studies conducted in ethnically diverse regions of the United States such as California and New York, few studies have assessed whether disparities in care exist for Hispanic and Asian-American populations. Further, few studies have examined subgroup differences within these populations. These issues are particularly salient for Hispanic and Asian-American subgroups, whose healthcare may be complicated by linguistic and cultural differences, immigration status, and other access-related issues.

### The Extent of Racial and Ethnic Disparities in Healthcare

As the discussion above suggests, many factors influence the provision and receipt of diagnostic and therapeutic healthcare services. Further, healthcare outcomes are influenced by a wide variety of factors, many of which are beyond the scope of clinical factors such as the efficacy of treatment protocols. Assessing the relative contribution of the many patient, provider, and system-level influences on care is therefore an imprecise exercise. Similarly, assessing the extent of racial and ethnic differences in healthcare that are not otherwise attributable to known factors such as access to care is not likely to yield reliable estimates.

Some studies have attempted to assess the extent of racial and ethnic disparities in a small number of key indicators of healthcare use. Weinick, Zuvekas, and Cohen (2000) assessed racial and ethnic differences in access to and use of healthcare services (i.e., having a usual source of care and the use of ambulatory care services), and evaluated the magnitude of these differences above and beyond access-related factors such as insurance status, income, and other socioeconomic characteristics. The authors found that after adjusting for health insurance, income, age, sex, marital status, education, health status, region of the country, and residence in a metropolitan area, Hispanics and African Americans were significantly more likely to lack a usual source of care and were less likely to use any ambulatory care services than white Americans. Hispanics were nearly 0% more likely to lack a usual source of care, and African Americans and Hispanics were nearly 9% and over 10% less likely, respectively, to have made any ambulatory care visits. The authors performed additional analyses to assess the extent of these disparities, simulating conditions in which all racial and ethnic groups earned equivalent income and were insured at the same level. For all groups, 55% to 77% of the observed differences remained, demonstrating that "health insurance coverage and income typically each account for only about one fifth, and never even as much as one half, of the disparities . . . observed" (Weinick, Zuvekas, and Cohen, 2000, p.43). The authors acknowledge, however, that these racial and ethnic disparities in the use of services could be related to unmeasured factors, such as job-related and non-financial barriers, poor cultural and linguistic access, an inadequate geographic distribution of healthcare providers in racial and ethnic minority communities, and other factors.

More such studies are needed to assess the relative contribution of access-related factors (e.g., insurance status), other socioeconomic and geographic variables (e.g., patients' education, income, and the availability of healthcare providers in a community), and racial and ethnic differences in healthcare preferences and attitudes to determine the extent of disparities in care. This research is needed across a range of health conditions. Currently, however, this research does not present a sufficient empirical foundation to assess the extent of racial and ethnic healthcare disparities. The committee therefore concludes that while evidence of racial and ethnic disparities in care appears consistently across a range of health conditions and medical procedures, attempts to assess or quantify the extent of these disparities, based on evidence currently available, are not likely to prove to be reliable or valid.

## SUMMARY

Racial and ethnic minority patients are found to receive a lower quality and intensity of healthcare and diagnostic services across a wide range of procedures and disease areas. This finding is remarkably consistent and robust, as only a handful of the several hundred studies reviewed here and by others (e.g., Geiger, this volume; Kressin and Peterson, 2001; Mayberry et al., 2000) find no racial and ethnic differences in care. In studies where patients' sociodemographic characteristics (e.g., education level, income), insurance status (e.g., public or privately funded insurance) and clinical factors (e.g., co-morbid illness, severity of disease) are controlled, these racial and ethnic differences are generally attenuated, but rarely disappear completely. Further, in a few well-designed, prospective studies, these disparities in care have been linked to poorer clinical outcomes and higher mortality among minorities (Peterson et al., 1997; Bach et al., 1999).

Insurance status, in particular, emerges in several studies as a key predictor of the quality of care that patients receive. The privately insured generally receive a higher quality of care than those who are insured through publicly funded sources (e.g., Medicaid), or those who have no health insurance. Racial and ethnic minorities are disproportionately represented between the latter two categories, yet when sources of insurance are controlled statistically or by study design, race and ethnicity remain as significant predictors of the quality of care. This disparity is best illustrated in studies of care among Medicare populations (Gornick et al., 1996), which reveal lower rates of use of effective, higher technology diagnostic and therapeutic procedures among minorities for illnesses such as heart disease, cancer, and other chronic illnesses, and higher rates of less desirable procedures, such as amputation and bilateral orchiectomy.

The quality of care that minority and non-minority patients receive is also partly a function of where these populations tend to receive care. Several studies note that patient care is of lower quality in non-teaching hospitals, public hospitals and clinics than in teaching hospitals or private settings. While some minorities are more likely to receive care in the former settings, they are more likely to access care in emergency departments, and are less likely to have a regular source of care (Collins, Hall, and Neuhaus, 1999). Further, minorities tend to have lower access than whites to specialty care, and are less likely to be treated in settings that offer higher-technology procedures—all factors related to the quality of care in the studies reviewed here. Again, however, when these variables are controlled statistically or by study design, racial and ethnic minorities tend to receive a lower quality of care.

Most studies have compared the quality of care received by minority patients relative to that of whites as the standard of comparison. This type of analysis, however, fails to provide a complete picture of the appropriateness of care, as whites may over-utilize some services, and racial differences in the severity of disease at presentation or treatment response may contraindicate the use of similar therapeutic interventions. Some of the best-designed studies reviewed here, however, assessed the quality of care provided relative to well-established clinical criteria, and use objective diagnostic measures to assess the extent and severity of disease. In these studies, race and ethnicity again typically emerge as significant predictors of the quality of care received, indicating that disparities in care are not simply a function of disproportionate use by whites or greater disease severity among minorities.

These findings appear consistently in studies of differences in care received by African-American and white populations, and increasingly, in studies involving Hispanic patients. A few studies suggest that Asian Americans also are less likely to receive the same quality of care as whites (e.g., Carlisle et al., 1995). This review produced no studies where the quality of care for American Indian, Alaska Native, or Pacific Islander populations were explicitly studied, or where the sample size of these populations permitted analysis. Further, in few instances were subgroups of these populations explicitly studied. As will be discussed in a later chapter, research is urgently needed to assess the quality of care for these populations relative to the burden of illness.

A few of the studies that find no racial and ethnic differences in care indicate that characteristics of health systems may serve an important role in mediating these disparities. Studies of patients in military healthcare systems reviewed here indicate a lower prevalence of racial or ethnic differences in the quality of healthcare that active-duty personnel or their families receive. Similarly, some studies of patients in VA systems demonstrate reductions in racial and ethnic differences in care, although these studies are less consistent. Future research must assess the range of factors that distinguish these heath systems from other private or publicly funded systems to better understand how patient race and ethnicity are related to care and care outcomes. For example, the impact of differences in provider profiles should be investigated, as VA hospitals commonly are staffed by a larger percentage of trainees than other systems. Nonetheless, these studies suggest that characteristics of these health systems, perhaps related to universal or equal access to care, may attenuate disparities that are typically found in other systems.

Collectively, these findings support the hypothesis that patients' race and ethnicity significantly predict the quality and intensity of care that they receive. Succeeding chapters of this report will review the historical context in which these disparities occur, and examine the types of settings in which minorities typically receive care, as well as the characteristics of healthcare providers that serve them. Potential sources of healthcare disparities will be closely examined, including patient preferences; provider biases, stereotyping, and clinical decision-making; and the impact of financial and institutional characteristics of health systems on the quality of care for minority patients. Finally, several strategies to eliminate these disparities are proposed, and future research directions are outlined.

**Finding 1-1: Racial and ethnic disparities in healthcare exist and, because they are associated with worse outcomes in many cases, are unacceptable.**

**Racial and ethnic disparities in healthcare exist. These disparities are consistent and extensive across a range of medical conditions and healthcare services, are associated with worse health outcomes, and occur independently of insurance status, income, and education, among other factors that influence access to healthcare. These disparities are unacceptable.**

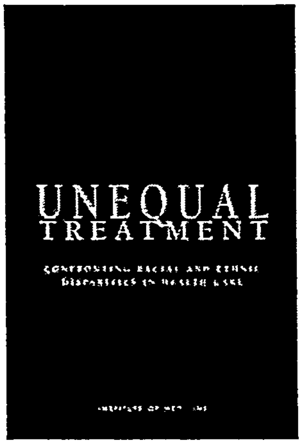
March 2002

# INSTITUTE OF MEDICINE

*Shaping the Future for Health*

# UNEQUAL TREATMENT:

## WHAT HEALTHCARE PROVIDERS NEED TO KNOW ABOUT RACIAL AND ETHNIC DISPARITIES IN HEALTHCARE



News accounts of the state of healthcare delivery seem to be full of bad news, including concerns about rising healthcare costs, patient safety and medical errors, and the growing numbers of uninsured Americans. To add to these problems, many recent news reports indicate that racial and ethnic minorities receive lower quality healthcare than whites, even when they are insured to the same degree and when other healthcare access-related factors, such as the ability to pay for care, are the same.

The Institute of Medicine (IOM) report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, added to the media fray when the IOM concluded that "(al)though myriad sources contribute to these disparities, some evidence suggests that bias, prejudice, and stereotyping on the part of healthcare providers may contribute to differences in care."

This finding was alarming to many healthcare professionals, the vast majority of whom work hard under very challenging conditions to ensure that patients receive the best possible healthcare to meet their needs. How could bias, prejudice, and stereotyping contribute to unequal treatment, particularly given that healthcare providers are sworn to beneficence and cannot, by law, discriminate against any patient on the basis of race, ethnicity, color, or national origin? This brief summary of the IOM *Unequal Treatment* report addresses this question, and summarizes other relevant findings to help healthcare professionals meet the objective of providing high-quality care for all patients.

**...the IOM concluded that "(al)though myria sources contribute to these disparities, som evidence suggests tha bias, prejudice, and stereotyping on the part of healthcare providers may contribute to differences in care."**

### DO RACIAL AND ETHNIC MINORITIES RECEIVE A LOWER QUALITY OF HEALTHCARE?

In 1999, Congress requested that the IOM assess the extent of racial and ethnic disparities in healthcare, assuming that access-related factors – such as insurance status and the ability to pay for care are the same; identify potential sources of these disparities, including the possibility that overt or subtle biases or prejudice on the part of healthcare providers might affect the quality of care for minorities; and suggest intervention strategies.

The study committee was struck by the consistency of research findings: even among the better-controlled studies, the vast majority indicated that minorities are less likely than whites to receive needed services, including clinically necessary procedures.

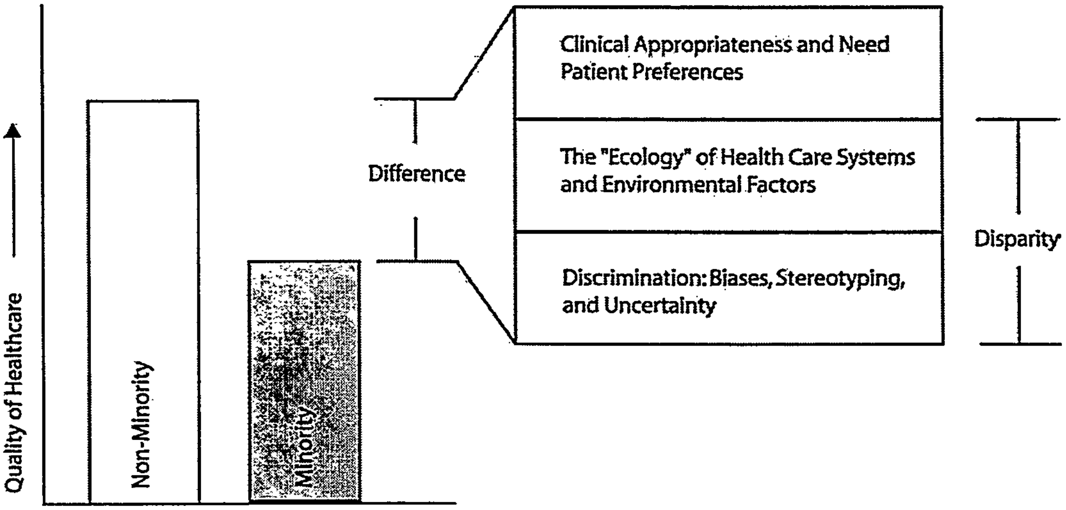
To fulfill this request, an IOM study committee reviewed well over 100 studies that assessed the quality of healthcare for various racial and ethnic minority groups, while holding constant variations in insurance status, patient income, and other access-related factors. Many of these studies also controlled for other potential confounding factors, such as racial differences in the severity or stage of disease progression, the presence of co-morbid illnesses, where care is received (e.g., public or private hospitals and health systems) and other patient demographic variables, such as age and gender. Some studies that employed more rigorous research designs followed patients prospectively, using clinical data abstracted from patients' charts, rather than administrative data used for insurance claims. The study committee was struck by the consistency of research findings: even among the better-controlled studies, the vast majority indicated that minorities are less likely than whites to receive needed services, including clinically necessary procedures. These disparities exist in a number of disease areas, including cancer, cardiovascular disease, HIV/AIDS, diabetes, and mental illness, and are found across a range of procedures, including routine treatments for common health problems.

## WHAT ARE THE SOURCES OF HEALTH CARE DISPARITIES?

Many factors may contribute to the health care disparities observed in these studies. Some researchers suggest that there may be subtle differences in the way that members of different racial and ethnic groups respond to treatment, particularly with regard to some pharmaceutical interventions, suggesting that variations in some forms of treatment may be justified on the basis of patient race or ethnicity. In addition, patients vary in help-seeking behavior, and some racial and ethnic minorities may be more likely than whites to avoid or delay seeking care. However, the majority of studies find disparities in clinical services that are equally effective for all racial and ethnic groups. Further, the studies that the IOM reviewed suggest that racial differences in patients' attitudes, such as their preferences for treatment, do not vary greatly and cannot fully explain racial and ethnic disparities in healthcare. A small number of studies, for example, find that African Americans are slightly more likely to reject medical recommendations for some treatments, but these differences in refusal rates are generally small (African Americans are only 3-6% more likely to reject recommended treatments, according to these studies). It remains unclear why African-American patients are more likely to reject treatment recommendations. Are they refusing treatment because of a general mistrust of health care providers? Or do some decline treatment because of negative experiences in the clinical encounter or a perception that their doctor is not invested in their care? More research is needed to fully understand treatment refusal because the reasons for refusal may lead to different strategies to help patients make informed treatment decisions.

urther, the studies hat the IOM reviewed uggest that racial dif- erences in patients' ttitudes, such as their references for treat- ent, do not vary reatly and cannot lly explain racial and thnic disparities in ealthcare.

If minority patients' attitudes toward healthcare and preferences for treatment are not likely to be a major source of health care disparities, what other factors may contribute to these disparities? As shown in the figure below, the IOM study committee considered two other sets of factors that may be associated with disparities in healthcare, assuming that all populations have equal access to care. The first set of factors are those related to the operation of healthcare systems and the legal and regulatory climate in which they operate. These include factors such as cultural or linguistic barriers (e.g., the lack of interpretation services for patients with limited English proficiency), fragmentation of healthcare systems (as noted earlier, these include the possibility that minorities are disproportionately enrolled in lower-cost health plans that place greater per-patient limits on healthcare expenditures and available services), the types of incentives in place to contain costs (e.g., incentives to physicians to limit services), and where minorities tend to receive care (e.g., minorities are less likely to access care in a private physician's office, even when insured at the same level as whites).



Differences, Disparities, and Discrimination: Populations with Equal Access to Healthcare.
SOURCE: Gomes and McGuire, 2001

The second set of factors emerges from the clinical encounter. Three mechanisms might be operative in healthcare disparities from the provider's side of the exchange: bias (or prejudice) against minorities; greater clinical uncertainty when interacting with minority patients; and beliefs (or stereotypes) held by the provider about the behavior or health of minorities. Patients might also react to providers' behavior associated with these practices in a way that also contributes to disparities. Research on how patient race or ethnicity may influence physician decision-making and the quality of care for minorities is still developing, and as yet there is no direct evidence to illustrate how prejudice, stereotypes, or bias may influence care. In the absence of such research, the study committee drew upon a mix of theory and relevant research to understand how these processes might operate in the clinical encounter.

*Clinical Uncertainty*

Any degree of uncertainty a physician may have relative to the condition of a patient can contribute to disparities in treatment. Doctors must depend on inferences about severity based on what they can see about the illness and on what else they observe about the patient (e.g., race). The doctor can therefore be viewed as operating with prior beliefs about the likelihood of patients' conditions, "priors" that will be different according to age, gender, socioeconomic status, and race or ethnicity. When these priors are considered alongside information gathered in a clinical encounter, both influence medical decisions.

**Any degree of uncertainty a physician may have relative to the condition of a patient can contribute to disparities in treatment.**

Doctors must balance new information gained from the patient (sometimes with varying levels of accuracy) and their prior expectations about the patient to make a diagnosis and determine a course of treatment. If the physician has difficulty accurately understanding the symptoms or is less sure of the "signal" – the set of clues and indications that physicians rely upon to make diagnostic decisions – then he or she is likely to place greater weight on "priors." The consequence is that treatment decisions and patients' needs are potentially less well matched.

### *The Implicit Nature of Stereotypes*

**...there is considerable empirical evidence that even well-intentioned whites who are not overtly biased and who do not believe that they are prejudiced typically demonstrate unconscious implicit negative racial attitudes and stereotypes.**

A large body of research in psychology has explored how stereotypes evolve, persist, shape expectations, and affect interpersonal interactions. Stereotyping can be defined as the process by which people use social categories (e.g., race, sex) in acquiring, processing, and recalling information about others. The beliefs (stereotypes) and general orientations (attitudes) that people bring to their interactions help organize and simplify complex or uncertain situations and give perceivers greater confidence in their ability to understand a situation and respond in efficient and effective ways.

Although functional, social stereotypes and attitudes also tend to be systematically biased. These biases may exist in overt, explicit forms, as represented by traditional bigotry. However, because their origins arise from virtually universal social categorization processes, they may also exist, often unconsciously, among people who strongly endorse egalitarian principles and truly believe that they are not prejudiced. In the United States, because of shared socialization influences, there is considerable empirical evidence that even well-intentioned whites who are not overtly biased and who do not believe that they are prejudiced typically demonstrate unconscious implicit negative racial attitudes and stereotypes. Both implicit and explicit stereotypes significantly shape interpersonal interactions, influencing how information is recalled and guiding expectations and inferences in systematic ways. They can also produce self-fulfilling prophecies in social interaction, in that the stereotypes of the perceiver influence the interaction with others in ways that conform to stereotypical expectations.

### *Healthcare Provider Prejudice or Bias*

Prejudice is defined in psychology as an unjustified negative attitude based on a person's group membership. Survey research suggests that among white Americans, prejudicial attitudes toward minorities remain more common than not, as over half to three-quarters believe that relative to whites, minorities – particularly African Americans – are less intelligent, more prone to violence, and prefer to live off of welfare. It is reasonable to assume, however, that the vast majority of healthcare providers find prejudice morally abhorrent and at odds with their professional values. But healthcare providers, like other members of society, may not recognize manifestations of prejudice in their own behavior.

**But healthcare providers, like other members of society, may not recognize manifestations of prejudice in their own behavior.**

While there is no direct evidence that provider biases affect the quality of care for minority patients, research suggests that healthcare providers' diagnostic and treatment decisions, as well as their feelings about patients, are influenced by patients' race or ethnicity. Schulman et al. (1999), for example, found that physicians referred white male, black male, and white female hypothetical "patients" (actually videotaped actors who displayed the same symptoms of cardiac disease) for cardiac catheterization at the same rates (approximately 90% for each group), but were significantly less likely to recommend catheterization procedures for black female patients exhibiting the same symptoms. In another experimental design, Abreu (1999) found that mental health professionals subliminally "primed" with African American stereotype-laden words were more likely to evaluate the same hypothetical patient (whose race was not identified) more negatively than when primed with neutral words. Further, in a study based on actual clinical encounters, van Ryn and Burke (2000) found that doctors rated black patients as less intelligent, less educated, more likely to abuse drugs and alcohol, more likely to fail to comply with medical advice, more likely to lack social support, and less likely to participate in cardiac rehabilitation than white patients, even after patients' income, education, and personality characteristics were taken into account. These findings suggest that while the relationship between race or ethnicity and treatment decisions is complex and may also be influenced by gender, providers' perceptions and attitudes toward patients are influenced by patient race or ethnicity, often in subtle ways.

*Medical Decisions Under Time Pressure with Limited Information*

Indeed, studies suggest that several characteristics of the clinical encounter increase the likelihood that stereotypes, prejudice, or uncertainty may influence the quality of care for minorities. In the process of care, health professionals must come to judgments about patients' conditions and make decisions about treatment, often without complete and accurate information. In most cases, they must do so under severe time pressure and resource constraints. The assembly and use of these data are affected by many influences, including various "gestalts" or cognitive shortcuts. In fact, physicians are commonly trained to rely on clusters of information that functionally resemble the application of "prototypic" or stereotypic constellations. These conditions of time pressure, resource constraints, and the need to rely on gestalts map closely onto those factors identified by social psychologists as likely to produce negative outcomes due to lack of information, to stereotypes, and to biases (van Ryn, 2002).

**In the process of care, health professionals must come to judgments about patients' conditions and make decisions about treatment, often without complete and accurate information.**

*Patient Response: Mistrust and Refusal*

As noted above, the responses of racial and ethnic minority patients to healthcare providers are also a potential source of disparities. Little research has been conducted as to how patients may influence the clinical encounter. It is reasonable to speculate, however, that if patients convey mistrust, refuse treatment, or comply poorly with treatment, providers may become less engaged in the treatment process, and patients are less likely to be provided with more vigorous treatments and services. But these kinds of reactions from minority patients may be understandable as a response to negative racial experiences in other contexts, or to real or perceived mistreatment by providers. Survey research, for example, indicates that minority patients perceive higher levels of racial discrimination in healthcare than non-minorities. Patients' and providers' behavior and attitudes may therefore influence each other reciprocally, but reflect the attitudes, expectations, and perceptions that each has developed in a context where race and ethnicity are often more salient than these participants are even aware of.

**Little research has been conducted as to how patients may influence the clinical encounter.**

## WHAT CAN HEALTHCARE PROVIDERS DO TO HELP ELIMINATE DISPARITIES IN CARE?

Given that stereotypes, bias, and clinical uncertainty may influence clinicians' diagnostic and treatment decisions, education may be one of the most important tools as part of an overall strategy to eliminate healthcare disparities. Healthcare providers should be made aware of racial and ethnic disparities in healthcare, and the fact that these disparities exist, often despite providers' best intentions. In addition, all current and future healthcare providers can benefit from cross-cultural education. Cross-cultural education programs have been developed to enhance health professionals' awareness of how cultural and social factors influence healthcare, while providing methods to obtain, negotiate and manage this information clinically once it is obtained. Cross-cultural education can be divided into three conceptual approaches focusing on *attitudes* (cultural sensitivity/awareness approach), *knowledge* (multicultural/categorical approach), and *skills* (cross-cultural approach), and has been taught using a variety of interactive and experiential methodologies. Research to date demonstrates that training is effective in improving provider knowledge of cultural and behavioral aspects of healthcare and building effective communication strategies.

**Healthcare providers should be made aware of racial and ethnic disparities in healthcare, and the fact that these disparities exist, often despite providers' best intentions.**

Standardized data collection is also critically important in efforts to understand and eliminate racial and ethnic disparities in healthcare. Data on patient and provider race and ethnicity would allow researchers to better disentangle factors that are associated with healthcare disparities, help health plans to monitor performance, ensure accountability to enrolled members and payors, improve patient choice, allow for evaluation of intervention programs, and help identify discriminatory practices. Unfortunately, standardized data on racial and ethnic differences in care are generally unavailable, and a number of ethical, logistical, and fiscal concerns present challenges to data collection and monitoring, including the need to protect patient privacy, the costs of data collection, and resistance from healthcare providers, institutions, plans and patients. In addition, health plans have raised significant concerns about how such data will be analyzed and reported. The challenges to data collection should be addressed, as the costs of failing to assess racial and ethnic disparities in care may outweigh new burdens imposed by data collection and analysis efforts.

Many other strategies must be undertaken, in conjunction with the training and educational strategies described here, to eliminate racial and ethnic disparities in healthcare. As noted in the report, these include, for example, policy and regulatory strategies that address fragmentation of health plans along socioeconomic lines, and health systems interventions to promote the use of clinical practice guidelines and promote the use of interpretation services where community need exists. In short, a comprehensive, multi-level strategy is needed to eliminate these disparities. Broad sectors – including healthcare providers, their patients, payors, health plan purchasers, and society at large – must work together to ensure all patients receive a high quality of healthcare.

**Many other strategies must be undertaken, in conjunction with the training and educational strategies described here, to eliminate racial and ethnic disparities in healthcare.**

## GUIDE TO INFORMATION SOURCES

An increasing number of resources are available to healthcare providers and their patients to increase awareness of racial and ethnic healthcare disparities and means to improve the quality of care for racial and ethnic minorities. The following is only a partial list of some of these resources, and is not intended as an endorsement of the products or individuals and groups that produced them:

American Board of Internal Medicine. (1998). *Cultural Competence: Addressing a Multicultural Society: The ABIM Report 1997-1998.* Philadelphia: American Board of Internal Medicine.

American Medical Association. (1999). *Cultural Competence Compendium.* Chicago, IL: American Medical Association. Product Number OP209199/ Phone # 1-800-621-8335.

Betancourt JR, Like RC, and Gottlieb BR, eds. (2000). Caring for diverse populations: Breaking down barriers. *Patient Care,* Special Issue, May 15, 2000.

Lavizzo-Mourey R, and Mackenzie ER. (1996). Cultural Competence: Essential Measurements of Quality for Managed Care Organizations. *Annals of Internal Medicine* 124, pp. 919-21.

National Alliance for Hispanic Health. *Quality Services for Hispanics: the Cultural Competency Component,* Rockville, MD: U.S. Department of Health and Human Services, 2000.

In addition to these sources, the Henry J. Kaiser Family Foundation and the Robert Wood Johnson Foundation have recently joined forces to sponsor an initiative to increase dialogue among physicians regarding healthcare disparities. To learn more about this initiative, please visit the "Why the Difference?" website at www.kff.org/whythedifference.

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Schulman, K.A., Berlin, J.A., Harless, W., Kerner, J.F., Sistrunk, S., Gersh, B.J., Dube, R., Taleghani, C.K., Burke, J.E., Williams, S., Eisenberg, J., Escarce, J.J., Ayers, W. (1999). The effect of race and sex on physicians' recommendations for cardiac catherization. *New England Journal of Medicine* 340:618-626.

van Ryn M, Burke J. 2000. The effect of patient race and socio-economic status on physician's perceptions of patients. *Social Science and Medicine* 50:813-828.

* * *

## For More Information...

Copies of *Unequal Treatment: Understanding Racial and Ethnic Disparities in Health Care* are available for sale from the National Academy Press; call (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or visit the NAP home page at **www.nap.edu.** The full text of this report is available at **http://www.nap.edu/catalog/10260.html**

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# The Health Disparities Myth

## Diagnosing the Treatment Gap

Jonathan Klick, PhD, JD
Sally Satel, MD

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# Introduction

*I also come from Harlem, a community of poor black people. I've had the opportunity to study these people and . . . I find universality of discrepancies and differences. Race is not the issue. The issue is human conditions.*

Harold P. Freeman, MD
Medical director, Ralph Lauren Center for Cancer
Care and Prevention, Harlem, New York[1]

Two fifty-year-old men arrive at an emergency room with acute chest pain. One is white and the other black. Will they receive the same quality of treatment and have the same chance of recovery? We hope so, but many experts today insist that their race will profoundly affect how the medical-care system deals with them, and that the black patient will get much inferior care. Is this really true? And if so, why? Are differences in treatment due to deliberate discrimination or other (less invidious) factors? This monograph critically assesses recent research bearing on these questions.

Interest in the determinants of minority health has grown considerably since the publication of the *Report of the Secretary's Task Force on Black and Minority Health* by the U.S. Department of Health, Education, and Welfare in 1985.[2] The academic literature falls into two categories. One line of inquiry emphasizes overt or subtle racial discrimination by physicians. Research reports in this category assert that many physicians treat their white patients better than their minority patients on the basis of race alone. We call this the "biased-doctor model" of treatment disparities.[3]

The other line of research focuses on the influence of so-called "third factors" that are correlated with race. These factors can influence care at the level of the health system, the physician, or both. They include, for example, variations in insurance coverage (insured versus uninsured versus underinsured; public versus private health plans; profit versus not-for-profit health plans), quality of physicians, regional variations in medical practices, and patient characteristics (such as clinical features of disease, or health literacy).

Of course, it is possible that both of these mechanisms—biased doctors and third factors—could operate simultaneously. Practical policymaking requires an inquiry into the relative contributions of each. In our view, it is the third factors that generate the strongest momentum in driving the differences between races in both care and outcomes. Indeed, for answers to the race-related differences in health care, it turns out that the doctor's office is not the most rewarding place to look. White and black patients, on average, do not even visit the same population of physicians—making the idea of preferential treatment by individual doctors a far less compelling explanation for disparities in health. Doctors whom black patients tend to see may not be in a position to provide optimal care. Furthermore, because health care varies a great deal depending on where people live, and because blacks are overrepresented in regions of the United States served by poorer health care facilities, disparities are destined to be, at least in part, a function of residence.

Yet the biased-doctor model has acquired considerable and unmerited weight in both academic literature and the popular press. It enjoyed a great boost in visibility from a 2002 report from the Institute of Medicine (IOM), part of the National Academy of Sciences, called *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*.[4] The IOM provides lawmakers with advice on matters of biomedical science, medicine, and health, and issues high-profile reports written by panels of outside experts. *Unequal Treatment* was widely hailed as the authoritative study on health disparities. It concluded that the dynamics of the doctor-patient relationship—"bias," "prejudice," and "discrimination"—were a significant cause of the treatment differential and, by extension, of the poorer health of minorities.

Media fanfare greeted the IOM report in news stories bearing headlines like, "Color-Blind Care . . . Is Not What Minorities Are Getting" (*Newsday*); "Fed Report Cites 'Prejudice' in White, Minority Health Care Gap" (*Boston Herald*); and "Separate and Unequal" (*St. Louis Post-Dispatch*).[5] Virtually every story ran the triumphant remark of Dr. Lucille Perez, then president of the National Medical Association, which represents black physicians: "It validates what many of us have been saying for so long—that racism is a major culprit in the mix of health disparities and has had a devastating impact on African-Americans."[6]

There were a few dissenting voices. Among them was Richard Epstein, law professor at the University of Chicago. In his article "Disparities and Discrimination in Health Care Coverage: A Critique of the Institute of Medicine Study," he wrote:

> The IOM study adopts exactly the wrong approach. . . . Instead of dwelling [as the report does] on the Tuskegee experiments as evidence of current biases that linger within the system, I would trumpet the dedicated men and women in the profession who are determined to help people of all backgrounds and races deal with their health problems. . . . It is a shame to attack so many people of good will on evidence that admits a much more benign interpretation. . . . And there are enough problems in the health care system even without the genteel guilt trip that pervades the IOM study.[7]

But Professor Epstein was drowned out by numerous commentators who implied or stated outright that current treatment differences are a product of a harsh racial climate and personal bias on the part of physicians. To read David Barton Smith, for example, one would think it was only yesterday, rather than forty years ago, that we stopped segregating hospitals and separating the blood supply by race. There "remain key parts of the unfinished civil rights agenda," writes the public policy expert at Temple University, pending "enough federal will and national unity" to resolve them.[8]

In this monograph, we evaluate the studies routinely put forth as evidence of harmful discrimination. Because the IOM report represents the most popular synthesis of the disparities literature, we draw heavily on its analysis. We also examine evidence not considered by the IOM panel.[9] These additional findings indicate that race-related variables, especially geography and socioeconomic status, shine important explanatory light into the recesses of the treatment gap.

We conclude that the studies examined by the IOM panel—consisting primarily of retrospective analyses of large health-system databases—fail to make a persuasive case that physician bias is a significant cause of disparate care or health status. In short, the studies fall short in trying to control for the wide array of factors that confound the influence of race on physicians' treatment decisions. Without adequate controls, it is simply not possible to distinguish care patterns that correlate with race from those that are due directly to race.

Indeed, as we will see, when researchers employ designs that control for more third factors, the magnitude of any race effect shrinks considerably, if it does not disappear altogether.

Furthermore, we challenge the validity of measures commonly used to quantify health disparities and to calibrate the success of efforts to improve minority health. (We refer here to the assessment of *relative* care—that is, measuring the ratio of procedures or other health services received by minorities compared with whites.) One reason we question these measures is that the fact that a group receives more services does not necessarily mean it will have better health outcomes. For example, whites often receive more invasive cardiac procedures than blacks, but among blacks and whites admitted with heart disease, the death rate for whites is not necessarily lower.[10] Thus, if outcomes are the focus, blacks are not necessarily being undertreated. Instead, whites are perhaps being overtreated in some instances—given procedures that do not improve their prospects of surviving. Why might this be? It has been suggested that because whites are (or are perceived to be) more litigious, doctors practice defensive medicine with them.[11] In addition, whites are more likely to be insured, so doctors have more incentive to order additional tests.[12]

Second, the focus on relative differences masks absolute measures of improved care and thereby sends the wrong message to policymakers. For example, a 2004 study found that black patients with diabetes who attended a Bronx clinic were tested for diabetic control 53 percent of the time; whites were tested 57 percent of the time.[13] This difference of four percentage points could be considered smaller (and better) than the testing differential of fourteen percentage points found at a Washington, D.C., clinic. But a further look shows that 59 percent of blacks in the Washington clinic were tested, versus 73 percent of whites. In absolute terms, the D.C. diabetics—both black and white—received better care than their Bronx counterparts, but a narrow judgment based on racial comparison alone suggests otherwise.

Indeed, absolute improvements in treatment—if they occur in all groups—will not close a gap. All boats will have risen, so to speak. The minority group will have gained significantly, and good news this surely is; but the measure of success is obscured if one fixates on relative measures. For example, after the Department of Health and Human Services (HHS) implemented three-year (1999–2002) locally based projects in each state to help underserved populations overcome "healthcare system and sociocultural barriers" to care, evaluators found they could not document a reduction in statewide disparities, in part because the health of whites improved along with those of minority groups.[14] Although these projects were successful in improving overall community health, they failed to reduce racial disparities per se.

Conversely, a misplaced focus on narrowing of disparities can obscure deficiencies in care. Amal Trivedi and colleagues at Harvard, for example, found greater improvements in black patients than whites in receipt of required tests and treatments (for example, eye exams for diabetics or beta-blocker after heart attack) over a six-year period.[15] The good news about the narrowed black-white differentials, however, was somewhat offset by the fact that neither white nor black patients, all of whom were enrolled in Medicare managed-care plans, received the tests with optimal regularity.

Unfortunately, many scholars who address the disparity problem neglect the bigger picture. As David Mechanic, a world authority on health-care practices, laments, "Increasingly, much of the policy discussion is focused on whether disparities are increasing or decreasing and less so on which interventions can bring about the largest health gains for all."[16] He points to black/white infant mortality ratios as an example. From 1980 to 2000, black infant deaths decreased by over one-third, but because white deaths decreased more, the ratio of black/white mortality actually increased.

"Simply focusing on ratios misses important advances," Mechanic writes, "and may confuse us as to what is and is not worth undertaking."[17] In general, he points out, health conditions amenable to improvement through technology will inevitably benefit the most advantaged individuals and groups first because they have the knowledge, resources, and networks to gain access to them most quickly.

This is a powerful illustration of how a narrow concentration on race distracts from the reality that the largest overall gain in population health comes from targeting disparities linked to socioeconomic class.[18] True, race and class are intertwined and in some contexts can be proxies for one another, but they are both associated, independently, with health status. In fact, class makes a much greater contribution than race.

Consider the national data on mortality from heart disease. Adults in the bottom quarter of the income distribution are two to four times as likely to die from heart disease as those in the top quarter. The differences between blacks and whites are minor by comparison—the black death rate exceeds the white by only one-fifth.[19] And middle-class blacks are much less vulnerable to fatal heart disease than low-income whites. Put another way, controlling for income, blacks have higher mortality than whites; but low-income blacks have more in common with low-income whites than with middle-class or wealthier blacks. Thus, the socioeconomic differences between racial groups are largely responsible for disparities in health status between whites and blacks.[20]

The misplaced emphasis on relative care calls too much attention to the sensational but unsubstantiated idea that racial bias is a meaningful cause of health disparities. Not only is the charge of bias divisive, it siphons energy and resources from endeavors targeting system factors that are more relevant to improving minority health: expanding access to high-quality care and facilitating changes in individuals' lifestyles and their capacity to manage chronic disease. From this perspective, proposed race-based remedies for the treatment gap—such as racial preferences in admission to medical school, racial sensitivity training for doctors, and legal action using Title VI of the Civil Rights Act—become trivial or irrelevant at best, and potentially harmful at worst.[21]

Given the enormous political emphasis on racial disparities, we are compelled to respond to those who see treatment differences through a racial lens and design health-care policies accordingly. But a true public health solution to inadequate care—one that seeks to maximize the health of all Americans—would more properly target all underserved populations, irrespective of group membership. Success would be reflected in the improved health of these communities; and, because many of them happen to comprise large numbers of minorities, racial and ethnic care differentials would diminish as well.

## 1

# Public Health Cast as Civil Rights

Just before Christmas 2003, the Agency for Healthcare Research and Quality, of the U.S. Department of Health and Human Services (HHS), released the *National Healthcare Disparities Report.*[1] It documented an all-too-familiar problem: the poorer health status of individuals on the lower rungs of the socioeconomic ladder, and the often inadequate treatment they receive compared to people with more resources and education.

The report sparked a heated controversy over whether HHS had downplayed the charge of racial bias in the health-care system. At issue were revisions made to a prepublication draft shortly before its release. Those included use of the more neutral word *difference* instead of *disparity* to describe discrepancies between the health of whites and minorities. This might seem like an innocuous substitution, but it was not. In public health circles, the word "disparity" has come to connote unfair difference due to a patient's race or ethnicity. It "has begun to take on the implication of injustice," observed epidemiologist Olivia Carter-Pokras at the University of Maryland.[2] Architects of the agency report, however, argued that the neutral term, *difference*, more accurately described their findings.[3]

The switching of *difference* and *disparity* prompted Henry Waxman, ranking minority member of the House Government Reform Committee, to send a harsh letter to Tommy Thompson, then HHS secretary. The word substitution, Waxman wrote, "alter[ed] the report's meaning . . . and fit a pattern of the manipulation of science by the Bush Administration."[4] The revision also set alarm bells ringing among a range of constituencies. "By tampering with the conclusions of its own scientists, HHS is placing politics before social justice," wrote members of the Congressional Black Caucus, Congressional Asian Pacific American Caucus, and Congressional Hispanic Caucus in a joint press release.[5] The National Medical Association pronounced itself "appalled."[6] Physicians for Human Rights bemoaned "remov[al] from the text [of] any inference of prejudice on the part of providers, and [its] focus on individual responsibility for disparities."[7]

The critics who scolded HHS for its revised executive summary cited the 2002 Institute of Medicine (IOM) report as proof that bias was common among physicians. While the IOM report did acknowledge the roles of other factors in minority health, it placed heavy emphasis on the failure of the medical profession to purge its ranks of prejudice—a shortcoming that was, as the report put it, "rooted in historic and contemporary inequities."[8]

Although the IOM report is now the most widely cited source for this claim, it was hardly the first to make the argument. A decade earlier, in *The Journal of the American Medical Association*, Secretary of Health and Human Services Louis Sullivan cast minority health as a civil rights issue, writing, "There is clear, demonstrable, undeniable evidence of discrimination and racism in our health care system."[9]

The Reverend Al Sharpton warned in 1998 that "health will be the new civil rights battlefront"; that same year, President Clinton remarked in a radio address delivered during Black History Month that "nowhere are the divisions of race and ethnicity more sharply drawn than in the health of our people," and speculated that one of the causes might be "discrimination in the delivery of health services."[10] In its 1999 annual report to Congress and the White House, the U.S. Commission on Civil Rights concluded that "racism continues to infect our health care system."[11] Recently, Senator Ted Kennedy urged that "greater resources should be given to the HHS Office for Civil Rights."[12] And, in an especially alarmist tone, Marian Wright Edelman of the Children's Defense Fund told the 2005 graduating class of Colgate

University that "the new racism that is seeping across our country is wrapped up . . . in racial disparities in health."[13]

We question the charge that episodes of doctor-patient miscommunication or assumptions physicians make about their patients are the product of doctors' ill will toward minority patients or disregard for them—sentiments implied by words like "bias" and "prejudice." Moreover, evidence (such as it is) that physicians' biased behavior is a major driver of disparate treatment is dwarfed by the undisputed and sizable effects of access to care and quality of care.[14]

Yet the social justice perspective often frames the issue of minority health. For example, introducing the Health Care Equality and Accountability Act in 2003, Senator Tom Daschle cited the need to correct doctors' "bias," "stereotyping," and "discrimination."[15] The American Medical Association felt moved to reaffirm its "long-standing policy of zero tolerance [toward] racially or culturally biased health care."[16] The American Public Health Association "call[ed] on the President and the Congress of the United States to recognize and promote legal redress for discrimination in health and health care."[17] On the research front, the National Institutes of Health are funding research on "the effect of racial and ethnic discrimination on health care delivery."[18] In some medical schools, "racial sensitivity" training is now required.[19] And, in 2005, New Jersey was the first state to pass a law requiring doctors to receive so-called "cultural competency" training as a condition of obtaining or renewing their licenses to practice medicine.[20]

These institutional mandates and practices legitimate the "biased-doctor model" of health disparities. We regret this, although we do believe that responsible clinicians should be aware of the potential for cultural misunderstandings between themselves and their patients. In fact, the IOM report may serve a useful consciousness-raising function, prompting doctors to ask themselves whether they are giving every patient the opportunity to benefit from treatment and to discuss complex issues, where appropriate, with them.[21] But, to the extent to which the IOM report is interpreted as evidence of widespread racial bias in the medical system, we believe its value is offset by the harmful consequences of this false conclusion.

## Disparity: Difference versus Inequity?

The word "disparity" has various definitions, ranging in meaning from value-neutral imbalance to unfair and pernicious difference.[22] One of the earliest appearances of the term was in the 1985 *Report of the Secretary's Task Force on Black and Minority Health*, published by the U.S. Department of Health, Education, and Welfare (now HHS), where it referred to "excess deaths"—that is, the number of deaths observed in minority populations, subtracted from the number of deaths that would have been expected if the minority population had the same age- and sex-specific death rate as the non-minority population. In 1999, Harold Varmus, director of the National Institutes of Health (NIH), established a working group to address the problem of health disparities. That group was the first to devise an NIH definition of health disparities: "Differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States."[23] Note that this definition is causally neutral, avoiding the question of what *produces* these differences.

The following year Congress established the National Center on Minority Health and Health Disparity. Its mission was to lead the NIH in its "effort to reduce and ultimately eliminate disparities," and assess its success in meeting the goal.[24] The center defined disparities as differences "in the overall rate of disease incidence, prevalence, morbidity, mortality or survival rate in a specific group compared to the general population."[25] Again, the language is silent on the question of causation.

Other government definitions reiterated the basic theme of neutral difference. For example, the *Healthy People 2010* report published in 2000 by HHS regarded disparities as "differences that occur by gender, race or ethnicity, education or income, disability, living in rural localities or sexual orientation."[26] And the Human Resources Services Administration, part of HHS, and the Minority Health and Health Disparity Research and Education Act of 2000, used the term to designate race-related differences in incidence of disease, access to care, or health outcome.[27]

Departing somewhat from cause-neutral definitions, the IOM report defined disparities as "racial or ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences and appropriateness of intervention."[28] While this did not necessarily mean that "bias," "prejudice," or "discrimination" must therefore account for differences in care that remained after "access-related factors or clinical needs, preferences and appropriateness of intervention" were accounted for, this was how the IOM interpreted them—an interpretation, as we will see, that was virtually preordained by the language Congress used to commission the report. In short, the IOM definition excluded every "good" reason for differences, so that only "bad" reasons were left. In his 2005 book, Thomas LaVeist, director of the Center for Health Disparities Solutions at Johns Hopkins School of Public Health, made the point sharply, defining disparities as "racial/ethnic differences in outcomes or quality of care that are indicative of injustice within the health care system or in the behavior of health care providers."[29]

Thus, with the definitional shift of "disparity" from being an observable difference to a moral failure, minority health was transformed from a public health issue into a civil rights issue.[30]

## 2

# The IOM Report

As we've already discussed, the 2002 Institute of Medicine report was largely responsible for legitimizing the notion that racism among doctors is widespread. We do not believe that conclusion was well-founded.

In an interview on PBS's *NewsHour with Jim Lehrer*, Dr. Adewale Troutman, director of the Louisville Metro Health Department, illustrated the biased-doctor model well. Disparities, he said, have

> a lot to do with several factors, including what has recently been discovered as an issue of discrimination, potential racism, stereotyping and bias within the health care delivery system as defined by the Institute of Medicine report published in 2002. . . . And that may be a part of the answer as to why the black-white mortality gap has continued over these many years. But that particular aspect of healthcare that says that when you go into a provider, whether it's a hospital or an individual practitioner, and you happen to look a certain way—and there is a belief based upon the IOM report that. there is provider attitude, whether it's conscious or unconscious and/or whether it's institutionalized racism that, in fact, dictates the kind of care that an individual is going to get.[1]

A strong claim—but is it true? We think not. There is insufficient empirical basis for Dr. Troutman's conclusion about physicians and his endorsement of the IOM conclusions. Before we address the nature and limits of the evidence put forth by the IOM, let us consider the ways in which its analysis and interpretation were influenced by its mandate.

The IOM report was commissioned by Congress in 1999 to determine whether differences in treatment exist when patients of any race or ethnicity have equal access to care. The panel was given two mandates. First, to "assess the extent of racial and ethnic differences in healthcare that are not otherwise attributable to known factors (e.g., ability to pay or insurance coverage)" and, second, to "evaluate potential sources of racial and ethnic disparities in healthcare, including the role of bias, discrimination, and stereotyping at the individual (provider and patient), institutional, and health systems levels."[2] The report panel, which comprised physicians, epidemiologists, social scientists, health economists, and administrators, commissioned additional outside experts to summarize peer-reviewed literature and government publications on health care and minorities.

In asking the IOM panelists to hold obvious determinants of treatment constant while having them focus on the potential "role of bias and discrimination" in health-care disparities, Congress practically invited them to interpret treatment discrepancies as evidence of bias. Simply put, if the IOM assumed that there were no benign explanations for disparities, then the only possible cause must be bias. Instructing the panel to hold major determinants of disparities constant had the effect of discounting them (and thus distorting the basis for policy recommendations). Because of these pressures, we believe, the panel erred in putting too much confidence in studies that were never designed by their authors to identify discrimination.

## Missing Variables

The most rigorous studies reviewed by the IOM sought to control for confounding clinical or economic variables, such as concurrent illness, supplemental insurance, or patients' refusal to undergo procedures. But because most of the studies were retrospective and relied upon chart review or large Medicare administrative databases, many such variables could not be captured.[3] And as the

IOM report itself acknowledges, the more confounding variables were identified, the smaller the differential between whites and minorities became: "Almost all of the studies reviewed here find that as more potentially confounding variables are controlled, the magnitude of racial and ethnic differentials in care decreases."[4]

Some studies were more scrupulous than others in accounting for potential determinants of treatment, but even so, a treatment differential often remained. For instance, Saif Rathore and Harlan Krumholz (both of the Yale School of Medicine) identify four categories of information as potential explanations for differences in care: eligibility, contraindications, confounding, and patient preferences. Eligibility and contraindications refer to patients' clinical fitness for a procedure. Some of these variables are generally recorded, such as comorbid conditions and severity of disease at the time care is sought. Others are often missing from administrative databases—for instance, EKG subtleties, position of occlusion in carotid and coronary vessels, coronary ejection fraction, and pulmonary function test performance—even though they figure importantly in physician decision-making.

Moreover—and this is key—these unrecorded variables do vary by race and ethnicity. Note, for example, the well-documented frequency with which coronary angiograms of black patients show less anatomical suitability for intervention—either lesions in the vessels are too diffuse for angioplasty, or the patients have a higher incidence of normal-appearing vessels, despite the clinical appearance of having suffered acute myocardial infarction (heart attack).[5] An examination of records, therefore, could suggest a racial bias in treatment simply because coronary angiograms are less often given to black patients, and the records themselves do not indicate the reasons for those treatment decisions.

In addition to patient-level variables, other influential factors demand consideration. Geographical variations can occur, for instance, in practice patterns, quality of health centers, availability of subspecialists, adequacy of pharmacy stocks, or use of profit versus not-for-profit programs. There are differences in provider characteristics, such as qualifications or scope of providers' referral networks, and hospital-to-hospital variations in number of patients treated or procedures performed, on-site technology, nurse-to-patient ratio, and so on.[6] These dimensions went largely unexamined by the IOM panel because it relied on data from analyses using national samples that contained no geographic identifiers, or that based conclusions about the entire country upon data drawn from a single area or hospital. Further, other regional covariates, such as medical malpractice risk exposure, reimbursement rates, and managed-care enrollment rates, are necessarily excluded from these kinds of studies.[7] Even in studies that do control for regional variation, there are open questions about how finely regions have to be delineated to account for differences on the local level.

Consequently, the panel concluded that treatment differences occur everywhere, and that they are manifest for all kinds of care. But this conclusion was in error, as other studies indicate. Baicker and colleagues at Dartmouth College, for example, have shown important regional inconsistencies in treatment. One region might display wide race disparities in some procedures, such as hip replacement or back surgery, smaller discrepancies in bypass, and almost no gap in mammograms.[8] Does that mean that doctors in the region who perform hip replacements are biased, but cardiac-care doctors are not? Or is it possible that there are other, benign reasons for those statistical disparities?

Missing variables are not the entire story, however. Other kinds of evidence are necessary to bestow a fuller picture of the dynamics involved in treatment differences; without them it is difficult to have confidence in the IOM's claims about bias on the part of providers.

## Prospective Studies

To perform an accurate assessment of the complex relationship between race and medical care, we need many more prospective studies that ask doctors and patients about how they make decisions to offer and to accept, respectively, particular treatments. The following vignette shows how difficult it is to interpret "bias" in medical records without an accompanying narrative from the clinician:

> Kathy A. is a nurse practitioner in a public health clinic near Washington, D.C. She treats many young African-American women. As part of the routine gynecological exam she asks them whether they had a PAP smear within the last two years. Typically, they say yes, and Kathy A. does not perform one. When she started looking through records systematically, Kathy A. realized that many of the women who said they had had a PAP smear never actually did. Soon she realized that many of the patients had mistaken a genital swab for STD for a PAP smear and has since kept this in mind during her history-taking (not to mention intensified her ongoing plea to the clinic director for computerized record-keeping).[9]

The innocent—though avoidable—mistake made by Kathy A. occurs daily in many inner-city clinics. On chart review, Kathy A. would appear to be a (white) clinician who was shortchanging black patients by not offering a routine PAP smear. But to allege that her error was borne of ill will, "prejudice," "bias," or "discrimination" is misguided. Indeed, asking doctors why they did not order a particular test could yield explanations such as the one offered by Dr. Gary Curhan. Writing in *JAMA* about workup for first-time kidney stones, he said, "If the patient is uninterested in making long-term lifestyle changes or taking medication, then I do not proceed with an evaluation [for a first stone.]"[10] Instead, he treats symptoms, like pain, but does not seek the cause of the stone. In other words, the physician decides to undertake an expensive workup only if a patient is invested in cooperating with the diet and other lifestyle changes needed to improve his condition.

Or consider the situation that confronts many nephrologists. As a patient progresses from stage four to stage five chronic kidney disease, the doctor or social worker is responsible for informing him or her of the options for renal replacement therapy. Ideally, the patient should be presented with three major options:

hemodialysis, peritoneal dialysis, or transplantation. Each of these has advantages and disadvantages, and patients are not equally suited for all. For example, patients with histories of poor compliance with treatment regimens might not be the best candidates for transplantation, since compliance with immunosuppressive therapy is critical to maintaining a functioning organ. In such a case, the physician or social worker may (consciously or unconsciously) present the options for transplantation in a way that "steers" the patient toward one or away from another.[11]

These examples highlight the social characteristics of patients as potential determinants of care. In his sweeping book, *The Status Syndrome: How Social Standing Affects Our Health and Longevity*, epidemiologist and physician Sir Michael Marmot documents the importance of factors that are not readily measured by disparity researchers—in part because their accounting requires time-consuming, face-to-face interviewing.[12] For example, Marmot emphasizes the importance of personal autonomy and control over one's life circumstances. With respect to treatment per se, it is not surprising that patients with chaotic lifestyles—an often inevitable aspect of living in or near poverty, irrespective of race—are not going to be good candidates for ongoing care requiring complex regimens.

## Audit Studies

Without an experimental design in which all patients have equal access to the same range of services and expertise, it is very hard to know how to interpret differentials in care. An audit study, in theory at least, would help resolve this design barrier. Audit studies are highly controlled, labor-intensive investigations in which only one variable—race, in this case—is altered while access to a particular treatment, clinical appropriateness of the treatment, and patient desire for it are all held constant.

Unfortunately, there are very few audit studies of health-disparities research. Even more unfortunately, the findings of one of them have been badly misrepresented by its author. In 1999, Kevin Schulman and colleagues at Georgetown University School of Medicine published an audit study in the *New England Journal of Medicine.*[13] Briefly, the team made videos of black and white actors playing patients with chest pain. About seven hundred physicians viewed these tapes and were asked whether they would refer the patients to catheterization. The actor-patients were dressed in hospital gowns and described identical symptoms, had the same EKG findings, and the same health insurance.

Schulman himself erroneously stated to the press that the black patient-actors in the study were 40 percent less likely to be referred to catheterization, and explicitly attributed the discrepancy to bias.[14] The 40 percent estimate appears to have been based on a misapplication of statistics, as demonstrated by a recalculation of the Schulman data by a team at the White River Junction Veterans Affairs Medical Center in Vermont.[15] More accurately, white men, white women, and black men were referred at the same rate of 90 percent. The two black women actor-patients in the study were referred at a mean rate of only 80 percent, largely due to the low referral rate for one of them—probably a reflection of her unconvincing acting rather than anything else. In all, the probability of referral for all black actors in the Schulman study was 7 percent lower than for whites, not 40 percent. As the White River Junction team wrote in the *New England Journal of Medicine* several months after publication of the Schulman article, "These exaggerations [of 40 percent] serve only to fuel anger and undermine the trust between physicians and their patients."[16]

Though there ended up being little difference in referral rates, the Schulman study galvanized the press. Perhaps the most inflammatory report appeared on the ABC news program *Nightline.* Here is how Ted Koppel introduced the segment:

> Last night we told you how the town of Jasper, Texas, is coming to terms with being the place where a black man was dragged to his death behind a truck by an avowed

> racist. Tonight we are going to focus on [doctors] . . . who would be shocked to learn that what they do routinely fits quite easily into the category of racist behavior.[17]

## Race Comparison Between Doctors

A third kind of study valuable for understanding race-related factors in treatment compares care provided by white *and* black doctors to white *and* black patients. For example, evidence that doctors of both races treat black patients similarly, say, in terms of rate of referral for catheterization—even if both refer black patients less often than they do white patients—would cause us to question a charge of bias. We are aware of only one study that has analyzed data with this question in mind.

Jersey Chen and colleagues at Yale University analyzed data from the Cooperative Cardiovascular Project.[18] They evaluated forty thousand Medicare beneficiaries hospitalized for acute myocardial infarction in 1994 and 1995 to determine whether differences between black patients and white patients in the use of cardiac catheterization within sixty days after acute myocardial infarction varied according to the race of their attending physicians. Black patients had significantly lower rates of cardiac catheterization than white patients, regardless of whether their attending physician was white (38.4 percent rate of catheterization for black patients, versus 45.7 percent for whites) or black (38.2 percent versus 49.6 percent).

There was no significant interaction between the race of the patients and the race of the physicians in the use of cardiac catheterization, strongly suggesting that racial bias was not at issue. Critics of the Chen study, however, have suggested that the predominantly white cardiologists to whom the black internists referred their patients exhibited racial bias by undertreating the black patients.[19] To this Chen and colleagues reply by noting this would mean that black attending physicians concurred with and supported racially biased decisions—a scenario they believe unlikely.[20] Moreover, the adjusted mortality rate for black patients was lower than, or similar to, that of white patients for up to three years after the infarction, suggesting that the care received by the patients, even if it was different, was equally effective.

The mortality outcome in the Chen study raises an often-overlooked and somewhat counterintuitive point: Differences in care do not inevitably translate into differences in outcome. Granted, lower death rates (mortality) may not reflect less sickness while alive (morbidity). Indeed, Padma Kaul of the University of Edmonton and colleagues did report evidence of poorer functioning within six months of acute myocardial infarction for black patients due to their lower rates of bypass surgery compared to whites.[21] Nonetheless, it is not always safe to assume that not undergoing a procedure inevitably causes harm. We should not reflexively interpret these differences as signs of inferior treatment.

The results of the RAND Health Insurance Experiment—a landmark study conducted between 1974 and 1982 to discover how much more medical care people will use if it is provided free of charge—are instructive. By randomly assigning subjects to different insurance arrangements, the researchers were able to prompt different levels of care and expenditures unrelated to the subjects' underlying health characteristics. By and large, the RAND research suggests that, in many contexts, increased treatment and expenditure levels do not translate into systematically better health.[22]

## Outcome Studies

Chen's finding of comparable mortality for blacks and whites is by no means unique. In fact, according to a Kaiser Family Foundation review of cardiac care studies, the overwhelming majority found no mortality differences between races despite lower rates of procedures for blacks.[23] Writing in *Medical Care* in 2005, Amber E. Barnato of the University of Pittsburgh and colleagues found that black patients had a lower risk of dying within thirty days of admission to treat acute myocardial infraction than clinically equivalent white patients at the same hospital. They observed this pattern despite the lesser likelihood of black patients receiving invasive care.[24] A 2005 study in the *New England Journal of Medicine* examined almost six hundred thousand "ideal candidates" for cardiac procedures from the National Registry of Myocardial Infarction from 1994 to 2002. Though white men underwent reperfusion (for example, balloon angioplasty or clot-dissolving treatment) more often than other groups, the thirty-day in-hospital mortality was no less for them than for black men and white women.[25]

One possible explanation is that catheterization may be overused in white men, meaning that the procedure is performed even when it will probably not benefit patients, because, as suggested earlier, doctors are practicing defensively to avoid liability.[26] Thus, higher frequency of invasive medical intervention and rates of coverage do not inevitably translate into better health.[27]

Recently, however, the pattern has been changing, showing greater mortality for blacks after acute myocardial infarction. Skinner and colleagues found a greater ninety-day mortality in a nationwide Medicare sample, which they attributed to the fact that the care of black patients was concentrated in hospitals that provide lower-quality care.[28] As Marc Sabatine of Harvard Medical School and colleagues demonstrated, though, quality of inpatient care is not the sole explanation. In his study, blacks and whites received similar protocol-driven care, yet six-month mortality was higher among black patients.[29] The authors speculate about the roles of "multiple socioeconomic and cultural factors undoubtedly at play."[30]

Discerning the rate of use that represents the highest quality of care is essential, because the remedy for differing rates of treatment due to unnecessary care in one group will not be the same as that for discrepancies based on underuse of needed care in another. The overtreatment of whites, however, can still coexist with the undertreatment of minorities. Researchers at Albert Einstein College of Medicine examined this possibility explicitly by analyzing New York State Department of Health data for 12,555 patients admitted to New York City hospitals with heart attack. They found that whites had higher rates of angioplasty and bypass grafting than blacks (25.2 percent versus 15.8 percent), though death rates during hospitalization for both groups were comparable. The death rate among blacks who did not receive bypass was similar to that of whites, suggesting that blacks were not inappropriately denied access to the procedures. Data on complications and course of recovery were not reported.[31]

When access to care is good and quality of care and patient characteristics are relatively uniform—such as in military health-care systems—racial disparities in care after controlling for the extent and severity of the disease are negligible.[32] A number of studies have documented comparable use of cardiovascular, pulmonary, and oncological procedures in black and white patients treated by the Veterans Affairs medical system.[33]

Others have shown similar or slightly better mortality rates for blacks compared to whites, despite receipt of fewer interventional procedures, such as catheterization and endarterectomy.[34] Notably, neonatal and infant mortality was found to be equal for white and black babies born to parents enlisted in the military; in the general population, black infant deaths are at least twice as frequent.[35] Suggested explanations for these phenomena include greater access to care and follow-up visits; more similarity between races within the Veterans Affairs patient population compared to the general population in terms of income and medical comorbidity, health-related attitudes, and higher quality of care; and monitoring of standards at Veterans Affairs medical centers affiliated with medical school and residency training programs.[36]

Thus, there are many explanations for the treatment gap. More of the kinds of studies just described—detailed prospective studies, audits, black-white doctor comparisons, and outcome analyses—are necessary to better understand physician decision-making. Nonetheless, many medical schools, health philanthropies, policymakers, and politicians are proceeding as if physician "bias" were an established fact. In the following chapters we explore additional possible explanations for health disparities for which studies need to account.

## 3

# Bias?

The claim that physicians' "bias" or "prejudice" toward minority patients is a fundamental dynamic driving health-care disparities is explosive—but we believe it is unproven and improbable and, as we have discussed, distracts from other factors influencing the nature of care patients receive. In the end, inferences about bias basically come down to an absence of sufficiently clear benign explanations for differences in care. Theoretically, this makes sense, but in practice no studies that we are aware of meet the burden of accounting for the panoply of factors that influence care. From a research standpoint, then, bias is largely a diagnosis of exclusion.

Thus, when studies find a persistent treatment gap after attempts to account for some of the obvious variables, we are left in ambiguous territory with much room for speculation. This is why it is imperative that researchers who are trying to identify bias within the doctor-patient interaction define their terms clearly and weigh alternative hypotheses.

According to popular understanding, bias may be conscious or unconscious in origin. Conscious bias underlies a knowing act—a deliberate effort to disadvantage members of one group solely because of who they are.[1] Unconscious bias, on the other hand, denotes an automatic or "implicit" assumption based on race or ethnicity. If the assumption is unflattering—for instance, that the patient will not adhere adequately to treatment, is not well-educated, or abuses alcohol—it is called negative stereotyping.

Saif Rathore and Harlan Krumholz have noted vagueness in the use of the term "bias." They cite a "lack of framework" for interpreting reports of variations in health-care use by race and ethnicity but finally conclude that "racial bias with adverse consequences in health care may be inferred if a racial variation in treatment . . . persists after accounting for health care system factors."[2]

Economists Ana Balsa, Thomas McGuire, and Lisa Meredith have attempted to parse the mechanisms by which treatment differences can result from an encounter between a doctor and patient.[3] The authors identify three mechanisms. The first and most blatant is overt prejudice. The prejudiced doctor would, presumably, be unwilling to treat patients from the disfavored group, either by avoiding practice in certain communities altogether or deliberately spending less time with them during visits. If he were required to treat them, he might give inferior care. The other two mechanisms, labeled "uncertainty" and "stereotyping," are kinds of inferences that arise from the mental shortcuts doctors routinely take in the face of incomplete information.

Balsa, McGuire, and Meredith recognize two versions of uncertainty. The first is miscommunication. This arises when the doctor has difficulty interpreting a patient's report of his symptoms: Individuals in same-race doctor-patient pairings, it is suggested, understand one another better than those in mixed-race ones. In turn, poor communication leads to differential care, with adverse outcomes for minorities. The authors call this "statistical discrimination," based on a concept first elaborated in the workplace, wherein white employers have an easier time assessing the productivity of white workers. (This is somewhat different than the standard definition of statistical discrimination, which means making a determination about an individual based on the average attributes of his group.)

The other form of uncertainty is called "rational profiling." This is a decision-making shortcut normally used in the presence of ambiguous or inadequate information. Here, the doctor knows from his own experience or the medical literature that the frequency of particular health problems and the effects of treatments can differ across races. Thus, he will consider medically relevant probabilities associated with race in diagnostic and treatment decisions—an example being the faster progression to renal complications in blacks with high blood pressure than in hypertensive whites.

Stereotyping, according to Balsa, McGuire, and Meredith, is another decision-making shortcut. It involves the reliance of doctors on negative assumptions about individuals from minority groups. Much-cited examples are found in studies by Michelle van Ryn and colleagues, wherein physicians were presented with clinical vignettes and asked to make inferences about patients of different races portrayed.[4] Despite similarity of information provided, the authors found that doctors were significantly more likely to expect black patients to dismiss medical advice, to be less likely to comply with rehabilitation, and to be more likely to abuse drugs and alcohol.

The distinction between rational profiling and negative stereotyping does not strike us as sufficiently clear—after all, some unflattering assumptions may simultaneously be rational ones. Balsa and colleagues seem to be blurring the distinction between factual judgments and value judgments or moral assumptions. Generalizations about compliance, for example, especially by a physician who is well-acquainted with the clientele of his community, may well be factual *and* negative. Though poor compliance is an undesirable characteristic in a patient, that doesn't mean the doctor inevitably dislikes his noncompliant patients or will treat them less competently.

Consider Dr. Neil Calman, an internist at Albert Einstein College of Medicine in New York City. In an essay in *Health Affairs* subtitled "A White Doctor Wrestles with Racial Prejudice," Dr. Calman flagellates himself for his "prejudice," which surfaced when he began caring for a black patient named Mr. North.[5] Dr. Calman describes being made to feel "vulnerable" during the first visit by Mr. North, who, the doctor knew, had been recently released from jail. The patient towered over him, spoke in a deep bass voice, and did not remove his reflecting sunglasses. It turned out, contrary to Dr. Calman's expectations, that Mr. North was highly conscientious about his health, kept all his appointments, and maintained careful records of his myriad medications. This surprised Dr. Calman, and he felt guilty about that. But that does not mean his assumptions about the patient were entirely unfounded, or that he was prejudiced. He felt uneasy during the initial visit because Mr. North was, in fact, acting like an intimidating ex-convict. And despite his unease, there is no evidence that the care he provided Mr. North was diminished by these feelings. Dr. Calman had worked for a quarter-century as an inner-city family doctor who, in addition to giving high-quality treatment, regularly took on social work tasks—for instance, finding a home for the children of one his patients, a single mother dying of AIDS. If this compassionate, devoted, and introspective doctor is "prejudiced," as he calls himself, we clearly need more like him.

Thus, we question whether negative assumptions about patients are the automatic equivalents of prejudiced attitudes (classically defined as hostility and rigidity and erroneousness). After all, unfavorable impressions can simply reflect realistic group differences in patterns of disease and behavior and imply nothing about the moral disposition of the person who holds such an impression. Indeed, if the doctor's assumptions are unaccompanied by ill will, are paired with efforts to compensate for an unfavorable perception of the patient (such as of poor compliance), and are amenable to change as the doctor sees, for example, a particular patient becoming more conscientious, then is this really prejudice? What harm has been done?

For example, if a physician assumes that a patient will not comply with triple therapy for HIV and simply forgoes the medication, he has acted unethically—even if he feels no ill will toward the patient. But giving the patient a compliance "trial," wherein the patient must at least keep a second appointment in order to receive medication, or assigning him to a special nurse-manager who phones him with medication reminders—even if it turns out that the doctor was wrong in his prediction of poor adherence—does not strike us as biased.

Furthermore, we are skeptical that doctors, or most decision-makers for that matter, act on inferences based on race alone. At the very least, key elements in the doctor's reasoning surely include observable phenomena as well: the patient's general demeanor and degree of engagement with the clinical exam and history-taking, for example, complemented by the doctor's experience with him. A patient who sees the same doctor from visit to visit has the benefit of preservation of clinical information and the opportunity to establish a rapport with him.

Negative stereotypes, in the end, may best be addressed through the self-correction that comes from calling attention to their existence. Journal clubs (weekly gatherings of medical professors and trainees to discuss newly published research) and bedside teaching rounds are good venues in which to develop the habit of being mindful of the complexity and subtlety of clinical discretion and assumptions made within the doctor-patient relationship. Compared to classroom settings, which have their place, rounds-based discussions offer a more organic way of addressing the issue because it is incorporated into day-to-day clinical routine.

To our knowledge, there exist no systematic, prospective evaluations of physician decision-making in relation to patient race, let alone of the clinical results of such decision-making. The literature on medical stereotyping contains data that are indirect, limited to interpretation of academic exercises that may have heuristic value but are inadequate for drawing conclusions about actual clinical encounters.

## 4

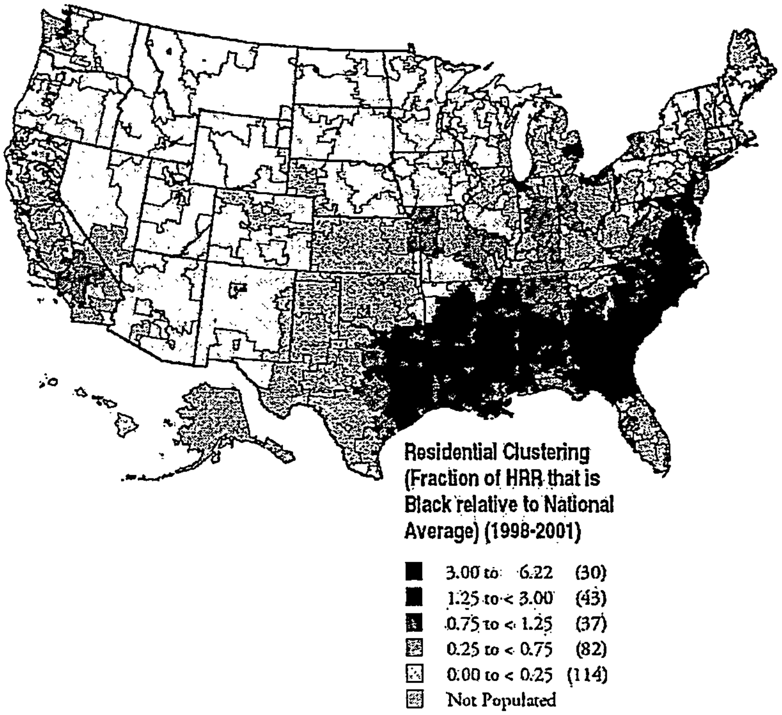
# Is Geography Destiny?

If bias is not a driving force behind differences in health care, what is? With most health care delivered locally—and with racial and ethnic groups not evenly scattered about the country—it is imperative that researchers account for geography in evaluations of health disparities. When they do, they discover that geographic residence often explains race-related differences in treatment better than even income or education. One of the most striking limitations of the IOM report is the absence of such an analysis.

Consider the concept of the "hospital referral region," or HRR. *The Dartmouth Atlas of Health Care* defines an HRR as a geographic area served by a major hospital equipped with comprehensive surgical capacity, also known as a tertiary care hospital.[1] In the United States there are 306 HRRs, yet only 36 of them have a nationally representative mix of residents. Among the rest, a number have black population rates that are three to six times the national average of 13 percent (see figure 1). Because health care varies a great deal depending on where people live, and because blacks are overrepresented in regions of the United States that are burdened with poorer health facilities, disparities are destined to be, at least in part, a function of residence.

Medicare datasets do not include geographic identifiers, so geographic data are often lost to researchers who rely on these sources. Consequently, as Amitabh Chandra and John Skinner of Dartmouth College have observed, many disparity evaluations do not sufficiently control for geographic variation among patients.[2] This can produce misleading findings.

FIGURE 1
**Distribution of Black Residents Nationwide**



SOURCE: Chandra and Skinner, "Geography and Racial Health Disparities."

For example, assume black patients from two different cities—city X and city Y—receive exactly the same care as white patients from the same places. In city X, all patients receive suboptimal care; in city Y, all patients receive excellent care.

Now compare the care of all black residents of cities X and Y with the care of whites from both cities. If the proportion of black residents in the two cities is not identical, there will appear to be racial differences in treatment even though blacks and whites living in the same place receive the same care. Thus, if minority patients are not randomly distributed throughout locations—only 6 percent of poor whites live in high-poverty neighborhoods while 22 percent of Hispanics and 34 percent of blacks do—geographic differences in utilization and health outcomes are going to appear, analytically, as racial disparities.[3] And researchers who fail to control for location effects will interpret geographic health disparities as racial disparities.[4]

As a rule, the quality of care received by blacks is inversely related to the concentration of black residents in the local population. For example, Baicker, Chandra, and Skinner found that the frequency of annual eye exams in black diabetic patients covered by Medicare declined as the number of blacks in the local population increased.[5] Along these lines, blacks who lived in predominantly white HRRs received the same or slightly better eye care than whites. Angus Deaton of Princeton University and Darren Lubotsky of University of Illinois have found that at both the regional and the metropolitan statistical area (MSA) level, both white and black mortality rates are higher in areas where blacks make up a larger portion of the total population.[6] Similarly, the Dartmouth group found significantly higher risk-adjusted mortality following acute myocardial infarction in U.S. hospitals that disproportionately serve black patients.[7] In her study, Amber Barnato and colleagues found that 1,000 of 4,690 hospitals nationwide accounted for treating 85 percent of the black Medicare patients in 1994–95.[8]

The effects of location on health disparities have also been studied using infant mortality rates. Jeannette Rogowski and colleagues at RAND used the rich Vermont-Oxford network dataset to examine the effects of hospital quality on the mortality rates of very low-birthweight babies, controlling for condition of the baby at birth (via Apgar scores) as well as other characteristics such as gestational age, race, method of delivery, birth defects, and prenatal care.[9] The authors found that black babies were more likely to be born in hospitals that primarily served minority areas (57 percent for black births, as compared with 18 percent for white births).

Thus, at a minimum, black and white babies are not being delivered at the same kinds of hospitals. The characteristics of the hospitals serving these two populations also varied systematically. Black babies were significantly more likely to be born in government-run hospitals that served a relatively high proportion of Medicaid patients, and where doctors spent less time with patients due to high patient volume (and for other reasons as well). Further, the hospitals where black babies were born were significantly less likely to have neonatal intensive care units or to perform neonatal cardiac surgery.

In the Rogowski analysis of twenty-eight-day infant mortality rates, these hospital characteristics proved to be a significant source of variation in the survival chances between white and black babies. Babies born in minority-serving hospitals were 30 percent more likely to die in the first twenty-eight days than those born in hospitals that served few minorities (less than 15 percent of patients), and this effect was quantitatively similar for both white and black babies.

Although not nearly as important as the minority-serving versus majority-serving distinction, many other hospital characteristics that differed by race also proved significant in determining mortality. For instance, having a neonatal intensive care unit that performed cardiac surgery reduced infant mortality by 14 percent, and being born in a government-run hospital raised mortality rates by 7 percent relative to a private, not-for-profit hospital, and by 24 percent relative to a for-profit hospital. Again, these results included controls for condition at birth, prenatal care, maternal income and education levels, and gestational age.

Thus, by focusing on race we miss a very important cause of health-care difference: geography. Where a person lives has a much larger effect on how the medical system treats him.

# 5

# Role of Hospital Variation

As we have seen, regional differences in health care can be a significant factor influencing health disparities. Variation among hospitals is another factor for which disparity studies often do not control. Indeed, the studies below describe a pervasive trend: Hospitals that treat greater numbers of minority patients generally offer poorer quality service than those that treat fewer minorities.

In general, hospitals that perform a low volume of surgical procedures such as coronary bypass, gall bladder removal, or valve replacement have higher mortality rates for the given procedure than those that perform more. A 2002 study by John Birkmeyer and others showed that black patients were more likely to be treated at low-volume hospitals and more likely to die for that reason.[1] The crucial importance of volume has been underscored by the Leapfrog Group (a coalition of more than eighty large public and private insurance purchasers), which urges both patients and payers to select hospitals that perform a certain minimum threshold number of procedures per year.

Elizabeth Bradley of Yale and colleagues found that hospital-to-hospital differences made a considerable impact on treatment differentials in the case of suspected heart attack. The cohorts included 37,143 patients receiving angioplasty at 434 hospitals, and 73,032 patients receiving fibrinolytic therapy (medicine to dissolve blood clots in coronary arteries) in 1,052 hospitals. Their findings: "A substantial portion of the racial and ethnic disparity in time to treatment is accounted for by the hospital to which a patient is admitted, in contrast to differential treatment by race and ethnicity inside the hospital."[2]

Within the region of New York City, Lucian Leape of the Harvard School of Public Health and colleagues found that about one-fifth of all patients who needed balloon angioplasty or bypass graft did not get them, largely because the hospitals to which they were admitted did not have onsite catheterization labs.[3] The frequency of failure to recommend these procedures and to transfer patients to sites at which they could be performed was equal across racial groups. Moreover, when patients were admitted to hospitals with onsite facilities, there was no racial variation in the rate at which the procedures were received.

Another study of New York State examined surgical complications by race. Using the 1998–2000 New York State Inpatient Data Set, a team led by Kevin Fiscella of the University of Rochester found that black patients had higher overall rates of postoperative complications, especially thromboembolism (blood clot) and septicemia (infection). When they controlled for patient-level characteristics (for example, presence of additional medical conditions) and hospital features (size, number of full-time registered nurses), racial differences in complications were "fully explained."[4]

Blustein and colleagues at Columbia University assessed the frequency with which whites and blacks patronized poorly equipped hospitals.[5] Following a cohort of 5,857 patients admitted to California hospitals with acute myocardial infarction in 1991, the authors found that white patients were more likely than blacks to travel past community facilities that lacked catheterization laboratories to tertiary hospitals that had the technology available.

A nationwide study of all Medicare patients treated in 4,690 hospitals between 1994 and 1995 for acute myocardial infarction (heart attack) revealed a similar finding. On average, black patients went to hospitals that used evidence-based medical treatments (that is, state of the art practices) less frequently and had worse mortality rates (but higher rates of cardiac procedures, suggesting better-quality surgical than medical care). "Incorporating the hospital effect altered the finding of racial disparity analyses and explained more of the disparities than race," wrote Amber Barnato of the University of Pittsburgh and her coauthors.[6]

Once again, we find that minority patients receive different treatments than whites primarily because they attend lower-quality hospitals—a pattern that helps exonerate physicians from the charge of systematic bias in their treatment of patients. Most likely, this is a function of minorities' disproportionate poverty or near-poverty status. Studies comparing similarly disadvantaged blacks and groups of whites (such as those clustered in poverty in Appalachia and rural Maine) would underscore the primacy of social capital (such as education and wealth) over race in the receipt of care.

## 6

# Impact of Malpractice

Financial risk associated with doctor malpractice insurance—and its impact on physician workforce distribution throughout the country—is another factor in access to care for minorities. Jonathan Klick of Florida State University and Thomas Stratmann of George Mason University examined the effects of medical malpractice reforms on where doctors choose to practice over the period 1980–98.[1] They discovered that states passing caps on noncompensatory damages in medical malpractice cases were more successful in attracting doctors. Additionally, the increase in the number of doctors practicing in these states appeared to have the largest effect on underserved communities with large minority populations.

This shows that when medical malpractice litigation risk grows, the doctors who consider moving to another state in response to that risk tend not to be those serving affluent, predominantly white communities. Doctors most sensitive to this risk (and the concomitant increase in liability insurance costs, as well as financial risk in general) are those with more modest incomes who are serving or considering serving marginalized communities.[2] Consequently, liability protections should improve access to care for individuals in these communities.

Klick and Stratmann go on to show that damage caps passed by the state translate directly into improvements in the black infant mortality rate. This is because doctors now have more financial incentive to practice in underserved areas. The authors found that enacting caps on noncompensatory damages at the $500,000 level reduces the black infant mortality rate by sixty-seven deaths per hundred thousand births, a statistically significant result that implies a reduction in average black infant mortality of about 7 percent. Increased access is likely to help both white and minority residents alike, but because the minority residents make up a disproportionate share of the population in these underserved areas, the effect will be to provide relatively greater improvements in minority health.

These results are consistent with other research examining the effects of increasing access to prenatal care generally. Lisa Dubay of the Urban Institute and colleagues found that decreasing doctors' exposure to medical malpractice liability risk increases the likelihood that mothers will receive prenatal care early in their pregnancies.[3] Though this effect is statistically significant for both black and white mothers, the magnitude of the effect is much larger for black mothers. Daniel Kessler of Stanford University and colleagues also reported that tort reform increased physician supply.[4]

# 7

# Patterns of Physician Use by Race

A central assumption that underlies the biased-doctor model is that black patients are served less competently than white patients by the same (white) physicians. But research by Peter Bach and colleagues at Manhattan's Memorial Sloan-Kettering Cancer Center and the Center for the Study of Health Care Change in Washington has produced findings that cast doubt on that assumption.[1] The authors showed that white and black patients, on average, do not even visit the same population of physicians—making the idea of preferential treatment by individual doctors a far less compelling explanation for disparities in health. They show, too, that a higher proportion of the doctors that black patients tend to see may not be in a position to provide optimal care.

The research team examined more than 150,000 visits by black and white Medicare recipients to 4,355 primary-care physicians nationwide in 2001. It found that the vast majority of visits by black patients—80 percent—were made to a small group of physicians—22 percent of all those in the study. Is it possible, the researchers asked, that doctors who disproportionately treat black patients are different from other doctors? Do their clinical qualifications and their resources differ?

The answer is yes. Physicians of any race in the study who disproportionately treated black patients were less likely to have passed a demanding certification exam in their specialty than the physicians treating white patients. More important, they were more likely to answer "not always" when asked whether they had access to high-quality colleague-specialists, such as cardiologists or gastroenterologists, to whom they could refer their patients, or to nonemergency hospital services, diagnostic imaging, and ancillary services, such as home health aid.

These patterns reflect geographic distribution. Primary-care physicians who lack board certification and who encounter obstacles to specialized services are more likely to practice in areas where blacks receive their care—namely, poorer neighborhoods, as measured by the median income. Bach and his colleagues suggest that these differences play a considerable role in racial disparities in health care and health status. They make a connection between well-established facts: that physicians who are not board-certified are less likely to follow screening recommendations and more likely to manage symptoms rather than pursue diagnosis. Thus, rates of screening for breast and cervical cancer or high blood pressure are lower among black patients than white, and black patients are more likely to receive a diagnosis when their diseases are at an advanced stage.

Limited access to specialty services similarly puts black patients at a disadvantage. The Bach study is the first to examine physicians' access to specialty care and nonemergency hospital admissions in light of the race of the patients they treat. That capacities of doctors who treat black patients may account for some part of the health gap was considered in a 2002 study by researchers at the Harvard School of Public Health. The study found that physicians working for Medicare managed-care plans in which black patients were heavily enrolled provided lower-quality care to all patients. Specifically, their patients were less likely to receive the four clinical services the authors measured—mammography, eye exam for diabetics, beta-blocker after myocardial infarction, and follow-up after hospitalization for mental illness.[2]

A report in the *American Journal of Public Health* in 2000 found that blacks in a sample of almost thirty thousand patients in New York State undergoing cardiovascular surgery in 1996 had poorer access to high-quality surgeons than did whites.[3] Even among patients at the same hospital, whites were treated by better-performing surgeons, a phenomenon that may reflect some selection of patients by surgeons based on insurance coverage.[4] Donald Gemson of the Columbia University School of Public Health and colleagues showed that foreign-trained physicians and doctors not board-certified were more likely to treat black patients in New York City than to treat whites. They also found that practitioners whose caseload was more than 50 percent black or Hispanic were less likely to follow nationally recognized treatment guidelines, such as recommending mammograms or flu vaccinations for the elderly.[5] Kevin Heslin of Charles R. Drew University and his team showed a correlation between physicians' experience in treating HIV and the race of their HIV patients, with HIV-positive black patients more likely to be treated by physicians less experienced with the disease.[6]

At the Center for Studying Health System Change in Washington, D.C., J. Lee Hargraves and colleagues used the Community Tracking Study Physician Survey, a nationally representative study of American physicians, to assess their abilities to obtain medically necessary services for their patients.[7] Physicians were asked how often they could arrange referrals to specialists and inpatient admissions for their patients. According to the survey, black physicians were more likely to report difficulties admitting patients to hospitals than white physicians, and Hispanic physicians were more likely to report having a poor specialty-referral network than white physicians.

It is important to recognize that many of the physicians working in black communities are hardworking, committed individuals who earn considerably less than other doctors. As Bach's team notes, they deliver more charity care than doctors who mostly treat white patients, and derive a higher volume of their practice revenue from Medicaid, a program whose fees are notoriously low. They are often solo practitioners who scramble to make good referrals for their patients but are stymied by a dearth of well-trained colleagues and by limited access to professional networks with advanced diagnostic techniques.

While some might be willing to describe these access differentials as "discrimination" in some broad sense, the solutions to this kind of problem are substantially different from remedies premised on physician bias. Further, from a policy standpoint, resources mistakenly devoted to mitigating the problem of individual bias generally will not be available to improve access to high-quality medical care for minority individuals.

## 8

# Patient-Side Factors Influence Health Disparities

So far we've examined differences among doctors and hospitals serving minority populations that might account for race-related treatment differences. But what about differences in the patient populations themselves?

### Self-Care

Built into the biased-doctor model is an assumption that solutions must come from providers and the system. To be sure, there is always room for greater self-awareness on the part of practitioners and for quality improvement on the part of the system, but if we fail to emphasize the role played by patients themselves, we abandon any hope of narrowing the health gap. Simply put, different racial groups have different behavioral profiles, and concentrating on the patient's side of decision-making is an essential element of improving minority health. But, again, these differences are less a characteristic of race, per se, than class.

Poorer, less-educated individuals are more likely to engage in risky behavior, such as smoking and excessive use of alcohol, and are less likely to initiate health-conscious activities, such as dieting and exercise.[1] Among African-Americans, who as a group are disproportionately poorer and less educated than whites, chronic conditions such as heart disease, stroke, lung cancer, HIV, and diabetes, whose progress can generally be arrested through self-care, represent major causes of death.[2] One-third of black women are obese, according to the Centers for Disease Control (CDC). They are nearly twice as likely as white women and more than five times as likely as Asian/ Pacific Islander women to be obese.[3]

A striking study by Ashwini Sehgal in *The Journal of the American Medical Association* reveals the importance of self-care. The team analyzed the impact of a Medicare-funded quality-improvement initiative on black-white differences in adequacy of hemodialysis, anemia, and nutritional status. They discovered that the initiative was able to equalize treatments that were simply given to the patient by medical staff, such as hemodialysis. But when it came to conditions that respond to self-care (such as anemia and other nutritional problems, which require patients to eat better or take prescribed dietary supplements regularly), the initiative was unsuccessful. It is important to recognize that failures of self-care are not signs of bias in the health care system. Poorer glycemic control among African-American patients has been documented in several cross-sectional population-based samples.[4]

David Williams of the University of Michigan and Pamela Braboy Jackson of Indiana University note that the prevalence of some diseases—such as heart disease and cancer, which are chronic—differs between blacks and whites, while that of others (such as pneumonia and flu, which are acute) does not.[5] The virtual elimination of disparities in treatment of common viral illnesses, they state, reflects several factors: widely available and simple technology, such as immunization, facilitated by Medicare and Medicaid; patient involvement that does not demand high levels of motivation, knowledge, or resources; and the fact that the intervention is applied only once. And, of course, it is motivation, knowledge, and resources that all play a vital role in decisions to exercise and to avoid certain foods, cigarettes, drugs, and excessive alcohol, to adhere to treatment regimens, and to seek treatment for medical care before illness becomes advanced.[6]

## Health Literacy

Health literacy refers to the ability to understand written or spoken health information and make informed decisions on the basis of it.

According to the U.S. Department of Education, nearly half of all American adults—ninety million people—have trouble reading and thus are at risk for making poor health decisions. Forty million adults scored at the lowest of five levels, level one, on the National Adult Literacy Survey, and fifty million scored at level two.[7]

Compared to white adults, blacks were about three times as likely to score at level one in prose skills, document reading, and quantitative skills, and about 50 percent more likely to fall into level two. In practical terms, these levels correspond to having trouble finding two or more numbers on a chart and performing a calculation; coordinating several bits of information from a single document; or locating bits of information or numbers in a lengthy text. Poor understanding of the importance of monitoring and lack of ability to learn how to do it have obvious consequences for patients with medical conditions that require ongoing self-management.

Low literacy occurs disproportionately among the poor and near-poor, the elderly, those living in the South and Northeast, minorities and, of course, those with fewer years of education. Language barriers contribute to poorer asthma management among non–English-speaking Latino children compared to English-speaking Latino, white, and black children.[8] Most studies found that poor adherence to medical regimens was linked to lower literacy and levels of education. The idea that intelligence plays a role in health differentials across a population has been examined as well.[9]

Literacy has consequences for health. In 2004 the Agency for Healthcare Research and Quality reported that weak reading skills and poor comprehension were linked to higher rates of hospitalization and use of expensive (and avoidable) emergency services.[10] Poorly educated individuals less often obtained preventive services like pap smears, mammograms, immunization, and testing for sexually transmitted disease. Similarly, breastfeeding, an important boost to the neonatal immune system, was found to be less common among less literate women. In its 2004 report, *Health Literacy: A Prescription to End Confusion*, the Institute of Medicine similarly concluded that there is a higher rate of hospitalization and use of emergency services among patients with limited health literacy.[11]

A number of investigators have found African-Americans in their samples to be less well informed about procedures than white patients. For example, researchers from the Cleveland, Ohio, Veterans Affairs Medical Center approached nearly six hundred veterans over fifty years of age who had moderate or severe osteoarthritis to question their knowledge regarding hip or knee joint replacement and their views on the postoperative course for joint surgery.[12] Black patients were significantly less likely than whites to have more than high school education, to have had family or friends who had had joint replacement, or to report a good understanding of joint replacement as a form of treatment, and they had greater expectation of pain with the procedure.

Similarly, researchers at the Philadelphia Veterans Affairs Medical Center conducted a survey of over six hundred patients with pulmonary disease from three veterans hospital sites across the country. They found that more blacks than whites (61 percent versus 29 percent) maintained the folk belief that the spread of lung cancer was accelerated when the tumor was exposed to air during surgery and would oppose surgery because of this (19 percent versus 5 percent).[13] A study of patients with operable lung cancer conducted at Detroit's Henry Ford Health System found refusal of surgery by black patients over three times more common than by whites. (Both whites and blacks were offered the surgery at similar rates.)[14] When angioplasty or bypass surgery was recommended to 1,075 patients at a single tertiary care VA hospital in New York City, the black patients were significantly more reluctant to give consent than whites (15.4 percent versus 8.3 percent).[15]

Most data on health literacy reflect a given point in time—a snapshot, or cross-sectional, picture of health status and reading skill and comprehension. There have been experiments in which some patients, but not others, were randomly assigned to literacy programs, but such studies are usually short-term, use narrow process measures (asking, for instance, did knowledge increase?) rather than outcome measures (did health improve?), have small samples, and do not analyze the data by the subject's level of education.

Two major evaluations have focused on the role of education in improving clinically relevant health outcomes. One, by Dana Goldman and James Smith of RAND, examined large existing datasets of patients with HIV/AIDS and insulin-dependent diabetes. The researchers chose these conditions because although treatment regimens are complex, they are effective if followed carefully.

In their appraisal of the data from the HIV Cost and Services Utilization Study, Goldman and Smith found that 57 percent of college graduates always followed their treatment plans, while only 37 percent of high school dropouts did so. Income, insurance, and disease status did not appear to affect treatment adherence, while education level consistently mattered.[16]

The RAND authors also compared patient outcomes in the Diabetes Control and Complications Trial, a large clinical trial in which half the subjects with insulin-dependent diabetes were randomly assigned to intensive intervention.[17] They found that self-management of disease varied greatly with the patient's level of schooling; compliance, in turn, had a meaningful impact on patients' overall health status. One group of subjects in the study received treatment as usual, while the other was scheduled for more frequent clinic visits and received frequent telephone contacts. Within each group, subjects varied in their educational attainment. When results were interpreted by level of education, the least-educated were found to benefit the most—mainly because the well-educated were already doing a good job of adhering to their treatment plans. By following treatment-as-usual protocols, Goldman and Smith predicted, health outcomes of less-educated diabetics would deteriorate at a more rapid rate.

The second intervention evaluation, by Russell Rothman and colleagues at Vanderbilt University School of Medicine, also found that low-literacy patients benefited from intervention.[18] The researchers randomly assigned one group of patients with Type II diabetes who had poor glucose control to either of two conditions: usual care versus intensive, semimonthly contacts with a diabetes case coordinator. During these contacts, patients in the second group received ongoing education in identifying the symptoms of hyper- or hypoglycemia, simplified explanations with visual aids, and repeated assessment of their comprehension. After one year, the authors found that patients receiving the intensive-management program had superior outcomes. In particular, managed patients with low literacy and poor glucose control fared better than their counterparts who received only treatment as usual. (Those with high literacy had comparable outcomes irrespective of whether they were managed.) Finally, literacy level appeared to be a more powerful predictor of who would benefit from intervention management than race, income, or clinical status.

Whether low literacy is a direct cause of poor health outcomes is an intriguing question. The ability to read directions, calculate intervals between medication doses, and understand the basic physiology of one's condition and the consequences of neglect are surely useful, but as the Agency for Healthcare Research and Quality points out, poor reading ability could also be a proxy for poorer access to care, low conscientiousness, or low level of trust in medical providers. And are these variables, in turn, markers for adherence to treatment regimens?

In sum, there have been no studies to date that assess improvement in health status as a function of improved literacy, or literacy as a mediator of compliance in the context of race. It is reasonable to expect that the health differential would shrink if minorities with poor reading and comprehension skills benefited from such interventions as adoption of structured treatment plans and intensive patient monitoring, but this remains to be demonstrated.

## 9

# Doctor-Patient Relationship

Miscommunication between doctor and patient or flawed inferences on the part of the physician are often ascribed to unappreciated cultural differences. Though difficult to quantify the extent to which these lead to differences in treatment, common sense dictates that better doctor-patient interactions lead to better care and thus to better health outcomes. Efforts to enhance the relationship between doctor and patient are called "cultural competence" training. Does this approach work? How does a "culturally competent" doctor differ from a humanely sensitive one? And should patients see doctors of their own race, or just the most competent doctor available, regardless of race?

### What Is Cultural Competence?

Cultural competence training is advanced as a remedy for miscommunication between doctors and patients of different racial or ethnic backgrounds. Half of all medical school programs offer cultural competence teaching, according to a report in *The Journal of the American Medical Association.*[1]

Cultural competence refers to a range of interventions. It can include useful, practical accommodations intended to help health providers care for unacculturated or immigrant populations—such as translation services, or education of medical staff about local healing customs and commonly used remedies. But it can also entail blatant racial sensitivity training. A sociologist writing in *Academic Medicine*, for example, sees the need for such training in order to counteract students' tendency to "deny social inequality, or . . . disadvantages experienced by Others, but not the accompanying privileges enjoyed by their own social group."[2] As promulgated by the HHS Office of Minority Health, cultural competence standards entail provision of language and "culturally appropriate" services, along with an injunction that clinical staff training should include discussion of the impact of "race and racism . . . on access to care, service utilization, quality of care, and health outcomes."[3] The standards for medical school accreditation, as put forth in 2003 by the Association of American Medical Colleges, require medical students to "learn to recognize cultural biases in themselves and others."[4]

At its most constructive, cultural competence is a variant of standard training in doctor-patient communication—a course that is required by all medical schools within the first two years of study. Joseph Betancourt, a physician at Harvard Medical School, describes an enlightened form of cultural competence that has "evolved from the making of assumptions about patients on the basis of their background to the implementation of the principles of patient-centered care, including exploration, empathy, and responsiveness to patients' needs, values, and preferences."[5]

In our view, Betancourt is simply describing the competent care that all patients, irrespective of racial or cultural identity, deserve. Consider Betancourt's description of an elderly Italian woman whose son asked the surgeon not to reveal to his mother that she had cancer because the knowledge would "kill her." The doctor explored the reason for secrecy and was able to negotiate with the son a comfortable way to inform the mother. In another scenario, a Hispanic woman suffered from hypertension that remained under poor control for two years despite various trials of antihypertensive drugs. When her doctor finally asked her about her understanding of the problem of high blood pressure, she told him that she could "feel" when her pressure was high, and that's when she took the medication. The doctor was then able to educate the patient how to take her pills correctly.

We wholly endorse the principles of cultural competence as set forth by Betancourt. What we question is the wisdom of "ghettoizing" cultural competence as a discrete didactic enterprise outside of standard doctor-patient relationship training. Indeed, these two cases were resolved using techniques that doctors should use with *any* patient—though they are especially likely to be called upon when patients are unsophisticated about health matters—but they do require time, unfortunately a scarce resource in many clinical settings. The common-sense approaches described by Betancourt transcend race and ethnicity. There was nothing particularly "Italian" or "Hispanic" about the clinical puzzles presented. In fact, some observers worry that cultural competence could deteriorate into an oversimplified paint-by-numbers affair that purports to teach students and physicians "how to treat" African-Americans, Asians, Latinos, and others.[6] Others recoil at the specter of a clinical milieu in which black patients will be assigned to black doctors, gay patients to gay doctors, and so on.[7]

There is no better way to affirm the universal principles of doctor-patient interaction than to consider the kind of pairing that happens in about one in five clinical encounters: the foreign doctor and the American patient.[8] This challenges the very premise upon which traditional cultural competence is based: the biased (white) doctor model.

In a moving essay, Alok Khorana, an Indian physician practicing in New York State, reflects on his experience caring for an elderly black man.[9] When he reaches an impasse with the family regarding transfer to hospice, Khorana worries that his previously trusting relationship with them has faltered because, perhaps, "they [were] thinking of me as, well, white."[10] He asks a nurse for help and she—a white woman—rather easily works with the family to accept hospice care. At first, Khorana is taken aback by her success, but after the nurse explains how she approaches "families we see that are struggling with this, black or white," Khorana remarks to himself, that "after all my handwringing and ruminating on race and race concordance, race was, at least in this case, a red herring."[11] In other words, the fact that Khorana was not black himself (he seemed to think that the family regarded him as "white") probably had little to do with his inability to engage the black family. Whatever the obstacle, it was not the mismatch between his race and the patient's family.

### Racial Concordance and Preference

If the clinical encounter is marred by cultural misunderstandings, will disparities in treatment and outcome be reduced if doctor and patient are of the same race or ethnic background? The premise that such concordance between patient and doctor is important to the resolution of disparities has prompted calls for using race as a medical school admission criterion.[12] But what evidence exists to affirm the benefits of concordance?

First, what do we know about patients' preferences for same-race physicians? According to a 1994 Harris poll for the Commonwealth Fund, race does not play an especially large role in patients' attitudes about their doctors. When asked to cite the factors that "influence your choice of doctor," the physician's "nationality/race/ethnicity" ranked twelfth out of thirteen possible options.[13] Just 5 percent of whites and 12 percent of minorities said it was important. A greater proportion of Asians, 28 percent, rated race/ethnicity as important, probably owing to language barriers.[14] Even so, over 60 percent of white, black, and Hispanic respondents said they did not consider the doctor's ability to speak their language particularly relevant to their choice of doctor.[15]

For the entire sample of four thousand respondents, factors such as ease of getting an appointment, convenience of the office location, and the doctor's reputation were most influential, cited by about two-thirds.[16] In some cases, concordance is most likely an accident of location, as minority physicians are more likely than white physicians to reside near and disproportionately practice in minority neighborhoods.[17] When Commonwealth respondents who expressed dissatisfaction with their regular doctor were asked for details, only Asians claimed that race or ethnicity was the problem. (And the percentage was small—only 8 percent of all Asian respondents.[18]) Among the subset of the entire sample who said they "did not feel welcome" at their doctor's office, a mere 2 percent of African-Americans and Hispanics and 4 percent of Asians attributed the discomfort to racial-ethnic differences.[19]

The main complaint of almost all groups was the doctor's "failure to spend enough time with me."[20] And of those who were dissatisfied enough to change doctors, only 3 percent of Asians and 2 percent of blacks did so on the basis of the physician's race or ethnicity.[21] The most common complaints were "lack of communication," "didn't like him or her," "couldn't diagnose problem," and "didn't trust his or her judgment."[22] Less than 1 percent of those who said they had limited choice about where to get care attributed that constraint to racial or ethnic discrimination.[23]

In focus groups commissioned by the Henry J. Kaiser Family Foundation, discussions revealed that "the most common form of discrimination described by minority consumers was not racial [or] ethnic, rather it was discrimination based on the ability to pay for health services."[24] A 1999 survey by the foundation queried almost 3,900 people about their doctors. Around 85 percent of whites, African-Americans, and Latinos rated their doctors as good or excellent.[25] Whites and blacks were about equal in answering "yes" when asked whether their clinicians paid enough attention to them (89 and 87 percent, respectively), though slightly fewer Hispanic patients said so (80 percent).[26] One in five black individuals preferred a doctor of his own race, while 12 percent did *not* want doctors of their own race.[27] Among Hispanics polled, 28 percent wanted doctors of their own race, and 17 percent said they did not. In a much smaller survey sponsored by Morehouse College of Medicine in Atlanta, 28 percent of the 251 African-Americans surveyed "considered it important that their doctor be of the same ethnic group as themselves."[28]

Studies of concordance do not show consistently positive effects of doctor-patient matching on various measures of care.[29] Only a handful of studies have been devoted to the question of whether patients' outcomes are better if they and their clinicians are of the same race. Many of these studies were conducted with psychiatric patients, and most showed that clinicians' race had a minimal impact on how black patients fared in their treatment and recovery.[30] One large study that appeared in the journal *Psychiatric Services* involved more than 1,700 homeless individuals participating in an intensive services program. Each person was randomly assigned a case manager with whom he worked closely. Over the course of a year, improvement in dimensions like the number of days a patient worked at a job, whether he had drug problems, and the number of days he spent homeless bore no relationship to whether he and the case manager were of the same race.[31] A recent study from the University of North Carolina found that physician race had little effect on the successful management of high blood pressure in elderly black and white patients. Seeing the same physician, however, was a key factor in good outcome.[32]

Other researchers have looked at the doctor-patient relationship in a different way. In one recent study, led by Lisa Cooper-Patrick of Johns Hopkins University School of Medicine and published in *The Journal of the American Medical Association*, patients gave their doctor visits a "participation score" based on the frequency with which they felt the doctor involved them in treatment decisions. Cooper-Patrick reports that black patients rated their visits as more "participatory" when their doctors were black.[33]

A closer look at the Cooper-Patrick data, however, leaves one unsure about its clinical significance. In particular, patients rated their interactions with same-race physicians (a participation score of 62.6 out of a possible 120) as barely different than interactions with different-race physicians (60.4 out of 120).[34] Using the same survey instrument, Kaplan and colleagues discovered that minority patients who saw minority doctors had *lower* scores on the questions of participation that those who saw white doctors.[35]

Evidence that race concordance between patient and physician improves care is, at best, inconsistent. One of the most effective ways to enhance the doctor-patient relationship is for doctors to spend more time with each patient. In her study, Cooper-Patrick found that the amount of time the doctor spent with the patient was linked to higher participatory ratings comparable to the ratings given by the patient when his race matched his doctor's, while Kaplan observed that the amount of time the patient spent with the doctor helped determine the participation score.[36] In the latter study, visits of less than twenty minutes were found to be too brief to involve patients in treatment decisions. In another analysis led by Kaplan, physicians who had "high-volume" practices were rated as less participatory than those who saw fewer patients but spent more time with each.[37] Given the value patients place on face-to-face time with their physician, no matter what his race, the real problem seems to be that an average primary care visit is fifteen minutes for everyone—rather than its being a few minutes shorter for black patients.[38]

Other standard features of a good doctor-patient relationship include sustaining eye-contact, minimally interrupting the patient when he is speaking, offering careful explanations of treatments and options, encouraging patients to ask questions, and so on. The physician must be alert to the idea that a patient's culture might interfere with the interview or willingness to accept care (for instance, some patients of Asian descent may be reluctant to make eye-contact), but unless he regularly serves patients of particular backgrounds, the physician cannot be expected to know idiosyncrasies of multiple groups.

Furthermore, sex, age, social class, and education make a big difference in concordance of doctor and patient medical knowledge. Take the example of black pediatrician Lynn Smitherman, who wrote a paper in *Pediatrics* entitled, "Use of Folk Remedies Among Children in an Urban Black Community: Remedies for Fever, Colic and Teething."[39] On a radio show she explained that she wrote the paper because she hadn't heard of any of the remedies—her mother and grandmother did not use any with her when she was a child—and assumed that many of her colleagues might not be familiar with them either. Similarly, many black trainees or physicians may not be any more aware of certain folk beliefs than whites—for example, the notions that air causes a cancer to spread, that the devil can cause a person to get cancer, or that chiropractic is an effective treatment for breast cancer.[40] Clearly, not all black Americans share the same cultural experiences.

Finally, the patient has a role in facilitating his care. The doctor can encourage patients who are less educated, unfamiliar with clinical encounters, or reticent during visits to bring advocates or family members with them.[41] Educational modules that prepare and coach patients to ask questions and present information about themselves to their doctors are promising where implemented.[42]

# Conclusion

To return to the question we posed at the beginning—would a white and black patient arriving at the emergency room receive the same care?—we see that the question itself (at least as it is commonly understood) is flawed. The question presumes that black and white patients frequent the same health-care services, carry the same insurance coverage, and have identical health conditions—yet the data reveal that often they do not.

The most obvious and influential causes of these disparities reside in the differing health resources available to blacks and whites, including the quality of the physicians who treat them. These features place the emphasis on aspects of the health-care system in generating race-related differentials in treatment and far less so on clinically unjustifiable differences in treatment of white and minority patients by a given physician.

Meanwhile, true physician "bias" is very difficult to measure and define (since rational inferences are not the same as genuine prejudice). The Institute of Medicine panel might well have come to that conclusion itself had Congress directed it to evaluate the relative contributions of geographic, demographic, social, and economic factors in explaining discrepancies in care and outcomes. With that charge, the panel might well have come to a similar conclusion about the contribution of bias and the dubious value of emphasizing its role in maintaining the care gap and trying to combat it.

But if physicians cannot fairly be accused of bias, does this just shift the charge of bias to the health-care system? In other words, do black patients receive poorer care because they are black or because they have disproportionately lower incomes and social capital (for example, less capacity for negotiating complex systems) than whites—and are thus disproportionately mired in systems that are underfinanced?

The most recent report from the Agency for Healthcare Research and Quality suggests this is so. It examines, separately, quality by race and quality by income.[1] It says that "remote rural populations" receive poor care, and "many racial and ethnic minorities and persons of lower socioeconomic positions" receive suboptimal care.[2] But a better test of the class-trumps-race hypothesis would be to compare the quality of care received by poor whites clustered in a particular geographic area, for example, Appalachian populations, to that received by poor blacks who are clustered, for example, in southeast Washington, D.C. If, after accounting for regional differences in practice or in health-care financing, comparable (and suboptimal) care were demonstrated, this would provide powerful support for the idea that systems serving poor people, irrespective of race, provide lower-quality care. Until such data are published—surprisingly we could find no reports on care of low-income whites versus low-income minorities—the allegation of racial bias in the system is unsupported.[3]

Fortunately, policymakers are attuned to the quality problem and are grappling with it on several fronts, including the promotion and spread of information technology, performance enhancement of medical systems, outcome-based reimbursement to providers, and provider incentives (including malpractice reform, tax breaks, and assertion of market mechanisms that, among other things, reward physicians for the time they spend with patients).[4] They also recognize that low-income patients benefit from a strong safety net provided by the federally funded community health-care system (guaranteeing a usual source of care); grassroots outreach through black churches, social clubs, and worksites; patient "navigators" to help negotiate the system; language services; and efforts to get more good doctors into distressed neighborhoods.[5] Seemingly simple innovations, such as clinic night hours, could be a great boon to patients with hourly-wage employment who risk a loss of income, or even their jobs, by taking time off from work for doctors' appointments.

Much has been made of the need for greater sensitivity in the doctor-patient relationship.[6] Common sense dictates that patients benefit when they trust their physicians and interact with them productively. But the remedies for unsatisfactory doctor-patient relationships do not reside in racial sensitivity training for health-care professionals, or the specter of Title VI litigation.

Rather, the true remedies to these problems would be fostered by the opportunity for the patient to see the same physician on each visit with ample time to discuss problems, and to be seen by a physician who, as Betancourt put it, engages in "exploration, empathy, and responsiveness to patients' needs, values, and preferences."

Ultimately, improvement in the quality of care and self-care would elevate the status of minority health appreciably. But the greater public-health good would be served by applying these goals to all underserved people, rather than focusing on minorities. By focusing on those with the worst health, as Stephen Isaacs and Steven Schroeder have pointed out, the targets of intervention will still turn out to be poor minority groups, but they will include lower-class whites as well.[7] For example, establishing screening (for cancer, diabetes, or hypertension) or wellness-education programs in benighted areas such as southeast Washington, D.C., or the Watts neighborhood of Los Angeles would benefit all residents and would shrink overall racial differentials in health outcome because they would disproportionately target minorities.

Targeting the underserved also changes the metric by which success is measured. That is, instead of trying to equalize the use of procedures and treatments in minorities versus whites, the goal should be high-quality care for everyone. As Baicker and Chandra point out, this makes sense for interventions that are considered effective preventive care, such as mammograms for women over fifty and eye exams for diabetics.[8] Indeed, this is exactly what Trivedi's study showed. His data, collected before deliberate efforts to reduce gaps in preventive care had begun, showed that quality improvement in general helped black patients disproportionately.[9] In contrast, for costly procedures whose administration depends partly on patient preference and whose "correct" rate of use is unknown, the goal should be for each patient in need to be well-informed and have choices of high-quality treatment.

Perhaps one of the most important factors in health disparities—self-care—does not depend much on health systems, except, perhaps, as vehicles for education. As Isaacs and Schroeder point out, medical-care failures have been estimated to account for only about 10–15 percent of premature deaths.[10] It is behaviors such as smoking, excessive alcohol use, unhealthy dietary patterns, and lack of exercise that figure so prominently in the development and course of chronic disease. In this arena, too, the influence of class outstrips race. Along these lines, Avis Thomas of the University of Minnesota and colleagues have found that after adjustment for income and risk factors such as blood pressure, cholesterol, and smoking, the rate of coronary heart disease in blacks and whites becomes equal.[11]

Words such as "prejudice," "bias," and "discrimination" are charged and divisive. Civil rights advocates talk about the lingering shadow cast by troubled race relations on the health-care system. Yet, paradoxically, health campaigns that seek to educate about alleged bias of physicians will only inflame the mistrust that some minority patients already harbor. Concentrating on improving the health of all underserved Americans is the most fair and efficient public health agenda.

# Notes

## Introduction

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# *MULTICULTURAL MEDICINE AND HEALTH DISPARITIES*

**DAVID SATCHER, MD, PhD**
Director
National Center for Primary Care
Morehouse School of Medicine
Atlanta, Georgia

**RUBENS J. PAMIES, MD, FACP**
Vice Chancellor for Academic Affairs
Dean for Graduate Studies
Professor of Internal Medicine
University of Nebraska Medical Center
Omaha, Nebraska

**CONTRIBUTING EDITOR**
**NANCY N. WOELFL, PhD**
Professor and Director
McGoogan Library of Medicine
University of Nebraska Medical Center
Omaha, Nebraska

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# CHAPTER 1

# *Health Disparities in the United States: A Continuing Challenge*

HANI K. ATRASH, MD, MPH
MELISSA D. HUNTER, MPH

## ▶ INTRODUCTION

The 20th century brought significant improvements in the health and longevity of the American public. However, some segments of the American public have not benefited fully from this progress. The disproportionate burden of poor health status and premature mortality in the United States, often referred to as health disparity, has been well documented for over two centuries. Health disparity was defined by the National Institutes of Health as "the differences in the incidence, prevalence, mortality, and burden of disease and other adverse health conditions that exist among specific population groups in the United States."[1] Many studies have documented widespread racial and ethnic disparities in health status and the many factors that contribute to these disparities: inequalities in income and education, environmental and economic conditions, specific health behaviors and life style patterns, access to care, and even quality of services. Health disparities have also been observed in other segments of the population characterized by geographic location, age, gender, disability status, and sexual orientation. For example, Casey et al reported that people living in rural areas are less likely to use preventive services such as mammograms, Pap smears, proctosigmoidoscopy, and influenza and pneumococcal vaccinations.[2]

Health disparities are evident in almost all measures of well-being in the United States. For example, the average American life expectancy at birth in 2001 was 77.2 years; for blacks or African Americans, life expectancy was 72.2 years, whereas for whites, it was 77.7 years.[3] Furthermore, in 1990, blacks or African Americans experienced 56 years of healthy life compared with 64.7 years of healthy life for Hispanics and 65 years of healthy life for white Americans.[4] The mortality rate due to heart disease among blacks or African Americans in 2000 was 324.8 deaths per 100,000 population compared with 255.5 deaths per 100,000 population among non-Hispanic whites.[5] In 2000, the death rate due to cancer was 200.6 per 100,000 among non-Hispanic whites compared with 248.5 per 100,000 among blacks or African Americans.[5] The incidence of serious morbidity is also higher among minority populations; for example, in 2001 the incidence of human immunodeficiency virus (HIV) infection or acquired immunodeficiency syndrome (AIDS) was 60.45 per 100,000 among blacks or African Americans compared with 6.67 among whites.[6] Disparities also exist in access to services and quality of health care; for example, in 1999, a much higher proportion of blacks or African Americans (56%) and Hispanics (44%) who needed HIV combination drug therapy were unable to receive it compared with whites (32%).[7]

## ▶ CHALLENGES TO UNDERSTANDING HEALTH DISPARITIES

Several issues face program managers and policy makers who seek to understand health disparities and develop and implement effective strategies to reduce or eliminate disparities. These issues start with a limited ability to accurately assess the magnitude and types of problems, because of issues related to the reliability of data and information, and are further complicated by the increasing diversity of the American public in both racial and ethnic composition. There is also wide diversity within each racial and ethnic group by health status and the various factors that contribute to good or poor health status, such as socioeconomic, environmental, educational, cultural, and other factors.

Although many of the observed differences are large, average differences between racial and ethnic groups may mask important differences within the society. For example, there is evidence that blacks or African Americans who live in very poor urban areas suffer extreme health disadvantages relative not only to non-Hispanic whites but also to blacks or African Americans who live in poor rural areas or middle-class urban neighborhoods.[8] In addition, health differences by national origin, socioeconomic status, and age, particularly within the Hispanic and Asian populations, are not apparent when statistics are reported at this level of aggregation. There is evidence, for example, that the health status of younger cohorts of Hispanics may be declining; and, among Asian and Pacific Islanders, those with low incomes and those with origins in South and Southeast Asia are disadvantaged relative to other Asian groups and non-Hispanic whites.[9,10] Hispanics from Cuba have much better health indicators than Hispanics from Central and South American countries, whereas Hispanics from Mexico tend to have the worst indicators.[5] In 2001, for example, 91.8% of Cuban American mothers had early prenatal care compared with 79.1% of Puerto Ricans, 74.6% of Mexican Americans, and 77.4% of other Hispanics.[5] The infant mortality rate was 4.3 per 1000 live births among Cuban Americans compared with 8.1 among Puerto Ricans, 5.5 among Mexican Americans, and 4.9 among other Hispanics.[5] Finally, in 2001, 19.2% of Cuban Americans younger than 65 years of age had no health insurance coverage compared with 16.0% of Puerto Ricans, 39% of Mexican Americans, and 33.1% of other Hispanics.[5]

### Increasing Diversity of the American Public

During the past 20 years, the diversity of the US population has increased. The proportion of white Americans decreased from 83.2% in 1970 to 69.1% in 2000; the proportion of blacks or African Americans increased from 11.1% in 1970 to 12.1% in 2000; and the proportion of Hispanics living in the United States increased from 4.7% in 1970 to 12.5% in 2000[11,12] (see Appendix A, Fig. A–1).* The Census Bureau further projects that by 2050, nearly one in every two Americans will be a member of a racial or ethnic minority[13] (see Fig. A–2). Concurrent with this increased population diversity, there has been an increase in the numbers of interracial marriages, resulting in an increase in the number of children of mixed race or ethnicity. For example, in the 1970 census, there were about 321,000 interracial unions. By 1980, the number had increased to about 1 million; and by 1990 there were about 1.5 million interracial couples.

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* Figures illustrating statistical information presented in this chapter are included in Appendix A at the end of the book.

Census data indicate that the number of children in interracial families grew from less than 500,000 in 1970 to about 2 million in 1990.[14,15]

Minority populations are also unevenly distributed around the country. In 2000, blacks or African Americans constituted 0.5% of the population of Montana compared with 61.3% of the population of the District of Columbia and 32.9% of the population of Louisiana,[16] Hispanics constituted 32.4% of the population of California compared with 0.7% of the population of West Virginia, and American Indians lived mostly in western and northeastern states.[17] With the steady increase in the minority population, the persistent barriers to care, and continuing inequity in the quality of health care, the issue of health disparity will only become more challenging.

## Data Collection

The collection of information about race and ethnicity is essential for the development and implementation of targeted strategies for the elimination of racial and ethnic health disparities. Currently, information on race and ethnicity to calculate health status indicators and health-care utilization measures is obtained from numerous sources collected by multiple agencies at the local, state, and federal levels. Categories and types of information collected include natality, mortality, morbidity, health behavior and attitude, health service utilization, health-care financing, population size and migration, and socioeconomic data.[18,19] Although data are collected by different agencies and from different sources, these data often need to be combined to estimate health-related indicators, such as using vital statistics and census data to estimate birth and death rates. Because these sources use different methods to determine the race and ethnicity of individuals, substantial inconsistencies may result in the categorization of race and ethnicity in data collecting and reporting. For example, information regarding race and ethnicity in the census depends on self-identification, which may differ from race and ethnic categorizations assigned by an interviewer or reported by a health-care provider.

Collection of vital statistics data in the United States dates to 1632, when the Grand Assembly of Virginia passed a law requiring a minister or warden from every parish to appear annually at court on the first of June to present a register of christenings, marriages, and burials for the year.[20] Since then, various colonies and states have initiated and implemented their own requirements for vital registration and data compilation and reporting.[20] In 1842, Massachusetts adopted the first State Registration Law in America, which required central state filing; provided for standard forms, fees, and penalties; specified types of information, including causes of death; and lodged responsibility for each kind of record in designated officials. The Seventh Federal Census of 1850 was the first attempt in 150 years of census data collection to collect information on births, deaths, and marriages.[20]

Census enumeration of vital events continued to serve as the source of national vital statistics data, while encouraging states to intensify their efforts to register vital events, and included mortality information from these registration systems in the census data for areas having records in satisfactory detail. This approach was not entirely abandoned until the census of 1910, when the developing vital registration area was large enough to provide national statistics. In 1900, the census office recommended a death certificate and requested each area to adopt it by January 1, 1900. In 1902, the census office, which had previously been disbanded between censuses, was made a permanent, full-time agency of the federal government and was given its present name, the Bureau of the Census.

For more than 30 years, the fundamental task of the Bureau of the Census in the field of vital statistics was to extend the registration area for births and deaths. This primary responsibility was accomplished with the admission of Texas into the birth and death registration areas in 1933. Alaska was added in 1950, Hawaii in

1917, Puerto Rico in 1932, and the Virgin Islands in 1924. By the early 1930s, responsibility for vital records had been largely transferred from civil offices to health departments. In 1946, the National Office of Vital Statistics was established in the Public Health Service. Before 1900, mortality rates by race were reported based on data obtained through the census. Starting in 1900, mortality was reported annually by race through the Annual Mortality Statistics Reports.[20–22]

## Race and Ethnicity Classification

The terminology used to classify the US public by race and ethnicity has changed over the years to be more consistent with current language and as a result of emerging changes in the composition of the population. The first census of the United States in 1790 enumerated three racial groups: "Whites," "Blacks," and "Civilized Indians" (ie, those who paid taxes).[23] During the 1800 and early 1900s, census and vital statistics reports classified the US public as "White," "Black," and "Other Colored" (which included Indians, with a few Chinese and Japanese).[21–28] New racial categories were added in the late 19th century and beyond (Chinese in 1870, Japanese in 1890) as the need arose to track new immigrant groups.[23] Starting in 1930, a new category, "Other," was added to the "Colored" group. The new category was added to include Mexicans, who were given a separate classification in the population census of 1930, "as the number of Mexicans in the population had increased very rapidly."[29] From 1930 through the 1970s, categorization by race always included a "White" category, the rest of the population was categorized as "Other," "All Other," "Non-White," and occasionally broken down further into "Black" and "Other."[21–28] The growth of the Hispanic population in the United States starting in the early 1970s stimulated interest in obtaining vital statistics information pertaining to that group. However, the ability to obtain reliable and accurate health-indicator rates for racial and ethnic groups in the United States has been seriously limited by the lack of clear guidance for classification and categorization and by the use of different systems by the various agencies collecting data.

In June 1976, a joint resolution of Congress (Public Law 94-311) required federal agencies to begin collecting and publishing data on Americans of Spanish origin or descent. During the 1980s, the number of states including a Hispanic identifier on their birth and death certificates steadily increased. In 1978, the Office of Management and Budget issued Directive 15, titled "Race and Ethnic Standards for Federal Statistics and Administrative Reporting."[14] The standards provided a minimum set of categories for data on race and ethnicity and called for four categories on race ("American Indian or Alaska Native," "Asian or Pacific Islander," "Black," and "White") and two categories for data on ethnicity ("Hispanic Origin," and "Not Of Hispanic Origin"). The directive further stated that "Self identification is the preferred means of obtaining information about individual's race and ethnicity, except in instances where observer identification is more practical (eg, completing a death certificate)." The directive was to apply immediately to all new and revised record-keeping systems; all existing record-keeping or reporting requirements were required to comply with the new directive at the time of extension or no later than January 1, 1980.[14]

In 1993, because of continuing concerns related to the accuracy and reliability of race- and ethnicity-specific information, the Office of Management and Budget (OMB) undertook a 4-year comprehensive review of the race and ethnicity categories under Directive 15 in collaboration with representatives from more than 30 agencies representing diverse federal needs for data on race and ethnicity. In October 1997, OMB issued its decision to introduce two modifications to Directive 15, as follows: (1) the Asian or Pacific Islander category will be separated into two categories—"Asian" and "Native Hawaiian or Other Pacific Islander," and (2) the term "Hispanic" will be changed to "Hispanic

or Latino."[15] The revised standards will have five minimum categories for data on race: "American Indian or Alaska Native," "Asian," "Black or African American," "Native Hawaiian or Other Pacific Islander," and "White." There will be two categories for data on ethnicity: "Hispanic or Latino" and "Not Hispanic or Latino." OMB provided definitions to each of these categories as follows:

- **American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- **Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- **Black or African American.** A person having origins in any of the black racial groups of Africa. Terms such as "Haitian" or "Negro" can be used in addition to "Black or African American."
- **Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. The term, "Spanish Origin," can be used in addition to "Hispanic or Latino."
- **Native Hawaiian or Other Pacific Islander.** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

The revised directive also requires that respondents be offered the option of selecting one or more racial designations. OMB further recommended that two formats be used for data on race and ethnicity. Self-reporting or self-identification using two separate questions is the preferred method for collecting data on race and ethnicity. In situations where self-reporting is not practicable or feasible, the combined format may be used. OMB directed that the new standards be used by the Bureau of the Census in the 2000 decennial census. Other federal programs were to adopt the standards as soon as possible, but not later than January 1, 2003, for use in household surveys, administrative forms and records, and other data collections.[15]

## Data Accuracy and Reliability

Studies have repeatedly demonstrated that a nontrivial proportion of non–black or African American minorities are misclassified as white on the death certificate. This numerator problem leads to an underestimate of the death rates for American Indians, Asian and Pacific Islanders, and Hispanics.[30–32] Additional bias in the reliability of health indicators for minority populations is related to the considerable heterogeneity within each of the major racial and ethnic populations with significant variation in health status within each group. Moreover, a relatively high proportion of Hispanics and other minorities, especially Asian Americans, is foreign-born, and their health profile reflects in part the impact of immigration. Immigrants tend to enjoy better health status than the native-born population, even when those immigrants are lower in socioeconomic status.[30,33] However, with increasing length of stay in the United States and adaptation to mainstream behavior, the health status of immigrants deteriorates.

## Misclassification

The current methods used for assigning race and ethnicity to population, deaths, and births are not consistent and therefore may cause a bias in estimating the race- and ethnicity-specific birth and death rates.

### *Births*

Racial classification of births is based on information provided by the family or based on observation. By law, the registration of births is the direct responsibility of the professional attendant at birth, generally a physician or midwife. In their absence, the parents of the child are responsible for the report. Each birth must be reported promptly; the reporting requirements vary from state to state, ranging from 24 hours after the birth to as much as 10 days. Certificates must be filed with the local registrar of the district in which the birth occurs.

The birth certificate does not provide for reporting of race of the newborn. Prior to 1989, for statistical purposes, classification of the child's race or national origin was based on the race or national origin of the parents. When both parents were not of the same race or national origin, rules had been established for coding various combinations. If only one parent was white, the child was assigned the race of the other parent. If neither parent was white, the child was assigned the race of the father, with one exception: if either parent was Hawaiian or part Hawaiian, the child race was assigned to Hawaiian. Beginning with the 1989 data, natality tabulations were modified to show race of the mother rather than race of the child.[20]

### *Deaths*

Race classification for deaths is recorded by the funeral director based on information provided by an informant or based on observation. The registration of deaths is the direct responsibility of the funeral director, or person acting as such. The funeral director obtains the data required other than the cause of death. The person who supplies the information to the funeral director is usually required to sign the certificate as informant to attest to the truth of the facts entered. The physician in attendance at the death is required to indicate the cause of death. If no physician was in attendance, the coroner, or person acting as such, is required to enter the cause of death. Where death is from other than natural causes, the coroner may be required to examine the body and report the cause of death, even though a physician was in attendance.[20]

### *Population*

Information on population in the census by race or ethnicity is based on information reported through self-reports of people who respond for themselves or others in their household.[18]

## Potential Bias

The multiple sources of data, together with the multiple means for classifying persons by race and ethnicity, have resulted in biases when data sources are combined to estimate health indicators for the various racial and ethnic groups. In general, studies have demonstrated good agreement between race reported on death certificates and other sources for white and black or African American decedents, but poorer consistency between the two sources for other racial groups.[18] An early study by Hambright compared race reported on death certificates with race reported for the same individuals on the 1960 census.[34] The study showed greater than 98% agreement between the two sources for white and black or African American decedents but poorer agreement for other groups (American Indians, 79.2%; Japanese, 97%; Chinese, 90.3%; and Filipino, 72.6%). Rosenberg et al compared race reported on death certificates for 1979 to 1989 with response to race questions on the Current Population Survey, a monthly survey comprising about 60,000 US households. The survey, which is carried out by the Census Bureau, asks questions about labor force participation and is the source of national unemployment figures. During certain months of the year, the survey asks supplemental questions on various social, demographic, and economic topics. Again, as in the earlier study, the level of agreement for the two major race groups was greater than 98%. In contrast, for American Indians, the level of agreement was 57%; for Asian or Pacific Islanders, 82.5%; for

Hispanics, 89.7% (Mexican, 84.9%; Puerto Rican, 85.9%; Cuban, 80%; other Hispanic, 47.6%); and for non-Hispanic, 99.8%.[18]

Thus, the quality, reliability, and accuracy of death rates by race and Hispanic origin vary among population groups. Generally, death rates are reliable for the white and black or African American populations, and the overall effect of black or African American and white undercounts does not seriously distort analysis or interpretation of the resulting mortality data.[35] However, for the other minority population groups, levels of mortality are seriously biased from misreporting in the numerator and undercoverage in the denominator of the death rates.

## ▶ DATA AND STATISTICS

### Health Monitoring

The number of measures of health status, health outcomes, behaviors, access, and quality of care is potentially unlimited. A simple way to obtain a general understanding of racial and ethnic disparities in health is to examine health indicators developed by the US Department of Health and Human Services (DHHS) to monitor the health of the nation: the Healthy People 2000 Health Status Indicators and the Healthy People 2010 Leading Health Indicators.

Starting in the late 1970s, the DHHS initiated a process for developing and setting national health targets based on scientific knowledge and for use in decision making and action. This process is used to identify the most significant preventable threats to health and to focus public and private sector efforts to address them. The first set of national health targets, the 1990 Health Objectives, was published in 1979 as part of "Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention."[36] The second set of targets, "Healthy People 2000: National Health Promotion and Disease Prevention Objectives," was released in 1990, and is a comprehensive agenda organized into 22 priority areas with 319 supporting objectives and three overarching goals: increase years of healthy life, reduce disparities in health among different population groups, and achieve access to preventive health services.[37] *Healthy People 2010* builds on both the 1979 Surgeon General's Report and Healthy People 2000 to set national objectives for 2010.[38] *Healthy People 2010* was designed to achieve two overarching goals: increase quality and years of healthy life, and eliminate health disparities.

Healthy People 2000 Objective 22.1 called for the development of a set of Health Status Indicators (HSIs) to facilitate the comparison of health status measures at the national, state, and local levels.[39,40] A group of public health professionals, known as Committee 22.1, developed and published a list of 18 HSIs in 1991[40,41] (Table 1–1). The process involved intensive consultation and review with over 200 public health professionals representing state and local health departments, professional organizations, and the academic community.[40]

The Leading Health Indicators were developed in conjunction with *Healthy People 2010,* with 10 areas of emphasis: physical activity, overweight and obesity, tobacco use, substance abuse, responsible sexual behavior, mental health, injury and violence, environmental quality, immunization, and access to health care.[38,42] The Leading Health Indicators serve as a link to the 467 objectives in *Healthy People 2010* and as the basic building blocks for community health initiatives. For each of the Leading Health Indicators, specific objectives derived from *Healthy People 2010* will be used to track progress[42] (Table 1–2). Like its predecessors, *Healthy People 2010* was developed through a broad consultation process, built on the best scientific knowledge and designed to measure progress over time. Healthy People 2000 Health Status Indicators measure health status outcomes and factors that put individuals at increased risk of disease or premature

**▶ TABLE 1-1.** Healthy People 2000 Health Status Indicators

1. Race- and ethnicity-specific infant mortality per 1000 live births
2. Total deaths per 100,000 population
3. Motor vehicle crash deaths per 100,000 population
4. Work-related injury deaths per 100,000 population
5. Suicides per 100,000 population
6. Homicides per 100,000 population
7. Lung cancer deaths per 100,000 population
8. Female breast cancer deaths per 100,000 population
9. Cardiovascular disease deaths per 100,000 population
10. Reported incidence of acquired immunodeficiency syndrome per 100,000 population
11. Reported incidence of measles per 100,000 population
12. Reported incidence of tuberculosis per 100,000 population
13. Reported incidence of primary and secondary syphilis per 100,000 population
14. Percent of low birth weight as measured by the percentage of live-born infants weighing less than 2500 g at birth
15. Births to adolescents (aged 10–17 years) as a percentage of total live births
16. Prenatal care as measured by the percentage of mothers delivering live infants who did not receive care during the first trimester of pregnancy
17. Childhood poverty as measured by the proportion of children younger than 15 years of age living in families at or below the poverty level
18. Proportion of people living in counties exceeding US Environmental Protection Agency standards for air quality during the previous year

*Source: Klein RJ, Hawk SA. Health status indicators: Definitions and national data.* Healthy People Statistical Notes, *vol 1, No 3. Hyattsville, Md: National Center for Health Statistics; 1992.*

mortality, whereas the 2010 Leading Health Indicators were selected to reflect individual behaviors, physical and social environmental factors, and important health system issues that greatly affect the health of individuals and communities.[41,42]

## Health Disparities

Racial and ethnic disparities in mortality, disability, and morbidity have existed for many years, and racial and ethnic minorities, with few exceptions, continue to experience higher rates of mortality, disability, and morbidity than nonminorities. In general, blacks or African Americans have worse health outcomes than any other race or ethnic group in the United States; American Indians or Alaska Natives and Hispanics often have worse health outcomes than whites; and Asians fare as well as, and sometimes better than, non-Hispanic whites. These racial disparities have been documented for decades and some have widened in recent years.

### *Mortality*

Since the beginning of the 20th century, blacks or African Americans and other minorities have had a higher maternal mortality rate than whites (see Fig. A–3). In 2001, black or African American women who became pregnant had more than three times the risk of dying of pregnancy-related causes than white women. The maternal mortality rate was 6.5 per 100,000 live births for non-Hispanic whites, 24.7 per 100,000 live births for blacks or African Americans, and 9.5 for Hispanics.[3] Blacks or African Americans and other minorities have also always had a higher infant mortality rate than whites. In 2001, the infant mortality rate among blacks or African Americans was 14.0 infant deaths per 1000 live births compared with 5.7 among whites—2.5 times higher[3] (see Fig. A–4).

**TABLE 1-2** Healthy People 2010 Leading Health Indicators and Specific Objectives to Track Them

1. Physical Activity:
   - Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion
   - Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day
2. Overweight and Obesity:
   - Reduce the proportion of children and adolescents who are overweight or obese
   - Reduce the proportion of adults who are obese
3. Tobacco Use:
   - Reduce cigarette smoking by adolescents
   - Reduce cigarette smoking by adults
4. Substance Abuse:
   - Increase the proportion of adolescents not using alcohol or any illicit drugs during the past 30 days
   - Reduce the proportion of adults using any illicit drug during the past 30 days
   - Reduce the proportion of adults engaging in binge drinking of alcoholic beverages during the past month
5. Responsible Sexual Behavior:
   - Increase the proportion of adolescents who abstain from sexual intercourse or use condoms if currently sexually active
   - Increase the proportion of sexually active persons who use condoms
6. Mental Health:
   - Increase the proportion of adults with recognized depression who receive treatment
7. Injury and Violence:
   - Reduce deaths caused by motor vehicle crashes
   - Reduce homicides
8. Environmental Quality:
   - Reduce the proportion of people exposed to air that does not meet the US Environmental Protection Agency's health-based standards for ozone
   - Reduce the proportion of nonsmokers exposed to environmental tobacco smoke
9. Immunization:
   - Increase the proportion of young children who receive all vaccines recommended for universal administration for at least 5 years
   - Increase the proportion of noninstitutionalized adults who are vaccinated annually against influenza and ever vaccinated against pneumococcal disease
10. Access To Health Care:
    - Increase the proportion of people with health insurance
    - Increase the proportion of people who have a specific source of ongoing care
    - Increase the proportion of pregnant women who begin prenatal care in the first trimester of pregnancy

*Source*: Healthy People 2010: Leading Health Indicators. *Available at: http://www.healthypeople.gov/document/html/uih/uih_4.htm.*

The gaps in maternal and infant mortality between blacks or African Americans and whites have widened over time. Neonatal and postneonatal mortality rates were also higher among blacks or African Americans than among whites. Underlying the continuing higher infant mortality rate among blacks or African Americans are higher rates of low birth weight and preterm delivery: in 2002, the incidence of low birth weight among non-Hispanic whites was 5.02% of births compared with 11.44% among blacks or African Americans and 5.44% among Hispanics; the incidence of preterm delivery among blacks or African Americans was 15.98% compared with 9.07% for non-Hispanic whites and 10.63% among Hispanics.[43]

Since 1900, general and age-adjusted mortality rates have continued to be higher for blacks or African Americans than for whites.[3] Also since 1900, life expectancy at birth has continued to be better for whites than for blacks or African Americans.[3] In 2001, blacks or African Americans had an overall age-adjusted death rate that was 1.3 times higher than that of the white population. The overall death rates for all other minority populations were lower than that for whites (see Figs. A–5 through A–7).

In 2000, elevated mortality rates for blacks or African Americans compared with whites existed for eight of the leading causes of death.[5] Blacks or African Americans experienced the highest rates of mortality from heart disease, cancers (including breast and lung cancer), influenza and pneumonia, cerebrovascular disease (including stroke), HIV and AIDS, diabetes, and homicide of any racial or ethnic group.[5,44] Compared with whites, American Indians had lower death rates for cerebrovascular disease (including stroke), heart disease, and cancer (including breast and lung caner), but higher rates of death from motor vehicle crashes, diabetes, and cirrhosis of the liver. Hispanics had higher death rates than whites for diabetes, HIV and AIDS, and cirrhosis of the liver.[5,44] For all of the leading causes of death in the United States except for homicide, the Asian or Pacific Islander population had mortality rates considerably lower than those of whites[5,44] (Table 1–3).

### *Disability*

The US Census Bureau reported that there were 49.7 million people with some type of long-lasting condition or disability in the United States in 2000, representing 19.3% of the population 5 years of age and older.[45] The incidence varied among the various racial and ethnic groups, ranging from 16.6% among Asians to 18.3% among whites, and 24.3% among blacks or African Americans and American Indians or Alaska Natives (see Fig. A–8). The incidence increased with age, but the differences held true for all age groups.[45] The incidence was much higher for adults aged 65 years and older but continued to be highest among the American Indian or Alaska Native population[45] (Table 1–4).

### *Morbidity and Health Status*

When asked to assess their own health and the health of family members living in the same household, a much higher proportion of whites than blacks or African Americans or Hispanics assessed their health as excellent or very good[46] (Table 1–5). For selected morbidity measures, blacks or African Americans had higher reported incidence rates than whites for HIV and AIDS, tuberculosis, syphilis, diabetes, and childhood asthma[6,46] (see Table 1–5). High rates of tuberculosis were also reported among the other minority groups, with the highest rate of tuberculosis among the Asian or Pacific Islander population[6] (see Table 1–5). In 1998, it was estimated that the highest proportion of people living in counties with poor air quality was Hispanic and Asian or Pacific Islander (60%); obesity was most common among adolescent and adult male and female blacks or African Americans as well as among adolescent Hispanics[46,47] (see Table 1–5). Blacks or African Americans, Hispanics, and American Indians or Alaska Natives had higher rates of births among mothers aged 10 to 17 years than whites and Asians or Pacific Islanders[5] (see Table 1–5).

▶ **TABLE 1-3.** Mortality Rates by Leading Cause, Year, and Race or Ethnicity, United States

| **Indicator and Year[a] (Reference)** | **Race or Ethnicity**<br>White | <br>B/AA | <br>H/L | <br>AI/AN | <br>A/PI |
|---|---|---|---|---|---|
| Age-adjusted mortality rate, 2001 (3) | 836.5 | 1101.2 | 306.8 | 686.7 | 492.1 |
| Diseases of the heart death rate, 2000 (5) | 255.5 | 324.8 | 196.0 | 178.2 | 146.0 |
| Malignant neoplasm death rate, 2000 (5) | 200.6 | 248.5 | 134.9 | 127.8 | 121.9 |
| Cerebrovascular disease death rate, 2000 (5) | 59.0 | 81.9 | 46.4 | 45.0 | 52.9 |
| Lung cancer death rate, 1998 (44) | 38.3 | 46.0 | 13.6 | 25.1 | 17.2 |
| Female breast cancer death rate, 2000 (5) | 26.8 | 34.5 | 16.9 | 13.6 | 12.3 |
| Influenza and pneumonia death rate, 2000 (5) | 23.5 | 25.6 | 20.6 | 22.3 | 19.7 |
| Stroke death rate, 1998 (44) | 23.3 | 42.5 | 19.0 | 19.6 | 22.7 |
| Diabetes mellitus death rate, 2000 (5) | 21.8 | 49.5 | 36.9 | 41.5 | 16.4 |
| Motor vehicle crash death rate, 2000 (5) | 15.6 | 15.7 | 14.7 | 27.3 | 8.6 |
| Suicide rate, 2000 (5) | 12.0 | 5.5 | 5.9 | 9.8 | 5.5 |
| Chronic liver disease and cirrhosis death rate, 2000 (5) | 9.0 | 9.4 | 16.5 | 24.3 | 3.5 |
| Work-related injury death rate, 2001 (5) | 4.2 | 3.8 | 6.0 | — | — |
| Homicide rate, 2000 (5) | 2.8 | 20.5 | 7.5 | 6.8 | 3.0 |
| HIV/AIDS death rate, 2000 (5) | 2.2 | 23.3 | 6.7 | 2.2 | 0.6 |

B/AA, black or African American; H/L, Hispanic or Latino; AI/AN, American Indian or Alaska Native; A/PI, Asian or Pacific Islander; —, not available.

[a] Rates are per 100,000 people.

*Source: Compiled from data in references 3, 5, and 44, as specified.*

Other health status indicators were reported through the Behavioral Risk Factor Surveillance System (BRFSS).[48] The 1997 BRFSS reported that blacks or African Americans were most likely of all racial or ethnic groups to report that they were in fair or poor health and most likely to have been told by a health-care professional that their blood pressure was high.[48] American Indians or Alaska Natives were most likely to be obese; whites were most likely to have been told by a health-care professional that their blood cholesterol level was high; and blacks or African Americans and American Indians or Alaska Natives were most likely to have been told by a health-care professional that they had diabetes[48] (see Table 1–5).

▶ **TABLE 1-4.** Percent of Noninstitutionalized Population With Any Disability by Age and Race or Ethnicity, United States, 2000

| **Age** | **Race or Ethnicity**<br>White | <br>B/AA | <br>H/L | <br>AI/AN | <br>Asian | <br>NH/PI |
|---|---|---|---|---|---|---|
| ≥ 5 years | 18.3 | 24.3 | 20.9 | 24.3 | 16.6 | 19.0 |
| 5–15 years | 5.7 | 7.0 | 5.4 | 7.7 | 2.9 | 5.1 |
| 16–64 years | 16.2 | 26.4 | 24.0 | 27.0 | 16.9 | 21.0 |
| ≥ 65 years | 40.4 | 52.5 | 48.5 | 57.6 | 40.8 | 48.5 |

B/AA, black or African American; H/L, Hispanic or Latino; AI/AN, American Indian or Alaska Native; NH/PI, Native Hawaiian or Other Pacific Islander.

Source: Disability Status: 2000. Census 2000 Brief. *Washington, DC: US Dept of Commerce, Economics and Statistics Administration, US Census Bureau; March 2003. Available at: http://www.census.gov/hhes/www/disability.html.*

▶ **TABLE 1-5.** Health Status and Morbidity Rates by Race and Ethnicity, United States

| | Race or Ethnicity | | | | |
|---|---|---|---|---|---|
| **Indicator and Year (Reference)** | White | B/AA | H/L | AI/AN | A/PI |
| % of persons of all ages whose health status was assessed as excellent or very good, 2003 (46) | 71.0 | 57.2 | 58.2 | — | — |
| % of children 0–14 years with at least one episode of asthma during the past 12 months, 2003 (46) | 4.5 | 8.8 | 4.3 | — | — |
| % people in counties with poor air quality, 1998 (44) | 35.9 | 45.8 | 59.8 | 30.2 | 60.9 |
| % of male adults obese, 2003 (46) | 22.6 | 28.7 | 23.1 | — | — |
| % of female adults obese, 2003 (46) | 21.1 | 38.3 | 27.5 | — | — |
| % <18 years living in poverty, 2001 (5) | 9.5 | 30.2 | 28 | — | 11.5 |
| % of children and adolescents overweight or obese, 2001 (47) | 8.8 | 16 | 15.1 | — | — |
| % of low birth weight, 2001 (5) | 6.76 | 12.95 | 6.47 | 7.33 | 7.51 |
| Incidence rate of AIDS, 2001 (6)[a] | 6.67 | 60.45 | 9.72 | 9.10 | 3.80 |
| % ≥18 years diagnosed with diabetes mellitus, 2003 (46) | 5.7 | 10.1 | 8.3 | — | — |
| Incidence rate of tuberculosis, 2001 (6)[a] | 3.64 | 14.07 | 11.33 | 11.58 | 32.65 |
| % of births to mothers 10–17 years, 2001 (5) | 2.3 | 7.3 | 5.8 | 6.8 | 1.3 |
| Incidence rate of syphilis, 2001 (6)[a] | 0.67 | 10.59 | 2.05 | 4.08 | 0.48 |
| Incidence rate of measles, 2001 (6)[a] | 0.02 | 0.01 | 0.04 | 0.05 | 0.42 |

B/AA, black or African American; H/L, Hispanic or Latino; AI/AN, American Indian or Alaska Native; A/PI, Asian or Pacific Islander; —, not available.

[a] Rates are per 100,000 people.

*Source: Compiled from data in references 5, 6, 44, 46, and 47.*

## Behavioral Risk Factors

Behavioral risk factor information is primarily derived from survey data and, in the absence of oversampling of small minority populations, no such information is available for several indicators for small minorities at the national level. Recent survey data indicate that white adolescents and adults were more likely to use tobacco products and consume alcohol than blacks or African Americans or Hispanics, but were more likely to engage in physical activity; Hispanic adolescents were least likely to abstain from sexual activity or use condoms.[5,46,47] Similar findings were reported through the BRFSS.[48] The 1997 BRFSS reported that black or African American adults were least likely to be involved in leisure-time physical activity, adult whites were most likely to consume alcohol (at least one drink during last month), and American Indians or Alaska Natives were most likely to engage in binge drinking (five or more drinks at least on one occasion in the past month) or not use seat belts[48] (Table 1–6).

## Health-Care Utilization and Access to Care

Rates of utilization of health care are different among the different minority populations. For example, in 2001, a higher proportion of white

▶ **TABLE 1–6.** Prevalence of Selected Behaviors by Race and Ethnicity, United States

| | Race or Ethnicity | | | | |
|---|---|---|---|---|---|
| **Indicator, Year (Reference)** | White | B/AA | H/L | AI/AN | A/PI |
| % of adolescents who abstain from sexual intercourse or use condoms, 2001 (47) | 86.6 | 85.2 | 83.6 | — | — |
| % of adolescents who engage in vigorous physical activity, 2001 (47) | 66.5 | 59.7 | 60.5 | — | — |
| % of adults (≥12 years) using alcohol (at least one drink in past 30 days), 2001 (5) | 52.7 | 35.1 | 39.5 | 35.0 | 31.9 (AO) |
| % of adolescents using alcohol (at least one drink in past 30 days), 2001 (47) | 50.4 | 32.7 | 49.2 | — | — |
| % of adolescents who used tobacco at least once in past 30 days, 2001 (5) | 37.7 | 19.4 | 29.4 | — | — |
| % of adults who engage in moderate physical activity, 2003 (46) | 36.2 | 26.1 | 25.2 | — | — |
| % of adults (≥12 years) who used tobacco at least once in past 30 days, 2003 (5) | 31.3 | 27.7 | 22.9 | 44.9 | 28.5 |
| % of adults (≥12 years) engaging in binge drinking (*5 drinks or more in 1 day at least once in past year*), 2001 (5) | 21.5 | 16.8 | 21.3 | 21.8 | 21.3 |
| % of adults (≥12 years) using any illicit drugs in past 30 days, 2001 (5) | 7.2 | 7.4 | 6.4 | 9.9 | 7.5 |

B/AA, black or African American; H/L, Hispanic or Latino; AI/AN, American Indian or Alaska Native; A/PI, Asian or Pacific Islander; AO, Asian Only; —, not available.

*Source: Compiled from data in references 5, 46, and 47.*

mothers received early prenatal care than mothers of other race or ethnicity; the lowest proportion of mothers receiving early prenatal care was among American Indians or Alaska Natives[5] (Table 1–7). Whites also had the highest proportion of children receiving all recommended vaccines, adults 65 years or older vaccinated against influenza, adults ever vaccinated against pneumococcal disease, persons having health insurance, and persons having a specific source of ongoing health care[5,46] (see Table 1–7). The 1997 BRFSS reported that Hispanics were least likely to seek preventive clinical services, including having had blood cholesterol checked within the past 5 years, having a Pap smear within the past 3 years, having a mammogram (for women older than 50) in the past 2 years, having a clinical breast exam (for women older than 50) in the past 2 years, having a home-kit fecal occult blood test (for people aged 50 or older), and having had a sigmoidoscopy (for people aged 50 or older).[48] In 1997, the highest prevalence of people with low educational attainment (less than high school education) was among the Hispanic population. Hispanics were also most likely to not have any health-care coverage, to not have a routine physical examination, and to report cost as a barrier to health care[48] (see Table 1–7).

## Health-Care Disparity

Concern has grown that even at equivalent levels of access to care, racial and ethnic minorities experience a lower quality of health services and are less likely to receive routine medical procedures than white Americans. For example,

▶ **TABLE 1-7.** Health-Care Utilization and Health-Care Coverage by Race and Ethnicity, United States

| | Race or Ethnicity | | | | |
|---|---|---|---|---|---|
| **Indicator, Year (Reference)** | **White** | **B/AA** | **H/L** | **AI/AN** | **A/PI** |
| % of persons who have a specific source of ongoing care, 2003 (46) | 90.4 | 86.4 | 78.1 | — | — |
| % of mothers with first-trimester prenatal care, 2001 (5) | 88.5 | 74.5 | 75.7 | 69.3 | 84.0 |
| % of young children who receive all recommended vaccines, 2001 (5) | 79 | 71 | 77 | 76 | 77 |
| % of adults ≥ 65 years who were vaccinated against influenza in past 12 months, 1999–2001 (5) | 66.7 | 48.8 | 54.8 | — | 62.6 (AO) |
| % of adults ≥ 65 ever vaccinated against pneumococcal disease, 1999–2001 (5) | 56.0 | 32.4 | 30.8 | — | 36.4 (AO) |
| % of persons without health insurance, 2001 (5) | 11.9 | 19.2 | 34.8 | 33.4 | 17.1 (AO) |

B/AA, black or African American; H/L, Hispanic or Latino; AI/AN, American Indian or Alaska Native; A/PI, Asian or Pacific Islander; AO, Asians Only; —, not available.

*Source: Compiled from data in references 5 and 46.*

blacks or African Americans with end-stage renal disease were less likely to receive peritoneal dialysis and kidney transplantation,[49,50] blacks or African Americans and Hispanic patients with bone fractures seen in hospital emergency departments were less likely than whites to receive analgesia, and black or African American Medicare patients with congestive heart failure or pneumonia received poorer quality care than whites.[51,52] Moreover, a growing number of studies have found racial differences in the receipt of major therapeutic procedures for a broad range of conditions even after adjusting for insurance status and severity of disease, including situations in which differences in economic status and insurance coverage are minimized through the Veterans Health Administration System and the Medicare program.[53–56]

In 1999, concerned over increasing reports of disparities in health care, Congress directed the Institute of Medicine (IOM) to assess disparities in the types and quality of health care received by US racial and ethnic minorities and nonminorities. The IOM's Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care defined health-care disparities as "racial and ethnic differences in the quality of health care that are not due to access-related factors of clinical needs, preferences, and appropriateness of intervention."[57] The committee examined many sources of data to assess the scope of disparities in health care, explore sources of these disparities, and generate strategies to eliminate them. Data sources included a review of the literature, commissioned papers, public testimony from professional societies and organizations, input from technical liaison panels, and focus group and roundtable input. The committee concluded that racial and ethnic disparities in health care are, with few exceptions, remarkably consistent across a range of illnesses and health-care services. These disparities are associated with socioeconomic differences and tend to diminish significantly, and in a few cases, disappear altogether when socioeconomic factors are controlled.[58] The majority of studies reviewed by the committee, however, found that racial and ethnic disparities remain even after adjustment for socioeconomic differences and other health-care access–related factors.[58–60]

## OTHER POPULATIONS

Although most attention and research has been directed toward health disparities among racial and ethnic minorities, recent statistics have documented serious health disparities among other segments of the population.

### Persons With Disabilities

The US Census Bureau reported that in 2000, 49.7 million people with some type of long-lasting condition or disability lived in the United States.[45] Persons with disability are at risk of secondary conditions (preventable physical, mental, and social disorders) resulting directly or indirectly from an initial disabling condition.[61] Data from the National Health Interview Survey indicate that people with disabilities are more likely to smoke and to be overweight, and less likely to engage in moderate physical activity. Moreover, people with disabilities are more likely to report that their health is poor or fair (44.8%) compared with people without disabilities (9.4%); and people with disabilities are also less likely to become involved in physical activity.[62] In a survey conducted in Washington state, Kinne et al reported that the prevalence of each of 16 secondary conditions (eg, chronic pain, sleep problems, periods of depression, respiratory infections, falls or other injuries, lack of romantic relationships, problems making or seeing friends, asthma, etc) was two to three times higher among adults with disabilities than among adults without disabilities.[63] People with disabilities are also more likely to have smoked or to be current smokers.[64] Data from the National Health Interview Survey also indicate that people with disabilities are less likely to participate in social activities such as calling friends or relatives, getting together with friends or relatives, or going to worship, to a restaurant, or to group events.[62] Furthermore, people with disabilities are less likely to be employed, and if employed, they are more likely to have lower income than people without disabilities.[62]

### Geographic Location

Health disparities have also been observed among people living in rural areas. For example, adult men and women living in rural areas are less likely to use preventive services such as mammograms, Pap smears, proctosigmoidoscopy, and influenza and pneumococcal vaccinations.[2]

### Socioeconomic Status

Another vulnerable segment of the US population are people classified as being of lower socioeconomic status (SES). This segment of the population also experiences worse health outcomes when compared with the higher SES group; for example, children from lower SES communities were found to have higher injury hospitalization and mortality rates[65]; and white, black or African American, and Mexican American men and women living in neighborhoods with lowest incomes were found to have two to four times higher mortality rates than those living in neighborhoods with the highest incomes.[66] Lower SES was also associated with lower reported health status and higher mortality.[67]

The Census Bureau reported that, in 2002, poor people were more likely to be without health insurance for the entire year independent of gender, race or ethnicity, or nativity.[68] Newacheck et al reported that, from 1979 to 2002, black or African American children experienced a higher prevalence of disability than white children. However, the investigators' multivariate analysis indicated that the difference in disability between blacks or African Americans and Whites could be explained entirely by differences in poverty status.[69]

## ▶ FACTORS CONTRIBUTING TO HEALTH DISPARITIES

Racial and ethnic variations in health result from variations in an individual's exposures or vulnerability and are a reflection of issues related to the health-care system. At the individual and community level, factors that contribute to variations in health include behavioral and psychosocial factors, material factors (education, occupation, and income), and environmental living conditions and resources. Health system factors include issues of access to health-care systems (physical, financial, and practical access [ie, customer friendliness]), access to services within the system (getting appointments, completing referrals to specialists, getting after-hours advice), health services utilization, health-care quality, and the ability of the system and providers to effectively address patients' needs (awareness of patients' conditions and functional limitations, knowledge and clinical skills, and cultural competence). These factors are interdependent, affect one another to a large extent, and often are driven by socioeconomics.

### Socioeconomics

Being in a lower socioeconomic class usually means having poorer housing conditions, fewer opportunities for higher education, less health insurance coverage, and lower access to health care. Environmental health risks—such as degradation; air, water and soil pollution; and other physical hazards—are more prevalent in low-income racial and ethnic minority communities. Individual risk factors for poor health are pronounced among many racial and ethnic minorities, and these risks are confounded by the disproportionate representation of minorities in the lower socioeconomic classes, as well as hazardous and low-paying occupations. For example, in 1996 50% of all garbage collectors, over 33% of all elevator operators, and 33% of all nursing aides and orderlies were blacks or African Americans. Similarly, more than 75% of all miscellaneous woodworkers, 68% of all farm product graders and sorters, 37% of all farm workers, and 34% of all fabric machine operators were Latino.

Many classic case studies have documented differential exposure to work-related toxicants, resulting in disproportionately high rates of occupational diseases among miners, steelworkers, chemical-industry workers, rubber and textile workers, and others.[70,71] Moreover, SES, in and of itself, is correlated with health status independently of individual risk factors, because people in each ascending step along the socioeconomic gradient tend to have better health, even when individual health risk factors are accounted for.[72] Thus, research into the reasons for health differences between racial and ethnic groups has focused largely on differences in SES (income, wealth, unemployment, and social support) and the associated access to preventive health-care services, suggesting that inequalities in income and education underlie some health disparities.[73–75] Other factors, however, clearly enter the picture, as minorities with supposedly equal access to care through insurance coverage and those employed still suffer worse health outcomes when compared with whites.

During the past 40 years, major changes occurred that were expected to drastically reduce or eliminate socioeconomic differences in health: infectious disease has declined as a leading cause of morbidity and mortality; adequate nutrition, housing, water, and waste disposal have become available to most American families; and Medicaid and Medicare (federal health insurance for the poor and elderly) have put health care within the reach of many of the poor. Nevertheless, socioeconomic differences in health persist, and the traditional explanations alone have limited power to explain the continuing association between social stratification and health.[74,76]

## Culture and Acculturation

Culture is defined as the integrated pattern of human knowledge, belief, and behavior that depends on the human capacity for learning and transmitting knowledge to succeeding generations.[77] That cultural factors—the customary beliefs, social forms, and material traits of a racial, religious, or social group[77]—also play a role in health disparities is demonstrated by differences in health status among different subpopulations in the United States. For example, among some immigrant Hispanic populations, birth outcomes have been found to be better than those of their US-born peers, suggesting that sociocultural risk increases with subsequent generations living in the United States.[78]

Data show that despite the fact that Mexican Americans tend to be poorer, less educated, and medically underserved compared with non-Hispanic whites, they are astonishingly healthy. Mexican American rates of infant mortality and low birth weight are equivalent to those for non-Hispanic whites and half those of blacks or African Americans, and overall mortality among Mexican Americans is lower than that among non-Hispanic whites.[5] Mexican Americans also have low rates of lung cancer, heart disease, and chronic respiratory disease.[79] These findings illustrate what researchers refer to as a paradox, because they are contrary to historical assumptions that increased risk associated with ethnicity can be explained in terms of genetic differences related to race or factors related to SES.[79]

In a 1989 study of low birth weight among Mexican Americans, Scribner and Dwyer proposed that factors associated with Mexican cultural orientation may be protective against the risk of low birth weight among Mexican Americans.[80] Scribner further suggests that this "acculturation" hypothesis explains the paradox in terms of cultural orientation linked to ethnicity.[79] Mexican American ethnicity is a marker of a Mexican cultural orientation that is defined by behavioral norms that can account for their favorable health status. Mexican Americans as a group smoke less, drink less, and eat a better diet than do non-Hispanic whites.[79] Over time, and once Mexican Americans have been fully acculturated in the high-risk environments of socioeconomically disadvantaged communities, their behavioral norms and health outcomes come to resemble those of other socioeconomically disadvantaged groups living in similar community environments.[79] Many studies have examined acculturation and reported that it does affect behaviors and the health status of immigrants. For example, recent adolescent immigrants were at lower risk than other students in relation to substance use,[81] greater acculturation was found to be associated with poorer childhood immunization status,[82] and Mexican American women had generally more undesirable behaviors and risk factors than Mexican immigrant women.[83] On the other hand, Mexican Americans who were born in the United States had a lower level of physical inactivity during leisure time[84]; older, US-born Hispanics were less likely to be current smokers[85]; and women who were more acculturated had significantly higher odds of ever and recently receiving a clinical breast examination and a mammogram than did less acculturated women.[86]

## Racism and Discrimination

Racism is defined as "a belief that race is the primary determinant of human traits and capacities; and that racial differences produce an inherent superiority of a particular race."[77] Marx further proposes that, put into practice, racism refers to relationships in which one group, supposedly distinguished by physical differences, has more power (political, economic, military) than another, and can and does use that power to act on or against a similarly distinguished oppressed group. Racism is distinguished from prejudice, in that prejudice is a preconceived idea that is usually unfavorable but is not necessarily acted on with power and authority.[87]

Jones offers a basic framework for understanding racism and how it influences health outcomes. She proposes that racism exists at three levels: institutionalized, personally mediated, and internalized.[88] Institutionalized racism manifests itself both in material conditions (eg, differential access to quality education, sound housing, gainful employment, appropriate medical facilities, and a clean environment) and in access to power (eg, differential access to information, resources, and voice, including voting rights, representation in government, and control of the media). Institutionalized racism is often evident as inaction in the face of need.[88] Personally mediated racism is defined as prejudice (differential assumptions about the abilities, motives, and intentions of others based on their race) and discrimination (differential actions toward others based on race). Personally mediated racism can be intentional or unintentional and includes acts of commission as well as of omission. This form of racism manifests itself as lack of respect (poor or no service, failure to communicate options), suspicion (shopkeepers' vigilance; everyday avoidance, including street crossing, purse clutching, and standing when there are empty seats on public transportation), and devaluation (surprise at competence, stifling of aspirations, scapegoating, and dehumanization). Internalized racism is the acceptance by members of stigmatized races of negative messages about their own abilities and intrinsic worth, characterized by their not believing in others who look like them and not believing in themselves. Internalized racism manifests as an embracing of "whiteness," self-devaluation, resignation, helplessness, and hopelessness.[88]

Krieger et al and Williams et al suggest that discrimination and racism may create stress leading to poorer health among members of racial minority groups.[89,90] Research indicates that racial discrimination and racism have a significant impact on health and are important contributors to the racial and ethnic health disparities in the United States.[58,73,74,88–92] For example, Krieger and Sidney reported that systolic blood pressure was higher among black or African American adults who experienced racial discrimination and accepted unfair treatment, compared with those who experienced racial discrimination but reported that they challenged unfair treatment.[91] In a population-based survey of Chinese Americans living in Los Angeles, Gee reported that individual and institutional measures of racial discrimination were associated with health status of minority group members after controlling for acculturation, sex, age, social support, income, health insurance, employment status, education, neighborhood poverty, and housing value.[92]

## Psychosocial Factors

Some researchers propose that psychosocial factors (health behaviors, stress in family, residential and occupational environments, social integration and support, perception of mastery and control, social ties, and attitudinal orientations) represent critical links between social structure and health status.[74,76] The social distribution of these factors represents the patterned response of social groups to the realities and constraints of the external environment imposed on them by social structure. Intervening mechanisms between social structure and health status are adaptive to the living and working conditions of the poor.[74] Accordingly, efforts to change the lifestyle of the poor without also altering social structure and life chances not only may be ineffective, but may do more harm than good. It has been reported that health education campaigns achieve only limited success and are more effective in producing behavior change in persons from higher socioeconomic levels than in their lower-level peers. For example, cigarettes are widely believed to alleviate stress and tension, and persons of lower SES face more stress and have fewer resources to cope with it than their better educated peers; thus strategies to promote smoking cessation could be much more complex among minority populations.[74]

## Access to Care

Racial and ethnic minorities are less likely than whites to possess health insurance coverage and, even when insured, may face additional barriers to care because of other socioeconomic factors, such as high copayments, geographic factors, and insufficient transportation. For example, Newacheck et al found that minority children with special health care needs were more likely to be without both health insurance coverage and a usual source of care, and to report inability to obtain needed medical care.[93] Poverty appears to be a major factor affecting access to care; in 2002, the proportion of people without health insurance for the entire year was much higher for all racial and ethnic groups living in poverty, reaching 42.8% for poor Hispanics[67] (see Fig. A–9). Several other factors contributed to having health insurance: gender, age, nativity, household income, education, and work experience. In each case, people living in poverty were much more likely to have no health insurance for the entire year than the general public with similar characteristics.[67]

## Health Care

Beyond access-related factors, the IOM's Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care concluded that a range of patient-level, provider-level, and system-level factors may be involved in racial and ethnic health care disparities. At the patient level, minority patients are more likely to refuse recommended services, adhere poorly to treatment regimens, and delay seeking care.[94,95] However, the committee concluded that racial and ethnic differences in patient preferences, care-seeking behaviors, and attitudes are unlikely to be major sources of health-care disparities.

At the health systems level, the ways in which systems are organized and financed, and the availability of services, may exert differential effects on patient care, particularly for racial and ethnic minorities. Minority populations have less access to care independent of their insurance status because fewer physicians and clinics exist in their communities.[96] And where health facilities exist, they may be less well equipped or staffed, or be overcrowded. Moreover, people who are members of minority groups are less likely to be referred for tests, or to receive specialty care, mental health care, or needed procedures and surgery. Language barriers, for example, pose a problem for many patients in areas where health systems lack the resources, knowledge, or institutional priority to provide interpretation and translation services. Similarly, time pressures on physicians may hamper their ability to accurately assess presenting symptoms of minority patients, especially where cultural or linguistic barriers are present.

Several factors may contribute to disparities in health care at the provider level: greater clinical uncertainty when interacting with minority patients, bias or prejudice against minorities, and beliefs or stereotypes held by the provider about the behavior or health of minorities.[58] In deciding on a diagnosis and course of treatment, a physician must balance new information gained from a patient with his or her prior knowledge and expectations about the patient. If the physician has difficulty accurately assessing and understanding a patient's presenting symptoms and condition, he or she is likely to place greater weight on prior knowledge and expectations, resulting in an imbalance between treatment decisions and the patient's needs. Moreover, there is considerable empirical evidence that even well-meaning whites who are not overtly biased and who do not believe that they are prejudiced typically demonstrate unconscious implicit negative racial attitudes and stereotypes.[97] Survey research suggests that among white Americans, prejudicial attitudes toward minorities remain more common than not, as over half to three quarters believe that relative to whites, minorities—particularly blacks or African Americans—are less intelligent, more prone to violence, and prefer to live off of welfare.[98] The committee concluded that, while there is no direct evidence that provider biases affect the quality of care for minority patients, research suggests that health-care providers' diagnostic and treatment decisions, as well as their feelings about patients, are influenced by patients' race or ethnicity,[99–101] and, that the relationship between race or ethnicity and treatment decisions is complex and may also be influenced by providers' gender, perceptions, and attitudes toward patients, often in subtle ways.[58]

## ▶ PROGRAMS AND INTERVENTIONS

Over the past 20 years, health disparities have attracted the attention of many policy and program leaders at all levels. Programs have been developed, implemented, and evaluated at the local, state, and federal levels in an effort to "close the gap" in health disparities. Numerous recent federal initiatives were established both to draw attention to the problem of health disparities and to develop and implement concrete plans to address these disparities within the medical, academic, research, and public health communities. Programs have been initiated and supported technically and financially within all agencies of the federal DHHS to improve access to care, quality of care, workforce diversity, and cultural competence. During the 1990s, DHHS measured national trends in race- and ethnic-specific rates for 17 Health Status Indicators. All racial and ethnic groups experienced improvements in rates for 10 of the 17 indicators but, despite the overall improvements, in some areas racial and ethnic disparities remained the same or even increased.[102]

It is difficult to obtain a comprehensive inventory of federal programs, because almost every agency has initiated special projects to study the racial and ethnic disparity in health and to act to close the gap. Websites and publications of the various DHHS agencies list multiple projects ranging from presidential initiatives to department initiatives and agency projects. Following are some examples:

- The Health Resources and Services Administration's (HRSA) Minority Management Development Program is a public–private partnership initiative designed to enhance the representation of minority managers and administrators in the managed care industry. The program provides managerial training, work experience, and knowledge of the industry through focused didactic and interactive training opportunities. (For more information, see the department's website, at *http://www.hrsa.gov/OMH/OMH/main2_projects.htm#10.*)
- The Office of Management and Budget, Executive Office of the President, issued and modified Directive 15 (discussed earlier) to provide guidance on classification of race and ethnicity for use in civil rights monitoring and enforcement. (See *http://clinton4.nara.gov/OMB/fedreg/ombdir15.html.*)
- The Office of the Secretary of Health and Human Services prepares and monitors the Healthy People objectives discussed earlier (http://www.healthypeople.gov/) and created the "Cross Cultural Health Care Program" in 1992 to serve as a bridge between communities and health-care institutions to ensure access to health care that is culturally and linguistically appropriate. This program facilitates cultural competency training for providers and medical staff, interpreter training for community interpreters and bilingual health-care workers, outreach to underrepresented communities, community-based research, interpreter services, translation services, and publications and videos relating to cross-cultural health care. (See *http://www.xculture.org/.*)
- The Agency for Healthcare Research and Quality (AHRQ) has awarded grants to nine Excellence Centers to Eliminate Ethnic/Racial Disparities (EXCEED). Each center

is investigating a different theme in an effort to understand causes of and factors influencing inequalities, and to identify and eliminate the causes of health disparities. (See *http://www.ahrq.gov/research/exceed.htm.*)

- The Centers for Medicare and Medicaid Services supports the Historically Black Colleges and Universities Grant Program (HBCUGP) and the Hispanic Health Services Research Grant Program (HHSRGP) to increase the pool of black or African American and Hispanic researchers available to carry out the research, demonstration, and evaluation activities of the center and to support governmental and foundation research in the health services area for the black or African American and Hispanic communities. Funding is provided to conduct research related to health-care delivery and health financing issues affecting minority populations, including issues of access to health care; utilization of health services; quality of services; health screening, prevention, and education; racial health disparities; social and economic differences; managed care systems; and costs of care. (See *http://www.cms.hhs.gov/researchers/priorities/grants.asp#HBCU.*)
- The National Institutes of Health (NIH) established the Trans-NIH Working Group to Develop a Strategic Research Agenda on Health Disparities, consisting of each NIH institute and center director. The goals of the working group are to develop a 5-year strategic research agenda; recruit and train minority investigators; form new and enhance current partnerships with minority and other organizations working to close health gaps; advance community outreach activities; define, code, track, analyze, and evaluate progress more uniformly across the agency; and enhance public awareness. (See *http://healthdisparities.nih.gov/working.html.*)
- The Centers for Disease Control and Prevention (CDC) implements the Racial and Ethnic Approaches to Community Health (REACH) project and supports many other projects targeted toward reducing and eliminating health disparities, such as the National Program for Cancer Registry, Alaska Native Colorectal Cancer Education Project, Hispanic Colorectal Cancer Outreach and Education Project, National Comprehensive Cancer Control Program, National Breast and Cervical Cancer Early Detection Program, National Training Center, and Research on Prostate Cancer Screening Behaviors. (See *http://www.cdc.gov/omh/AMH/AMH.htm.*) REACH 2010 is a federal project designed to eliminate disparities in six priority areas by the year 2010: cardiovascular disease, immunizations, breast and cervical cancer screening and management, diabetes, HIV and AIDS, and infant mortality. The racial and ethnic groups targeted by REACH 2010 are blacks or African Americans, American Indians, Alaska Natives, Asian Americans, Hispanic Americans, and Pacific Islanders. Local and community-based coalitions design, implement, and evaluate community-driven strategies to eliminate health disparities. (See *http://www.cdc.gov/reach2010.*)

State and local programs also play an integral role in reducing health disparities, and almost all states have initiated projects to narrow and eliminate health disparities. For example, in the state of California, the Healthy Start initiative sought to improve the lives of children, youth, and families. Healthy Start provided comprehensive services within the community, school, and home to produce measurable improvements in school readiness, educational success, physical health, emotional support, and family strength. In a 1997 statewide evaluation of Healthy Start Works, the California Department of Education reported that parents and students expressed strong support and guidance when needed as well as increased test scores and parent involvement in school activities. (For more information, see *http://www.cde.ca.gov/ls/pf/hs/facts.asp.*)

## ▶ EVALUATION

Most programs and initiatives developed to reduce or eliminate health disparities have yet to be evaluated using rigorous methodologies. Evaluation of such programs is complicated because of the multifactorial nature of disparities and the difficulty of having any one factor for reducing disparities emerge independent of others. Thus, in many cases when evaluation was conducted, it focused on process rather than outcome, because process is a more readily observable phenomenon.

The REACH 2010 evaluation model uses the following five stages to guide the collection of qualitative and quantitative data:

1. **Capacity building.** Community coalition actions to reduce disparities.
2. **Targeted actions.** Intervention activities believed to bring about a desired effect.
3. **Community and system changes.** Changes to the community environment and to the knowledge, attitudes, beliefs, and behaviors of influential individuals or groups.
4. **Widespread risk and protective behavior changes.** Changes in rates of risk-reduction behaviors among a significant percentage of community members.
5. **Health disparity reduction**. Narrowing gaps in health status.

Positive behavior changes that have reduced health risks among REACH 2010 communities to date include increases in the percentages of community members receiving mammograms, Pap smears, and cholesterol and glycosylated hemoglobin screenings. These changes have helped to reduce disparities in cholesterol and blood sugar screenings.

The Medical University of South Carolina at Charleston and the Georgetown REACH Diabetes Coalition have formed an urban–rural coalition to improve the health of more than 12,000 blacks or African Americans with diagnosed diabetes in Charleston and Georgetown counties. After 24 months of program participation, blacks or African Americans have more physical activity in their lives, healthier foods at group activities, and better diabetes care and control. Between 1999 and 2002, the gap between blacks or African Americans and whites in annual $A_{1c}$ testing, which is used to measure blood glucose control, was virtually eliminated. The goal of the coalition is to eliminate all disparities in diabetes care and control in Charleston and Georgetown counties by 2007. (For further information, see *http://www.cdc.gov/nccdphp/aag/aag_reach.htm.*)

One of the most successful programs in eliminating health disparities has been the CDC efforts under the Childhood Immunization Initiative to eliminate disparities in vaccine coverage. During the 1989–1991 measles epidemic, which produced more than 55,000 cases of measles, the incidence of measles in minority children was four to seven times higher than that among white children.[103–105] As part of this initiative, a dual immunization strategy was developed with interventions likely to reach the majority of children (eg, increased funding for health departments and for vaccine programs, research, national public information campaigns, and annual state surveys of vaccine coverage). Additional interventions were designed to reach subgroups of the population with higher proportions of children from racial and ethnic minorities (eg, the Vaccine for Children program, free vaccines for uninsured or underinsured children, local immunization action plans, user-friendly hours for public clinics, special information campaigns).[103] As a result of these strategies, and in addition to dramatically improving vaccination coverage and eliminating measles in all racial and ethnic populations, the vaccination coverage gap between white and minority children was reduced from 15% in 1985 (49% among minorities and 64% among whites), to 6% in 1992 (78% among minorities and 84% among whites), and to 2% in 1997 (89% among blacks or African Americans, 88% among Hispanics, 92% among

American Indians or Alaska Natives, and 90% among whites).[104]

## SUMMARY AND RECOMMENDATIONS

Health disparities are the product of a multitude of factors, among them, racism; psychosocial, cultural, socioeconomic, and environmental factors; quality of care factors; and policy factors. Many of these factors fall outside the influence of the health-care system. Accordingly, the elimination of inequalities in health status ultimately may require changes not only in psychosocial factors (lifestyle characteristics and living conditions) and health-care delivery, but also in socioeconomic conditions.[74]

Health services interventions, alone or in collaboration with social and economic interventions, are likely to play a significant role in reducing racial and ethnic health disparities. The health-care system can contribute by addressing specific factors that have an impact on health disparities, such as understanding and targeting population-specific differences in risk factors for illness, developing prevention messages with a specific clinical or population focus, and promoting adequate utilization of self-care principles and health-promoting services by vulnerable populations. This will require enhanced data collection to define the various components of the problem (health indicators as well as access, utilization, workforce competence, health-care quality), develop targeted interventions to deal with each component, and implement these interventions in partnership with community-based organizations. The system should also intensify its efforts to ensure increasing use of services by underserved populations by making the system more accessible, responsive, and user-friendly. Steps in that direction include diversifying the health-care workforce and acting to improve the cultural competence of personnel. Above all, the health-care system must immediately deal with the issue of disparity in health care.[106] Over the past 20 years, numerous initiatives have been established both to draw attention to the problem of health disparities and to develop and implement concrete plans for addressing these disparities within the medical, academic, research, and public health communities. However, despite an overall improvement in health, in some areas racial and ethnic disparities remained the same or even increased.

The IOM Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care recommended a comprehensive, multilevel strategy to eliminate health-care disparities. The committee recommended that all sectors involved in health-care delivery—including health-care providers, their patients, payers, health plan purchasers, and society at large—work together to ensure that all patients receive high-quality health care. The committee's first recommendation was to avoid fragmentation of health plans along socioeconomic lines. Racial and ethnic minorities are more likely than whites to be enrolled in "lower-end" health plans, which are characterized by higher per capita resource constraints and stricter limits on covered services.[107] The disproportionate presence of racial and ethnic minorities in lower-end health plans is a potential source of health-care disparities. Such socioeconomic fragmentation of health plans engenders different clinical cultures, with different practice norms, tied to varying per-capita resource constraints.[108] Equalizing access to high-quality plans can limit such fragmentation.

The committee further recommended strengthening the stability of patient–provider relationships in publicly funded health plans. Several lines of research suggest that the consistency and stability of the physician–patient relationship is an important determinant of patient satisfaction and access to care. Having a usual source of care is associated, for example, with use of preventive care services.[109]

The committee suggests that training and education of health-care providers are essential components of the proposed overall strategy. Educating health-care providers to make them aware of racial and ethnic disparities in health care, and the fact that these disparities often exist, despite providers' best intentions, can help alleviate stereotypes, bias, and clinical uncertainty that may influence clinicians' diagnostic and treatment decisions. Cross-cultural training of all current and future health-care providers can enhance their awareness of how cultural and social factors influence health care while providing methods to obtain, negotiate, and manage this information clinically once it is obtained. Cross-cultural education can be divided into three conceptual approaches focusing on *attitudes* (cultural sensitivity and awareness approach), *knowledge* (multicultural and categorical approach), and *skills* (cross-cultural approach).[58] It is also extremely important to intensify efforts to recruit and train more providers from disadvantaged minority backgrounds.

The IOM committee recommended increased efforts to collect data on patient and provider race and ethnicity to allow researchers to better disentangle factors associated with health-care disparities, help health plans monitor performance, ensure accountability to enrolled members and payers, improve patient choice, allow for evaluation of intervention programs, and help identify discriminatory practices.[58] The committee made further recommendations in conjunction with the training and educational strategies to eliminate racial and ethnic disparities in health care, including policy and regulatory strategies that address fragmentation of health plans along socioeconomic lines, and health systems interventions to the use of clinical practice guidelines and the use of interpretation services where community need exists.

There is an urgent need for the development of comprehensive programs that rely on evidence of successful interventions and avoid a one-size-fits-all approach. There is also a need for better coordination of initiatives and collaboration among public institutions, private foundations, and professional associations to achieve national health objectives. Health-care interventions should target high-risk populations; focus on the most important contributing factors for a given community, population, or disease condition; use culturally and linguistically appropriate methods; include measures of quality of care and health outcomes; and prioritize dissemination efforts.[75]

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# CHAPTER 7

# *Cardiovascular Disease and Hypertension*

CHARLOTTE JONES-BURTON, MD
ELIJAH SAUNDERS, MD, FACC, FACP

## ▶ INTRODUCTION

African Americans and other ethnic minorities are disproportionately represented among persons with lower education, lower socioeconomic status (SES), and medical diseases. In 1996, approximately 20% of African Americans and 40% of Hispanics had fewer than 12 years of schooling, compared with less than 10% of Caucasians. In addition, approximately 40% of African American and Hispanic children younger than 18 years of age live below the poverty line.[1] Income level is closely associated with educational attainment, and these statistics reflect the inequalities in SES and education. These inequalities are undoubtedly related to the health disparities that exist in the United States. Higher education and income status afford opportunities for individuals to live in safe neighborhoods, access medical care on a regular basis, and engage in eating and lifestyle behaviors that promote wellness. More importantly, SES has been linked to cardiovascular risk factors[2] and has been found to be a predictor of coronary disease mortality.[3]

## ▶ RACIAL DISPARITIES IN HEALTH

There are significant racial disparities in the incidence of most diseases, including hypertension, renal disease, and cardiovascular diseases. Even when the incidence of disease is lower in African Americans (eg, breast cancer), the morbidity and mortality is higher in African Americans. Since 1932, it has been evident in medical literature that there is a difference in blood pressure among blacks and whites in the United States.[4] Today, hypertension is a common disease worldwide. The prevalence of hypertension in the United States in people 18 years old or older is approximately 29%, affecting more than 58 million individuals.[5] African Americans are disproportionately represented in this number. Even though African Americans constitute approximately 12% of the US population, 33.5% have hypertension compared with 28.9% of non-Hispanic whites.[5] This disparity in hypertension begins after puberty and persists into adult life. The greatest racial difference is seen among those aged 40 through 59 years: 50% of blacks in this age group are hypertensive compared with 30% of whites.[6]

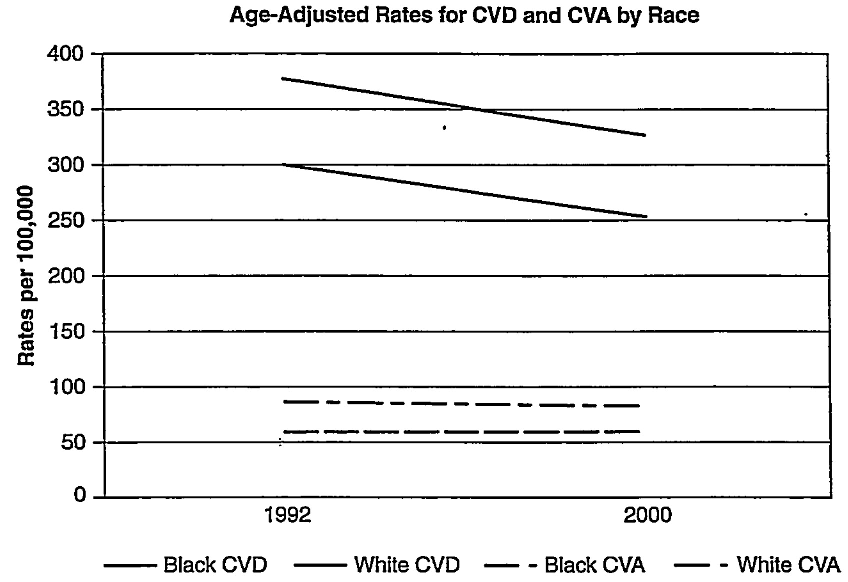

**Figure 7–1.** Age-adjusted rates in African Americans and Caucasians for cardiovascular and cerebrovascular diseases. (CVA, cerebrovascular accident; CVD, cardiovascular disease.) (*Based on information in Saunders E, ed. Racial Differences in Cardiovascular Health. Pfizer Facts; 2003.*)

By age 65, as many as 75% of African American women are hypertensive, compared with approximately 50% of Caucasian women in the same age group.

Not only is hypertension precocious in African Americans, the disease is more severe and results in more target organ damage.[7] More importantly, the morbidity and mortality associated with hypertension from stroke, kidney disease, and heart disease affect African Americans disproportionately. In the 1990s, heart disease and stroke death rates declined in both Caucasians and African Americans, but age-adjusted rates for African Americans remained higher (Fig. 7–1). Specifically, age-adjusted heart disease and stroke death rates are 29% and 40% higher in African Americans, respectively.[6] Hypertension in African Americans leads to an 80% higher stroke mortality rate, a 50% higher heart disease mortality rate, and a 32% higher rate of hypertension-related end-stage renal disease (ESRD) than the general population.[8] In 1950, the cardiovascular disease mortality rate was 1.6 times higher for African Americans than Caucasians.[9] Even when the general population has exhibited a decline in mortality, the rate of decline in African Americans is consistently lower than the decline in Caucasians.[10] Therefore, it is not surprising that in 1995, the cardiovascular disease mortality rate for African Americans remained the same as it was in 1950.

Medical literature has documented the existence of racial disparities in health care for cardiovascular diseases (ie, ischemic heart disease and congestive heart failure). Superficially, this is thought to be a result of limitations in access to medical care for African Americans. However, even when access to care is not an issue, such as in Department of Veterans Affairs hospitals, physicians are less likely to refer African American patients for cardiac catheterization,[11] and African Americans are less likely to undergo invasive cardiac procedures.[12] Additionally, it has been shown that among Medicare patients enrolled in managed health care plans, blacks were less likely than whites to receive $\beta$-blockers after myocardial infarction, a known standard of care.[13]

It has been well documented that African Americans are less likely to receive invasive cardiovascular procedures, even after controlling for health insurance.[14] Even though the rate of percutaneous transluminal coronary angioplasty in US blacks has doubled since 1992, African Americans are still less likely to receive this procedure (248 procedures per 1000 circulatory system discharges compared with 396 per 1000 discharges for Caucasians).[6] Similarly, blacks are half as likely to undergo coronary artery bypass graft than whites, 40 and 81 per 1000 hospital discharges, respectively.[6] Among those with inducible arrhythmias, blacks are less likely to receive implantable cardioverter-defibrillators than whites.[15]

The inequalities in access to health care suggest that racial discrimination influences the type of health care received by African Americans. The impact of racism—defined as "an organized system, rooted in an ideology of inferiority, that categorizes, ranks, and differentially allocates societal resources to human population groups"[10]—on African Americans in the United States is difficult to assess in clinical studies. To date, the Jackson Heart Study is the only study designed to focus on racial disparity in cardiovascular disease. This prospective study, currently ongoing, includes approximately 6000 African Americans, aged 35 to 84 years, from Jackson, Mississippi. It is the largest study of its type of African Americans in the United States[16] and has been called by some the "Black Framingham Heart Study."

## Genetics and Pathophysiology

For at least the past half century, the observation that blacks in the United States experience higher levels of blood pressure than whites[17] spawned the doctrine that blacks and whites are fundamentally distinct, biologically and physiologically. Research has attempted to characterize blacks as biologically inferior, and thus more prone to illness.[18] Titles of articles in peer-reviewed literature perpetuate this notion of innate distinction and inferiority; for example, "The pathogenesis of hypertension: Black–white differences,"[19] and "Hypertension in African-Americans: A paradigm of metabolic disarray."[20] Likewise, statements have been made without factual basis, equating racial disparity with increased virulence. Even though several hypotheses have been generated regarding the racial differences that exist between African Americans and Caucasian Americans, there remains a paucity of evidence supporting a unique pathophysiology for the occurrence of hypertension in African Americans.

One frequently cited explanation for the increased rate of hypertension in African Americans is based on the voyage from Africa to America on slave ships (the so-called Middle Passage). Grim and others have speculated that during these arduous trips, the slaves were placed in a Darwinian situation of "survival of the fittest," in which survival depended on "high-sodium-retaining" genes.[19] Once an individual with these genes assumed a lifestyle in an environment in which sodium was plentiful (acculturation), the hypothesis suggests, the risk of hypertension escalated. This theory is problematic and controversial.[21]

Another explanation espouses the significant differences in sodium handling between blacks and whites. Studies demonstrate that African Americans have increased sodium sensitivity, retaining more sodium than whites and exhibiting a greater rise in blood pressure.[19] Although many hypertensive African Americans have normal to high circulating renin activity, as a group, they are more likely to manifest suppressed circulating renin activity than hypertensive Caucasians. However, this does not prove a genetic basis. In fact, this could be the result of a secondary effect on the kidneys, caused by prolonged exposure to elevated blood pressure that has been unrecognized, untreated, or undertreated. If this is the norm in African American families, then certainly this pattern could be passed on through generations.

The pursuit for a specific genetic mutation to explain the racial differences in hypertension is ongoing. Various genes, including renin, angiotensinogen, angiotensin-converting enzyme (ACE), and kallikrein, have been studied,[22] but this area of study has been plagued by small study samples. One exciting area of genetic interest involves the epithelial sodium channel (ENaC) located in the cortical collecting duct of the kidney. This channel is involved in sodium reabsorption, and a gain of function mutation in this channel leads to increased sodium reabsorption, increased effective circulating blood volume, and salt-sensitive, low-renin hypertension. Polymorphisms of this channel have been identified, and one allele has been found to be present in approximately 6% of individuals of African origin, but not in white populations.[23] Changes in the sympathetic nervous system, the adrenocorticotropic hormone–cortisol axis, and vascular reactivity, particularly endothelial function, have also been examined.[23]

Despite the various hypotheses, hypertension is likely the result of a complex interplay of genetics and pathophysiology, such as differences in excretion of sodium and potassium, environment (particularly diet and stress), and demographic factors, especially, age, race or ethnicity, and geographic location.

## Target Organ Damage

There is a strong and independent relationship between elevated blood pressure and congestive heart failure (CHF),[24] coronary heart disease (CHD), stroke, and kidney disease.[25] Pooled information from nearly 400,000 adults in nine observational studies reveals a five times higher risk of CHD and 10 times higher risk of stroke in individuals with a diastolic blood pressure of 105 mm Hg versus those with a diastolic blood pressure of 74 mm Hg.[26] Numerous studies have clarified the role of hypertension in the racial disparity of prevalence and death rates for cardiovascular disease, CHF, stroke, and ESRD.[27]

## Congestive Heart Failure and Hypertension in African Americans

CHF is twice as common in hypertensive as in normotensive individuals.[28] The development of left ventricular hypertrophy is proportional to the elevation in blood pressure. A 20 mm Hg increase in systolic blood pressure increases the relative risk of left ventricular hypertrophy by 43% in men and 25% in women.[29] It is not surprising that hypertension in African Americans contributes to the increased incidence of left ventricular hypertrophy and CHF in this racial group. Even though the overall prevalence of CHF is similar for African Americans and Caucasians,[6] African Americans with left ventricular hypertrophy have a greater risk, 30% to 50% higher, for hospitalization[14] and mortality that is 2.5 times higher than Caucasians.[14] In a cohort of African Americans with essential hypertension and the absence of angiographic coronary artery disease, left ventricular hypertrophy was found to be a powerful, independent predictor of cardiovascular morbidity and mortality. Furthermore, cardiovascular mortality from left ventricular hypertrophy was twice as likely in women as in men.[30] In 1999, the age-adjusted death rates for cardiomyopathy were approximately twice as high in African Americans as in Caucasians.[31] Hypertension is the most common cause of cardiomyopathy in African Americans. It is often associated with left ventricular diastolic dysfunction, which can lead to heart failure with normal systolic function.

Not only is left ventricular hypertrophy a risk factor for CHD and cardiovascular mortality, it is also an independent risk factor for ischemic stroke in all age, sex, and racial or ethnic groups.[32,33] Specifically, concentric hypertrophy has been found to be associated with a 2.5-fold increase in ischemic stroke after adjustment of other risk factors for stroke.[34] Additionally, left ventricular hypertrophy appears to predispose individuals to arrhythmias, and it is known that sudden death is more prevalent in African Americans than in Caucasians.[15,35]

## Coronary Heart Disease and Hypertension in African Americans

Thirteen million Americans have coronary artery disease (CAD).[31] More than 1 million people experience a myocardial infarction (MI) each year. In NHANES 1999–2000, the prevalence of MI among Caucasians was greater than in African Americans, approximately 4% and 2.25%, respectively.[6] MI is the leading cause of all deaths in both African Americans and Caucasians.[31] Even though the age-adjusted death rate for CHD decreased by 20% for the total population from 1987 to 1995, the decrease was only 13% for African Americans.[36] Thus, African Americans still experience the highest death rates from heart disease of any racial or ethnic group in industrialized countries.[37] Compared with Caucasians, who had an age-adjusted death rate from heart disease of 253.6 per 100,000, African Americans die from heart disease at an alarming 326.5 per 100,000.[6]

Aside from the contribution that differences in risk factors, time to presentation and access to medical care prior to MI, and SES contribute to this obvious racial disparity, the pathogenesis of CAD in African Americans remains unclear. It is unknown whether significant biologic differences exist. One hypothesis focuses on abnormalities in coronary endothelial function and vasoactivity on the basis of race.[38,39] It has been shown that African Americans with left ventricular hypertrophy experience a blunted response to acetylcholine, a nitric oxide–dependent vasodilator, compared with Caucasians with similar left-ventricular hypertrophy. Furthermore, augmentation of coronary blood flow was shown to be significantly depressed in African Americans as compared with Caucasians with left ventricular hypertrophy.[38]

Psychosocial stress increases the development of atherosclerosis.[40] Anger has been linked to cardiovascular disease, including hypertension and CAD.[41] The experience of anger is particularly relevant to blacks in the United States, a society built on institutionalized racism. In 1995, a study published by the Federal Glass Ceiling Commission found that African Americans earn 21% less than Caucasians in the same jobs.[42] This suggests that skin color continues to be the vehicle used to allocate African Americans to lower SES, an unjust appointment that predicates health disparities.

## Cerebrovascular Accidents and Hypertension in African Americans

Stroke is the third leading cause of death in the US population, accounting for approximately 7% of all deaths in the United States in 2000.[43] The age-adjusted prevalence of stroke for Americans is higher in both African American men and women than in white American men and women (Fig. 7–2). African Americans possess a disproportionate burden of the risk factors for stroke and stroke mortality. This racial disparity is multifactorial, but strongly correlated to the increased prevalence of other cardiovascular disease risk factors—diabetes and hypertension in African Americans. Another factor that may contribute to this epidemic in blacks in addition to greater severity of risk factors is lack of access to care.[34]

There are racial differences in the subtypes of stroke. In particular, African Americans have a higher incidence of cerebral infarction, subarachnoid hemorrhage, and intracerebral hemorrhage.[34] Similarly, different subtypes of

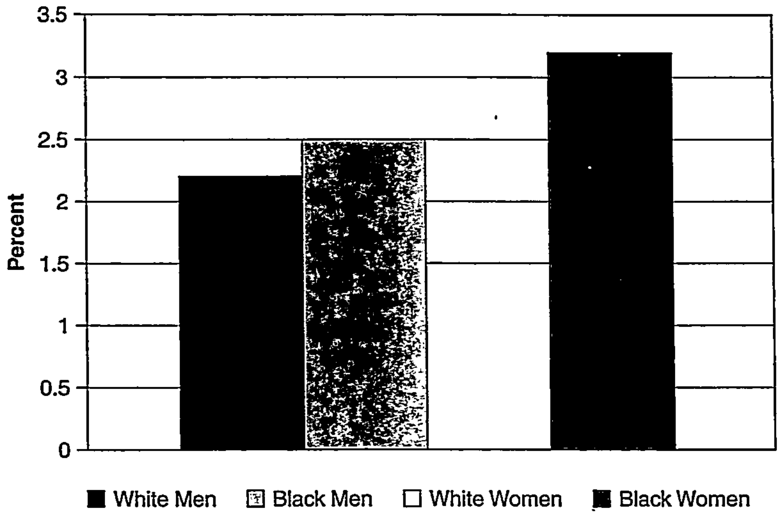

**Figure 7–2.** Age-adjusted prevalence of stroke by race and gender in the United States. (*Based on information in Saunders E, ed. Racial Differences in Cardiovascular Health. Pfizer Facts; 2003*).

ischemic stroke may occur in African Americans, namely, lacunar infarcts and large artery intracranial occlusive disease.[34] These racial disparities in subtypes of stroke are greatest at younger ages. Young African Americans have a two- to threefold greater risk of ischemic stroke than their white counterparts and are more likely to die as a result of stroke.[44] In fact, in 2000, stroke mortality was higher in blacks than in whites at all ages.[31]

## Kidney Disease and Hypertension in African Americans

African Americans suffer from kidney disease in disproportionate numbers to Caucasians. Previous studies have suggested that the higher prevalence of kidney disease is linked to the higher prevalence of hypertension in this population.[45] Indeed, African Americans have the highest rate of hypertension-related ESRD of any other racial or ethnic group (five times higher than in Caucasians).[46] In addition, African Americans have a higher rate of diabetes-related ESRD, second only to Native Americans. Over the past decade, the overall incidence of ESRD has steadily increased, and the racial disparity related to this disease has persisted.[47] Although African Americans comprise approximately 12% of the US population, they represent 31% of patients with ESRD.[48] African American males aged 25 to 44 years of age are 20 times more likely to develop ESRD as a result of elevated blood pressure than are white males in the same age group.[49] Additionally, African Americans with ESRD on the average are younger than Caucasians, with the median ages for each group 59.4 and 67.1, respectively.[50]

A recent data analysis of the National Health and Nutrition Examination Surveys III (NHANES III) and the United States Renal Data System (USRDS) did not find a higher prevalence of chronic renal insufficiency (defined as a glomerular filtration rate from 15 to 59 mL/min per 1.73 $m^2$) in African Americans as compared with Caucasians.[51] This leads to speculation that African Americans have an increased susceptibility to ESRD compared with Caucasians. In fact, even when similar levels of blood pressure control occur, renal function in African Americans has been shown to decline five times faster than in non-African Americans.[52] The cause of this rapid progression to ESRD is likely multifactorial, including the higher prevalence of renovascular disease, decreased use of "renoprotective" agents, and higher prevalence of obesity in African Americans. Other factors that contribute to this rapid demise include lower SES and education, leading to suboptimal medical care, cultural aspects (delaying presentation to the health system, health care beliefs), and environmental exposures, such as illicit drug use.[53,54]

Although causation is difficult to identify, it is clear that risk factors for and incidence of cardiovascular disease are higher in patients with kidney disease. The Heart Outcomes Prevention Evaluation (HOPE) study revealed that patients with microalbuminuria, a marker of kidney disease, had a 61% increased risk of MI, stroke, and death from cardiovascular causes.[55] In fact, patients with kidney disease are more likely to die of cardiovascular disease than of kidney failure.[56] In a group of dialysis patients, mortality related to cardiovascular disease was 10 to 30 times higher than in the general population.[57] This increased burden of cardiovascular disease in patients with kidney disease is a result of multiple factors, including anemia,[58] impaired vasculature,[59] increased inflammation,[60] and increased oxidative stresses[61] in this population. Although many patients with kidney disease have multiple cardiovascular risk factors, it is important to note that the presence of chronic kidney disease is an independent risk factor for cardiovascular disease.[63]

## Treatment of Hypertension in African Americans

The rates of cardiovascular mortality have declined over the past decade.[6] Undoubtedly, better hypertension control has contributed to this decline in mortality. Awareness of hypertension remains high, as well. Specifically, among African Americans aged 40 years and over, 71% to 83% reported awareness of hypertension. In this group, a majority reported that their hypertension was being treated (83% to 97%). Despite the high awareness and treatment of this disease, it is astounding that a minority of African Americans receiving treatment achieve blood pressures below 140/90 mm Hg, only 31% of all hypertensive patients meet this criteria[63] and 25% of African American hypertensive patients.[64] In other words, despite increased knowledge regarding hypertension and therapeutic agents to treat hypertension, adequate blood pressure control remains the exception, not the rule.

The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) revised the classification of hypertension[65] (Table 7–1). Because African Americans develop a more severe hypertension, and do so earlier, the identification of "prehypertensive" should identify a larger group of patients to enable more aggressive targeting prior to the onset of hypertension. JNC 7 recommends a goal of blood pressure lower than 140/90 mm Hg and lower than 130/80 mm Hg in patients with diabetes and chronic kidney disease.

Until recently, clinical trials have not included large numbers of African American patients to test hypotheses regarding therapeutic regimens for hypertension. Two landmark

▶ **TABLE 7–1.** JNC 7 Classification of Blood Pressure[65]

| Classification | Systolic BP (mm Hg) | Diastolic BP (mm Hg) |
|---|---|---|
| Normal | < 120 | < 80 |
| Prehypertension | 120–139 | 80–89 |
| Stage 1 hypertension | 140–159 | 90–99 |
| Stage 2 hypertension | ≥ 160 | ≥ 100 |

BP, blood pressure; JNC 7, seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.

trials, African American Study of Kidney Disease and Hypertension (AASK)[66] and Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)[67] have provided insight into the management of African Americans with hypertension.

AASK, a randomized, double-blind trial, was designed to evaluate two different blood pressure goals (strict, 125/75 mm Hg, and usual, 140/90 mm Hg) and three different antihypertensives as first-step agents (a dihydropyridine calcium channel blocker, amlodipine; an ACE inhibitor, ramipril; and a $\beta$-blocker, metoprolol) on the progression of hypertensive kidney disease in African Americans.[66] This trial enrolled 1094 African Americans and is the first trial with significant power to evaluate the effects of inhibition of the renin-angiotensin-aldosterone system in African Americans. For patients with proteinuria, data revealed that the decline in glomerular filtration rate, the primary outcome, was 36% slower in the ramipril group compared with the amlodipine group over 3 years. There was a similar decline in glomerular filtration rate in the metoprolol group. However, unique to the ramipril group was a statistically significant risk reduction in secondary outcomes (a decline in glomerular filtration rate, ESRD, or death) and less proteinuria. Blood pressure was considerably lower during the follow-up period than at baseline in a large percentage of participants (78.9%), but there was no statistically significant difference in blood pressure between the treatment groups (of note, additional agents were added in a stepwise approach to achieve blood pressure goals with furosemide, used in the majority of participants).

Additionally, the observed benefits occurred at similar blood pressure levels. These data support the initial use of an ACE inhibitor in African Americans with hypertensive kidney disease, despite the degree of albuminuria. This represents a paradigm shift from limited use of ACE inhibitors in African Americans (because of the lower potency in blood pressure reduction when used as monotherapy) to an essential use of ACE inhibitors in these patients because of additional benefits other than blood pressure reduction. Perhaps the most important lesson learned from the AASK trial is that African Americans can achieve target blood pressure goals through persistent and intense treatment Table 7–2).

**▶ TABLE 7–2.** Lessons Learned From AASK

- African American hypertensive patients with mild renal insufficiency can attain the usual BP goal (< 140/90 mm Hg)
- Multidrug therapy is often need to achieve usual BP goal (including a diuretic)
- In African American hypertensive patients with mild renal insufficiency, an ACE-inhibitor-based regimen was as effective in achieving BP targets as a dihydropyridine calcium-channel-blocker–based regimen
- In African American hypertensive patients with mild renal insufficiency and proteinuria >300 mg/d, an ACE-inhibitor based regimen provided more renal protection than a dihydropyridine patients based regimen

AASK, African American Study of Kidney Disease and Hypertension; ACE, angiotension-converting enzyme; BP, blood pressure.

ALLHAT, the largest antihypertensive treatment trial to date, enrolled approximately 15,000 African Americans (35% of the total study group).[67] Patients were randomly assigned to initial therapy with four antihypertensive medications: a diuretic, chlorthalidone; an ACE inhibitor, lisinopril; an $\alpha$-blocker, doxazosin; and a dihydropyridine calcium channel blocker, amlodipine. The doxazosin arm of the trial was terminated early after patients in this arm developed CHF at a greater rate than did the patients treated with chlorthalidone. There was no significant difference observed in the remaining three drugs in preventing the primary outcome of the trial, major coronary events, or in their effect on overall survival. However, chlorthalidone was superior to lisinopril in lowering blood pressure and in preventing aggregate cardiovascular disease, including stroke and CHF

**▶ TABLE 7–3.** Average Number of Antihypertensive Agents Used to Achieve Target Blood Pressure in Four Randomized, Controlled Trials

| | MDRD | ABCD | HOT | UKPDS |
|---|---|---|---|---|
| Goal BP (mm Hg) | MAP < 92 | DBP < 75 | DBP < 80 | DBP < 85 |
| Average number of drugs per patient | 3.6 | 2.7 | 3.3 | 2.8 |

ABCD, Appropriate Blood Pressure Control in Diabetes trial; DBP, diastolic blood pressure; HOT, Hypertension Optimal Treatment; MAP, mean arterial pressure; MDRD, Modification of Diet in Renal Disease Study; UKPDS, UK Prospective Diabetes Study Group.

Note: The goal MAP of < 92 mm Hg specified in the MDRD trial corresponds to a systolic/diastolic blood pressure of approximately 125/75 mm Hg.

*Adapted from Lea JP, Brown DT, Lipkowitz M, et al. Preventing renal dysfunction in patients with hypertension: Clinical implications for the early AASK trial results. Am J Cardiovasc Drugs 2003; 3(3):193–200.*

As well, chlorthalidone was superior to amlodipine in preventing CHF. In African American patients, the data revealed a greater reduction in systolic blood pressure (4 mm Hg) that was more favorable for chlorthalidone than for lisinopril. As well, this greater reduction in systolic blood pressure appears to account for the decrease in stroke risk observed only in African American patients (RR 1.40, 95% CI 1.17–1.68).[68] Based on these results, the authors concluded that thiazide diuretics are superior in preventing one or more major forms of cardiovascular disease and should be the preferred agent for first-step antihypertensive therapy. However, it should not be overlooked that a majority of patients in ALLHAT, and other major clinical trials[69] (Table 7–3), require multiple agents to lower blood pressure. In other words, monotherapy is usually insufficient to treat hypertension, particularly in African Americans (Table 7–4).

In light of these clinical data and other trials, the Hypertension in African Americans Working (HAAW) Group of the International Society on Hypertension in Blacks (ISHIB) published an evidence-based consensus statement regarding the management of high blood pressure in African Americans[70] (Fig. 7–3). This evidence-based approach is a marked departure from the traditional "stepwise" approach of starting with a drug and titrating up. For the first time, dual therapy was recommended as initial treatment for patients with markedly elevated blood pressure (systolic blood pressure ≥15 mm Hg or diastolic blood pressure ≥10 mm Hg above their target). JNC 7,[65] published shortly afterward, supports a similar approach for all patients with hypertension. It is also of note that in the HAAW/ISHIB document, it was suggested that among the highest risk patients (diabetes, kidney disease) with blood pressures above 145/90 mm Hg, combination therapy should be instituted with a drug that blocks the renin-angiotensin-aldosterone system.

**▶ TABLE 7–4.** Lessons Learned From ALLHAT

- African Americans have a greater benefit in systolic blood pressure reduction (4 mm Hg) with the use of a thiazide-like diuretic than an ACE inhibitor.
- African Americans have a greater reduction in stroke with the use of a thiazide-like diuretic.
- African Americans have a greater reduction in heart failure with the use of a thiazide-like diuretic.
- Thiazide-like diuretics should be a part of every therapeutic regimen to control BP in African Americans, unless contraindicated.
- Multidrug therapy is often needed to achieve usual BP goal (< 140/90 mm Hg).

ALLHAT, Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial; ACE, angiotension-converting enzyme; BP, blood pressure.

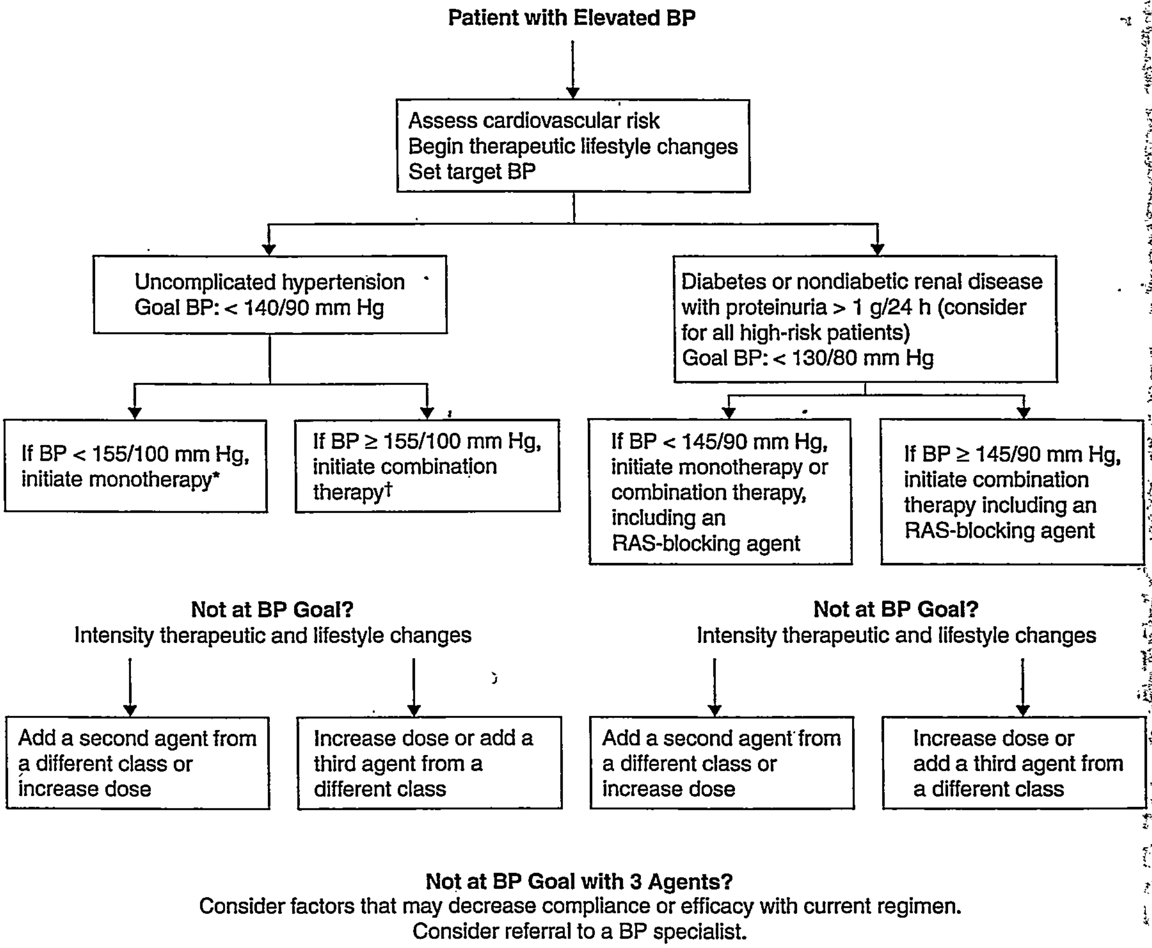

**Figure 7-3.** Clinical algorithm for achieving target BP in African American patients with high blood pressure (BP). (*) Indicates to initiate monotherapy at the recommended starting dose with an agent from any of the following classes: diuretics, β-blockers, calcium channel blockers, angiotensin-converting enzyme (ACE) inhibitors, or angiotensin receptor blockers (ARBs). (†) Indicates to initiate low-dose combination therapy with any of the following combinations: β-blocker and diuretic, ACE inhibitor and diuretic, ACE inhibitor and calcium channel blocker, or ARB and diuretic. (RAS, renin-angiotensin-aldosterone system.) (*Reprinted with permission from Douglas JG, Bakris GL, Murray-Epstein M, et al. Management of high blood pressure in African Americans: Consensus statement of the hypertension in African Americans working group of the International Society on hypertension in Blacks. Arch Intern Med 2003;163(5):525–541*).

## ▶ CLOSING THE RACIAL GAP IN HYPERTENSION AND CARDIOVASCULAR DISEASE

With cardiovascular disease being the leading cause of death in the industrialized world, it is appropriate to examine whether this applies consistently to all racial and ethnic groups, especially in a country as diverse as the United States. It is clear from the numerous data cited in this chapter that this is not true. It seems that ethnic minorities, particularly African Americans, in a multicultural society experience considerable health disparities, as discussed in various chapters of this book. Considerable racial disparities have been reported in the incidence and prevalence of cardiovascular and renal diseases and hypertension. Although genetics have been examined as a possible source of these differences, they account for little of the observed difference between populations.

There is an inverse correlation between poor health and socioeconomic, educational, and psychosocial factors. This has been demonstrated conclusively with cardiovascular and related diseases in African Americans, who have higher morbidity and mortality compared with their white counterparts. Disparity in cardiovascular health is not limited to the diseases themselves, but also to the health care given for these diseases. Therefore, it is not a surprise that health outcomes are considerably worse in minority groups, such as African Americans, than in the majority population.

In this chapter, we presented data to support the disparities in health and health care, along with studies in African Americans indicating that the risk of cardiovascular disease can be reduced by offering the same care and access that is routinely given to the white population. Barriers to such care include stereotyping, bias in diagnosis and treatment, and lack of cultural competence. There was a time in the near past when prominent cardiologists and academicians believed that African Americans had CAD infrequently, if at all. It took the effort of a number of minority medical groups [National Medical Association, ISHIB, Association of Black Cardiologists (ABC)] as well as unbiased researchers and social activists to refute these misconceptions. Thus, we need to supplement the education, and in some cases, retrain certain cardiovascular specialists. Medical students need to learn, early in their careers, to diagnose and to treat cardiovascular, renal, and hypertensive diseases in minorities in a culturally sensitive manner. Finally, health-care providers rendering care to minority patients with cardiovascular risk factors and diseases need to understand the differences in the presentation and clinical course of the disease that may be unique to these patients.

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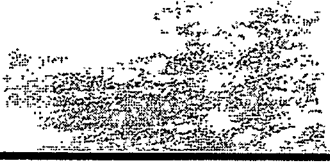

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# The Sullivan Alliance to Transform America's Health Professions

One in four Americans is a member of a racial or ethnic minority group, with Hispanics, African Americans, and American Indians making up more than a quarter of the nation's population. The U.S. Census Bureau predicts that by 2050, the majority of Americans will be black, Asian, Native American, or Hispanic. In some cities and states, they already represent a majority of the population.

But health care for many Americans in these racial and ethnic groups has not sufficiently improved in our increasingly diverse society. In too many cases, race or ethnicity still determine health status, access to health care, and health outcomes. In its report, the Sullivan Commission described the current situation: "...too many Americans are suffering life or death consequences... the time is right and our citizens are anxious for action."

Under the leadership of Dr. Louis W. Sullivan, former U.S. Secretary of Health and Human Services, and Dr. Lonnie R. Bristow, former president of the American Medical Association, the Sullivan Alliance to Transform America's Health Professions was established to increase diversity in the health professions in order to help reduce racial and ethnic health disparities. In partnership with the Health Policy Institute of the Joint Center for Political and Economic Studies, the Alliance is comprised of 28 members

The Alliance is comprised of former members of the Institute of Medicine (IOM) Committee on Institutional and Policy-Level Strategies for Increasing the Diversity of the U.S. Health Care Workforce and The Sullivan Commission on Diversity in the Healthcare Workforce. In 2004, the IOM Committee and the Sullivan Commission completed their work and issued the following reports, respectively: In the Nation's Compelling Interest: Ensuring Diversity in the Healthcare Workforce and Missing Persons: Minorities in the Health Professions. Together, the IOM and Sullivan Commission reports, including their 62 recommendations for action, offer the nation a comprehensive blueprint for achieving diversity and ensuring cultural competency among our nation's health professionals.

Drawing on the experience and expertise of leading health, business, community, education, and legal experts, the Alliance is harnessing the momentum created by the reports and acting on initiatives focused on the implementation of the recommendations. Through strong leadership, deep commitment, and sustainable efforts, the Sullivan Alliance aims to transform the health professions and narrow the gaps in health status and access to health care that continue to leave too many Americans at risk.

# Addressing Racial and Ethnic Disparities in He Care

## Fact Sheet

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The overall health of the American population has improved over the past few decades, but all Americans have not shared equally in these improvements. Among nonelderly adults, for example, 17 percent of Hispanic, and 16 percent of black Americans report they are in only fair or poor health, compared with 10 percent of white Americans.

How much do differences in the health care that people receive contribute to disparities in health? What strategies can overcome these differences in care? These are questions for health services research, and ones that researchers supported by the Agency for Healthcare Research and Quality (AHRQ, formerly the Agency for Health Care Policy and Research) have begun to address.

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## Identifying Disparities in Care

### Access to Primary Care

Primary care is the underpinning of the health care system, and research studies have shown that having a usual source of care raises the chance that people receive adequate preventive care and other important health services. Data from AHRQ's Medical Expenditure Panel Survey (MEPS) reveal that:

- About 30 percent of Hispanic and 20 percent of black Americans lack a usual source of health care compared with less than 16 percent of whites.
- Hispanic children are nearly three times as likely as non-Hispanic white children to have no usual source of health care.
- African Americans and Hispanic Americans are far more likely to rely on hospitals or clinics for their usual source of care than are white Americans (16 and 13 percent, respectively, v. 8 percent).

### Diagnosis and Treatment

Race and ethnicity influence a patient's chance of receiving many specific procedures and treatments. Of nine hospital procedures investigated in one study, five were significantly less common among African American patients than among white patients; three of those five were also less common among Hispanics, and two were less common among Asian Americans. Other AHRQ-supported studies have revealed additional disparities in patient care for various conditions and care settings including

- Heart disease. African Americans are 13 percent less likely to undergo coronary angioplasty and one-third less likely to undergo bypass surgery than are whites.
- Asthma. Among preschool children hospitalized for asthma, only 7 percent of black and 2 percent of

Hispanic children, compared with 21 percent of white children, are prescribed routine medications to prevent future asthma-related hospitalizations.

- Breast cancer. The length of time between an abnormal screening mammogram and the followup diagnostic test to determine whether a woman has breast cancer is more than twice as long in Asian American, black, and Hispanic women as in white women.
- **Human immunodeficiency virus (HIV) infection.** African Americans with HIV infection are less likely to be on antiretroviral therapy, less likely to receive prophylaxis for *Pneumocystis* pneumonia, and less likely to be receiving protease inhibitors than other persons with HIV. An HIV infection data coordinating center, now under development, will allow researchers to compare contemporary data on HIV care to examine whether disparities in care among groups are being addressed and to identify any new patterns in treatment that arise.
- **Nursing home care.** Asian American, Hispanic, and African American residents of nursing homes are all far less likely than white residents to have sensory and communication aids, such as glasses and hearing aids. A new study of nursing home care is developing measures of disparities in this care setting and their relationship to quality of care.

Identifying that disparities in care exist is important, but it is not enough. Now, researchers are also beginning to focus on why these disparities exist, which disparities actually indicate poor-quality care, and how to develop strategies to address them.

## Looking Beyond Income and Insurance

Disparities in health care are often ascribed to differences in income and access to insurance. Research has shown these to be important, but by no means the only factors. For instance, the proportion of Hispanic Americans with a usual source of care has declined substantially over the past decade (from 80 percent in 1986 to 70 percent in 1996). Insurance coverage has also declined, and the lack of insurance in some groups is dramatic (among Hispanic men, for instance, 37 percent have no health insurance). Nonetheless, declines in insurance coverage explained only one-fifth of the change in access to a usual source of care.

In another recent study, AHRQ-funded researchers in Boston examined the quality of care provided to hospital patients with congestive heart failure or pneumonia. Quality of care was measured both by physician review and by adherence to standards of care. The researchers found no difference in quality of care for patients from poor communities compared with other patients, after adjusting for other factors. They did find, however, that African American patients received a lower quality of care than white patients.

### Physician Decisionmaking

A small study of physicians' decisions about whether to refer patients for cardiac catheterization, a diagnostic procedure for heart disease, provides supportive evidence that factors other than insurance and income can influence the quality of care people get. This study, which used actors portraying similar economic backgrounds, found that black women were significantly less likely than white men to be recommended for referral, despite reporting the same symptoms. (Differences between other groups studied were not statistically significant.)

### Hospital Characteristics

In the Boston study of the quality of care, quality for African American patients was lower in nonteaching than in teaching hospitals. In another study, white patients were more likely than Hispanic and African American patients to receive invasive cardiac procedures in hospitals performing a high volume of such procedures, a factor strongly associated with the quality of cardiac care.

### Cultural and Communication Barriers

Adding to the increasing evidence of cultural expectations, assumptions, and language as factors affecting the quality of care, an ongoing study by AHRQ-supported researchers in San Francisco is surveying African American, Hispanic, and white patients to examine how interpersonal processes—the way patients and clinicians interact—affect the health care that patients get and the outcomes of their care.

## Translating Research Into Practice

### Supporting Evidence-based Decisionmaking

One way to begin to address disparities in the quality of care is to improve clinicians' abilities to apply the results of previous research to minority patients whenever relevant research exists. AHRQ supports tools such as the National Guideline Clearinghouse™ (http://www.guideline.gov) to give clinicians and other health decisionmakers better access to evidence-based information about diagnosis and treatment.

### Helping Patients Pursue High-quality Care

To support patient decisionmaking, AHRQ researchers and staff have developed numerous Spanish-language publications, including Spanish versions of:

- Consumer Assessment of Health Plans (CAHPS®). The CAHPS® questionnaire provides survey-based assessments of consumers' satisfaction with their care and helps people select among health plans.
- Put Prevention Into Practice *Personal Health Guide* and *Child Health Guide*. These patient booklets help people track whether they or their children have received recommended preventive services.

### Developing Better Strategies for Quality Improvement

AHRQ is currently supporting several research initiatives to develop new tools for improving the quality of care and new strategies providers can use to help them incorporate evidence into everyday practice. Several of these initiatives place a special emphasis on supporting research that can help address racial and ethnic disparities in health. In fiscal year 1999, AHRQ directed approximately $2 million towards this specific objective. In fiscal year 2000, this investment is expected to increase by $10 million, including:

- Funding for "centers of excellence" to develop practical tools in eliminating racial and ethnic disparities.
- Supporting research that involves partnerships between academic researchers and health care providers who serve predominantly minority communities.
- Supporting training for minority health services researchers to address the priorities identified in the President's Initiative to Eliminate Racial and Ethnic Disparities in Health.

Through such research, AHRQ can help close the gap between what we know and what we can do to address these disparities.

*AHRQ Publication No. 00-PO41*
*Current as of February 2000*

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# Disparities/Minority Health

## Blacks are more likely than whites and Hispanics to die following cardiovascular procedures, despite hospital experience

Black and Hispanic patients are more likely to undergo cardiovascular procedures in hospitals that perform a low volume of such procedures, and these hospitals usually have poorer outcomes than high-volume hospitals with more expertise. However, a new study shows that even after adjusting for differences in hospital volume, black patients were more likely than Hispanic and white patients to die after undergoing cardiovascular procedures. These findings suggest that hospital characteristics other than the number of procedures performed, such as financial resources, provider staffing, and availability of ancillary services, may be different in hospitals providing care to large numbers of minority patients.

Researchers, supported in part by the Agency for Healthcare Research and Quality (T32 HS00020), examined racial and ethnic differences in postoperative mortality for 719,679 hospitalizations for 4 cardiovascular procedures: cardiac artery bypass grafting (CABG), percutaneous transluminal coronary angioplasty (PTCA), abdominal aortic aneurysm (AAA) repair, and carotid endarterectomy (CEA). They used 1998 to 2001 data from the Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project.

Blacks had nearly twice the risk of dying than whites after elective AAA repair, 19 percent greater risk after CABG, and nearly twice the risk after CEA, but did not have any greater risk of dying after PTCA. Hispanic patients were at no greater risk of dying after these procedures than whites. Both blacks and Hispanics had higher rates of urgent and emergency (rather than elective) AAA repair. This suggests inadequate screening or delayed referrals for surgery among Hispanic and black patients with aortic aneurysms.

More details are in "Impact of hospital volume on racial disparities in cardiovascular procedure mortality," by Amal N. Trivedi, M.D., M.P.H., Thomas D. Sequist, M.D., M.P.H., and John Z. Ayanian, M.D., M.P.P., in the January 17, 2006, *Journal of the American College of Cardiology* 47(2), pp. 417-424.

# Minority Health

## Death rates for cardiovascular disease are higher among American Indians and Alaska Natives than other U.S. groups

National vital event data published by the Indian Health Service (IHS) prior to the early 1990s suggest that cardiovascular disease (CVD) mortality rates (for example, for heart attack and stroke) are lower for American Indians and Alaska Natives (AIAN). This finding is somewhat puzzling, given that American Indians have for years had some of the Nation's highest rates of major CVD risk factors, such as smoking, diabetes, and obesity.

In a recent study, Dorothy A. Rhoades, M.D., M.P.H., of the University of Colorado Health Sciences Center, adjusted for racial misclassification in the IHS data (something that was not done by the IHS until the early 1990s) and concluded quite the opposite. She found that AIAN have higher CVD mortality rates than the rest of the U.S. population, and these rates may have been higher for more than a decade.

Furthermore, CVD mortality is increasing among AIAN but decreasing in the general population widening a previously unrecognized disparity, notes Dr. Rhoades. She used IHS vital event data to compare trends in CVD mortality from 1989-1991 to 1996-1998 among three U.S. population groups: AIAN, all races, and whites.

After adjusting for age and racial misclassification, by 1996-1998, the number of CVD deaths per 100,000 among AIAN was 195.9 compared with 166.1 and 159.1 for all races and whites, respectively. The annual percent change in CVD mortality for AIAN was 0.5, a slight increase, compared with -1.8, a decline, in the other groups. The most striking and widening disparities were found for middle-aged AIAN, but CVD mortality among elderly AIAN was lower than in the other groups. Efforts to reduce CVD mortality in AIAN must begin before the onset of middle age, concludes Dr. Rhoades. Her work was supported in part by the Agency for Healthcare Research and Quality (HS10854).

See "Racial misclassification and disparities in cardiovascular disease among American Indians and Alaska Natives," by Dr. Rhoades, in the March 15, 2005, *Circulation* 111, pp. 1250-1256.

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# High Blood Pressure

**AHA Recommendation**

High blood pressure, or hypertension, is defined in an adult as a systolic pressure of 140 mm Hg or higher and/or a diastolic pressure of 90 mm Hg or higher. Blood pressure is measured in millimeters of mercury (mm Hg).

| **Blood pressure (mm Hg)** | **Normal** | **Prehypertension** | **Hypertension** |
|---|---|---|---|
| Systolic (top number) | less than 120 | 120–139 | 140 or higher |
| Diastolic (bottom number) | less than 80 | 80–89 | 90 or higher |

*mm Hg = millimeters of mercury*

**High blood pressure directly increases the risk of coronary heart disease (which leads to heart attack) and stroke, especially along with other risk factors.**

High blood pressure can occur in children or adults. It's particularly prevalent in African Americans, middle-aged and elderly people, obese people and heavy drinkers. People with diabetes mellitus, gout or kidney disease have hypertension more often.

High blood pressure usually has no symptoms. It's truly a "silent killer." But a simple, quick, painless test can detect it.

**Related AHA Scientific Statements:**
Hypertension

**Related AHA publications:**

- Heart and Stroke Facts
- Understanding and Controlling Your High Blood Pressure (also in Spanish)
- Shaking Your Salt Habit
- Know the Facts, Get the Stats
- Managing Your Weight (also in Spanish)
- High Blood Pressure in African Americans
- Six Steps to a Healthier Heart
- High Blood Pressure and Stroke
- "What Is High Blood Pressure?" and "How Can I Reduce High Blood Pressure?" in Answers By Heart kit (also in Spanish kit)
- "What Is High Blood Pressure Medicine?", "Why Should I Limit Sodium?" and "How Can I Monitor My Weight and Blood Pressure?" in Answers By Heart kit

**See also:**

Blood Pressure
Blood Pressure -- Buying and Caring for Home Equipment
Blood Pressure Levels
Blood Pressure Testing and Measurement
Diabetes Mellitus
Heart Attack
High Blood Pressure Causes
High Blood Pressure in Children

High Blood Pressure, Factors That Contribute To
High Blood Pressure Statistics
High Blood Pressure, What Can Be Done
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# Mortality After Acute Myocardial Infarction in Hospitals That Disproportionately Treat Black Patients

Jonathan Skinner, Amitabh Chandra, Douglas Staiger, Julie Lee and Mark McClellan

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**Epidemiology**

# Mortality After Acute Myocardial Infarction in Hospitals That Disproportionately Treat Black Patients

Jonathan Skinner, PhD; Amitabh Chandra, PhD; Douglas Staiger, PhD;
Julie Lee, PhD; Mark McClellan, MD, MPA, PhD

*Background*—African Americans are more likely to be seen by physicians with less clinical training or to be treated at hospitals with longer average times to acute reperfusion therapies. Less is known about differences in health outcomes. This report compares risk-adjusted mortality after acute myocardial infarction (AMI) between US hospitals with high and low fractions of elderly black AMI patients.

*Methods and Results*—A prospective cohort study was performed for fee-for-service Medicare patients hospitalized for AMI during 1997 to 2001 (n=1 136 736). Hospitals (n=4289) were classified into approximate deciles depending on the extent to which the hospital served the black population. Decile 1 (12.5% of AMI patients) included hospitals without any black AMI admissions during 1997 to 2001. Decile 10 (10% of AMI patients) included hospitals with the highest fraction of black AMI patients (33.6%). The main outcome measures were 90-day and 30-day mortality after AMI. Patients admitted to hospitals disproportionately serving blacks experienced no greater level of morbidities or severity of the infarction, yet hospitals in decile 10 experienced a risk-adjusted 90-day mortality rate of 23.7% (95% CI 23.2% to 24.2%) compared with 20.1% (95% CI 19.7% to 20.4%) in decile 1 hospitals. Differences in outcomes between hospitals were not explained by income, hospital ownership status, hospital volume, census region, urban status, or hospital surgical treatment intensity.

*Conclusions*—Risk-adjusted mortality after AMI is significantly higher in US hospitals that disproportionately serve blacks. A reduction in overall mortality at these hospitals could dramatically reduce black-white disparities in healthcare outcomes. (*Circulation.* **2005;112:2634-2641.**)

**Key Words:** death, sudden ■ myocardial infarction ■ hospitals ■ outcomes ■ race

The Institute of Medicine study on racial disparities in health and health care has documented the sharp differences in the treatment of diseases for blacks, particularly for cardiovascular diseases.[1-24] Less well understood is the mechanism generating disparities in health outcome. Do physicians or hospitals provide poorer quality care to their black patients compared with their white patients? Or are black patients more likely to be treated by a physician or hospital where all patients receive lower-quality care, regardless of race?[25-27] The importance of the latter hypothesis has been demonstrated recently in studies showing blacks are more likely to be seen by physicians with less clinical training than those treating whites[28] and to be treated at hospitals with higher risk-adjusted surgical mortality and lower rates of evidence-based treatments and protocols.[29-33] However, the association between the racial composition of hospitals and health outcomes such as mortality is not known.

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The present study compares outcomes, measured by 90-day and 30-day adjusted mortality rates after acute myocardial infarction (AMI), for hospitals that disproportionately treat black patients relative to those that do not. To address this question, we drew on a nearly 100% sample of fee-for-service Medicare patients with an index AMI between January 1997 and September 2001, comprising 1.14 million individuals. We measured the percentage of all AMI patients in a hospital who were black and categorized hospitals into 10 approximate deciles ranked by the extent to which a hospital served the black community. Risk-adjusted mortality was examined across these deciles, under the hypothesis that hospitals with a large share of black patients were different from hospitals with a smaller (or zero) share. The importance of factors such as income, hospital ownership, surgical

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From the Center for Evaluative Clinical Sciences (J.S., A.C.), Dartmouth Medical School, Hanover, NH; Department of Economics (J.S., A.C., D.S.), Dartmouth College, Hanover, NH; National Bureau of Economics Research (J.S., A.C., D.S.), Cambridge, Mass; Congressional Budget Office (J.L.), Washington, DC; and Center for Health Policy and Center for Primary Care and Outcomes Research (M.M.), Stanford University School of Medicine, Palo Alto, Calif

The views expressed in this report are those of the authors and should not be interpreted as those of either the Congressional Budget Office or the Centers for Medicare and Medicaid Services.

Correspondence to Jonathan Skinner, Center for Evaluative Clinical Sciences, Dartmouth Medical School, HB 7251 Hanover, NH 03755. E-mail jonathan.skinner@dartmouth.edu

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treatment intensity, racial composition, region, and unmeasured health status was considered separately, with each factor as a potential confounder.

## Methods

### Data

The primary data set was a longitudinal sample from the 100% Medicare fee-for-service population hospitalized for AMI between January 1997 and September 2001. The criterion for determining the presence of AMI from the claims was a primary diagnosis code of AMI (41000–41091) without evidence of an old myocardial infarction. Federal hospitals were excluded. The initial sample with valid provider and location identification comprised 1 254 786 individuals. Patients were assigned to their hospital of initial admission for heart disease treatment, even if the patient was later treated at another hospital. Using information from the Medicare Denominator File, the race of each patient was determined as black, other (which includes Hispanic identification), or the residual group, which we denote as "white." Because of concerns about the statistical power required to discern outcome differences and the low sensitivity of Hispanic responses,[34] we exclude respondents in the "other" category (n=42 200), which left 2 groups, black and white. There is a very strong correlation between black racial measures in the Medicare claims data and self-reported racial identity.[34]

Observations were excluded if there was evidence from claims data of a previous myocardial infarction (n=54 357) or if patients enrolled in a health maintenance organization during the calendar year after the AMI index event (n=17 160). (Patients enrolled in a risk-bearing health maintenance organization at the time of the AMI were not in this sample because there was no record of the AMI on the claims data.) Additional criteria for exclusion were the inability to match the patient's zip code to the patient's region of residence (n=114), lack of valid income data for that zip code (n=2819), and hospitals with fewer than 10 AMIs over the entire period of analysis (n=1400), which left a sample of 1 136 736.

This sample was used to calculate the percentage of all AMI patients in a hospital who were black. We then created approximate deciles of this measure to provide a summary measure of the extent to which a hospital serves the black community. The lowest "decile" comprised the 12.5% of patients admitted to hospitals without any black AMI patients during the period 1997 to 2001. The use of this slightly larger grouping avoided the need to split the sample in an arbitrary way. Decile 2 is attenuated as a result, so that the bottom 2 groups constitute one fifth of the sample. The remaining deciles are defined conventionally. Patient counts in each of these higher deciles were not exactly 10% because patients in a given hospital were retained in the same decile category.

### Measuring Healthcare Outcomes

The primary measure of outcomes was risk-adjusted 90-day mortality rate. Although risk-adjusted 30-day mortality rates are also presented, we favor 90-day rates because they are less likely to penalize hospitals with high rates of revascularization and subsequent operative mortality. Previous uses of these outcome data have been described elsewhere.[35–38] As noted by previous studies, measures of hospital performance that use patient outcome data can be biased by differences across hospitals in the average severity of disease.[39] However, measures of risk-adjusted AMI mortality have been shown to be valid indicators of hospital quality and have been incorporated into hospital profiling efforts, for example, those developed by the Agency for Healthcare Research and Quality.[40]

Flexible quadratic age and gender interaction terms (age, age$^2$, sex, age×sex, and age$^2$×sex) were included in all analyses. As well, the following disease categories were entered separately as categorical variables: vascular disease, dementia, renal disease, pulmonary disease, diabetes (with and without complications), liver disease (with and without complications), and cancer (nonmetastatic and metastatic). Also included were year categorical variables (with the year 2001 being the reference year) and categorical variables that indicated the severity of the AMI, whether anterior, inferior, subendocardial, or a reference "other" category.

### Analysis

Multivariable logistic regression models were estimated for risk-adjusted 90-day (and 30-day) mortality across the deciles of the percentage of black patients in each hospital. In each model reported here, standard errors were clustered at the hospital level, and all statistical analysis was performed with STATA version 8.0.[41] We wish to facilitate exposition and to avoid misinterpreting ORs as relative risks when the underlying event is not rare,[42] and so we report expected probabilities rather than ORs. We used the ADJUST command in STATA, which sets all covariates to their mean values and then "turns on" each of the decile categorical variables in turn. For each decile, an estimate and CI was calculated in log-ORs; these were then converted into probability units. This was the expected mortality rate (and CI) for a representative patient, one with average risk characteristics.

### Potential Explanations for Differences in Risk-Adjusted Mortality Outcome Measures

We examined the role of 6 observable factors that might explain differences in hospital-level mortality outcomes. The first was that the different racial composition of the deciles could lead to unmeasured confounding if black patients exhibited higher rates of mortality even after adjustment for risk factors. We addressed this hypothesis in 2 ways. The first was to estimate the logistic model with race-decile interaction terms, which allowed for 2 separate mortality gradients, one for black and the other for white AMI patients. The disadvantage of this approach is that there were very few black AMI patients in the lower deciles, with a corresponding deficiency in statistical power. We therefore combined deciles 2 to 6 into 1 group that comprised 11.4% of black patients and 39.8% of white patients. The second approach was to estimate a logistic model separately for black and white patients, but with a single variable, the percentage of black AMI patients in the hospital (a hospital-level variable), to test for a linear race-specific gradient in the logistic regression.

Second, hospitals that admitted black AMI patients have been shown to be less likely to perform surgical interventions.[3–19,43] To capture these effects, hospital-specific rates of CABG and percutaneous coronary interventions in the sample were included in 1 specification of the regression. Third, hospitals may differ with respect to average volume of treatment.[30,44–46] The hospital-specific AMI volume was therefore included as an additional explanatory variable. Fourth, the ownership status of hospitals could confound racial effects if black patients were more likely to be admitted to government hospitals. We therefore used indicator variables to adjust for the teaching and ownership status of the hospital (government [non-Federal], not-for-profit, and for-profit). As noted by others, these variables are markers for multiple competing factors[47] and should not be interpreted as measuring the effect of ownership, volume, or treatment intensity per se.

Fifth, there may be systematic differences in income levels across regions, and so we adjusted by median household income by zip code from the 2000 US census. Finally, we adjusted for location of residence using the 4 US census regions and whether the individual lived in an urban area. We note that adjusting for geography can lead to underestimates (or overestimates) of true racial disparities.[27] If a large fraction of blacks live in the South, then adjusting for Southern residence automatically removes 1 factor (average mortality differences between Southern and non-Southern hospitals) that can explain overall racial disparities in outcomes.

Unmeasured confounding factors could bias estimates. Specifically, if patients seen in hospitals that disproportionately treated blacks experienced a higher prevalence of comorbidities not observed in the data, we would spuriously attribute elevated mortality rates to such hospitals. To examine this hypothesis, we constructed an index of disease severity, as proxied by observed comorbidities and the location of the infarct. This index was estimated with a

**TABLE 1. Characteristics of AMI Patients and Hospitals by Average Percentage of Black AMI Patients in the Admitting Hospital**

| Deciles of Percentage of Black Patients in Hospital | Average Percentage of Patients Who Are Black, % | Range (Minimum–Maximum), % | No. of Hospitals | Percent of Patients in an Urban Area, % | Percent of Patients in the South, % | No. of Patients |
|---|---|---|---|---|---|---|
| Lowest decile | 0.0 | 0–0 | 1369 | 24.0 | 12.5 | 142 666 |
| 2nd | 0.3 | 0.0–0.4 | 162 | 40.1 | 9.7 | 84 971 |
| 3rd | 0.7 | 0.4–0.9 | 276 | 47.8 | 21.3 | 113 853 |
| 4th | 1.4 | 0.9–1.8 | 342 | 43.9 | 29.8 | 113 526 |
| 5th | 2.2 | 1.8–2.8 | 287 | 48.4 | 36.9 | 113 769 |
| 6th | 3.4 | 2.8–4.2 | 291 | 43.9 | 38.3 | 112 265 |
| 7th | 5.2 | 4.2–6.4 | 326 | 41.2 | 39.9 | 114 056 |
| 8th | 8.2 | 6.4–10.4 | 337 | 43.6 | 51.2 | 114 348 |
| 9th | 14.2 | 10.4–19.4 | 358 | 43.8 | 71.6 | 114 686 |
| Highest decile | 33.6 | 19.5–98.6 | 541 | 35.2 | 68.9 | 115 596 |
| Total | 6.9 | 0.0–98.6 | 4289 | 40.8 | 38.0 | 1 136 736 |

Based on AMI index events from January 1, 1997, to September 30, 2001, for beneficiaries enrolled in fee-for-service Medicare. In calculating averages, each hospital is weighted by the number of patients treated over the study period. Urban areas are defined as counties that are classified as being part of a Metropolitan Statistical Area. States are classified as being in the South or West using US Census Bureau definitions for these regions. All differences across deciles are jointly significant at the $P<0.001$ level.

logistic regression that predicts 90-day mortality and included race, age, sex, all measured comorbidities, and the severity of the AMI. Differences in the severity of the comorbidities and location of the AMI generate variation in the index of predicted mortality and are presented by hospital racial decile in terms of predicted 90-day mortality. When there are no differences across hospital deciles in the comorbidity index, the role for unmeasured confounding variables to bias estimates is circumscribed, because confounding variables tend to be correlated with one another; smokers (an unmeasured variable), for example, tend to have lower incomes and are more likely to present with chronic obstructive pulmonary disease or cancer (measured variables). The finding that the measured variables are unassociated with hospital deciles therefore reduces the likelihood that the unmeasured (correlated) covariates are positively associated with hospital deciles.[48]

## Results

Table 1 presents summary statistics for fee-for-service Medicare beneficiaries who were treated for AMI between January 1, 1997, and September 30, 2001. The table illustrates the construction of the deciles used in the analysis. The average Medicare AMI patient was treated in a hospital at which 6.9% of the patients were black. The bottom "decile" accounted for 12.5% of the population who were admitted to 1369 hospitals (comprising 32% of all hospitals) that saw no black AMI patients over the duration of the study period. These hospitals constitute decile 1 (the lowest decile) of percentage of black patients in the hospital. On the other end of the spectrum, 33.6% of patients in decile 10 hospitals were black. Patients admitted to hospitals with the highest fraction of black patients were more likely to live in the South and less likely to live in an urban setting. Differences across the deciles were significant statistically ($P<0.001$).

There was large variation in ownership status and treatment intensity between hospitals based on the extent to which they treated the black population (Table 2). Relative to the hospital at which the average AMI patient was treated, hospitals that disproportionately treat blacks were more likely to be teaching hospitals, more likely to be government (non-Federal), and less likely to be not for profit. These hospitals were similar in terms of CABG and PTCA intensity but have lower AMI volume. All differences across the deciles were highly significant statistically ($P<0.001$).

With the exception of hospitals that treated no blacks, the distribution of comorbidities and severity of the AMI across hospitals (adjusted for age, race, and sex) was similar (Figure 1). In decile 2 hospitals (where only 0.3% of patients were black), the index of predicted 90-day mortality based solely on comorbidities and severity of the AMI was 22.2% (95% CI 22.1% to 22.3%). It was 22.1% (95% CI 22.0% to 22.2%) and 22.0% (95% CI 21.9% to 22.1%) for hospitals in deciles 9 and 10, respectively. The noticeable exception to the similarity in comorbidities across deciles of percentage of black patients was seen for patients in decile 1 hospitals. These patients, all of whom were white, had predicted 90-day mortality of 23.7% (95% CI 23.6% to 23.8%), 7% higher than the expected mortality in the other deciles. Although not reported in Table 1, the elevated mortality in decile 1 was attributable largely to the elevated prevalence of renal failure (2.9% in this decile compared with 2.2% for other deciles; $P<0.001$) and a lower likelihood of being diagnosed with a subendocardial infarction (39.0% versus 49.0% for other deciles; $P<0.001$).

Figure 2 illustrates risk-adjusted 90-day mortality across hospital deciles. Hospitals that had a greater share of black AMI patients had substantially higher risk-adjusted mortality Even though patients in decile 1 hospitals were the sickest (as measured by the index of comorbidities), they experienced the lowest risk-adjusted mortality after AMI. Figure 2 presents results from 2 models. In the first, outcomes were adjusted for age, race, sex, and comorbidities. In the second, we further adjusted for income, hospital ownership, region, and treatment characteristics. The 2 models yielded similar results, which suggests that the hospital characteristics and income were not significant explanatory variables once we

**TABLE 2. Hospital Ownership Characteristics and Hospital Treatment Characteristics by Average Percentage of Black AMI Patients in the Admitting Hospital**

| | Hospital Teaching and Ownership Status, % | | | | Hospital Treatment Characteristics | | |
|---|---|---|---|---|---|---|---|
| Percentage of Black Patients in Hospital (Deciles) | Teaching | Government Non-Federal | Not For Profit | For Profit | Average CABG Rate After AMI, % | Average PTCA Rate After AMI, % | Annual AMI Volume |
| Lowest | 3 | 18 | 76 | 7 | 9 | 16 | 48 |
| 2 | 7 | 6 | 91 | 3 | 12 | 25 | 143 |
| 3 | 8 | 7 | 77 | 15 | 12 | 22 | 139 |
| 4 | 8 | 9 | 82 | 9 | 11 | 21 | 117 |
| 5 | 16 | 8 | 81 | 11 | 13 | 23 | 154 |
| 6 | 15 | 7 | 83 | 11 | 13 | 24 | 154 |
| 7 | 23 | 8 | 80 | 13 | 12 | 23 | 152 |
| 8 | 28 | 14 | 74 | 12 | 12 | 23 | 143 |
| 9 | 20 | 17 | 70 | 13 | 12 | 23 | 129 |
| Highest | 30 | 17 | 70 | 13 | 11 | 20 | 107 |
| Average | 16 | 11 | 78 | 11 | 12 | 22 | 126 |

Based on AMI index events from January 1, 1997, to September 30, 2001, for beneficiaries enrolled in fee-for-service Medicare. Each hospital is weighted by the number of patients treated over the study period. Annual AMI Volume is the average number of patients aged at least 65 years in the Medicare program admitted to the hospital for AMI. All differences across deciles are jointly significant at the $P<0.001$ level.

had adjusted for comorbidities. The area under the receiver operator curve was 0.679 for the first model and 0.681 for the second.

Figure 3 presents estimated adjusted mortality separately by race. Because of the small number of black AMI patients in deciles 2 to 6, these deciles were combined to improve statistical power in estimating race-specific adjusted mortality. Estimated mortality for blacks in decile 10 hospitals was significantly higher than for decile 2 to 6 hospitals ($P=0.04$). The difference between black and white adjusted mortality rates was not significant within each hospital decile, but a joint test of significance rejected the null hypothesis of equality ($P<0.001$). For the logistic regressions estimated separately for white and black AMI patients, the mortality gradient (by fraction of black admissions to the hospital) was significant for both white ($P<0.001$) and black ($P=0.007$) patients.

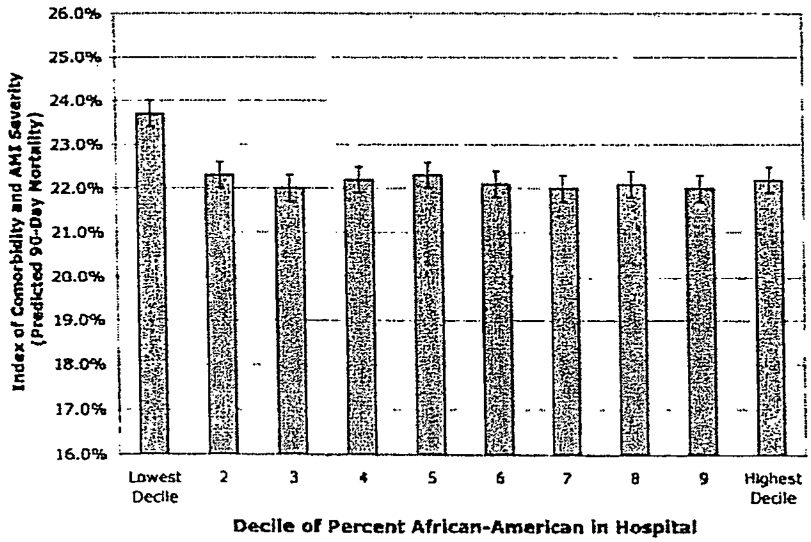

Figure 1. Index of comorbidity and AMI severity by average percentage of black AMI patients admitted to the hospital. The graph reports the average index of comorbidity and AMI severity by hospital decile according to the average percentage of black AMI patients admitted to that hospital. Multiple indicators for severity were used: the presence of vascular disease, pulmonary disease, dementia, diabetes, renal failure, or cancer, and the location of the infarct (anterior, inferior, subendocardial, or other). These indicators were combined into 1 index with the coefficients from a prediction model for 90-day mortality used as weights. Thus, the index predicts 90-day mortality based on comorbidities and severity of the AMI, after adjustment for age, gender, and race. This index was intended to test the hypothesis that AMI patients are sicker in hospitals that disproportionately admit blacks. The graph indicates that this hypothesis was rejected; indeed those patients admitted to the lowest decile (no black admissions) experienced elevated risk factors.

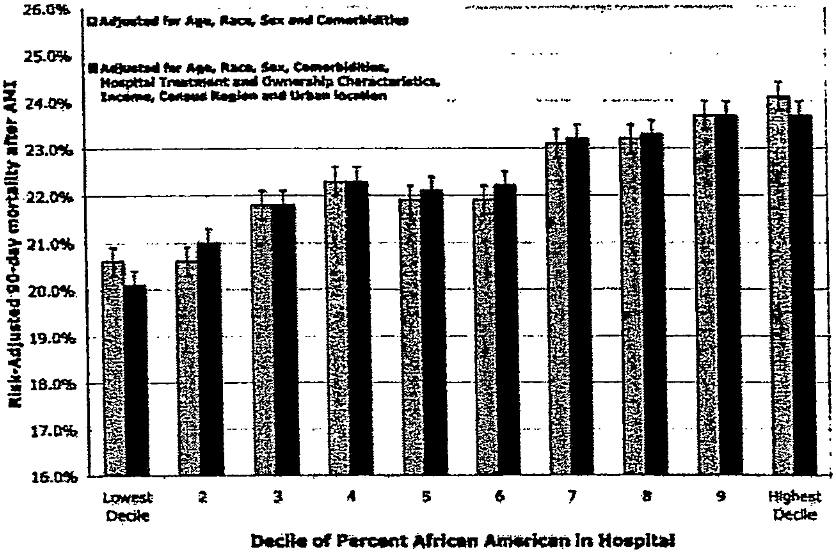

Figure 2. Risk-adjusted 90-day mortality after AMI by the average percentage of black AMI patients admitted to the hospital. The graph reports 90-day mortality after adjustment for age, gender, race, comorbidities, and location of the infarct (anterior, inferior, subendocardial, or other). Comorbidities included presence of vascular disease, pulmonary disease, dementia, diabetes, renal failure, and cancer. Hospital ownership and treatment characteristics are listed in Table 2 and included teaching hospital, government non-Federal ownership, nongovernmental not-for-profit ownership, investor-owned (for-profit), hospital PTCA and CABG rates, and annual AMI volume. Income refers to beneficiary's zip code income. Region refers to the 4 US census regions. A joint test of the importance of hospitals deciles was significant at the $P<0.001$ level.

We obtained similar results regarding the association between hospital deciles and mortality using 30-day mortality. In these models, which also adjusted for age, race, gender, comorbidities, hospital teaching status, region, ownership, and treatment intensity, 30-day mortality in decile 1 hospitals was 14.9% (95% CI 14.6% to 15.2%), in decile 2 15.6% (95% CI 15.2% to 16.1%), and in decile 10 17.6% (95% CI 17.2% to 18.0%). With these estimates, hospitals in decile 10 experienced 18% higher mortality relative to decile 1 hospitals; however, 30-day mortality within hospitals was not significantly higher among black patients.

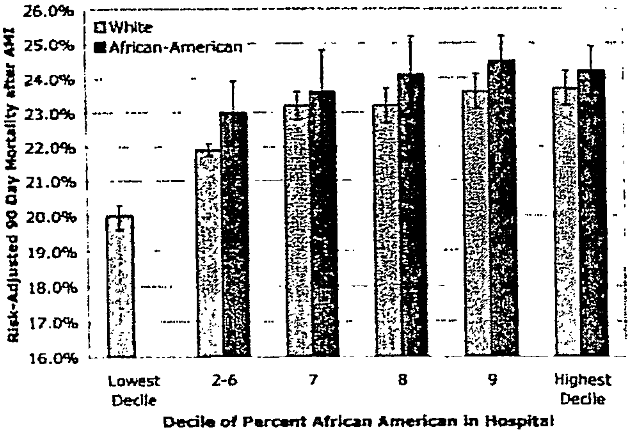

Figure 3. Risk-adjusted 90-day mortality after AMI by race and average percentage of black AMI patients admitted to the hospital. This regression included all covariates described in the legend for Figure 2, but with black and white hospital decile effects allowed to differ To improve statistical power, deciles 2 to 6, which together constituted 11% of the black AMI sample, were combined.

Any potential burdens of higher mortality risk in hospitals that serve blacks was borne disproportionately by black patients, because a large fraction of this population was seen in the hospitals that comprised decile 9 and decile 10 hospitals. As Figure 4 shows, nearly half of blacks were seen in decile 10 hospitals, which were those with among the highest risk-adjusted mortality. Sixty-nine percent of black patients were seen in the 21% of hospitals that constituted decile 9 and 10 hospitals.

## Discussion

Risk-adjusted mortality after AMI was significantly higher in hospitals that disproportionately served blacks, and this result held even after adjustment for a variety of potential confounding factors. The results of the present study may appear inconsistent with those in the study by Kahn et al,[49] who found that blacks with a variety of clinical conditions were more likely to be admitted to higher-quality urban teaching hospitals. However, their study used a different time period (1981–1986), and their sample was limited to 5 states. More recently, several studies have noted that black patients are treated by physicians with less clinical training,[28] referred to lower-quality cardiac surgeons,[50] and treated at hospitals with higher risk-adjusted surgical mortality.[30] Other studies have also found a negative association between the fraction of blacks admitted to the hospital and the use of emerging medical technologies[33] and favorable birth outcomes.[51,52]

Within hospitals, 90-day mortality rates for blacks were somewhat higher than for whites. These results contrast with most studies using data from earlier periods that generally have not found elevated mortality risks among black AMI patients.[6,12,13,20,49,53,54] More recent studies, however, have

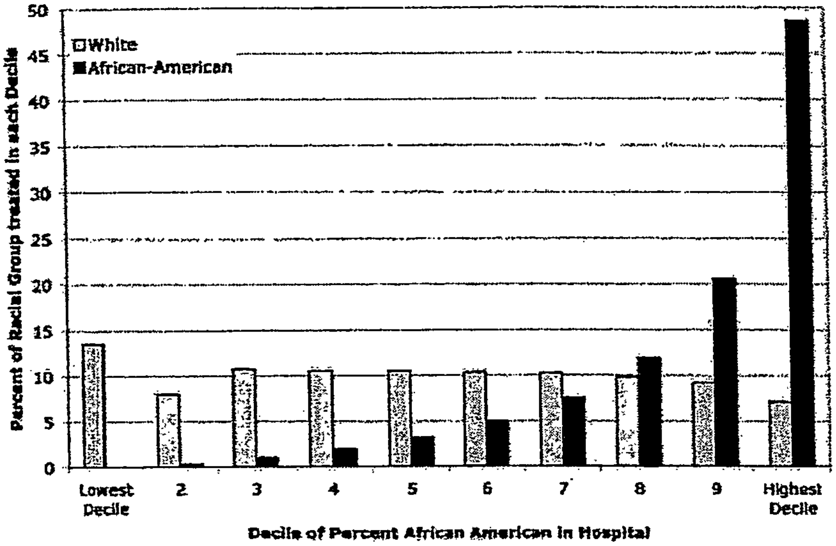

**Figure 4.** Distribution of black and white patients by the average percentage of black AMI patients admitted to the hospital. The graph reports the share of each racial group (relative to all black or white AMI patients in the Medicare fee-for-service population) treated in hospitals within each decile category. A joint test of the importance of hospitals deciles was significant at the $P<0.001$ level.

found higher rates of mortality and functional disability among black AMI patients.[18,19]

The most important limitation of the present study is the possibility that the unobservable health status of AMI patients in neighborhoods served by hospitals with a disproportionate number of black AMI admissions is systematically different from the average. If so, the higher mortality rates observed in these hospitals could be the result of unmeasured confounding factors, rather than hospital performance per se. One obvious difference across hospital deciles is simply that there are more black patients in the higher deciles, and if they are systematically sicker, conditional on covariates, then the estimates could be biased. However, even if outcomes are measured using white mortality rates or black mortality rates separately, a significant mortality gradient is obtained.

Another limitation arises if risk adjustment does not adjust adequately for underlying illness. If the categorical comorbidity variables do not measure the severity of the disease (for example, if diabetes is more severe among black AMI patients in decile 2 hospitals than among black AMI patients in decile 10 hospitals), then the results could be biased. It could also be the case that unmeasured confounding factors (for example, smoking or exercise behavior) play a role in the elevated rates of mortality in the high-decile hospitals. But the role for unmeasured confounding factors is constrained. For unmeasured confounding factors to bias the results, they would need to be unassociated with the measured confounders, which, as shown in Figure 1, explain none of the observed mortality gradient.

In addition, hospitals serving a disproportionate number of black AMI patients tend to be located in low-income neighborhoods, so the race variable could reflect socioeconomic status. A parallel analysis (not reported) assigning hospitals to deciles of zip code income (rather than deciles of the proportion of black AMI patients) failed to show any consistent patterns. risk-adjusted mortality in decile 10 (high-income) hospitals was not significantly different from risk-adjusted mortality in decile 1 (low-income) hospitals. Similarly, accounting for the broad region of residence or urban status did not alter the results of the present study.

Why is risk-adjusted mortality, for both blacks and whites, associated with a higher fraction of black hospital admissions? One hypothesis is that black AMI patients are more likely to be admitted to hospitals with lower volume, and lower volume has predicted worse outcomes in other studies.[44–46] Similarly, it could be the case that overall revascularization rates in hospitals with a large fraction of black patients could be lower, as suggested by previous research documenting racial gaps in surgical treatment of cardiovascular disease.[3–19,43] These explanations alone cannot explain the gradient, because the regression analysis adjusted for such factors. A plausible explanation is that differences in hospital-level quality not adequately adjusted for in the present analysis but highlighted in recent studies, such as time to reperfusion, the prescription of $\beta$-blockers, postsurgical mortality, or the quality of physicians, could explain observed differences in outcomes.[28,30–32,55,56]

Another limitation of the study is that it does not address racial disparities that take place within the hospital because of differences in the use of effective treatments or lack of communication between black patients and a largely white clinical staff. For example, Barnato et al[32] documented substantially lower rates of PTCA and CABG for black AMI patients even after adjusting for the hospital to which they were admitted. Statistical analysis that distinguishes between these 2 explanations—disparities within hospitals and disparities that occur because blacks go to different hospitals than whites—is therefore critical for future research on disparities.[57]

The potential benefits that come from increasing quality of care are well understood.[58–61] One implication of the present study is that reducing mortality rates in high-mortality hospitals can have implications for reducing racial disparities in health outcomes. Because 21% of hospitals treat 69% of elderly black AMI patients, targeting quality improvements at hospitals that disproportionately serve blacks could dramatically reduce black-white disparities in care. In addition, because many black Medicare beneficiaries live in urban areas with more than 1 hospital, efforts to better direct patients toward high-quality hospitals may also be an effective means of reducing disparities.

## Acknowledgments

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# GEOGRAPHIC VARIATION IN HEALTH CARE AND THE PROBLEM OF MEASURING RACIAL DISPARITIES

KATHERINE BAICKER,*† AMITABH CHANDRA,*
AND JONATHAN S. SKINNER*‡

**ABSTRACT** In its study of racial and ethnic disparities in health care, the Institute of Medicine (IOM) concluded that there were large and significant disparities in the quality and quantity of health care received by minority groups in the United States. This article shows that where a patient lives can itself have a large impact on the level and quality of health care the patient receives. Since black or Hispanic populations tend to live in different areas from non-Hispanic white populations, location matters in the measurement and interpretation of health (and health care) disparities. There is wide variation in racial disparities across geographic lines: some areas have substantial disparities, while others have equal treatment. Furthermore, there is no consistent pattern of disparities: some areas may have a wide disparity in one treatment but no disparity in another. The problem of differences in quality of care across regions, as opposed to racial disparities in care, should remain the target of policy makers, as reducing quality disparities would play a major role in improving the health care received by all Americans and by minority Americans in particular.

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*Department of Economics, Dartmouth College, Hanover, NH.
†National Bureau of Economic Research, Cambridge, MA.
‡Center for the Evaluative Clinical Sciences, Dartmouth Medical School, Hanover, NH.
Correspondence: Amitabh Chandra, Department of Economics, 6106 Rockefeller Hall, Dartmouth College, Hanover, NH 03755.
E-mail: Amitabh.Chandra@Dartmouth.edu.

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IN ITS COMPREHENSIVE STUDY OF racial and ethnic disparities in healthcare, the U.S. Institute of Medicine (IOM) concluded that there were large and significant disparities in the quality and quantity of health care received by minority groups in the United States. Explicit in that review is the finding that "many sources—including health systems, healthcare providers, patients, and utilization managers—may contribute to racial and ethnic disparities in healthcare" (Smedley, Stith, and Nelson 2003, 10). In this paper, we argue that another key factor must be included in that list: geography. We show that where a patient lives can itself have a large impact on the level and quality of health care the patient receives. This matters in the measurement and interpretation of health (and health care) disparities, since black or Hispanic populations tend to live in different areas from non-Hispanic white populations.

Although an earlier study suggested that geography might work in favor of low income and African American populations because of their closer proximity to inner-city academic medical centers (Kahn et al. 1994), we find a generally different result: that blacks tend to live in parts of the country that have a disproportionate share of low-quality providers. Within those hospitals, both whites and blacks tend to receive low-quality care, but since blacks are over-represented in such areas, the quality of the hospital will cause an overstatement of the role that race plays in disparities at the level of the health care provider.

A second lesson from our analysis is that racial disparities in health care are a local phenomenon. Hospitals and regions of the country vary enormously in the extent to which such health care disparities are present; there are health care markets that serve large numbers of minorities that do not have disparities, although a plurality do. This finding limits the extent to which anecdotal evidence or even detailed quantitative studies from a given hospital, city, or state may be used to shed light on the larger problem of racial disparities at the national level. Nor is it entirely clear to what extent some regions are systematically worse, or systematically better, at eliminating health care disparities. In related work, we have found some regions have small (or no) disparities for one procedure, but high disparities for another (Baicker et al. 2003). The weak systematic correlation in racial disparities across myriad different procedures undermines the case for explanations that rely on a "legacy of segregated and inferior healthcare for African Americans" (Smedley, Stith, and Nelson 2003, 103). Alternatively, a more powerful explanation may lie in the presence of "surgical signatures" in different areas (Roos and Roos 1981; Wennberg 1990; Wennberg, McPherson, and Caper 1984). Surgical signatures refer to the persistent and dramatic differences in the rates at which certain surgical procedures are performed in adjacent regions with very similar patient populations. They are the consequence of the practice patterns of individual physicians and the local medical culture regarding a particular treatment. They have not been found to be correlated with patient characteristics or differences in physician supply. The idiosyncratic variation in the location and size of disparities suggests that future inquiries should investigate the potential role of a few individual providers, who account for a large proportion of the caseload, in generating disparities.

A focus on the geography of heath care will also suggest a different perspective than the conventional wisdom on the role of public policy in mitigating the deleterious effects of the under-use of health care in some minority populations. Often, interventions are designed to ensure the treatment a patient receives in a given hospital or by a given provider is independent of the patient's race. In contrast, we argue that, in the presence of geographic disparities in health care, policies designed to equalize patients' treatment within hospitals will not erase disparities at the national level, as differences in where minority groups live would still result in large disparities in care. What is necessary to erase health care disparities is to implement national policies designed to improve the overall quality of treatment or health of all patients, which in turn will have a disproportionate effect on reducing racial, ethnic, and geographic disparities in health care and health outcomes. Interventions focused on the overall quality of hospitals in a few regions of the country (where a disproportionate share of minorities communities are located) could dramatically reduce racial disparities in care.

We certainly do not argue that geographic variations in health care explain the full amount of the measured racial disparity in care. Indeed, in some cases geographic variations in health care may even mask existing disparities at the local level. Instead, our view is that overall health and health care disparities should be considered to be the sum of two components: (1) unequal treatment within a hospital or by a given provider, and (2) unequal treatment because of where people live. The reason that this distinction is important is because the sources of inequity are quite different: in the first case it is either at the level of the health care interaction (whether because of bias by the provider or poor information or preferences of the patient), while in the second case it is related to differences in where people live, which is dependent on factors such as wage and income, as well as barriers to housing that are less likely to be associated with the health care system per se.

Our analysis proceeds in four sections. First, we establish that the best unit of analysis for geographic variations in health care is the geographic area that is served by a major tertiary care hospital. We formalize this notion by introducing the concept of a "hospital referral region" (HRR) from the *Dartmouth Atlas of Health Care* (Wennberg and Cooper 1999). Second, we use these HRRs to illustrate the enormous variation in the quality of care that patients, independent of race, receive in different regions of the United States. Third, we show that there is significant residential clustering by race among these regions, with blacks disproportionately represented in the Southeast. Fourth, we use these results to quantify the relationship between geographic variation in health care and the measurement of racial disparities in care, using as an example eye examinations for diabetics in the Medicare population. We conclude with a discussion of the policy implications of our research The degree to which racial disparities are driven by differences in care within regions, as opposed to between regions, has profound implications for designing health care policy.

## MEASURING GEOGRAPHIC VARIATION IN HEALTH CARE

Understanding the role that geographic variation plays in driving racial disparities in health care requires a careful delineation of different health care service regions. The *Dartmouth Atlas of Health Care* divides the United States into 306 "hospital referral regions" (HRRs). These regions, some of which cross state borders, are constructed using a complex algorithm of commuting patterns of patients to major referral hospitals, and correspond to the level at which care is actually given. More simply, one may think of HRRs as representing local markets for health care, or the geographic level at which "back end" services such as cardiac surgery and end-of-life care are received. The regions are derived from data on Medicare beneficiaries, and thus capture the geographic pattern of where beneficiaries go for care.

We use data on residential clustering and the delivery of health care treatments by HRR from the *Dartmouth Atlas*, which is based on Medicare claims data. Treatment rates are determined by where the patient lived rather than where he or she received services. Thus if a Medicare enrollee living in Hartford, Connecticut, were admitted to a hospital in Boston, the utilization would be attributed to Hartford, and not to Boston. This means that the variations observed at the HRR level are blurred somewhat—since the practice patterns of Boston hospitals are assigned back to the Hartford HRR—but it avoids the potentially more serious shortcoming of unusually high utilization rates in large referral centers such as Boston or Rochester, Minnesota. Analysis at the HRR level is preferable to analysis at the city or state level, since it uses the empirical pattern of patient commuting to determine the geographic boundaries of each referral region, rather than assuming that the arbitrary political boundaries of states and cities also define the level at which the health care is delivered.

Throughout this paper we rely on data from the Medicare program. There are several advantages to using this data. First, the Medicare program is a substantial component of the U.S. health care system that comprises almost 20% of all health care expenditures and is regulated by policies designed to influence the delivery of care. Second, analysis of the Medicare population can dramatically mitigate the extent to which differences in health insurance contaminate estimates of racial disparities in health care. Third, we have a rich data set to draw on, based on tens of millions of patient visits per year. These sample sizes are necessary for a comprehensive investigation of race disparities in health care, in order that small sample sizes do not affect the quality of the inferences being made.

## GEOGRAPHIC VARIATION IN HEALTH CARE

We now examine the extent to which geographic disparities affect health care across hospital referral regions, including the quality of care provided to patients in different HRRs. The data we use are obtained from the *Dartmouth Atlas of Health Care* and are based on Medicare claims data for 1995–1996 (Wennberg and Cooper 1998).

One way to measure the quality of health care provided in a region is the use of low-cost, highly effective procedures that have known medical benefits and are rarely contraindicated. This methodology was pioneered by the Medicare Quality Improvement Organization and is designed to capture interventions and evaluations "for which there is strong scientific evidence and professional consensus that the process of care either directly improves outcomes or is a necessary step in a chain of care that does so" (Jencks et al. 2000, 1670). As such, detailed risk adjustment is less critical, as few patients are contraindicated for these procedures (such as the prescription of warfarin for atrial fibrillation or biennial eye examination for diabetics). Following Wennberg, Fisher, and Skinner (2002), we use an "effective care" index of 11 such measures, including the administration of angiotensin-converting enzyme inhibitors, aspirin, and beta-blockers after heart attacks; mammograms for older women; influenza and flu vaccines; and eye exams and the evaluation of lipid profiles and HbA1c for diabetics. The use of these procedures should be relatively insensitive to the preferences and characteristics of the population and relatively uniform across areas—most beneficiaries should be receiving this care across the country. Nevertheless, we also adjust the use of the measures for the age, sex, race, and underlying illness of the population (as reflected by discharges for a number of conditions such as heart attacks, gastrointestinal bleeding, hip fracture, and the like). These adjustments do not affect the results of the analysis.

Figure 1 shows the distribution of the use of effective care across HRRs. Some HRRs use effective care at a much higher rate than others, with the mean use varying from a low of 30% to a high of almost 60%. Residents in the Northeast, for example, are much more likely to get effective care than those in the Southwest.

What causes this wide geographic variation in the use of cheap and effective care that we would argue should be universal? A substantial literature stemming in large part from the *Dartmouth Atlas* documents and explores the causes of this geographic variation—seen not just in effective care, but in rates of many different surgical procedures and intensity of treatment (Baicker and Chandra 2003; Baicker et al. 2003; Chandra and Skinner 2004; Fisher et al. 2003a, 2003b; Wennberg and Cooper 1999; Wennberg, Fisher, and Skinner 2002). Differences could stem from historical practice patterns, the slow diffusion of technology, differential supply of specialists and hospital capacity, differences in patient characteristics and preferences, or any of a number of other factors. Our analysis does not attempt to discern the root causes of geographic disparities, but rather seeks to

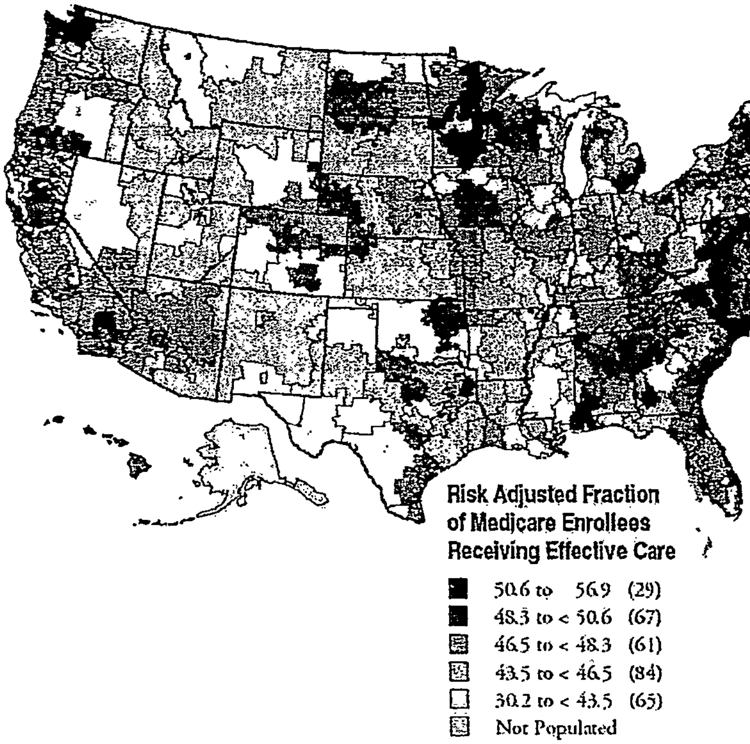

**FIGURE 1**

*Distribution of effective care in health referral regions (HRRs).*

establish the importance of these disparities in widespread racial differences in the quality of care received.

## GEOGRAPHIC CLUSTERING BY RACE

Blacks and whites are not equally represented in different parts of the country. In order to understand the role that this uneven distribution plays in health care disparities, we need to understand how much segregation there is in the health care providers and hospitals used by blacks and whites.

Figure 2 shows the extent to which black and white residents are not evenly distributed across the country. The shading of each HRR represents the fraction of blacks living in an area relative to the national average (of approximately 14%). If blacks and whites were not residentially clustered, all of the HRRs would have a ratio of around 1, meaning that each one would have the same mix of black and white residents—each would be about have about 14% black residents. Only 37 of the 306 HRRs have a nationally representative mix of residents. In fact, several regions of the country have black population rates that are three to six times greater than the national average. Blacks disproportionately live in the Southeast, while whites disproportionately live in the West and in the Northeast.

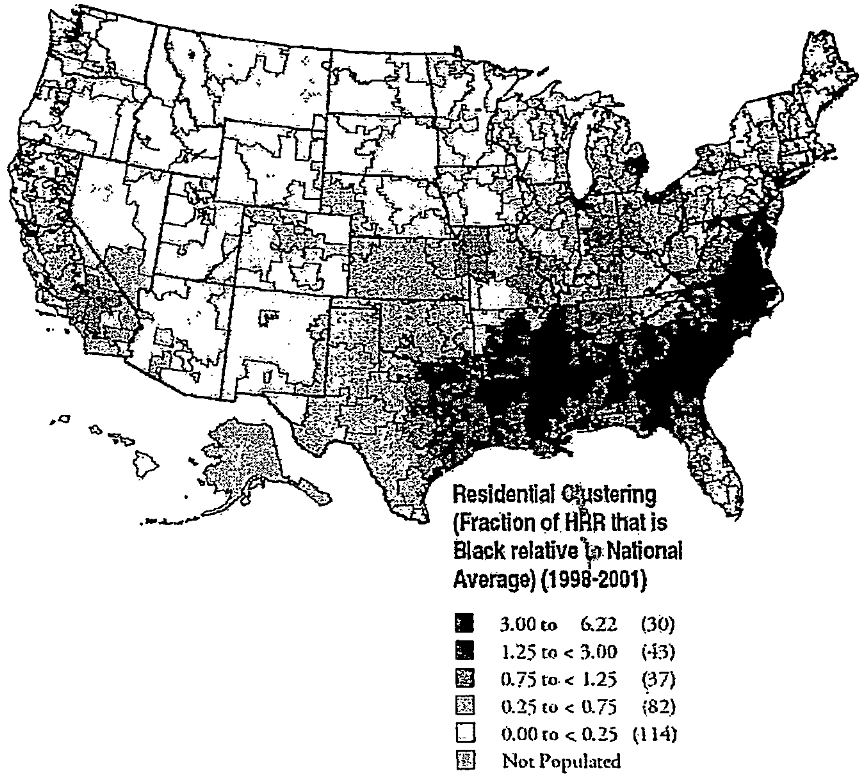

**FIGURE 2**

*Relative distribution of blacks in HRRs.*

## DISENTANGLING WITHIN-AREA AND BETWEEN-AREA RACIAL DIFFERENCES IN CARE

There is a substantial literature documenting racial disparities in health care. In nearly every study, African American or Hispanic patients experience lower levels of health care even when high-quality controls for patient risk adjustment are included in the analysis (Smedley, Stith, and Nelson 2003). Most previous studies have used national samples, and thus their results represent an average across the many regions in the United States (although some focus on a single area). Having established above both that there is substantial variation in care between different hospital areas and that there is substantial residential clustering by race, we turn to the role that residential segregation plays in driving observed racial disparities in health care.

To understand the role of residential segregation in racial disparities, we first establish that there are different patterns of care in areas with different racial compositions. We focus on one particular component of effective care—annual eye exams for diabetics—as an example. We divide the 306 HRRs into quintiles based on the fraction of their population that is black, and then examine the fraction of

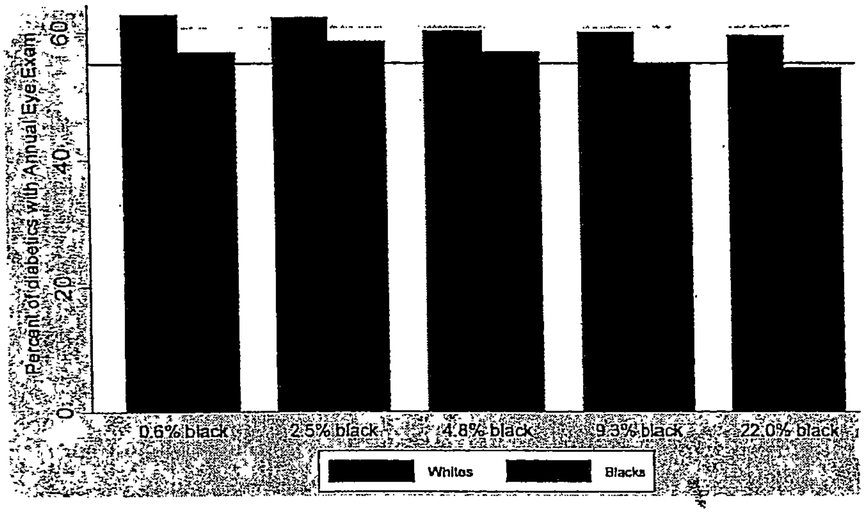

**FIGURE 3**

*Black-white differences in eye exams for diabetes in HRRs with different percentages of black patients. Notes: Each quintile contains an equal proportion of beneficiaries. Numbers below quintile bars report the average percent of blacks in the HRRs that comprise the quintile. Horizontal lines report the U.S. rate for white (light line) and black (dark line) beneficiaries. The analysis adjusts for age and sex.*

patients in these quintiles receiving effective care and other surgical procedures. The 61 HRRs with the highest proportion of black residents are, on average, 22% black, while the 61 with the lowest proportion are less than 1% black. The two horizontal lines on the graph in Figure 3 report the use of annual eye exams for diabetics for the average white and average black beneficiary across all quintiles. As Figure 3 shows, a significantly lower fraction of blacks living in the fifth of HRRs with the most blacks (that is, those areas that are on average 22% black) receive annual eye exams, relative to those living in the fifth of HRRs with the fewest blacks. In other words, the quality of care received by African Americans deteriorates as the black population in an area increases. The same pattern holds true for whites: the rate at which white diabetics receive an annual eye exam falls as the percentage of blacks in an area increases. In the quintile with the fewest proportion of blacks (areas that are 0.6% black on average), black diabetic patients receive eye exams at a slightly higher rate than the average white beneficiary.

This graph highlights the fact that there *are* disparities in care within HRRs, but that residential segregation increases racial differences. To explore this point further, we examined racial disparities within specific HRRs. Figure 4 shows data for the 25 HRRs with the greatest number of black residents. More than 45% of blacks live in these 25 HRRs. In the Bronx, black diabetics receive eye exams at a higher rate than do whites. Similarly, there are several HRRs where racial disparities are small to negligible—for example, in Birmingham, Alabama, Raleigh, North Carolina, and Washington, D.C. On the other hand, HRRs like

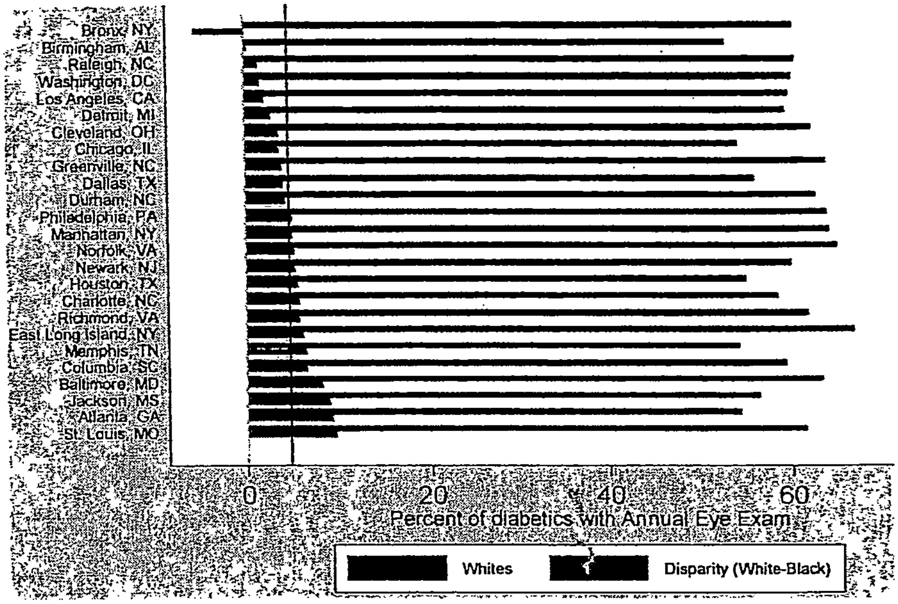

**FIGURE 4**

*Black-white differences in eye exams for diabetes in cities with the largest black populations. Notes: Vertical line indicates the disparity for the typical black beneficiary in the United States. Cities are ranked by the magnitude of racial disparity. The analysis adjusts for age and sex.*

St. Louis, Atlanta, and Jackson, Mississippi, have disparities that exceed the average national disparity. Thus, even within cities with a sizeable black community, there are large differences in the degree of disparity between white and black treatment: Birmingham and Jackson have large African American populations and share a history of institutionalized segregation, yet the two areas have remarkable different levels of disparities for the procedure that we have studied.

What is it about some cities that causes them to provide high-quality care to African Americans? Standard explanations that rely on a legacy of discrimination are not borne out by the data, since places such as Raleigh and Birmingham show almost no racial disparities. For some surgical treatments, the differences may arise from one or two surgeons accounting for the majority of procedures in their region. In other cases, the differences in racial disparities may arise from spatial "mismatches" of patients and physicians, for example, because of segregation in residential areas, the location of hospital services, or the efficiency of the public transportation system. Skinner and colleagues (2003) found that Detroit had one of the largest disparities in knee replacement surgery for both men and women, which contrasts with its more positive ranking for eye examinations.

What fraction of the overall difference in the health care that blacks and whites receive can be attributed to different care within a region, and what fraction is attributable to the fact that blacks and whites often live in different regions? We can decompose the disparities into a within-area component and

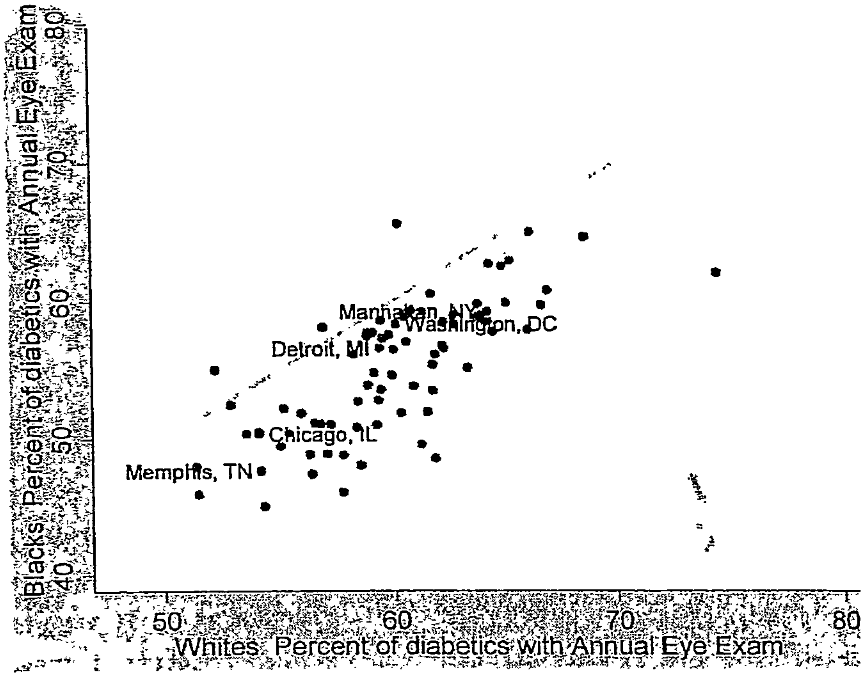

**FIGURE 5**

*Black-white differences in eye exams for diabetes in cities with the largest black populations. Data from Figure 4 is incorporated.*

between-area component graphically, by plotting the white rate along one axis and the black rate along another, as in Figure 5. Each point represents the one of the 80 largest HRRs in terms of African American population. These 80 HRRs account for over 80% of the African American population; the HRRs in the Figure 5 include those in Figure 4 and additional ones. The five HRRs with the largest African American populations are Chicago, Detroit, Memphis, New York, and Washington, D.C. In HRRs close to the 45-degree line, such as Detroit or Washington, D.C., black diabetics receive annual eye exams at rates equal to whites. In HRRs below the line, such as Chicago, black diabetics receive annual eye exams at a lower rate than whites

The fact that most of the points are below the line shows that, on average, blacks receive eye exams at a lower rate within a local region. If all of the difference in the treatment that blacks and whites receive is driven by different residential patterns, and none by differential treatment within a hospital referral region, then each HRR would be located along the 45-degree line shown on the graph. We can decompose the national difference in the rate at which black and white diabetics receive eye exams into the portion attributable to differences within regions and the portion attributable to different residential patterns. For this procedure, more than 56% of the racial disparity is attributable to blacks and whites living in different hospital markets. Conversely, 44% of the observed disparity in eye exams for diabetics is the consequence of blacks and whites being treated differently within hospital referral regions. Figure 5 also illustrates an interesting point regarding the preoccupation with studying disparities as opposed to noting differences in the levels of care received by race: in HRRs such as Chicago and Memphis, the white rate is substantially below the black rate in HRRs such as New York. Therefore, whites in Chicago and Memphis would also benefit from quality improvements that raise the level of care for all diabetics in these HRRs.

As long as African Americans continue to live in regions with disproportionately low rates of treatment, policies that simply aim to equalize rates within hospitals will still result in national disparities in care. Furthermore, such policies do nothing to improve the quality of care received by non-black Medicare beneficiaries who also reside in areas with low rates of effective care. While it is not our view that the welfare of these (non-black) individuals exceeds that of black beneficiaries, it is a mathematical fact that there are more non-black beneficiaries than black beneficiaries. As such, policies that target the geographic schism in health care, as opposed to a narrow focus on racial disparities, will positively affect a greater number of Americans.

## POLICY IMPLICATIONS

This analysis highlights two important points with significant implications for health policy. First, geographic variations in health care are responsible for a substantial component of the observed racial disparity in care, since blacks live disproportionately in parts of the country that have low-quality hospitals and providers. Second, there is wide variation in racial disparities: some areas have substantial disparities, while others have equal treatment. Furthermore, there is no consistent pattern of disparities—some areas may have a wide disparity in one treatment but no disparity in another. These facts mean that studies of individual conditions or areas are at best uninformative and at worst misleading for national policy makers.

There are many barriers to providing high-quality health care to minority populations, particularly in the presence of distrust and poor information surrounding health care procedures (Ibrahim et al. 2002). In this paper, we have argued that even aggressive behavior on the part of regional health providers to improve the quality of information and access to care at the local level cannot eliminate entirely overall racial or ethnic disparities. The problem of differences in quality of care across regions should still remain a target of policy makers, as reducing such disparities would play a major role in improving the health care received by all Americans in general and by minority Americans in particular

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HEALTHY
PEOPLE
2010

# Tracking
# Healthy People 2010

**U.S. Department of Health and Human Services**
**November 2000**

Go to main Table of Contents

# Part A:
# General Data Issues

## 1. Midcourse Review Overview

Healthy People 2010 is a comprehensive, nationwide health promotion and disease prevention agenda to improve the health of the United States population during the current decade. It has two overarching goals: (1) increase quality and years of healthy life and (2) eliminate health disparities. In the November 2000 edition of Healthy People 2010, these goals were supported by 467 specific objectives in 28 focus areas, which addressed specific components of health promotion and disease prevention. Every measurable objective had a target to be achieved by the year 2010.[1]

Each focus area is managed by a lead agency or co-lead agencies of the U.S. Department of Health and Human Services (DHHS). Lead agencies are responsible for undertaking activities to achieve the year 2010 goals and for reporting progress on the focus area objectives over the course of the decade. Focus area work groups consisting of experts in the subject area provide ongoing support and continuity. Guidance for the overall effort is provided by the Healthy People 2010 Steering Committee, which is chaired by the Assistant Secretary for Health and includes representatives from the DHHS agencies. The Healthy People 2010 process is coordinated by the Office of Disease Prevention and Health Promotion, under the direction of the Assistant Secretary for Health.[1]

Midway through the decade, DHHS conducted a comprehensive assessment of Healthy People 2010. The purpose of the 2005 Midcourse Review was to:

- Assess progress toward the two overarching goals of increasing the quality and years of healthy life and eliminating health disparities
- Assess progress toward the targets for the objectives
- Modify, add, or delete objectives, as necessary
- Adjust targets for objectives with baseline data revisions
- Update the statistical documentation and databases

Under the direction and leadership of the Office of Disease Prevention and Health Promotion, a Midcourse Review Executive Committee was formed to assist the Healthy People Steering Committee in guiding and coordinating the Midcourse Review process and products. Members of this committee were the Healthy People 2010 agency coordinators from the National Institutes of Health, the Substance Abuse and Mental Health Services Administration, the Centers for Disease Control and Prevention (CDC), the Health Resources and Services Administration, and the Agency for Healthcare Research and Quality, as well as staff from the Office of Minority Health, the Office of Women's Health, and the CDC National Center for Health Statistics.

During the Midcourse Review, measures for increasing the quality and years of healthy life and eliminating health disparities were developed and assessed (see sections 2 and 3:

Measuring Quality and Years of Healthy Life, and Measuring Health Disparities). Progress toward target attainment and elimination of health disparities was evaluated, and areas were identified that were successful or facing challenges. Progress toward the targets of Healthy People 2010 objectives with data beyond the baseline was assessed using the percentage of targeted change that was achieved, or "progress quotient." (See section 4: Target Setting and Assessing Progress for Measurable Objectives.) The Midcourse Review publication and related information can be accessed at http://www.healthypeople.gov/data/midcourse/default.htm#pubs.

The Midcourse Review provided an opportunity for updates and modifications to the objectives, including deletions and additions, and produced a revised list of all Healthy People 2010 objectives and subobjectives. Changes to the objectives were considered for the following reasons:

- To more accurately communicate what the objective is measuring and/or to allow it to be measured;
- To use a new or different data source or new research/science;
- To reflect new science or research;
- To establish a baseline and set a target for a developmental objective;
- To acknowledge that data are not available and a funding commitment does not exist.

Some objectives lacked baseline data in the November 2000 edition of *Healthy People 2010*, but were considered areas of sufficient national importance to be placed on the national agenda for data collection. These objectives were called "developmental" objectives. *Healthy People 2010* stated that "Developmental objectives with no baseline at the midcourse will be dropped."[1] The Healthy People Steering Committee determined that a developmental objective could be retained at the midcourse if baseline data had been collected but not yet analyzed, or a data source was identified and a funding commitment was made by December 31, 2004 (even if the baseline data were not yet available). Of the 140 developmental objectives, 84 became measurable with the establishment of baselines, 27 objectives were deleted due to lack of baseline data, and 29 with data anticipated by the end of the decade were retained as developmental despite a lack of data at the Midcourse Review.

As part of the Midcourse Review, DHHS lead agencies could request changes in objective wording, measure, or data source subject to approval by the Healthy People 2010 Steering Committee and the Assistant Secretary for Health. A number of changes were approved. These changes are shown within each focus area chapter in the Midcourse Review publication.

During the Midcourse Review, proportional target adjustments also were made to objectives and subobjectives whose baselines for the total population had changed since the publication of *Healthy People 2010*. (See section 4: Target Setting and Assessing Progress for Measurable Objectives for details.)

Between August 15 and September 15, 2005, the public was given an opportunity to comment on the Midcourse Review modifications that had been approved by the Assistant Secretary for Health. Electronic comments were solicited on objectives and subobjectives that were:

- Moving from developmental to measurable status
- Modifying language
- Proposed for addition
- Proposed for deletion
- Establishing new baselines targets target-setting methods, or changes to data sources.

The public comments were reviewed and considered by the co-lead agencies, the Healthy People Steering Committee, and the Assistant Secretary for Health

The public was not invited to comment on: the two overarching goals; baseline revisions and proportional target adjustments resulting from baseline revisions; changes in the Federal standards for collecting and presenting data on race and ethnicity[2]; or other adjustments to data in the population template for population-based objectives. (See section 6: Population Template.)

The entire *Tracking Healthy People 2010* publication was revised to include new and updated data issues, and new and revised operational definitions for all objectives and subobjectives that have changed since the original publication in 2000. It is available on the internet through DATA2010, the Healthy People 2010 online database (http://wonder.cdc.gov/data2010/). DATA2010 was completely revised and updated to reflect the modifications in the objectives and tracking data that occurred prior to and during the Midcourse Review, including changes in the way the data on race and ethnicity are collected and tabulated.[2] (See section 6: Population Template.) Currently, DATA2010 not only shows the most recent Healthy People 2010 data, updated quarterly, but has a new option to display the final data tables at midcourse, upon which the Midcourse Review measures of progress and disparity were based. (See section 12: Healthy People 2010 Database.)

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# 2. Measuring Quality and Years of Healthy Life

## Introduction

The first overarching goal of Healthy People 2010 is to help individuals of all ages increase life expectancy and improve their quality of life.[1]

Life expectancy is the average number of years people born in a given year are expected to live based on a set of age-specific death rates. At the beginning of the 20th century, life expectancy at birth was 47.3 years. Life expectancy has increased dramatically over the past 100 years; in 2002 life expectancy at birth was 77.3 years.[2]

The gains in life expectancy since the early 1900s are largely attributable to the control of infectious diseases through improved sanitation, vaccines, and antimicrobials; improved nutrition; and advances in medical research and treatment. However, longevity is no longer a sufficient measure of the health of a population. Over the last century, chronic diseases have replaced infectious diseases as major causes of death, resulting in an increase in the number of persons with functional limitations associated with chronic illness. Preventing disabling conditions, improving function, relieving physical pain and emotional distress, and maximizing health across the life span have become issues that are as important to address as increasing life expectancy.[3]

## Measuring Life Expectancy

Life expectancy is measured by constructing a life table. There are two types of life tables: the cohort (or generation) life table and the period (or current) life table. The cohort life table presents the mortality experience of a particular birth cohort (for example, all persons born in the year 1900) from birth throughout their lives. The cohort life table is based on age-specific death rates observed throughout the lifetime of the cohort members and thus reflects the mortality experience of an actual population from birth until the final group member has died.[2]

Unlike the cohort table, the period table does not represent the mortality experience of an actual birth cohort. Rather, the period table presents what would happen to a hypothetical cohort if it experienced throughout its entire life, the mortality conditions of a particular period in time. Thus, for example, a period life table for 2002 assumes a hypothetical cohort subject throughout its lifetime to the age-specific death rates prevailing for the current population in 2002.[2] The period table is used to construct the life expectancies tracked in Healthy People 2010. The methodology for constructing period life tables for the United States has been published elsewhere.[4]

## Measuring Quality and Years of Healthy Life

Given the multi-dimensional nature of health, assessing quality and years of healthy life is much more complex than measuring life expectancy, and the field is still evolving.

Various measures are used nationally and internationally to measure healthy life. These measures fall into three general categories:[5]

- Self-assessments of overall health status by individuals or their proxies.
- Composite measures that include multiple dimensions of health. Scores on the various dimensions are combined into a single measure using a predetermined algorithm.
- Measures that combine mortality and morbidity (where the morbidity measure can be either of the types described above or a measure of a single dimension of health). These measures use years as the metric to quantify healthy life.

*Healthy People 2010* mentioned several possible measures of population health: self perceived health status, healthy days, and Years of Healthy Life (YHL),[1,6] the measure used in Healthy People 2000. In 1998, the National Center for Health Statistics convened a workshop to select measures that best capture the complexity of assessing years of healthy life within the context of Healthy People 2010.[7] Three summary measures that combine mortality with different measures of morbidity were selected to track progress towards Goal 1 of Healthy People 2010. The measures are: (1) expected years in good or better health; (2) expected years free of activity limitation; and (3) expected years free of chronic disease. The first two summary measures evolved from the YHL measure. YHL combines information about mortality, self-rated health, and activity limitation into a single measure. The new measures separate the self-rated health component from the limitation of activities component to better track change over time. Expected years of life free of chronic diseases was added to provide an additional aspect of population health.

## Healthy Life Measures

The three healthy life measures used for Healthy People 2010 are defined as follows:

***Expected years in good or better health*** is the average number of years a person can expect to live in good or better health. This measure assesses healthy life using a single global assessment question which asks a person to rate his or her health as "excellent," "very good," "good," "fair," or "poor".

***Expected years free of activity limitation*** is the average number of years a person can expect to live free from a limitation in activities, a need for assistance in personal or routine care needs, or a need to use special equipment.

***Expected years free of chronic disease*** is the average number of years a person can expect to live without developing one or more of the following conditions: heart disease, cancer, diabetes, hypertension, kidney disease, arthritis, or asthma.

## Computing Healthy Life Measures

Healthy life expectancies are calculated using a period life table methodology as described above.[4] Age-specific mortality rates are combined with age-specific prevalence rates to produce an estimate of overall healthy life expectancy. The methodology has been published elsewhere.[7]

Healthy life expectancies can be compared across populations, as well as over time, as long as the age-specific prevalence rates are reliable across all age categories. Often, several years of data must be combined to produce reliable rates.

## Data Sources for Healthy Life Measures

Healthy life calculations use mortality data from the National Vital Statistics System and health data from the National Health Interview Survey (NHIS). (See Part C for descriptions of these systems.) Although the NHIS provides detailed information on health and health behaviors, the institutionalized population is excluded from the NHIS sample. Since the institutionalized population is more likely to report poor health, measures may underestimate the effect of the health component on healthy life expectancies and, therefore, may overestimate healthy life expectancy.

## Data items used for Healthy Life measures

***Self-rated health status*** is measured by the single question in which the respondent is asked to rate his or her health as "excellent," "very good," "good," "fair," or "poor." This self-assessed health rating has been validated to be a useful indicator of a person's actual health for a variety of populations and thus permits broad comparisons across different conditions and populations.[8] In addition to the NHIS, the National Health and Nutrition Examination Survey, the Behavioral Risk Factor Surveillance System, and other surveys include the measure.

***Activity limitation*** is measured using questions about personal care needs, limitations of activities, and use of special equipment. Adults are asked whether they need assistance with personal care needs, such as eating, bathing, dressing, or getting around inside the home; if they need assistance with routine care needs, such as household chores; if they have mental or physical problems that prevent them from working at a job; or if they have health problems that require the use of special equipment, such as a cane, wheelchair, or special telephone. Persons responding "yes" to any of these questions are classified as having an activity limitation. Children are considered limited in activity if the proxy adult respondent answers "yes" to any of the limitation, special services, or special equipment questions.

***Chronic disease status*** is measured by a question which asks if a doctor has ever diagnosed the respondent with a given disease. The list of selected chronic diseases includes hypertension, stroke, coronary heart disease, arthritis, kidney disease, diabetes, and cancer. All selected chronic diseases have related objectives within Healthy People 2010. Respondents who answer "yes" to any of the selected diagnoses are classified as having a chronic disease. The NHIS does not request information on the severity of the disease, even though relative risk of mortality varies with the severity and type of chronic disease.

## Future Directions

Since the measurement of healthy life is an evolving field, it is important to continue to develop better measures of healthy life and to improve the data on which these measures are based.

### Refining Measurement of Quality and Years of Healthy Life

The three summary measures selected for use in Healthy People 2010 will provide trend data for the final decade review. However, measures incorporating other aspects of health that have not been included in summary measures of health, such as healthy behaviors and mental health, are needed to provide different ways of summarizing this important construct. Work is continuing in this area.

### Expanding Data Collection

Better data are necessary to support both the current measures and any newly developed measures. Limited sociodemographic data are a particular problem. Currently, the black and white populations are the only population groups with sufficiently reliable data in most national data sources to produce healthy life estimates. Moreover, social determinants of health, such as education, income, or occupation, are sometimes lacking from national health data sources. For the Healthy People objectives, understanding the status of subgroups of the population is important for public health policy.

Another challenge is collection of data on the institutionalized populations such as those in prisons and nursing homes. Household-based surveys, the source of much of the data used to measure the health components of healthy life expectancy, do not collect information on these populations or on the homeless. Many of these individuals are likely to experience poor health, and estimates of healthy life that do not include these populations are biased.

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## 3. Measuring Health Disparities

The second overarching goal of Healthy People 2010 is to eliminate disparities among segments of the population, including differences that occur by gender, race or ethnicity, education or income, disability, geographic location or sexual orientation.[1] The specific population groups associated with each of these characteristics are defined in section 6: Population Template. The goal of eliminating health disparities applies to 498 population-based objectives and subobjectives in *Healthy People 2010*; that is, those objectives that measure health aspects of the population. The goal is not applicable to objectives that measure schools, worksites, or States or to objectives that are tracked using counts of events rather than rates or percents.

In Healthy People 2010, disparity is defined as the quantity that separates a group from a reference point on a particular measure of health that is expressed in terms of a rate, proportion, mean, or some other quantitative measure.[2] In order to measure disparity between groups, four critical analytic issues need to be addressed:

- What reference point should be used to measure disparity?
- Should disparity be measured in absolute or relative terms?
- Should disparity be measured in terms of favorable or adverse events?
- How can disparity be summarized across multiple subgroups?

A detailed discussion of these conceptual issues and their implications for measuring disparity in Healthy People 2010 has been published.[2] A brief synopsis of the issues and the approaches adopted for Healthy People 2010 is provided below.

### Choice of reference point

Disparity can be measured in relation to various reference points, including the year 2010 target, the total population rate, an average of group rates, or the rate for a specific group such as the largest group, or the group with the most favorable or "best" rate. There are advantages and disadvantages associated with each of these reference points.

The "best" group rate has been chosen as the reference point for measuring disparities in Healthy People 2010 because it emphasizes the potential for improvement among the comparison groups. Implicit in the use of the "best" group as the reference point is the idea that the best group rate is theoretically achievable by the other groups.

The best group is used as the reference point in analyses of characteristics with two groups (e.g., gender, disability, geographic location) and characteristics with three or more groups (e.g., race and ethnicity, education or income). The disparity for a particular characteristic is measured by comparing the rate for the best group and the rates for the other groups at a given point in time. It is important to remember that, for a particular objective, the best rate will differ from one characteristic to the next. In addition, for a particular characteristic, the group with the best rate may change over time.

In some instances, the group with the most favorable rate is not suitable for selection as the best group because it does not meet an additional criterion for statistical reliability. In Healthy People 2010 disparity analyses, a group can only be selected as the best group if its rate has a relative standard error of less than 10 percent. This criterion is more stringent than the 30 percent relative standard error used by many Healthy People 2010 data sources for data suppression.[3] This criterion prevents the measurement of disparity from a highly variable reference point. If the group with the most favorable rate does not meet the criterion for selection as the best group, then the group with the next most favorable rate that meets this criterion is selected as the reference point. If no more than one group meets this criterion, measures of disparity are not computed for that characteristic.

## Measuring disparity on an absolute or relative scale

Differences between the best group rate and the other group rates can be measured in absolute or relative terms. Absolute measures, such as the simple difference, describe the arithmetic difference between group rates and are expressed in the same units of measurement as the group rates. Relative measures, such as the percent difference, describe the arithmetic difference between group rates relative to a reference rate – that is, as a percentage of the reference rate. Relative measures are unitless. Absolute measures are valuable in assessing public health impact and can be easier to interpret than relative measures. However, relative measures make it possible to compare disparities across objectives that are measured on different scales.

In general, absolute and relative measures yield concordant conclusions about disparity at a *point in time*. However, in some instances absolute and relative measures of disparity may lead to different conclusions about changes *over time*. For example, when the best group rate is declining, a reduction in the absolute difference from the best group rate can occur without a reduction in the relative difference. Relative statistics are more appropriate for trend analyses because they adjust for changes in the level of the reference point over time and adjust for differences in the level of the reference point when comparisons are made across objectives.

## Measuring disparity in terms of favorable or adverse events

Some Healthy People 2010 objectives are expressed in terms of favorable events or conditions that are to be increased while others are expressed in terms of adverse events or conditions that are to be reduced. For example, objective 1-1 is expressed in terms of favorable events: *increase the proportion of persons with health insurance*. Conversely, objective 3-1 is expressed in terms of adverse events: *reduce the overall cancer death rate*.

The magnitude of an absolute measure of disparity at a particular point in time does not depend on whether an indicator is expressed in terms of adverse or favorable events. However, the magnitude of a relative measure of disparity does depend on the way that the objective is expressed. In addition, conclusions about *changes in disparity over time* depend on whether the objective is expressed in terms of favorable or adverse events. A more detailed explanation, including numerical examples, has been published.[2,4] For these reasons, it would not be appropriate to compare the relative disparity for one objective expressed in terms of favorable events with the relative disparity for another objective expressed in terms of adverse events or to compare changes in disparity for these objectives over time.

Given the desire to compare disparity across the Healthy People 2010 objectives, a single approach – expression of all objectives in either favorable or adverse terms – was needed. A decision was made to measure disparity in terms of adverse events. Dichotomous objectives that are stated in terms of favorable events (increase desired) are expressed in terms of adverse events (reduction desired) when measures of disparity are computed. The objectives themselves are not restated or changed in *Healthy People 2010.*

## Statistics for measuring health disparity

Pair-wise statistics are being used to monitor progress toward the elimination of disparity for individual groups (compared to the best group) for all characteristics. For characteristics with three or more groups (e.g., race and ethnicity, education level, and income level), summary statistics are also used. A detailed description of the statistics and techniques employed to measure disparities in Healthy People 2010 has been published.[2] The key pair-wise and summary statistics being used for Healthy People 2010 disparity analyses are presented below.

### Pair-wise statistics

The percent difference is used to quantify disparities between the best group rate and another group rate. The percent difference is computed as:

$$\text{Percent difference} = \frac{R_i - R_B}{R_B} \text{ X } 100$$

where $R_B$ is the best group rate for a particular characteristic and $R_i$ is the rate for any other group of interest for a particular characteristic. For example, racial and ethnic disparities are measured as the percent difference between the best racial and ethnic group rate and each of the other racial and ethnic group rates. Methods for assessing the statistical significance of the percent difference are provided elsewhere.[2]

## Summary statistics (characteristics with three or more groups)

The index of disparity is used to determine whether the overall disparity from the best group rate is increasing or decreasing for the set of groups that make up a characteristic. It represents the *average percent difference* between the individual groups and the best group for the characteristic. The index of disparity is calculated as:

$$\text{Index of disparity} = \frac{\left(\sum_{i=1}^{n-1} PD_i\right)}{n-1}$$

where $PD_i$ is the percent difference from the "best" group rate for each of the groups of interest $(i)$, and $(n-1)$ is the number of groups minus 1. Because the percent difference is calculated with the best group rate as the reference point, the number of comparisons is equal to the number of groups minus one. Methods for assessing the statistical significance of the index of disparity have been developed.[2] These methods involve generating a standard error for the index of disparity using a type of resampling or "bootstrap" procedure.

## Assessing changes over time

When data beyond the baseline are available for an objective, the change in disparity from the baseline to the most recent data point can be measured. For pair-wise comparisons, changes in disparity over time are measured by subtracting the percent difference from the best group rate at the baseline from the percent difference from the best group rate at the most recent data point. The change is expressed in percentage points: positive differences represent an increase in disparity and negative differences represent a decrease in disparity. Similarly, for comparisons involving three or more groups, the change over time is calculated by subtracting the index of disparity at the baseline from the index of disparity at the most recent data point. This statistic can be used to make comparisons over time only when data are available for the same groups defined in the same way at the baseline and at the most recent data point.

When standard errors for the constituent rates are available, the statistical significance of the change in the percent difference or the index of disparity over time can be evaluated.[2] When standard errors for the constituent rates are not available, the statistical significance of the change in the percent difference or the index of disparity over time cannot be evaluated.

## References

1. U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

2. Keppel, K.G.; Pearcy, J.N.; Klein, R.J. Measuring progress in Healthy People 2010. *Statistical Notes* No. 25. Hyattsville, MD: National Center for Health Statistics, 2002.
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# 4. Target Setting and Assessing Progress for Measurable Objectives

## Target-Setting Methods

One of the three overarching goals for the Healthy People 2000 prevention initiative was to reduce health disparities among Americans.[1] The framework of Healthy People 2010 has taken this a step further by proposing to "eliminate health disparities" as one of the two overarching goals for the next decade.

To support the goal of eliminating health disparities, a single national target that is applicable to all selected populations has been set for each measurable, population-based objective. Three guiding principles were used in setting targets for the measurable, population-based objectives:

- For objectives that address health services and protection (for example, access to prenatal care and health insurance coverage) the targets have been set so that there is an improvement for all racial/ethnic segments of the population; that is, the targets are set to "better than the best" racial/ethnic subgroup shown for the objective. Data points for at least two population groups under the race and ethnicity category are needed to use "better than the best" as the target-setting method.

- For objectives that can be influenced in the short term by policy decisions, lifestyle choices, and behaviors (for example, physical activity, smoking, suicide, alcohol-related motor vehicle deaths), the target setting method is also "better than the best" group.

- For objectives that are unlikely to achieve an equal health outcome in the next decade, regardless of the level of investment (for example, occupational exposure and resultant lung cancer), the target represents an improvement for a substantial proportion of the population and is regarded as a minimum acceptable level. Implicit in setting targets for these objectives is the recognition that population groups with baseline rates already better than the identified target should continue to improve.

Beyond this general guidance, the exact target levels were determined by the focus area workgroups that developed the objectives. The workgroups used various methods for arriving at the target levels, including retention of the year 2000 target, computation of a statistical regression using current rates to project a target, knowledge of the programs currently in place and expected change, and expert judgment.

The following target-setting methods have been used:

- Better than the best.
- __ percent improvement.
- "Total coverage" or "Total elimination" (for targets like 100 percent, 0 percent, all States, etc.).
- Consistent with ________________(another national program, for example, national education goals).
- Retention of the Healthy People 2000 target.

The specific method for developing the target is described under each objective in *Healthy People 2010*.[2]

## Baseline revisions

Targets were adjusted for those objectives for which a change was made to the total population baseline data point after the publication of *Healthy People 2010*. Baseline data were changed for a variety of reasons including revisions in methodology, survey questions, baseline year, and population denominators. Baseline data for several objectives were revised to accommodate updated public health recommendations. In several cases, baseline data were revised because the previously published data were based on preliminary analyses. Target revisions were not made in cases in which the baseline data for a select population had changed but data for the total population were unchanged.

The method used to adjust the target for an objective with a revised baseline for the total population depended on the original target-setting method outlined in Healthy People 2010.

- Targets based on "better than the best" racial/ethnic subgroup were revised using the same percent improvement from the racial/ethnic group with the "best" rate as was computed for the original target.
- Targets based on percent improvement were revised using the original percent improvement.
- Targets based on total elimination, total coverage, or consistent with another program were not revised.

## Developmental objectives

The target-setting method for developmental objectives that became measurable during the 2005 midcourse review takes into account the reduced time period (approximately 5 years) to achieve the target. The recommended method for setting targets for previously developmental population-based objectives is one unit "better than the best" racial and ethnic group, using the units in which the objective is measured. That approach represents the minimally acceptable improvement for all racial/ethnic groups.

If the objective is measured in whole numbers, the unit is 1. If the objective is measured in tenths, the unit is 0.1, etc. The original target-setting for population-based objectives was not limited to one unit "better than the best" racial/ethnic group.

The focus area workgroups had the option of proposing a target setting method greater or less than one unit "better than the best" population group (e.g., a specified percent improvement, etc.) subject to approval by the Assistant Secretary for Health.

Non-population-based developmental objectives that became measurable during the 2005 midcourse review set targets consistent with similar objectives in the focus area. Targets for these objectives could also take into consideration the reduced period to achieve the target.

## Assessing Progress

Progress is assessed by the movement from the baseline measure toward or away from the target. This is determined by the progress quotient which indicates the change between the baseline and most recent data as a percent of the total change sought. The formula for the progress quotient (PQ) is as follows:

PQ = (most recent value – baseline value) / (year 2010 target – baseline value) * 100

A number of objectives contain multiple measures. Progress is assessed separately for each measure. For these objectives, therefore, the progress may be mixed if some measures are progressing toward the target and others are regressing. Whenever possible, assessment of progress should consider the standard errors associated with the data (see section 11: Variability of Estimates).

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## 5. Population Estimates

Healthy People 2010 uses population estimates from the U.S. Census Bureau to calculate morbidity and mortality rates for many of the objectives. Every 10 years, the U.S. Bureau of the Census (Census Bureau) conducts a full census of the resident population of the United States, Puerto Rico, and U.S. territories and collects data on gender, race, age, and marital status; the estimates produced represent the U.S. population as of April 1 of the census year. More detailed data on education, housing, occupation, income, and other information are also collected from a representative sample of the population (about 17 percent of the total population).[1]

The increasing diversity of the population has necessitated modification of the way race data are collected. In both the 1980 and 1990 censuses, a substantial number of persons did not specify a racial group that could be classified as any of the categories on the census form (white, black, American Indian, Eskimo, Aleut, Asian, or Pacific Islander).[2] In 1980, the number of persons of "other" race was nearly 7 million; in 1990 it was almost 10 million. In both censuses, the majority of these persons were of Hispanic origin (based on response to a separate question on the form), and many wrote in their Hispanic origin, or Hispanic origin type (for example, Mexican, Puerto Rican) as their race.

The Census Bureau presents population data by race in two different ways. In decennial census publications, persons of unspecified race are maintained in the single category of "other." For the purpose of providing comparable denominator data to other Federal and non-Federal data users, in both 1980 and 1990, the Census Bureau produced another set of population estimates for census years; in these population estimates, persons of unspecified race were allocated to one of the four tabulated racial groups (white, black, American Indian or Alaska Native, Asian or Pacific Islander), based on their response to the Hispanic question. These four race categories conformed to the Office of Management and Budget (OMB) Directive 15, "Race and Ethnic Standards for Federal Statistics and Administrative Reporting"[3] and were more consistent with the race categories used in most major data systems, including vital statistics.[4] The postcensal and intercensal population estimates described below were based on these "OMB-consistent" populations.

In 1997, OMB issued "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity,"[5] which supersedes the 1977 Statistical Policy Directive 15. Both documents specify rules for the collection, tabulation, and presentation of race and ethnicity data within the Federal statistical system. The 1977 standards required Federal agencies to report race-specific tabulations using four single-race categories, namely, White, Black, American Indian or Alaska Native, and Asian or Pacific Islander. The 1997 revision incorporated two major changes designed to reflect the changing racial and ethnic profile of the United States. First, the 1997 revision increased from four to five the minimum set of categories to be used by Federal agencies for identification of race. As in the past, these categories represent a social-political construct and are not anthropologically or biologically based. The five categories for race specified in the 1997 standards are: American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; and White. Second, the revised standards add the requirement that Federal data collection programs allow respondents to select one or more race categories when responding to a query on their racial identity. This provision means that there are potentially 31 race groups, depending on whether an individual selects one, two, three, four, or all five of the race categories. Collection of additional detail on race or ethnicity is permitted so long as the additional categories can be aggregated into the minimum categories.

In recent years, data systems have been revising their collection and tabulation procedures to comply with the 1997 standards. Some data systems implemented the new standards between 1999 and 2003, while others are still in the process of planning for or implementing the new standards. Therefore, templates for race and Hispanic origin vary across objectives. In addition, the data systems used to track the population-based objectives in Healthy People 2010 may not provide data for all of these domains and subgroups. However, some data systems provide data for additional subgroups, for example, Hispanic origin subgroups such as Cuban, Mexican American, and Puerto Rican.[6]

During the transition to full implementation of the 1997 standards, two different standards for the collection of race and ethnicity data are being used, creating incomparability across data systems. Further, within a given data system, the change in the race standards results in incomparability across time, thus making it difficult to perform trend analyses. The OMB recognized that approaches to make data collected under the 1997 standards comparable to data collected under the 1977 standards would be needed. Therefore, the OMB issued "Provisional Guidance on the Implementation of the 1997 Standards for Federal Data on Race and Ethnicity."[7] The guidance document contains a detailed discussion of bridging methods. (Bridging is a mechanism for collapsing the multiple-race- group population counts into single-race-group counts.)

## Postcensal Population Estimates

National population estimates for the years after the decennial census (postcensal estimates) are calculated using the decennial census as the base population and adjusting those counts using the following measures of population change: births and deaths (provided by the National Center for Health Statistics), immigration data (provided by the U.S. Immigration and Naturalization Service), data on the movement of Armed Forces personnel (from the U.S. Department of Defense [DoD]), movement between Puerto Rico and the U.S. mainland (from Puerto Rico Planning Board), and movement of Federal employees abroad (from the Office of Personnel Management and DoD). These estimates reflect the U.S. population as of July 1 of each year. Postcensal estimates for State and county populations are also calculated using these data, as well as data from the Internal Revenue Service and State departments of education. Postcensal estimates become less accurate as the date of the estimates moves farther from the date of the census.[8]

The population estimates in the postcensal years are based on the April 1, 2000, resident population as enumerated by the Census Bureau. They result from bridging the 31 race categories used in Census 2000, as specified in the 1997 OMB standards, to the four race groups specified under the 1977 OMB standards. The bridged-race postcensal estimates were prepared by the Census Bureau's Population Estimates Program under a collaborative agreement with the National Center for Health Statistics.[9]

## Intercensal Estimates

After each decennial population census, intercensal estimates for the preceding decade are calculated to replace postcensal estimates. These estimates reflect the population as of July 1. Intercensal estimates are more accurate than postcensal estimates because they incorporate data from the enumerations at the beginning and end of the decade. The intercensal estimates for the 1980s were used to revise some of the baselines for mortality objectives in Healthy People 2000; these were published in the *Healthy People 2000 Midcourse Review and 1995 Revisions.*[10] Intercensal estimates for 1991-99, incorporating the bridged 2000 Census data, were produced by the Census Bureau under a collaborative agreement with NCHS.[11] These estimates have been used to recalculate some of the morbidity and mortality data for Healthy People 2010 baselines and tracking data for data years prior to the year 2000.

## Population Undercounts

Some subgroups of the population (including some racial, ethnic, and age groups) are less likely than other groups to be completely enumerated in the decennial census. The undercounts of these groups lower the denominators and result in higher morbidity and mortality rates for these populations.[12, 13] The Census Bureau makes estimates of net census undercount for the total, white, and black populations by age. These estimates are then used to weight the populations used by most of the national health surveys, including National Health Interview Survey, the National Health and Nutrition Examination Survey, the National Survey of Family Growth, and the National Health Care Surveys. The National Vital Statistics System (mortality and natality) use population denominators that are not adjusted for net census undercount.

## Target Populations

Several types of target populations are used for Healthy People 2010 objectives:

### Resident Population

The resident population includes all persons whose usual place of residence is in one of the 50 States or the District of Columbia, including Armed Forces personnel stationed in the United States. The resident population is usually the denominator when calculating birth and death rates and rates of new cases of disease. The resident population is also the denominator for selected population-based rates that use numerator data from the National Nursing Home Survey.

### Civilian Population

The civilian population is the resident population, excluding members of the Armed Forces (although their family members are included). The civilian population is the denominator for other Healthy People 2010 data sources, such as the National Hospital Discharge Survey.

### Civilian, Noninstitutionalized Population

The civilian, noninstitutionalized population is the civilian population not residing in institutions (for example, correctional facilities, psychiatric hospitals, and nursing homes). This population is the denominator for rates from Healthy People data sources such as the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Care Survey. This population is also used in the weighting procedure to produce national estimates from health surveys such as National Health Iinterview Survey, the National Health and Nutrition Examination Survey, and the National Household Survey on Drug Abuse.

Details on the specific populations targeted for each major Healthy People 2010 data system can be found in the data source tables included in Part C: Major Data Sources. The objective operational definitions shown in Part B indicate the population covered by each objective, if applicable.

## References

1. Detailed information on the methodology used to collect census data is available from the U.S. Bureau of the Census Web site: www.census.gov.
2. U.S. Bureau of the Census. U.S. population estimates, by age, gender, race and Hispanic origin, 1980–91. *Current Population Reports.* Series P-25, No. 1095. Washington, DC: U.S. Department of Commerce, 1992.
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## 6. Population Template

### Minimum Template

During the review of the September 1998 *Healthy People 2010 Draft for Public Comment*,[1] the need for greater consistency in tracking population groups became apparent. To address this issue, a minimum template for all Healthy People 2010 population-based objectives was adopted. Population-based objectives may show more detailed and additional breakouts if appropriate.

This minimum select population template applies to most measurable population-based objectives and is also applied to developmental population-based objectives (see section 2. Developmental Objectives) as data become available. The template does not apply to non-population-based objectives such as those that measure schools, worksites, or States. Because of problems in interpreting risk, the template is also not shown for population-based measurable objectives that are tracked using counts of events rather than rates or percents.

The minimum template for all population-based objectives is:

- Race:
  - American Indian or Alaska Native
  - Asian
  - Black or African American
  - Native Hawaiian or Other Pacific Islander
  - White

- Two or more races
  - American Indian and Alaska Native; White
  - Black or African American; White

- Hispanic Origin and Race:
  - Hispanic or Latino
  - Not Hispanic or Latino
    - Black or African American
    - White

- Gender:
  - Female
  - Male

- Socioeconomic status:
  - Family income level
    - Poor
    - Near poor
    - Middle/high income

    or
  - Education level
    - Less than high school
    - High school graduate
    - At least some college

Additional subgroups are included for specific objectives, including: geographic location (urban/rural), health insurance status, disability status, chronic disease status, sexual orientation, and specific age groups. These subgroups are defined elsewhere in this publication.

The categories for Race differ from those used with Healthy People 2000 and during the development of Healthy People 2010. (See Race and Hispanic Origin, below.)

The groups listed under most headings (race, Hispanic origin, gender, and income) in the minimum template are comprehensive; that is, they are intended to sum to the population (excluding "unknowns") tracked by the objective. For example, the three groups under income equal the total population tracked by the objective. The exception is the education category, which is limited to people of a minimum age or, in some cases, a maximum age (see Socioeconomic Status discussion below). The groups listed under the subheading "Not Hispanic" are not inclusive.

If data are not provided for a group, this is indicated by one of four statements: data have been collected but have not yet been analyzed (DNA), data are not collected by the data system used to track the objective (DNC); data do not meet the criteria for statistical reliability, data quality, or confidentiality (DSU); or the specific breakout is not applicable (NA). In cases where data for the entire template are not collected by the data system tracking the objective, a note to this effect will replace the template. (For more information on statistical reliability, see section 11: Variability of Estimates and Data Suppression.)

## Race and Hispanic Origin

### OMB Classification

On October 30, 1997, the Office of Management and Budget (OMB) published "Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity".[2] These standards revised the 1977 OMB Directive No. 15, "Race and Ethnic Standards for Federal Statistical Reporting.[3] The revised standards modified the Federal data collection policy, requiring Federal agencies to collect information that reflects the increasing diversity of our Nation's population.

The revised standards were used by the U.S. Census Bureau in the 2000 decennial census. Other Federal programs were required to incorporate them into household surveys, administrative forms and records, and other data collections by January 1, 2003.

Section 5: Population Template, includes a discussion of issues related to the transition from OMB Directive 15 to the 1997 Standards.

OMB Directive No. 15 defined the basic racial and Hispanic origin categories for Federal statistics and program administrative reporting as American Indian or Alaska Native, Asian or Pacific Islander, Black, White, and Hispanic.[3] The 1997 policy requires agencies to offer respondents the option of selecting one or more of the following five racial categories:

- **American Indian or Alaska Native**. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- **Asian**. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- **Black or African American**. A person having origins in any of the black racial groups of Africa.
- **Native Hawaiian or Other Pacific Islander**. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **White**. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

These five categories are the minimum set for data on race for Federal statistics, program administrative reporting, and civil rights compliance reporting. The new standards explicitly do not include an "other race" category for data collection; however, an "other" category may be used for tabulating and data reporting.[3] For Healthy People 2010, the designation "black" is used in place of "Black or African American."

The "some other race" option is increasingly being selected in the U.S. Census. Of persons self-identifying their race as "other", 97 percent also identify themselves as Hispanic. In the 2000 Census, 44 percent of persons of Hispanic origin selected some other race as their sole racial identification.[4]

The OMB standards require that at a minimum, the total number of persons identifying with more than one race be reported when data are available. It is stressed that this is a minimum; the presentation of detailed information on specific racial combinations subject to constraints of data reliability and confidentiality standards is preferred. Based on preliminary research, it is estimated that less than 2 percent of the Nation's total population is likely to identify with more than one race.[3] Over time, this percentage may increase as those who identify with more than one race become aware of the opportunity to report more than one race group.

The standards regarding Hispanic origin provide for the collection of data on whether or not a person is of "Hispanic or Latino" culture or origin. This category is defined as follows:

**Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. The term, "Spanish origin," can be used in addition to "Hispanic or Latino." Persons of Hispanic origin may be of any race and persons in the various race groups may be of any origin.

To provide flexibility and to assure data quality, the new OMB guidelines recommend that a two-question format (separate race and Hispanic ethnicity questions) be used, especially when respondents can self-identify. When race and ethnicity are collected separately, ethnicity should be collected first. Most Healthy People data systems that use self-identification, such as the National Health Interview Survey and the National Health and Nutrition Examination Survey, use the two-question format. When self-identification is not feasible (for example, the National Notifiable Disease Surveillance System) or when there are overriding data collection considerations (for example, the Youth Risk Behavior Surveillance System), a combined race and ethnicity question can be used that includes a separate Hispanic category co-equal with the other (racial) categories. When a combined question is used, more than one entry (race and ethnicity or multiple races) is possible.

## Misreporting Racial and Ethnic Data

Most health surveys and censuses obtain the self-reported race of the respondent. This is considered to be the most accurate representation of a person's racial or ethnic background. However, some data systems cannot collect self-reported race or ethnicity.. For example, the National Vital Statistics System mortality component collects information about the decedent from an informer. In other systems, such as those derived from hospital/patient care records, it is often unclear whether the information is self-reported. In these cases, race and ethnicity may be entered by someone else (for example, clerical staff or hospital personnel) based on observation or the report of proxy respondents. Several of these data systems are discussed below.

### *National Vital Statistics System (Mortality)*

Death rates by race and Hispanic origin may be biased from misreporting of race and Hispanic origin in the numerator of the rates and misreporting and undercoverage in the denominator of the rates.[5] Numerator data are from the death certificate as reported by the funeral director based on information from an informant, usually a family member.[6] Denominator data, from surveys or the Census, is either self-reported or reported by a member of the household. Studies comparing death certificate information with that from independent sources such as the Current Population Survey, indicate that the reporting of race on the death certificate is good for the white and black populations; however, the reporting of race and Hispanic origin for other groups may be seriously under-stated.[7] Additional problems, such as population undercounts (see section 5: Population Estimates), affect population censuses and estimates.[8] As a consequence of the combined effect of numerator and denominator biases, it has been estimated that death rates for the white and black populations are overestimated by about 1 percent and 5 percent respectively. Death rates are underestimated for the American Indian or Alaska Native population by approximately 21 percent; for the Asian or Pacific Islander population by 11 percent; and for the Hispanic population by 2 percent.[5] These estimates are approximations; they do not take into account differential misreporting by age and sex among the race/ethnic origin groups.

For Healthy People 2010, infant mortality rates for races and ethnic populations are based on linked files of infant deaths and live births.[9] These rates use the race of mother as self-reported on the birth certificate and, therefore, are not affected by the misreporting of race on the death certificate.

### *Patient Care Data*

Systems that collect data from patient records such as the National Hospital Discharge Survey (NHDS), the National Ambulatory Medical Care Survey, the National Hospital Ambulatory Medical Care Survey, the National Notifiable Disease Surveillance System, the HIV/AIDS Surveillance System, also may misreport the race of individuals. It is often unclear how race and ethnicity are reported in these systems. The race and ethnicity of the patient may be reported by hospital or other medical care personnel by observation, by proxy report, or by the patient. Therefore, one must use information on race and ethnicity from these systems with caution.

## Missing Data

In addition to the problems of misreporting race and ethnicity, the information on race reported by some data systems are often missing or incomplete. Some of these systems are described below. Specific information on the quality and completeness of reporting of race and ethnicity for the major Healthy People 2010 data systems is included, where available, in the data source description in Part C: Major Data Sources.

### *National Hospital Discharge Survey*

Race is not reported in about 18 percent of NHDS records since data on race are not reported by many hospitals due to the omission of a race field on hospital discharge reporting forms.[10] More hospitals have automated their discharge systems in recent years and are currently using form UB-92 which does not require race reporting. A comparison of NHDS data with data on persons who reported being hospitalized in the National Health Interview Survey (NHIS) (NHIS data were adjusted to exclude hospitalizations of 1 day or less) indicated that underreporting for the white patients was about 22 percent in 1991; the difference for African Americans was negligible.[10] Hispanic origin is not reported for 50 percent of the NHDS records.[11]

### *National Ambulatory Medical Care Surveys*

Race is not reported for about 10 to 21 percent of records in the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Care Survey. However, missing values are imputed for both surveys.[12, 13, 14]

### *National Notifiable Disease Surveillance System*

Although staff in State health departments and the Centers for Disease Control and Prevention attempt to obtain complete demographic information associated with nationally notifiable cases of disease, some data (particularly for the variables of race and ethnicity) are not available for some cases of disease. Laws, regulations, and mandates for public health reporting (including specific data items that are reported) fall under the authority of individual States, and in some States, race and ethnicity may not be approved for reporting to the national level. Race and ethnicity data may also be unknown when cases are reported from a laboratory or when cases are reported as aggregate disease totals.

## Socioeconomic Status

One of the three overarching goals for the Healthy People 2000 prevention initiative was to reduce health disparities among Americans.[15] Healthy People 2010 has taken this a step further, making the elimination of health disparities one of the two primary goals to be achieved by 2010. While disparities among racial and ethnic groups—especially between whites and blacks—received considerable attention over the last decade, differential health outcomes and access to social and health care resources often reflect differences in education, occupation, income, and wealth. Monitoring progress toward eliminating social and economic disparities in health requires improved collection and use of standardized data on the socioeconomic status of individuals.

Socioeconomic status (SES) may be represented by income, level of education, or type of occupation. Healthy People 2010 uses education and income-related measures as primary measures of SES. The following discussion presents data issues for income and education measures.

### Income

Income is the most common measure of SES and is probably the most relevant to health policy formulation. Current income provides a direct measure of the quality of food, housing, leisure-time amenities, and health care an individual is able to acquire, as well as reflecting the relative position in society. However, income may fluctuate over time so that income received in a given year may not accurately reflect one's lifetime income stream or total wealth, the measures of resources more relevant to health. For example, elderly persons who have low incomes may also have accumulated assets that offset their need for a high annual income. Of particular importance in considering the relationship between income and health is the fact that income may be low because illness has limited the amount of income earned or prevented earning income entirely. The use of income as a measure of SES also involves more practical difficulties. In many heath surveys a substantial number of persons either do not know or refuse to report their incomes.[16]

### *Family Income*

The National Health Interview Survey (NHIS) and the National Health and Nutrition Examination Survey consider all persons within a household who are relate to each other by blood, marriage, or adoption to constitute a family. Each member of a family is classified according to the total income of the family. Unrelated individuals are classified according to their own income. Since 1997, the NHIS has collected family income data for the calendar year prior to the interview (for example, 2003 family income data were based on 2003 calendar year information). Family income includes wages, salaries, rents from property, interest, dividends, profits and fees from their own businesses, pensions, and help from relatives. Family income data are used in the computation of the poverty level. To handle the problem of missing data on family income in the NHIS, multiple imputations were performed for survey years 1997-2000 with five sets of imputed values created to allow for the assessment of variability due to imputation. Family income was imputed for 25 percent of families in 1997, 29 percent in 1998, and 31-32 percent in 1999-2002.[17] A detailed description of the imputation procedure is available from: www.cdc.gov/nchs/about/major/nhis/2003imputedincome.htm.

When income is selected for the template, poor, near poor, and middle/high income categories are used unless overridden by programmatic or data considerations (for example, eligibility for the Special Supplemental Nutrition Program for Women, Infants, and Children). In these special cases, the poverty categories appropriate for the program or system are used. For most health surveys, income is defined as money income before taxes and does not include the value of non-cash benefits such as food stamps, Medicare, Medicaid, public housing, and employer-provided fringe benefits.

### *Poverty Level*

Converting income to poverty status adjusts for family size and inflation, facilitating comparisons among groups and over time. Poverty status measures family income relative to family size using the poverty thresholds developed by the U.S. Bureau of the Census, based on definitions originally developed by the Social Security Administration. These thresholds vary by family size and composition and are updated annually to reflect changes in the Consumer Price Index for all urban consumers. Families or individuals with income below their appropriate thresholds are classified as below the poverty level. Focusing simply on the dichotomy of "above" versus "below" poverty, however, obscures the full gradient of inequalities in income distribution and in health. Understanding burden across the income gradient provides information useful for potential eligibility expansions or other programmatic modifications. For Healthy People 2010, the three categories of family level income that are primarily used (see figure 4 for the distribution of population by poverty status) are:

- Poor (below the Federal poverty level),
- Near poor (100-199% of the Federal poverty level), and
- Middle and high income (200% or more of the Federal poverty level).

For a family of four, the average Federal poverty level weighted for family composition was $18,810 in 2003. Table 1 shows the 2003 poverty thresholds by size of family and number of related children under 18 years.

Table 1. **Poverty thresholds in 2003, by size of family and number of related children under 18 years.**

| **Size of Family Unit** | *Related Children Under 18 Years* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **None** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| One person | | | | | | | | | |
| Under 65 years | 9,573 | | | | | | | | |
| 65 years and older | 8.825 | | | | | | | | |
| Two persons | | | | | | | | | |
| Householder under 65 years | 12,321 | 12,682 | | | | | | | |
| Householder 65 years and older | 11,122 | 12,634 | | | | | | | |
| Three persons | 14,393 | 14,810 | 14,824 | | | | | | |
| Four persons | 18,979 | 19,289 | 18,660 | 18,725 | | | | | |
| Five persons | 22,887 | 23,220 | 22,509 | 21,959 | 21,623 | | | | |
| Six persons | 26,324 | 26,429 | 25,884 | 25,362 | 24,586 | 24,126 | | | |
| Seven persons | 30,280 | 30,479 | 29,827 | 29,372 | 28,526 | 27,538 | 26,454 | | |
| Eight persons | 33,876 | 34,175 | 33,560 | 33,021 | 32,256 | 31,285 | 30,275 | 30,019 | |
| Nine persons or more | 40,751 | 40,948 | 40,404 | 39,947 | 39,196 | 38,163 | 37,229 | 26,998 | 35,572 |

Note: Numbers represent income in U.S. dollars.
Source: U.S. Bureau of the Census, Current Population Survey, 2004 Annual Social and Economic Supplement.

In addition to the limitations discussed for income, converting income to poverty status introduces other issues that need to be considered. If income data are collected by selecting an appropriate income category, rather than giving the actual dollar amount, then the conversion to poverty status must be performed using category means or medians and will thus result in some misclassification.

## Education

Education is frequently used as the measure of SES in presentations of health data. There are several reasons for this preference. Education is generally more completely reported than income; usually 95 percent or more of respondents report their attained level of education. Unlike occupation, all adults may be characterized by their education level. Education, unlike income or occupation, remains fixed for most people after the age of 25 and usually is not influenced by health. In addition, education is highly related to both income and occupation.

Education cannot be used to characterize the socioeconomic position of children (except through the educational level of parents or head of household). The average education level of the U.S. population has increased steadily over time, complicating comparisons across age groups. Between 1971 and 1997, the educational attainment of persons aged 25 to 29 years completing high school rose from 78 to 87 percent; the percentage with some college rose from 44 to 65 percent; and the percentage with 4 or more years of college rose from 22 to 32 percent.[18]

Educational attainment is typically measured either by the number of years of education the individual has completed or by the highest credential received. The categories for educational attainment that are primarily used in Healthy People 2010 are:

- Less than high school (persons with less than 12 years of schooling or no high school diploma),
- High school graduate (persons with either 12 years of schooling, a high school diploma, or Certificate of General Educational Development [GED], and
- At least some college (persons with a high school diploma or GED and 13 or more years of schooling).

In general, data on educational attainment are presented for ages beginning with 25 years, consistent with guidance given by the U.S. Bureau of the Census. However, objectives using different data systems may have different age groups for the education variable. The actual ages that are use to calculate educational attainment for some of the major Healthy People 2010 data systems are shown in Table 2. Because of the requirements of the different data systems, the age groups used to calculate educational attainment for an objective may differ from the age groups used to report the data for other select populations and the overall measure of the same objective. For clarity, each objective in Healthy People 2010 states the age groups used to measure the levels in the educational attainment category. Caution must be used in comparing the data by educational attainment with data for the main objective and other select populations.

Healthy People 2010 baseline education data for the mortality objectives are based on reports from 46 States and the District of Columbia. Mortality statistics do not report data by education for the elderly population (65 years and older) because the percentage with "education not stated" is higher for this group and because of possible bias due to misreporting of education on the death certificate. The death rate for high school graduates (12 years of education) is generally overstated because there is a tendency for some people who did not graduate from high school to be reported as high school graduates on the death certificate; by extension, the death rate for the group with less than 12 years of education tends to be understated.[19]

**Table 2. Healthy People 2010 data systems and ages used to report educational attainment.**

| Data System | Ages Used To Report Educational Attainment |
|---|---|
| Behavioral Risk Factor Surveillance System (BRFSS) | 25 years and older |
| National Health and Nutrition Examination Survey (NHANES) | 25 years and older<br>(unless otherwise noted) |
| National Health Interview Survey (NHIS) | 25 years and older |
| National Survey of Family Growth (NSFG) | 22–44 years |
| National Vital Statistics System—Mortality (NVSS-M) | 25–64 years |
| National Vital Statistics System—Natality and Linked (NVSS-N and NVSS-L) | 20 years and older |
| National Survey on Drug Use and Health (NSDUH) | 18 years and older |

## Other Population Groups

Several other groups were considered for inclusion in the minimum set of select populations but were left to the discretion of the Public Health Service agencies responsible for each Healthy People 2010 focus area to include under specific objectives where appropriate. These groups included urban/rural residence, health insurance status, disability status, age, sexual orientation, the institutionalized population, and immigrant status, some of which are discussed in greater detail below. Some objectives also include select populations of persons with specific conditions—such as persons with diabetes, persons with hypertension, and persons with arthritis.

### Urbanization

Urban residence in Healthy People 2010 is specified as either residing within or outside a metropolitan statistical area or residing within or outside an urbanized area or urban place (called "urban" in the template) as designated by the U.S. Census Bureau.

#### *Urban*

Urban residence is defined as people living within the boundaries of an urbanized area and the urban portion of places outside an urbanized area that have a decennial census population of 2,500 or more. An urbanized area is an area consisting of a central place(s) and adjacent urban fringe that together have a minimum residential population of at least 50,000 people and generally an overall population density of at least 1,000 people per square mile of land area. The U.S. Census Bureau uses published criteria to determine the qualification and boundaries of urbanized areas. For more information see the Census Bureau Web site at http://www.census.gov/geo/www/tiger/glossary.htm.

### *Metropolitan Statistical Areas (MSA's)*

Metropolitan statistical areas (MSAs) are established by the U.S. Office of Management and Budget. The MSA standards are revised before each decennial census. When census data become available, the standards are applied to define the actual MSAs. An MSA is a county or group of contiguous counties that contains at least one urbanized area of 50,000 or more population. In addition to the county or counties that contain all or part of the urbanized area, an MSA may contain other counties that are metropolitan in character and that are economically and socially integrated with the main city. In New England, cities and towns, rather than counties, are used to define MSAs. Counties that are now within an MSA are considered to be nonmetropolitan.[20]

## Health Insurance Status

The health insurance status template applies only to persons aged under 65 years. Those 65 years and older are considered to be covered by Medicare. Respondents are identified as having health insurance if they are covered by either private or public health plans. Private insurance includes fee-for-service plans, single service hospital plans, and coverage by health maintenance organizations. Public insurance includes Medicaid or other public assistance, Temporary Assistance for Needy Families, Supplementary Security Income, Medicare, or military health plan coverage.

## Disability

In 1980, the World Health Organization published the first version of the International Classification of Impairments, Disabilities, and Handicaps (ICIDH)[21] as a classification of the "consequences of disease." The International Classification of Functioning, Disability, and Health (ICF) was published in 2001.[22]

According to IFC, components of disability include:

- Impairments to body functions,
- impairments to body structures,
- limitations to participation in activities with or without assistance or the use of assistive devices, and
- barriers and facilitators which make up the physical, social and attitudinal environment (environmental factors).

The major sources of national data on people with disabilities include:

- Decennial Census
- Survey of Income and Program Participation
- National Health Interview Survey (NHIS)
- National Health and Nutrition Examination Survey (NHANES)

- Medical Expenditure Panel Survey
- Current Population Survey

For Healthy People 2010, the major sources of disability data are the NHIS and NHANES for national data and the Behavioral Risk Factor Surveillance System (BRFSS) for State-level data. The NHIS has several variables that can be used to operationally define disability status, including limitation of activity, restriction of participation (bed days, work-loss days, school-loss days), and assessed health status.[23] The BRFSS also collects information on health-related quality of life, limitation of activity, and self-assessed health status.

Disability is operationally defined in a number of different ways for program purposes and for analytic and research purposes, depending on the data collected by the data systems. In Healthy People 2010, disability is primarily defined using information on activity limitation or the use of special equipment. The definitions used by the NHIS, BRFSS, and NHANES are described below.

In the 1997 NHIS, a person is classified as having a disability if a "yes" response was obtained to <u>any</u> of the age-appropriate limitation questions or to the use of special equipment. (See the operational definition for the denominators used for objectives 6-2 (children) and 6-3 (adults) in Part B for the specific questions used from the 1997 NHIS.) For NHIS data prior to 1997, the special equipment questions were not asked, so persons are categorized in the templates as "with activity limitation" rather than "with disabilities."

State data are available from the BRFSS telephone surveys. For Healthy People 2010, using 1998 BRFSS data, people answering "yes" to <u>any</u> of the following questions define adults 18 years and older with disabilities:

- Are you limited in any way in any activities because of any impairment or health problem?
- If you use special equipment or help from others to get around, what type do you use?

The 1999-2002 NHANES is also used to classify persons with disability. Persons 20 years and older were identified by NHANES as having a disability if they met any of the following criteria:

- Unable to work at a job or business because of a physical, mental, or emotional problem
- Limited because of difficulty remembering or because of periods of confusion
- Limited in any activity because of a physical, mental or emotional problem

- Uses special equipment, such as a cane, a wheelchair a special bed, or a special telephone.

Disability data from the NHANES III were limited to the second phase (1991–94) and are calculated only for people 20 years and older. People are classified as having a disability if a "yes" response was obtained to <u>any</u> of the following questions:

- Are you limited in the kind or amount of <u>work</u> you can do because of any impairment or health problem?
- Are you limited in the kind or amount of <u>housework</u> you can do because of any impairment or health problem?
- Are you limited in any way in any <u>activities</u> because of any impairment or health problem?
- Do you usually use any device to help you get around such as a cane, wheelchair, crutches or walker?

The Centers for Disease Control and Prevention proposed that a standardized set of questions on disability status be developed. As standard questions are adopted by the data systems, the data produced from them are being incorporated into the Healthy People 2010 objectives that specifically identify people with disabilities. This presents the opportunity to have a standard definition of people with disabilities that can be used across data systems and geographic levels. Objective 6-1 of Healthy People 2010 is tracking the incorporation of a standard definition in major data systems used to monitor the Healthy People 2010 objectives. As of 2004, 33 percent of relevant data systems had adopted the standard questions.

To a large extent, disability measures are related to the generation of many summary measures discussed in the goals section of *Healthy People 2010*[24] Summary measures of health generally combine information on mortality and health into a single measure. Many of these summary measures use variables that directly relate to disability status to generate the health component (often referred to as health-related quality of life) of the measure. Because of this, disability measures have importance beyond the assessment of the disability status of a population.

## Age

Age is not included in the minimum template because showing inclusive age categories would add considerable complexity to the minimum set. Furthermore, age is often stated in the objective (for example, mammograms for females 40 years and older) and many objectives are relevant only for a subset of age groups. Age-specific select populations are added to objectives where needed and may not be inclusive of the total population. For example, age-specific measures for the elderly, adolescents, or children have been added to some objectives without adding other groups, although showing inclusive age breakouts, if relevant, is preferred.

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## 7. Age Adjustment

Because many Healthy People 2010 objectives have outcomes that vary by age, data for a number of objectives are age adjusted. Age adjustment is a technique to control for differences among populations or changes over time due only to differences in age composition. Healthy People 2010 uses age-adjusted rates computed by the direct method, that is by applying the age-specific rates in a population of interest to a standardized age distribution in order to eliminate differences in observed rates that result from age differences in the population composition.

Age-adjusted rates are useful for comparing two or more populations (such as race/ethnic groups) at a point in time or a single population at two or more points in time. They should not be used to measure absolute magnitude. (Absolute magnitude is best measured by the number of events or by crude [unadjusted] rates.) The actual numerical value of an age-adjusted rate is dependent upon the standard population used and should be viewed as a construct or index rather than a direct or actual measure. It is also important to note that age-adjusted rates may only be compared to rates adjusted to the same standard population.[1]

In Healthy People 2010, many of the mortality objectives are age adjusted, as are many of the objectives that measure health outcomes and risk factors. Age-adjusted data may be shown for objectives that target either the total population or a subgroup of the population with a large age range. Objectives or population subgroups that target groups with relatively small age ranges (generally less than 40 years) are not adjusted.[2] Data for older adult age groups (e.g. 50 and over, 65 and over, etc.) are generally age adjusted.

For some population groups, the age-adjusted rates are considerably different from crude rates. This happens because the age distribution of the group is quite different from the age distribution of the standard population. For example, for the Hispanic population has a much younger age distribution than the standard population. Consequently, the age-adjusted rates in this population for those outcomes and behaviors that are generally more frequent among the older population are considerably higher than the corresponding crude rates.

With the exception of two objectives (4-1 and 4-7), all age-adjusted rates in Healthy People 2010 are based on the year 2000 standard population, which was derived from the United States projected 2000 population. The selection of the standard age distribution, or standard population, is to some extent arbitrary.[3,4] A number of different standards have been used over the years by Federal and State statistical agencies. Prior to 1999, the National Vital Statistics System used a standard based on the 1940 population, while other agencies of the U.S. Department of Health and Human Services (DHHS) used different standards. Since data year 1999, all DHHS agencies have been using the 2000 standard.[5,6]

Those objectives tracked with age-adjusted data are noted in Part B: Operational Definitions. Data not specifically denoted as age adjusted, should be considered crude (unadjusted) data.

## Mortality

There are about 55 Healthy People 2010 objectives and subobjectives that monitor mortality outcomes. Most of these use data from the National Vital Statistics System, of which 27 are tracked with age- adjusted death rates (see Appendix D). The remaining mortality objectives and subobjectives are measured using either:

- Numbers of deaths
- Age-specific death rates
- Maternal/infant mortality rates, for which births are the denominator, or
- Crude death rates from data systems other than the National Vital Statistics System, such as the Fatality Analysis Reporting System or the Census of Fatal Occupational Injuries

The measurement details for each objective are specified in the operational definitions.

The age-adjusted death rate (AADR) is a weighted average of age-specific death rates where the age-specific weights represent the relative age distribution of a standard population. The AADR is calculated by the direct method using the following formula:[9]

$$\text{AADR} = \sum w_{si} \cdot R_i$$

where $R_i$ is the age-specific death rate for age interval $i$ and $w_{si}$ denotes the standard weight for age interval $i$ such that

$$w_{si} = \frac{P_{si}}{\sum P_{si}}$$

where $P_{si}$ denotes the population in age interval $i$ in the standard population, $0 < w_{si} < 1$, and the $w_{si}$ sum to 1.

After publication of *Healthy People 2010*, all mortality baselines were revised to data year 1999 to accommodate the change to ICD-10 (see Section 8). Age-adjusted death rates used for Healthy People 2010 are based on the 2000 population standard. Therefore, they differ from rates shown in previous Healthy People 2000 reports[7], which were based on the 1940 standard population. Thus, the rates computed for Healthy People 2000 cannot be used in trend comparisons with rates computed for Healthy People 2010.

Age adjusted mortality rates for the period 1999-2003 were calculated using the 2000 standard age distribution for mortality and the corresponding weights shown in Table 3.

**Table 3. 2000 standard million age distribution.**

| Age | Population *(in thousands)* | Standard Million | *Proportion Distributions* ($w_{si}$) |
|---|---|---|---|
| All ages | 274,634 | 1,000,000 | 1.000000 |
| Under 1 year | 3,795 | 13,818 | 0.013818 |
| 1-4 years | 15,192 | 55,317 | 0.055317 |
| 5-14 years | 39,977 | 145,565 | 0.145565 |
| 15-24 years | 38,077 | 138,646 | 0.138646 |
| 25-34 years | 37,233 | 135,573 | 0.135573 |
| 35-44 years | 44,659 | 162,613 | 0.162613 |
| 45-54 years | 37,030 | 134,834 | 0.134834 |
| 55-64 years | 23,961 | 87,247 | 0.087247 |
| 65-74 years | 18,136 | 66,037 | 0.066037 |
| 75-84 years | 12,315 | 44,842 | 0.044842 |
| 85 years and older | 4,259 | 15,508 | 0.015508 |

Source: U.S. Census Bureau, Population Estimates Program.

The age-adjustment weights shown in Table 3 were created from populations rounded to the thousands and aggregated into larger age groups. This method of computing weights was used for all age-adjusted rates appearing in the *Healthy People 2010 Midcourse Review,* including objectives tracked by mortality and health survey data. In early 2006, the method for creating weights was changed. Since that time, whole number populations by single years of age have been used to create the age adjustment weights for Healthy People 2010 age-adjusted objectives. This allows users to age adjust data using any combination of age groups. Table 4 shows the 2000 U.S. standard population by single years of age. There is very little difference between the weights using populations rounded to the thousands and weights based on whole number populations. Additional information about the whole number standard population can be found at: http://seer.cancer.gov/stdpopulations/ [8].

### Table 4. U.S. standard population by single years of age.

| Age in Years | 2000 U.S. Standard Population | |
|---|---|---|
| | Single Ages to 99 | Single Ages to 84 |
| 00 | 3,794,901 | 3,794,901 |
| 01 | 3,758,562 | 3,758,562 |
| 02 | 3,773,025 | 3,773,025 |
| 03 | 3,791,001 | 3,791,001 |
| 04 | 3,869,031 | 3,869,031 |
| 05 | 3,896,081 | 3,896,081 |
| 06 | 3,917,855 | 3,917,855 |
| 07 | 3,978,143 | 3,978,143 |
| 08 | 3,903,983 | 3,903,983 |
| 09 | 4,223,778 | 4,223,778 |
| 10 | 4,230,322 | 4,230,322 |
| 11 | 4,027,959 | 4,027,959 |
| 12 | 3,941,299 | 3,941,299 |
| 13 | 3,923,270 | 3,923,270 |
| 14 | 3,933,929 | 3,933,929 |
| 15 | 3,952,423 | 3,952,423 |
| 16 | 3,853,629 | 3,853,629 |
| 17 | 4,012,263 | 4,012,263 |
| 18 | 3,936,904 | 3,936,904 |
| 19 | 4,064,299 | 4,064,299 |
| 20 | 4,037,599 | 4,037,599 |
| 21 | 3,764,802 | 3,764,802 |
| 22 | 3,555,718 | 3,555,718 |
| 23 | 3,489,233 | 3,489,233 |
| 24 | 3,409,873 | 3,409,873 |
| 25 | 3,421,099 | 3,421,099 |
| 26 | 3,328,203 | 3,328,203 |
| 27 | 3,434,987 | 3,434,987 |
| 28 | 3,450,602 | 3,450,602 |
| 29 | 4,087,176 | 4,087,176 |
| 30 | 3,999,004 | 3,999,004 |
| 31 | 3,810,183 | 3,810,183 |
| 32 | 3,774,385 | 3,774,385 |
| 33 | 3,840,938 | 3,840,938 |
| 34 | 4,086,860 | 4,086,860 |
| 35 | 4,288,078 | 4,288,078 |
| 36 | 4,349,620 | 4,349,620 |
| 37 | 4,469,476 | 4,469,476 |
| 38 | 4,290,207 | 4,290,207 |
| 39 | 4,782,575 | 4,782,575 |
| 40 | 4,666,685 | 4,666,685 |

| Age in Years | 2000 U.S. Standard Population | |
|---|---|---|
| | Single Ages to 99 | Single Ages to 84 |
| 41 | 4,493,582 | 4,493,582 |
| 42 | 4,487,560 | 4,487,560 |
| 43 | 4,424,004 | 4,424,004 |
| 44 | 4,407,398 | 4,407,398 |
| 45 | 4,268,017 | 4,268,017 |
| 46 | 4,033,859 | 4,033,859 |
| 47 | 3,958,468 | 3,958,468 |
| 48 | 3,681,489 | 3,681,489 |
| 49 | 3,863,960 | 3,863,960 |
| 50 | 3,720,935 | 3,720,935 |
| 51 | 3,504,329 | 3,504,329 |
| 52 | 3,475,657 | 3,475,657 |
| 53 | 3,754,218 | 3,754,218 |
| 54 | 2,769,220 | 2,769,220 |
| 55 | 2,749,739 | 2,749,739 |
| 56 | 2,786,795 | 2,786,795 |
| 57 | 2,947,472 | 2,947,472 |
| 58 | 2,404,462 | 2,404,462 |
| 59 | 2,418,766 | 2,418,766 |
| 60 | 2,259,141 | 2,259,141 |
| 61 | 2,179,759 | 2,179,759 |
| 62 | 2,132,873 | 2,132,873 |
| 63 | 2,030,730 | 2,030,730 |
| 64 | 2,051,769 | 2,051,769 |
| 65 | 2,033,933 | 2,033,933 |
| 66 | 1,862,107 | 1,862,107 |
| 67 | 1,849,893 | 1,849,893 |
| 68 | 1,788,769 | 1,788,769 |
| 69 | 1,875,238 | 1,875,238 |
| 70 | 1,843,087 | 1,843,087 |
| 71 | 1,784,744 | 1,784,744 |
| 72 | 1,802,080 | 1,802,080 |
| 73 | 1,674,285 | 1,674,285 |
| 74 | 1,621,378 | 1,621,378 |
| 75 | 1,610,943 | 1,610,943 |
| 76 | 1,530,137 | 1,530,137 |
| 77 | 1,450,062 | 1,450,062 |
| 78 | 1,456,186 | 1,456,186 |
| 79 | 1,367,231 | 1,367,231 |
| 80 | 1,172,978 | 1,172,978 |
| 81 | 1,065,672 | 1,065,672 |
| 82 | 963,587 | 963,587 |

| Age in Years | 2000 U.S. Standard Population | |
|---|---|---|
| | Single Ages to 99 | Single Ages to 84 |
| 83 | 890,893 | 890,893 |
| 84 | 807,104 | 807,104 |
| 85 | 693,158 | 4,259,173 |
| 86 | 607,940 | |
| 87 | 536,762 | |
| 88 | 452,814 | |
| 89 | 387,893 | |
| 90 | 327,827 | |
| 91 | 273,709 | |
| 92 | 226,917 | |
| 93 | 180,330 | |
| 94 | 143,772 | |
| 95 | 118,131 | |
| 96 | 88,924 | |
| 97 | 65,909 | |
| 98 | 46,278 | |
| 99 | 37,194 | |
| 100+ | 71,615 | |
| Total. | 274,633,642 | 274,633,642 |

**Table 5. United States standard population for age-adjusting death rates.**

| Age | Standard Population |
|---|---|
| All ages | 274,633,642 |
| Under 1 year | 3,794,901 |
| 1-4 years | 15,191,619 |
| 5-14 years | 39,976,619 |
| 15-24 years | 38,076,743 |
| 25-34 years | 37,233,437 |
| 35-44 years | 44,659,185 |
| 45-54 years | 37,030,152 |
| 55-64 years | 23,961,506 |
| 65-74 years | 18,135,514 |
| 75-84 years | 12;314,793 |
| 85 years and older | 4,259,173 |

Source: U.S. Census Bureau, Population Estimates Program.

## Health Surveys

A number of other Healthy People 2010 objectives use data from national health surveys that are also age adjusted. These are specified in the operational definition for each objective. They include objectives tracked by the National Health Interview Survey, the National Hospital Discharge Survey, the National Hospital Ambulatory Medical Care Survey, the Behavioral Risk Factor Surveillance System (BRFSS), and the National Health and Nutrition Examination Survey. Data for these objectives are age adjusted to the 2000 standard population, using the equations previously shown where $R_i$ is the age-specific rate for the health status, health behavior, or health care utilization variable, as appropriate.

While the same standard population is employed, the age groups used to adjust survey data may differ from those used to adjust mortality data. In general, to maximize the stability of the rates, fewer age groups are used. Differences in adjusted rates resulting from the different specific age groups used should be relatively small.

In some cases, the applicable age range for the objective may not be the total population. For example, an objective may refer to persons aged 18 years and older, females aged 40 years and older, or persons aged 45-74 years. In these cases, the weights are based on the population in the specified age range selected for adjustment.

The age groups used to adjust Healthy People 2010 survey data are shown in the operational definition for each objective. The specific grouping used depends on the data system and the population targeted by the objective.[7]

When the denominator for an objective is persons with a chronic disease (diabetes, cancer, chronic kidney disease, arthritis, and coronary heart disease), the data for age groups under 45 years (or, in some cases, 40 years) are aggregated into a single group for the age-adjustment calculation. This is done to stabilize the age-adjusted rates. The age distribution of persons with chronic diseases tends to differ considerably from the standard population used for age adjustment. Using the standard age groups to age-adjust an objective with a chronic disease denominator places relatively large weights on the younger age groups. The relatively small numbers of people with those conditions in these age groups may result in highly variable rates. Combining the younger age groups increases stability and reliability.

More information on age adjustment of survey data for Healthy People 2010 can be found in Klein and Schoenborn.[7]

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# 8. Mortality and Morbidity Classification

## Mortality Data

Data for objectives that monitor specific causes of death are classified and coded according to the World Health Organization's (WHO) Tenth Revision of the International Classification of Diseases (ICD-10).[1] The ICD is a classification system that provides basic guidance for coding and classifying causes of death. It includes disease, injury, and poisoning categories, as well as the rules used to select the single underlying cause of death from the several diagnoses that may be reported on the death certificate. The ICD also includes definitions, tabulation lists indicating cause-of-death groupings used to present mortality data, and the format of the medical certification of death. Use of the ICD for the classification and coding of mortality statistics is required under an agreement between the United States and the WHO.[2]

Since 1900, the ICD for mortality has been revised approximately every 10 years, with the exception of the 20-year interval between the Ninth and Tenth revisions. The revisions are essential to ensure that disease classifications are consistent with advances in medical science and changes in diagnostic practice. ICD-10 was implemented in the United States effective with deaths occurring in 1999.[3]

The original Healthy People 2010 baselines for mortality objectives were based on 1997 and 1998 data coded to the Ninth Revision of the ICD (ICD-9).[4] The introduction of a new ICD revision creates discontinuities in time series trends for causes of death because of the reclassification and changes in coding rules. Consequently, to minimize these discontinuities, the baseline data year for cause-specific mortality objectives was revised to 1999. Subsequent tracking data for these objectives are classified according to ICD-10. The specific ICD-10 codes used for each mortality objective are shown in the operational definitions (Part B of this publication) and in Appendix C.

Data for most Healthy People 2010 mortality objectives are based on the underlying cause of death. The underlying cause of death is defined as the disease or injury that initiated the sequence of events leading directly to death or as the circumstances of the violence or accident that produced the fatal injury.[1] It is selected from the conditions entered by the physician in the cause of death section on the death certificate. When more than one cause is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, provisions of the ICD, and associated selection rules and modifications.[3] Generally, more information is reported on the death certificate than is directly reflected in the underlying cause of death. This is captured in the multiple cause-of-death statistics. Several objectives use all mentions of a cause (or "multiple" cause) on the death certificate. Specific objectives tracked by multiple-cause statistics are noted in the operational definitions.

The United States Standard Certificate of Death was revised in 2003 to improve the quality of data reported on the death certificate and to facilitate the collection of data needed to address coding changes resulting from the implementation of ICD-10. Some of the revisions include: the provision of additional space in the cause of death section to give the attending physicians more opportunity to list contributing conditions; the addition of a question regarding tobacco use to help reduce under reporting of tobacco use as a contributing factor to death; the addition of a question regarding pregnancy status of female decedents to improve the reporting of maternal deaths; and the addition of a question to gather information about the decedent's role in transportation accidents. The education item was revised from an open-ended item about years of education to check boxes of educational degree categories. In addition, the race and Hispanic origin questions were changed from open-ended items to check boxes in order to replicate the format of the race and Hispanic origin items on the Census questionnaire.[5] The transition to the 2003 Standard Certificate of Death by the States is occurring over multiple years. Five areas (4 States and New York City) implemented the revision in 2003.[6] States that have transitioned to the 2003 Standard Certificate of Death are excluded from education analyses. Due to the different educational profiles of the excluded states, data from 2003 and onward is not directly comparable to earlier years.

## Morbidity Data

Baseline data for cause-specific morbidity objectives are coded to International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM).[7] The specific ICD-9-CM codes used are shown in the operational definition for each morbidity objective and in Appendix D.

ICD-9-CM is a clinical modification of ICD-9. The ICD-9-CM coding system includes a fifth digit, thus providing greater specificity and detail than ICD-9. ICD-9-CM is intended to serve as a tool in the classification of morbidity data for indexing of hospital medical records, medical care review, and ambulatory and other medical care programs, as well as for basic health statistics. It is used to code and classify morbidity data from inpatient and outpatient records, physicians' offices, long term care facilities and most health surveys. ICD-9-CM is compatible with its parent classification (ICD-9), thus meeting the need for comparability of morbidity and mortality statistics.[7]

Code assignment using ICD-9-CM is based on official national coding guidelines. The guidelines for selecting the "first-listed" or principal diagnosis for morbidity records differ from those used to select the underlying cause of death on death records. Under morbidity coding rules, the first listed or principal diagnosis is that condition established after study to be chiefly responsible for occasioning the admission to the hospital or the encounter with the health care provider for care. In some instances the principal diagnosis may be a manifestation of the disease rather than the underlying cause. For example, if a patient with a primary malignant neoplasm with metastasis is admitted to receive treatment directed toward a secondary site, the secondary site would be designated on the hospital discharge form as the principal diagnosis.[8]

In general, the morbidity objectives in Healthy People 2010 are tracked using the principal diagnosis. However, in some cases "all-listed" diagnoses, which include the principal and all other diagnoses appearing on the medical record, are used (as many as 7 to 10 diagnoses may appear in some records). Specific objectives tracked by all-listed diagnoses are noted in the operational definitions

Additional codes have been added and code changes have been made to the ICD-9-CM since its implementation in 1986. A conversion table for diagnosis and procedure code changes between 1986 and the current data year is available to assist users in data retrieval. The table shows the date the new code became effective and its previously assigned code equivalent. The latest additions to the classification appear in bold print.[8]

A clinical modification of ICD-10 (ICD-10-CM) has been developed as a replacement for ICD-9-CM. As of this writing, a pre-release of the ICD-10-CM is available, however, there is no anticipated implementation date. The results of a joint testing of the ICD-10-CM pre-release are available from the American Hospital Association and the American Health Information Management Association, at the following addresses:

http://www.cdc.gov/nchs/about/otheract/icd9/icd10cm.htm
http://www.hospitalconnect.com/aha/press_room-info/content/ICD10report030922.pdf
http://library.ahima.org/xpedio/groups/public/documents/ahima/pub_bok1_020969.html

Once implemented, revised coding guidelines, training materials and crosswalks between ICD-9-CM and ICD-10-CM will be made available on the NCHS Web site.

Data for the Healthy People 2000 morbidity objectives from the sources listed above were also coded according to ICD-9-CM, although in a few cases, the specific codes used for the 2010 objectives are different from those used for the comparable Healthy People 2000objective. These differences are noted in the operational definition for the objective in Part B: Operational Definitions.

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## 9. National Data

Data used to track the Healthy People 2010 objectives are based on events occurring in the 50 States and the District of Columbia, where available. Unless specifically noted, all objectives exclude data for U.S. territories. The data used to track most population-based Healthy People 2010 objectives are derived from either a national census of events (for example, the National Vital Statistics System and the National Notifiable Disease Surveillance System) or from nationally representative sample surveys (for example, the National Health Interview Survey and the National Survey on Drug Use and Health).

For some objectives, however, complete national data are not available and data for selected States and/or areas are used to monitor the objectives. In these cases, the coverage area is described with the data for the objective and in the operational definitions. Examples of these data systems include the Adult Spectrum of Disease Project and the Health Care Cost and Utilization Project. Data for these objectives may not be representative of the United States as a whole. If the data used to track an objective are not nationally representative, the number of States in the reporting area is noted. If during the decade national data become available, they will be used to track the objectives.

For some national data systems that cover the entire United States, such as the National Vital Statistics System and the Behavioral Risk Factor Surveillance System, data are not available for some variables for all States. This is either because data for a specific variable are not collected by some States or because the quality of data for some States is not sufficient to produce reliable estimates for some variables. Some examples are shown in Table 6, with the number of States reporting in the baseline and most recent data years. The number of reporting States can vary from year to year. This information is also shown in the operational definitions for selected objectives.

**Table 6. Variables in major data systems for which data are not available from all States.**

| Data System | Variable | Number of States With Data Available (Baseline year) | Number of States With Data Available (Most Recent Data Year) |
|---|---|---|---|
| National Vital Statistics System (Mortality) | Education | 46 States + District of Columbia (1998) | 46 States + District of Columbia (2002) |
| National Vital Statistics System (Natality) | Maternal smoking | 46 States + District of Columbia and New York City (1998) | 49 States + District of Columbia and New York City (2002) |
| Behavioral Risk Factor Surveillance System | Diabetes variables | 39 States (1998) | 46 States (2003) |

# 10. State and Local Data

Healthy People has provided a framework for national, State, and local health agencies and non-governmental organizations to assess health status, health behaviors, and services and to plan and evaluate health promotion programs.[1,2] The national Healthy People initiatives have served as a "menu" for identifying State and local priorities and selecting objectives that are most relevant to specific States, communities, and specific settings (schools, worksites, etc.), and health care delivery systems.[3,4] Twenty-two percent of the objectives included in the Department of Health and Human Services's strategic plan (developed in accordance with the Government Performance and Results Act of 1993) were adopted from Healthy People 2000.

This focus on performance has prompted State and local health agencies to shift from their emphasis of primarily providing services to one that conducts needs assessment and quality assurance.[5,6] This shift has required increased collection and analysis of data. Health care delivery organizations have also experienced this shift and have increased efforts to collect standardized data on patients, services, and outcomes. Many health care organizations are using the Health Employer Data Information System as a mechanism to standardize the collection of data and to evaluate outcomes. The increased emphasis on data collection and analysis for purposes of assessment and evaluation has increased the need to address the associated issues of data availability, validity/reliability, comparability, and utilization. These issues also affect the relevance of the national Healthy People objectives at the State and local level.

The large number and diversity of State and local health agency structures and resources amplify the impact of these data issues when trying to compare Healthy People plans, objectives, and progress among States or between a State and the nation. States also vary considerably in their capacity to monitor the objectives they identify as most relevant to their constituents. In 1997, States reported an average ability to measure 39 percent of the Healthy People 2000 objectives.[1] To focus on the need to develop capacity for tracking at the State and local level, Healthy People 2010 includes a separate focus area (focus area 23) aimed at improving infrastructure and surveillance capability.[7]

Some key areas where these issues need to be examined at State and local levels are discussed below.

## Objective Wording/Operational Definition

The Healthy People "menu" provides a useful way for States and localities to focus on serious health issues, but many agencies and organizations have tailored the objectives to better focus on specific concerns of their constituents. These modifications may more effectively address the health concerns of the State or local population, but they also reduce comparability when evaluating objective progress relative to the nation, other States, or localities. For example, Objective 8-18 tracks the proportion of persons living in homes tested for radon at the national level. Some States have adopted this objective verbatim, while others have included schools or day care centers within the same objective. In addition, the operational definitions and data sources for the same or similar national and State/local objectives may vary considerably. Self-reported data from a household survey is used to monitor the national radon objective, whereas some States use data based on actual installation of radon monitors and picocurie information collected.

## Population Data/Race and Ethnicity Reporting

Many Healthy People objectives are population based and are expressed in terms of mortality or morbidity rates (for example, lung cancer deaths per 100,000), where the denominator is a population estimate. National, State, and local health agencies primarily rely on population estimates produced by the United States Census Bureau. The Bureau provides population counts from the decennial census for the nation, States, counties, and large municipalities. It also produces annual postcensal estimates for the years following the census (see section 5: Population Estimates). These estimates are available by gender, age, race and ethnicity (see section 6: Population Template). However, the sizes of some racial groups (American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander) are relatively small, even at the national level, and are distributed unevenly across State and local areas. This precludes many jurisdictions from producing reliable rates for objectives that focus on these populations.

## "Rare" Events/Confidentiality

Some Healthy People objectives (for example, suicide or HIV deaths) address important, sensitive health issues which are, fortunately, relatively rare events. Small numbers of suicides or HIV deaths in a county or municipality with a relatively small population may result in unreliable, nonrepresentative rates. Reporting these rates by certain characteristics, or geocoding and displaying maps of the distribution of sensitive or rare events may jeopardize confidentiality. Thus, it may be necessary to aggregate data over geographic areas, personal characteristics, and/or data years to address these issues.

## Age Adjustment

In general, States and localities age-adjust mortality data to the same standard population used for the national data (see section 7: Age Adjustment).

## Data Sources

The availability and comparability of data for national, State, and local monitoring of Healthy People objectives vary considerably. Some data, especially vital statistics, are readily available at all geographic levels. The standardization of vital statistics data contributes to its comparability across jurisdictions. Because they are readily accessible and generally comparable, mortality and natality data were key parts of the 18 Health Status Indicators (HSI) selected for widespread State and local use in Healthy People 2000.[8] However, vital statistics data provide only a limited perspective on health status, risk behaviors, and access to health care. Morbidity and risk factor data are required to monitor a large proportion of the Healthy People 2010 objectives. Data for these objectives come from a wide range of household surveys, environmental hazard data, and other sources.

Many of the national Healthy People objectives are monitored using data from the National Health Interview Survey (NHIS). Some of these objectives are monitored at State and some local levels using data from the Behavioral Risk Factor Surveillance System (BRFSS). In general, it should be noted that both differences in the data collection methods (household interview versus telephone interview) and wording of questions used to monitor the same objectives at the national vs. the state level can affect the comparability of the information collected. In addition, some objectives monitored with identical questions in the NHIS and the BRFSS (for example, firearm storage) are only included periodically in a specific rotating module of the BRFSS or supplements to the NHIS. Not all States use these modules and/or the year of the "rotation" may not coincide with national data from the NHIS. This limits comparability between national and State data.

Other national Healthy People objectives are monitored using composite data sources. The national data from these systems are aggregated from data collected at State or local levels. Unlike the vital statistics data (which include all births and deaths), several of these systems are samples of events that use somewhat different data collection and analysis methods among States or communities. For example, the National Water Quality data are compiled from State data on "assessed" rivers, lakes, and estuaries. States vary in the proportions and the specific bodies of water they assess across time. Hence, both State and national estimates may be subject to considerable variation. This affects the quality and comparability of national, State, and local data.

State and local jurisdictions were unable to monitor progress toward some of the Healthy People 2000 objectives. This prompted the development of Healthy People 2000 Priority Data Needs,[9] which identified sources of State and local data that could be used to track important health issues, such as adult immunization and access to primary health care. During the development of the Healthy People 2010 objectives, participants proposed that a set of Leading Health Indicators be selected to further improve national, State, and local agencies' abilities to measure and evaluate health status and programmatic activity.[10] The availability of data for the Leading Health Indicators may be somewhat limited at the State level and it represents a substantial challenge for measurement at the local level.

While local data are not yet available, state data are currently available through DATA2010 for selected measures (see section 12: Healthy People 2010 Database). State data can be accessed through all table generating options available in DATA2010.

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## 11. Variability of Estimates and Data Suppression

Two main types of data systems are used to track Healthy People 2010 objectives: *sample surveys* and *population-count systems* (also called surveillance systems). Evaluating data from both types of systems requires consideration of variability. For sample surveys, sampling error (also called sampling variability) is of interest. For population-count systems, random variation is of interest. Issues of data quality (for example, item non-response, bias, non-representativeness) can affect data from both types of sources.

### Sample Surveys

For many health outcomes, assessing all individuals in a population may be impossible, impractical, expensive, or inaccurate. Therefore, it is usually advantageous to study a sample of the original population. Much of the data used to monitor the Healthy People 2010 objectives are derived from sample surveys (for example, the National Health Interview Survey and the National Survey on Drug Use and Health) that make estimates for a population from a representative sample of respondents. These estimates are subject to sampling error. One commonly-used measure of sampling error is the standard error. The standard error represents the variation in an estimate that can occur by chance since only a sample of the population is surveyed rather than the entire population. Assuming a normal distribution of events, the chances are about 68 in 100 that an estimate from the sample would differ from a complete census by less than the standard error. The chances are about 95 in 100 that the difference would be slightly less than twice the standard error. This is often referred to as the 95 percent confidence interval, where the estimate is expressed as a range of the observed rates, approximately +/-1.96 standard errors.

To properly interpret differences between rates for different population groups or changes over time in data derived from sample surveys, it is important to consider the variation associated with each rate. Healthy People 2010 uses a population template that includes detailed racial, ethnic and socioeconomic categories for all population-based objectives (see section 6: Population Template). This template necessitates the tabulation of data for relatively small population groups. These data are often associated with large standard errors. Thus, apparent differences between population groups or between a population group in the template and the total population may be within expected sampling error. Standard errors should be considered when evaluating progress or comparing population groups for objectives using survey data. For ease of presentation, the standard errors associated with the estimates for the Healthy People 2010 objectives do not appear in either *Healthy People 2010*[1] or *Tracking Healthy People 2010*. However, where available, they are included in the Healthy People 2010 database, DATA2010 (see section 12: Healthy People 2010 Database). More information on the sample design and variance estimation for some of the major data systems used to monitor the Healthy People 2010 objectives can be found in Part C: Major Data Systems, and in other publications.[2-9]

## Population-Count Systems

Some of the data systems used to track the Healthy People 2010 objectives are based on complete counts of events occurring to the population (for example, the National Vital Statistics System, the HIV-AIDS Reporting System, and the United States Renal Data System). As such, these data are not subject to sampling error, although they are subject to errors in the registration process. However, when the estimates are used for analytical purposes, such as the comparison of rates over time or among groups or areas, the number of events that actually occurred may be considered as one of a large series of possible results that could have arisen under the same circumstances. This is known as random variation. When the number of events is large, random variation is usually small. However, when the number of events is small (fewer than 100) and the probability of such an event is small, random variation can be substantial and considerable caution must be used in interpreting the change described by the estimates. In these cases, it is desirable to compute the standard error of the rates and use that computation in the comparison of interest. Standard errors for rates derived from population-count systems, where available, are included in DATA2010. More information on random variation and small numbers can be found in the "technical notes" section of the annual *National Vital Statistics Reports*.[10, 11]

## Data Suppression

Healthy People 2010 shows data for all of the groups included in the population template, when available. However, in some instances data are not available and one of the following symbols is shown in place of a data value:

- DNC – Data are not collected by the data system used to monitor the objective.
- DNA – Data have been collected but have not yet been analyzed.
- DSU – Data do not meet the criteria for statistical reliability, data quality, or confidentiality (data are suppressed).

The first two categories, DNC and DNA, are self-explanatory. There are three main reasons a statistic in Healthy People 2010 is suppressed (shown as DSU):

- The number of events is too small to produce a reliable estimate or may violate confidentiality requirements.
- The sample design does not produce representative estimates for a particular group.
- There is a high item non-response rate or a large number of unknown entries.

Different criteria for data suppression have been adopted by the various data systems used to monitor the Healthy People 2010 objectives. Some sample surveys use a single criterion for data suppression. For example, data from the Behavior Risk Factor Surveillance System are considered unreliable and are suppressed if the denominator is based on fewer than 50 sample cases. Other sample surveys use a combination of criteria. For example, data from the National Health Interview Survey are suppressed if the denominator is based on fewer than 50 events or if the relative standard error is greater than 30%. For population-count systems that are based on a complete census, typically a single criterion for data suppression based on the number of events is used. For example, the National Vital Statistics System considers rates based on fewer than 20 events to be unreliable.

In presenting data for the Healthy People 2010 objectives, NCHS adheres to the specific criteria for data suppression delineated by each data system. More information on data suppression, including a summary of the criteria used by the "major data systems" for Healthy People 2010, has been published elsewhere.[12]

For most objectives, an estimate or count based on a single year can be shown. However, for some objectives (or subgroups in the population template) that are based on relatively few events, multiple years of data are used to produce more stable estimates. For example, all of the objectives measured by the National Health and Nutrition Examination Survey use estimates based on either 2, 4, or 6 years of data.

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## 12. Healthy People 2010 Database

The Healthy People 2010 database, DATA2010, is an interactive, on-line database developed by the Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS). DATA2010 can be accessed through NCHS's Healthy People 2010 website at http://www.cdc.gov/nchs/hphome.htm or at http://wonder.cdc.gov/data2010.

DATA2010 contains the baseline and tracking data for all measurable Healthy People 2010 objectives. National data are available for all of the measurable objectives. State data are available for a subset of the measurable objectives. Socio-demographic data for population-based objectives are also provided; data are shown by race and Hispanic origin, gender, and socio-economic status (education or income). Through a series of menus and drop-down boxes, users can obtain data for:

- All objectives for one of the twenty-eight focus areas
- Objectives used to track the U.S. Department of Health and Human Services' *Steps to a Healthier U.S.* initiative
- Objectives used to track the ten Healthy People 2010 Leading Health Indicators
- All objectives for a particular data source
- A single objective within a focus area
- Objectives containing a specific word or phrase
- All objectives for a specific population group (e.g., adolescents, Hispanics, or women).

The standard data table output includes the following information:

- Objective number
- Objective text
- Baseline year and data
- Tracking data for subsequent years
- 2010 Target
- Footnotes
- Data source(s)

The standard data tables can be constructed in ASCII, comma-delimited, or HTML format for use in common software applications such as EXCEL, Lotus 1-2-3, and SAS. Users can also download statistical data spreadsheets in EXCEL format that contain unrounded data and standard errors (where available). Data can be graphed in

DATA2010 using an advanced selection option to create horizontal and vertical bar charts or line charts.

In addition to data, DATA2010 contains other technical information related to tracking the Healthy People 2010 objectives. For instance, users can obtain operational definitions for each objective, ICD-9 and ICD-10 codes for morbidity and mortality objectives, and the age-adjustment categories used for age-adjusted measures.

DATA2010 is updated on a quarterly basis to provide the most accurate and up-to-date data for the Healthy People 2010 objectives. New data and revisions to data previously shown are added during each update.

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Special Article

# RACIAL DIFFERENCES IN THE TREATMENT OF EARLY-STAGE LUNG CANCER

PETER B. BACH, M.D., LAURA D. CRAMER, SC.M., JOAN L. WARREN, PH.D., AND COLIN B. BEGG, PH.D.

## ABSTRACT

*Background* If discovered at an early stage, non–small-cell lung cancer is potentially curable by surgical resection. However, two disparities have been noted between black patients and white patients with this disease. Blacks are less likely to receive surgical treatment than whites, and they are likely to die sooner than whites. We undertook a population-based study to estimate the disparity in the rates of surgical treatment and to evaluate the extent to which this disparity is associated with differences in overall survival.

*Methods* We studied all black patients and white patients 65 years of age or older who were given a diagnosis of resectable non–small-cell lung cancer (stage I or II) between 1985 and 1993 and who resided in 1 of the 10 study areas of the Surveillance, Epidemiology, and End Results (SEER) program (10,984 patients). Data on the diagnosis, stage of disease, treatment, and demographic characteristics of the patients were obtained from the SEER data base. Information on coexisting illnesses, type of Medicare coverage, and survival was obtained from linked Medicare inpatient-discharge records.

*Results* The rate of surgery was 12.7 percentage points lower for black patients than for white patients (64.0 percent vs. 76.7 percent, $P<0.001$), and the five-year survival rate was also lower for blacks (26.4 percent vs. 34.1 percent, $P<0.001$). However, among the patients undergoing surgery, survival was similar for the two racial groups, as it was among those who did not undergo surgery. Furthermore, analyses in which adjustments were made for factors that are predictive of either candidacy for surgery or survival did not alter the influence of race on these outcomes.

*Conclusions* Our analyses suggest that the lower survival rate among black patients with early-stage, non–small-cell lung cancer, as compared with white patients, is largely explained by the lower rate of surgical treatment among blacks. Efforts to increase the rate of surgical treatment for black patients appear to be a promising way of improving survival in this group. (N Engl J Med 1999;341:1198-205.)

IN the United States, lung cancer is the leading cause of death attributed to cancer among both men and women, claiming the lives of more than 150,000 people each year. About one third of patients with the most common histologic type of lung cancer, non–small-cell cancer, are first given the diagnosis at an early, potentially curable stage. If treated by surgical resection, these patients have a 40 percent likelihood of surviving for five years or longer. In contrast, patients who present with advanced disease or who do not undergo surgical resection have a median survival of less than one year.[1] In the light of this information, it is important to determine whether patients who have potentially curable disease actually receive surgical treatment.

Several studies have uncovered an association between race and the likelihood of receiving surgical treatment for resectable non–small-cell lung cancer. Greenwald et al. found that patients with stage I disease in Seattle, San Francisco, and Detroit were less likely to undergo surgical resection if they were black or of lower socioeconomic status than if they were white or of higher socioeconomic status.[2] Smith et al. found similar disparities in the treatment of black patients and white patients in a cohort in Virginia.[3] Samet et al. found that older age and Hispanic ancestry were associated with lower rates of surgical treatment in a cohort in New Mexico.[4]

We undertook a study to answer two questions about the treatment of early-stage, non–small-cell lung cancer. First, is there a difference in the rate of surgical treatment between white patients and black patients with this type of lung cancer, and if so, is the discrepancy still apparent once we account for the effects of coexisting illness, socioeconomic status, insurance coverage, and availability of care? Second, does this discrepancy in part explain the differences in survival between black patients and white patients with lung cancer? To answer these questions, we

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From the Health Outcomes Research Group, Department of Epidemiology and Biostatistics (P.B.B., L.D.C., C.B.B.), and the Department of Medicine, Pulmonary Service (P.B.B.), Memorial Sloan-Kettering Cancer Center, New York; and the Applied Research Branch, National Cancer Institute, Bethesda, Md. (J.L.W.). Address reprint requests to Dr. Bach at the Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, 1275 York Ave., Box 221, New York, NY 10021.

chose a setting and design that mitigated the effect of the confounding factors. We proposed two hypotheses: that black patients would receive surgical treatment less frequently than white patients and that differences in survival between black patients and white patients would be substantially explained by the difference in the rates of surgical treatment.

## METHODS

### Sources of Data

We tested our hypotheses with the use of data from the Surveillance, Epidemiology, and End Results (SEER) cancer registries that have been linked with data on Medicare hospitalizations. The SEER–Medicare data base has been used extensively to assess patterns of care for persons with new diagnoses of cancer.[5,6] The SEER registries, sponsored by the National Cancer Institute, list all incident cases of cancer in five metropolitan areas (San Francisco–Oakland–San Jose, Detroit, Atlanta, Seattle, and Los Angeles County) and five states (Connecticut, Utah, New Mexico, Iowa, and Hawaii) and cover approximately 14 percent of the population of the United States.[7] These data contain information on each newly diagnosed case of cancer, including the month and year of the diagnosis; the location, histologic type, nodal involvement, and spread of the tumor; and the type of treatment provided within four months after diagnosis (e.g., surgery or radiation). The site of cancer is coded in the SEER data according to the *International Classification of Diseases for Oncology,* 2nd edition (ICD-O-2).[8]

The Medicare program, which provides health care coverage for 97 percent of persons 65 years of age or older, collects claims for all services covered by the program. Information about hospitalizations is included in the Medicare Provider Analysis and Review (MEDPAR) files, which contain information on all hospital admissions since 1984. Medicare also maintains files that document the dates of death of beneficiaries and whether they were covered by a traditional indemnity program or by a health maintenance organization (HMO).

The SEER and Medicare data bases have been linked in order to permit population-based studies of health outcomes. The data on 94 percent of the persons included in the SEER files who are 65 years of age or older have been successfully linked to Medicare records.[7] Focusing on this group of people who were eligible for Medicare led to the exclusion of the 44 percent of patients in the SEER data base who received diagnoses of lung cancer before the age of 65 years, but this allowed us to adjust for coexisting conditions, eliminated the confounding effects of insurance coverage, and provided sufficient geographic specificity to allow us to control for the availability of health care.

### Study Participants

The subjects were persons with a form of lung cancer for which surgical resection has been shown to confer a definitive benefit — stage I or stage II non–small-cell lung cancer.[9] We included all patients classified as non-Hispanic white or black who were 65 years of age or older, who resided in 1 of the 10 SEER areas, and who were given a diagnosis between 1985 and 1993 of primary cancer of the lung, non–small-cell histologic type (SEER codes 34.0 to 34.9 and ICD-O-2 morphology codes 8010 to 8040, 8050 to 8076, 8140, 8250 to 8260, 8310, 8320, 8323, 8430, 8470 to 8490, 8550 to 8573, 8980, and 8981); there were a total of 59,365 patients.

From this group we excluded patients who had not undergone a complete evaluation to determine the stage of disease — that is, those for whom there was either no documentation or incomplete documentation with regard to tumor size, spread, or nodal involvement in the SEER data base (21,006 patients [35.4 percent]). We then identified patients with stage I or stage II disease (12,900 patients) according to the staging system of the American Joint Committee on Cancer,[10,11] using the information in the SEER data base on size, spread, and nodal involvement of the tumor. The definitions of these stages were constant throughout the study period. We then excluded patients for whom diagnoses were obtained from death certificates or at autopsy (127 patients [1.0 percent]) and those in whom a second cancer was diagnosed within two months of the primary lung cancer (1789 patients [13.9 percent]), leaving a cohort of 10,984.

### Surgical Treatment and Survival after Diagnosis

Patients were considered to have undergone surgical resection if the variable for site-specific surgery in the SEER data base indicated that a procedure that was curative in intent had been performed. Such procedures included local resection, wedge resection, segmentectomy, lobectomy, sleeve resection, partial pneumonectomy, and radical pneumonectomy (SEER codes 10 to 70). The month and year of diagnosis were documented in the SEER data base; for analytic purposes, we assumed that the diagnosis was made on the first day of the month. Dates of death were obtained from Medicare, which receives this information from the Social Security Administration. All records of death are complete through December 31, 1994, which was therefore chosen as the date of data censoring for patients who were last known to be alive.

### Characteristics of the Participants

#### *Demographic Characteristics and Coexisting Illnesses*

Information on the sex of the patients was obtained from Medicare records, and information on race and age at diagnosis was obtained from the SEER data base. The socioeconomic status of each patient was estimated on the basis of Medicare data on the median income for the ZIP Code of the patient's residence. This variable was necessarily an aggregate measurement of income, as opposed to a factor that reflected socioeconomic status on an individual basis. We constructed two strata: one containing the patients who resided in areas in the lowest quartile of median income, and the other containing the remaining patients.

The burden of coexisting illness was determined with the use of MEDPAR inpatient records through an examination of all hospital admissions occurring within the 12-month period before the month of diagnosis. We calculated two indexes of coexisting illness for each patient: one according to the method suggested by Romano et al.,[12] in which the maximal Charlson comorbidity index[13] was calculated on the basis of inpatient records during this period and the other according to the total number of hospital admissions during this period. In order to calculate these two indexes, we needed one year of recorded Medicare data before diagnosis. We therefore calculated the comorbidity indexes and conducted the adjusted analyses only for patients who at the time of diagnosis were 66 years of age or older and were covered by traditional indemnity insurance, since Medicare does not collect data on hospitalization for persons in HMOs (84 percent of the total sample of 10,984). The Romano–Charlson index could not be determined for patients without a hospitalization during this period.

#### *Access to Care*

All patients were insured by Medicare. We assigned each patient the coverage (HMO or indemnity) that he or she had during the month in which the diagnosis was made. To assess the local availability of care, we used the health care service areas defined by the Health Resources and Services Administration. These areas represent regions with certain characteristics of health care availability, and they have been used in other studies of the availability of health care.[14,15] The areas range in size from parts of a city to substantial portions of less populous states. The health care service area corresponding to each patient's area of residence was documented in the SEER data base — our 10,984 study participants resided in 80 health care service areas. To determine whether some of our findings could be related to variations in the local availability of health care services, we looked for heterogeneity in our findings with respect to the health care service areas and SEER areas.

### Statistical Analysis

We assessed the association between the race of the patients and the receipt of surgical treatment by comparing the overall rates of resection (among black patients as compared with white patients) for the entire cohort; by comparing the resection rates between black patients and white patients within relevant subgroups, such as those defined by age, comorbidity index, and area of residence; by determining the effect of race on the receipt of surgical treatment while controlling for other important factors, such as sex, median income in the ZIP Code of residence, age, stage of disease, and comorbidity (one of the two measures); and by determining whether the disparities in resection rates were consistent with respect to the SEER area (with use of the Breslow–Day test for heterogeneity), health care service area (with use of the Mantel–Haenszel test for heterogeneity), and study year (with use of the Mantel–Haenszel test).[16]

Survival curves were constructed with the Kaplan–Meier method and compared with use of the log-rank statistic.[17] For analyses involving adjustments for potential confounding factors, we used the Cox proportional-hazards method.[17] All P values are two-sided. All analyses were performed with SAS software (version 6.12, SAS Institute, Cary, N.C.). The estimated survival benefit under a scenario in which black patients received surgical treatment at a rate identical to that of white patients is based on the estimated survival probabilities derived from the observed population.

## RESULTS

### Characteristics of the Study Participants

There were 10,984 patients in this study; 860 (8 percent) were black, and 10,124 (92 percent) were non-Hispanic white (Table 1). There were no substantial differences between the two groups with respect to the stage of disease, type of insurance, number of hospitalizations in the 12 months before the diagnosis, or the Romano–Charlson comorbidity index. Black patients were slightly younger and somewhat more likely to be men. The most important disparity between the two groups was that black patients were substantially more likely to reside in a ZIP Code area with a low median income. Also, the distribution of patients among the SEER areas differed between the two groups.

TABLE 1. CHARACTERISTICS OF BLACK AND WHITE MEDICARE BENEFICIARIES 65 YEARS OF AGE OR OLDER WITH STAGE I OR II NON–SMALL-CELL LUNG CANCER, 1985 TO 1993.*

| CHARACTERISTIC | BLACK PATIENTS | WHITE PATIENTS |
|---|---|---|
| | no. (%) | |
| All participants | | |
| Total no. | 860 | 10,124 |
| Age (yr) | | |
| 65–69 | 376 (44) | 3,502 (35) |
| 70–74 | 280 (33) | 3,261 (32) |
| ≥75 | 204 (24) | 3,361 (33) |
| Sex | | |
| Male | 583 (68) | 6,264 (62) |
| Female | 277 (32) | 3,860 (38) |
| Stage of disease | | |
| I | 682 (79) | 8,003 (79) |
| II | 178 (21) | 2,121 (21) |
| Median income in ZIP Code of residence | | |
| Lowest quartile | 451 (52) | 1,907 (19) |
| Highest three quartiles | 289 (34) | 6,914 (68) |
| Not determined | 120 (14) | 1,303 (13) |
| SEER area† | | |
| Atlanta | 122 (14) | 730 (7) |
| Connecticut | 69 (8) | 1,662 (16) |
| Detroit | 375 (44) | 1,792 (18) |
| Los Angeles County | 85 (10) | 589 (6) |
| San Francisco–Oakland–San Jose | 165 (19) | 1,595 (16) |
| Type of Medicare insurance | | |
| Health maintenance organization | 75 (9) | 961 (9) |
| Indemnity | 780 (91) | 9,112 (90) |
| Not determined | 5 (<1) | 51 (<1) |
| Participants ≥66 yr with indemnity insurance | | |
| Total no. | 712 | 8,479 |
| Total no. of hospitalizations in previous year | | |
| 0 | 520 (73) | 6,455 (76) |
| 1 | 133 (19) | 1,446 (17) |
| 2 | 41 (6) | 368 (4) |
| >2 | 18 (3) | 210 (2) |
| Highest Romano–Charlson index in previous year‡ | | |
| Not evaluated§ | 520 (73) | 6,455 (76) |
| 0 | 67 (9) | 697 (8) |
| 1 | 72 (10) | 801 (9) |
| >1 | 53 (7) | 526 (6) |

*Because of rounding, all percentages do not total 100.

†SEER denotes the Surveillance, Epidemiology, and End Results program. Only the patients from the areas that contributed more than 5 percent of the black cohort are listed.

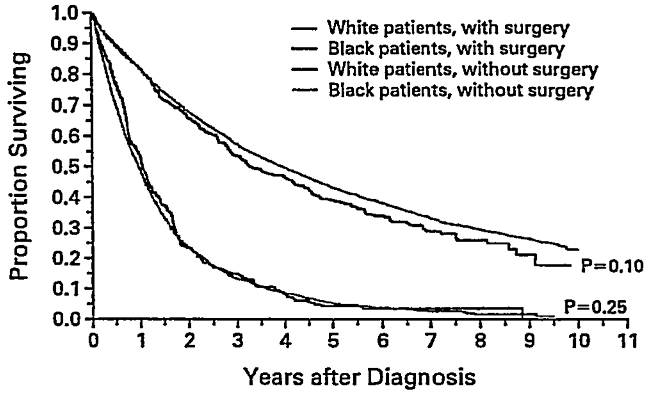
‡The Romano–Charlson index was calculated only for the patients who were hospitalized in the 12-month period before the diagnosis.

§These participants constitute the cohort for which comorbidity scores could not be calculated.

### Resection Rates and Association with Survival

Black patients and white patients who underwent surgery had roughly similar rates of survival at five years — 39.1 percent among black patients and 42.9 percent among whites (P=0.10) (Fig. 1). Those who did not undergo surgery also had similar five-year survival rates (4 percent among blacks and 5 percent among whites, P=0.25) (Fig. 1). However, 76.7 percent of the white patients underwent surgery, whereas only 64.0 percent of the black patients received this treatment (P<0.001) (Table 2). The combination of discrepant resection rates and similar survival rates after treatment contributed to a substantial difference in the overall survival rates, as shown in Figure 2.

We diagrammed the effect of these results in a hypothetical cohort of 1000 white patients and 1000 black patients (Fig. 3): 76.7 percent of the whites underwent surgery, and 42.9 percent of these patients survived for five years, whereas only 5.2 percent of the remaining 23.3 percent of patients who did not receive surgical treatment survived for that long. Thus, overall, 341 patients (34.1 percent) were alive at five years. In contrast, of the 1000 black patients, only 264 patients were alive at five years — 77 (7.7 percent) fewer than in the white cohort. Two factors are responsible for this difference: the lower rate of resection among blacks (64.0 percent, vs. 76.7 percent among whites) and the slightly (though nonsignificantly)



| No. of Patients at Risk | | | | | | |
|---|---|---|---|---|---|---|
| White, surgery | 7763 | 4495 | 2255 | 1069 | 407 | 12 |
| Black, surgery | 550 | 301 | 145 | 69 | 30 | 0 |
| White, no surgery | 2361 | 458 | 110 | 30 | 6 | 0 |
| Black, no surgery | 310 | 60 | 14 | 2 | 1 | 0 |

**Figure 1.** Survival of Medicare Beneficiaries 65 Years of Age or Older Who Were Given a Diagnosis of Stage I or II Non–Small-Cell Lung Cancer between 1985 and 1993, According to Treatment and Race.

lower five-year survival rate after surgery among blacks (39.1 percent vs. 42.9 percent). If black patients had undergone surgery at a rate similar to that for white patients, we estimate that 308 black patients would have been alive at five years, a number only 3.3 percent lower than that for whites. These figures suggest that of the 77 more deaths per 1000 black patients, the majority (44) can be attributed to the failure to provide surgical treatment for a curable disease.

### Stratified and Adjusted Analyses

We performed a number of stratified and adjusted analyses to test the robustness of these results. The pivotal disparity in rates of resection was evaluated in several important subgroups (Table 2). The results show that the lower resection rate among black patients was consistent. In addition, we found no evidence that the disparity in resection rates differed according to the health care service area (P=0.85) or SEER area (P=0.64) or that the overall resection rate or the disparity in resection rates varied during the years of the study (P=0.62) (data not shown).

The disparity also persisted in two multivariable logistic-regression analyses in which we controlled for age, sex, stage of disease, median income in the ZIP Code of residence, and coexisting illness, as measured by either the Romano–Charlson index or the number of hospitalizations in the previous year. On the basis of these analyses, the odds ratios for undergoing surgery among black patients, as compared with white patients, were 0.54 when the Romano–Charlson index was used as a measure of coexisting illness and 0.53 when the number of hospitalizations was used — findings that were consistent with the unadjusted odds ratio of 0.52. The results of all the analyses support the hypothesis that race is an important independent factor in determining the likelihood that a patient with early-stage, non–small-cell lung cancer will receive surgical treatment.

The observed similarities in survival among black patients and white patients after either receiving or not receiving surgical treatment were also evaluated in analyses adjusted for factors previously identified as affecting survival. These analyses showed a slightly increased risk of death among black patients after surgery (relative risk, 1.10; P=0.18) and a slightly decreased risk of death for black patients who did not undergo surgery (relative risk, 0.84; P=0.02) (Table 3). The analyses also confirmed that in this cohort, residence in an area with a lower median income, male sex, older age, a higher stage of disease, and more coexisting illness all conferred an increased risk of death, regardless of treatment.

## DISCUSSION

The optimal treatment for early-stage, non–small-cell lung cancer is surgical resection — a treatment with a substantial cure rate.[9,18,19] In this study, we determined whether the rate of surgical treatment for stage I or stage II non–small-cell lung cancer was lower for black patients 65 years of age or older than it was for white patients in the same age group. Then we compared the survival rates between black patients and white patients who had undergone surgery and between black patients and white patients who had not undergone surgery. Using several analytic techniques to control for the confounding effects of disease stage, type of insurance coverage, avail-

TABLE 2. RATE OF RESECTION AND RELATIVE RISK ACCORDING TO RACE.

| VARIABLE | NO. OF PATIENTS | RESECTION RATE (%) | | RELATIVE RISK (95% CI)* | P VALUE |
|---|---|---|---|---|---|
| | | BLACK PATIENTS | WHITE PATIENTS | | |
| Total | 10,984 | 64.0 | 76.7 | 0.83 (0.79–0.88) | <0.001 |
| Age (yr) | | | | | |
| 65–69 | 3,878 | 73.7 | 85.4 | 0.86 (0.81–0.92) | <0.001 |
| 70–74 | 3,541 | 64.3 | 80.2 | 0.80 (0.73–0.88) | <0.001 |
| ≥75 | 3,565 | 45.6 | 64.2 | 0.71 (0.61–0.83) | <0.001 |
| Sex | | | | | |
| Male | 6,847 | 64.8 | 76.7 | 0.85 (0.80–0.90) | <0.001 |
| Female | 4,137 | 62.1 | 76.6 | 0.81 (0.74–0.89) | <0.001 |
| Stage of disease | | | | | |
| I | 8,685 | 64.1 | 77.0 | 0.83 (0.79–0.88) | <0.001 |
| II | 2,299 | 63.5 | 75.5 | 0.84 (0.75–0.94) | <0.001 |
| Median income in ZIP Code of residence | | | | | |
| Lowest quartile | 2,358 | 61.9 | 70.7 | 0.88 (0.81–0.95) | <0.001 |
| Highest three quartiles | 7,203 | 67.5 | 78.0 | 0.87 (0.80–0.94) | <0.001 |
| Not determined | 1,423 | 63.3 | 78.2 | 0.81 (0.71–0.93) | <0.001 |
| SEER area† | | | | | |
| Atlanta | 852 | 55.7 | 70.4 | 0.79 (0.67–0.93) | <0.001 |
| Connecticut | 1,731 | 69.6 | 79.5 | 0.88 (0.75–1.02) | 0.05 |
| Detroit | 2,167 | 59.2 | 73.1 | 0.81 (0.74–0.89) | <0.001 |
| Los Angeles County | 674 | 65.9 | 79.3 | 0.83 (0.71–0.97) | 0.006 |
| San Francisco–Oakland–San Jose | 1,760 | 74.6 | 79.9 | 0.93 (0.85–1.02) | 0.10 |
| Type of Medicare insurance‡ | | | | | |
| Health maintenance organization | 1,036 | 70.7 | 76.3 | 0.93 (0.80–1.08) | 0.27 |
| Indemnity | 9,892 | 63.5 | 76.7 | 0.83 (0.78–0.87) | <0.001 |
| Comorbidity§ | | | | | |
| No. of hospitalizations in previous year | | | | | |
| 0 | 6,975 | 64.0 | 77.6 | 0.83 (0.77–0.88) | <0.001 |
| 1 | 1,579 | 59.4 | 72.3 | 0.82 (0.71–0.95) | 0.002 |
| 2 | 409 | 56.1 | 70.7 | 0.79 (0.60–1.05) | 0.06 |
| >2 | 228 | 50.0 | 56.2 | 0.89 (0.55–1.43) | 0.61 |
| Highest Romano–Charlson index in previous year¶ | | | | | |
| 0 | 764 | 59.7 | 81.6 | 0.73 (0.60–0.89) | <0.001 |
| 1 | 873 | 58.3 | 67.3 | 0.87 (0.71–1.06) | <0.12 |
| >1 | 579 | 54.7 | 60.1 | 0.91 (0.71–1.18) | 0.45 |

*Relative risks are of undergoing surgical resection for black patients as compared with white patients. CI denotes confidence interval.

†SEER denotes the Surveillance, Epidemiology, and End Results program. Only data from the areas that contributed more than 5 percent of the black cohort are listed.

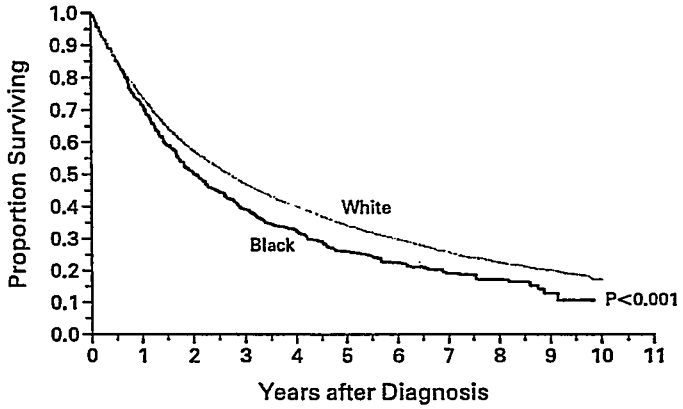
‡Data were missing for 5 black patients and 51 white patients.

§This category includes only the patients who were 66 years of age or older and who had indemnity insurance coverage at the time of diagnosis.

¶The Romano–Charlson index was calculated only for the patients who were hospitalized in the 12-month period before the diagnosis.

ability of care, socioeconomic status, age, and coexisting illnesses, we found that black patients were less likely than white patients to undergo surgical resection (a difference of 12.7 percentage points). Both unadjusted and adjusted analyses showed that black patients who underwent surgical resection had a five-year survival rate similar to that of white patients who underwent resection, and we estimated that of the 77 more deaths per 1000 black patients, the majority (44) could be attributed to the lack of surgical treatment.

If black patients were to undergo surgery at a rate equal to that of white patients, their survival rate would probably be substantially improved and would approach that of white patients. Given equal rates of resection, we estimate that there would be a 3.3 percent discrepancy in survival at five years (341 survivors among 1000 white patients vs. 308 among 1000 black patients). The survival curves shown in Figure 2 for black patients and white patients after surgery suggest a similar conclusion: given equal treatment, black patients will have a survival rate that is only marginally lower than that for white patients. The small disparity in survival between black patients and white patients with equal resection rates is not surprising, even if surgery confers an equal benefit in each group.



No. of Patients at Risk

| | | | | | | |
|---|---|---|---|---|---|---|
| White patients | 10,124 | 4953 | 2365 | 1099 | 413 | 12 |
| Black patients | 860 | 361 | 159 | 71 | 31 | 0 |

**Figure 2.** Survival of Medicare Beneficiaries 65 Years of Age or Older Who Were Given a Diagnosis of Stage I or II Non–Small-Cell Lung Cancer between 1985 and 1993, According to Race.

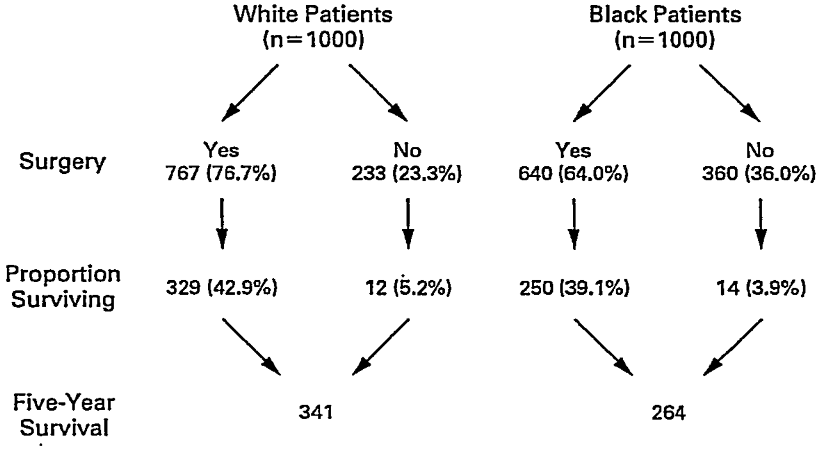


**Figure 3.** Relation between the Rate of Surgical Resection for Stage I or II Non–Small-Cell Lung Cancer and Five-Year Survival in Hypothetical Cohorts of 1000 Black and 1000 White Medicare Beneficiaries 65 Years of Age or Older.

If 76.7 percent of the black patients had undergone surgery, 308 of them would be expected to be alive five years after diagnosis.

The actuarial data (deaths due to all causes) in the same population show a larger gap: on average, a 73-year-old black person has a 76 percent likelihood of survival for five years, as compared with 81 percent for a 73-year-old white person.[20]

These results should be viewed with caution. We focused on Medicare beneficiaries who were 65 years of age or older, and it is not clear whether there is similar variability in the care provided to younger patients with lung cancer. In addition, in all the patients in our study, the diagnosis of non–small-cell lung cancer and the stage of disease had been established, which meant that all the patients had had extensive involvement with the health care system. Our study did not address the care received by patients who present with advanced disease or those in whom the stage of disease has not been determined. Two other factors that we did not investigate also increase mortality due to non–small-cell lung cancer in black persons. The annual incidence of non–small-cell lung cancer in this population of people who are 65 years of age or older is higher among black persons (359

TABLE 3. EFFECT OF RACE AND OTHER FACTORS ON SURVIVAL AMONG PATIENTS WHO UNDERWENT SURGERY AND THOSE WHO DID NOT.

| FACTOR | RELATIVE RISK OF DEATH | | | |
|---|---|---|---|---|
| | PATIENTS UNDERGOING SURGERY | P VALUE | PATIENTS NOT UNDERGOING SURGERY | P VALUE |
| Race | | | | |
| White* | 1.00 | | 1.00 | |
| Black | 1.10 | 0.18 | 0.84 | 0.02 |
| Income | | | | |
| Highest three quartiles* | 1.00 | | 1.00 | |
| Lowest quartile | 1.10 | <0.05 | 1.15 | 0.007 |
| Sex | | | | |
| Female* | 1.00 | | 1.00 | |
| Male | 1.44 | <0.001 | 1.21 | <0.001 |
| Age | | | | |
| 65–69 yr* | 1.00 | | 1.00 | |
| 70–74 yr | 1.17 | <0.001 | 1.10 | 0.17 |
| ≥75 yr | 1.46 | <0.001 | 1.20 | 0.004 |
| Stage of disease | | | | |
| I* | 1.00 | | 1.00 | |
| II | 1.98 | <0.001 | 1.35 | <0.001 |
| Romano–Charlson comorbidity index | | | | |
| Not available* | 1.00 | | 1.00 | |
| 0 | 1.01 | 0.84 | 1.25 | 0.02 |
| 1 | 1.23 | <0.001 | 1.22 | 0.006 |
| >1 | 1.49 | <0.001 | 1.42 | <0.001 |

*This was the reference category.

per 100,000 population) than among white persons (294 per 100,000).[21,22] Also, among persons 65 years of age or older in whom the stage of disease is determined at the time of diagnosis, the SEER data show that black patients are less likely than white patients to have resectable (i.e., stage I or II) disease (27 percent vs. 31 percent) (unpublished data).

In this study, we were also limited in our ability to make adjustments for two factors that might have influenced the interpretation of our results. We used an aggregate measure of income as a surrogate for the socioeconomic status of each patient. Some investigators have argued that our aggregate measure is an adequate surrogate marker for socioeconomic status,[23] but others have argued that the optimal socioeconomic variable is at the level of the patient, not at the level of the community.[24] Therefore, we cannot be sure that we have separated the effects of race from those of socioeconomic status.

In addition, we could not ascertain the Romano–Charlson comorbidity index for the 76 percent of our patients who were not hospitalized in the year before the diagnosis. However, it seems unlikely that this lack has led us to make incorrect conclusions, for three reasons. First, in the 24 percent of patients in whom we could evaluate coexisting illness in terms of the Romano–Charlson comorbidity index, the disparity in treatment was consistent. Second, most clinicians would agree that, barring the presence of severe pulmonary disease, a patient who had not required hospitalization for a year could probably tolerate a thoracotomy and partial lung resection.[25] Third, we can predict that the bias we may have introduced by using this measure of coexisting illness would, if anything, have led us to underestimate the disparity in treatment between black and white patients. Specifically, for chronic diseases that are responsive to outpatient management, such as chronic obstructive pulmonary disease, blacks are more likely than whites to be hospitalized for the same degree of illness, thus increasing our estimate of the burden of coexisting illness among blacks.[25,26]

Variations in the care of patients with similar diseases have been observed since Wennberg and Gittelsohn first called attention to the phenomenon in 1973.[27] Unlike the treatments under scrutiny in many other studies, the optimal strategy for the treatment of early-stage, non–small-cell lung cancer is unambiguous: surgical resection confers a meaningful probability of cure, whereas other therapies do not. We cannot determine from our data why black patients have a lower rate of resection than their white counterparts, but we can conclude that the difference in treatment has a substantial effect on survival. Others have argued that the preferences of black patients may differ from those of white patients or that black patients may weigh the risks of surgical therapy differently.[28,29] An alternative explanation is that black patients are offered optimal treatment less frequently than their white counterparts.[30] These are certainly issues worthy of investigation in future studies.

*We are indebted to the Applied Research Branch, Division of Cancer Prevention and Population Science, National Cancer Institute; to the Office of Information Services and the Office of Strategic Planning, Health Care Financing Administration; to Information Management Services; and to the SEER program. The interpretation and reporting of the data from the linked SEER–Medicare data base are the sole responsibility of the authors.*

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# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

## Preface

**The Strategic Framework**

Although the health of all Americans has continued to improve over the more than two decades since the 1985 *Task Force Report on Black and Minority* Health was issued, racial and ethnic health disparities persist and, in some cases, are increasing. The persistence of such disparities suggests that current approaches and strategies are not producing the kinds of results needed to ensure that all Americans are able to achieve the same quality and years of healthy life, regardless of race/ethnicity, gender and other variables (as reflected in the two overarching goals of *Healthy People 2010*).

Garth N. Graham, MD, MPH
Deputy Assistant Secretary
for Minority Health

The mission of the HHS Office of Minority Health (OMH) is to improve the health of racial and ethnic minority populations through the development of health policies and programs that will help eliminate disparities. OMH has a unique leadership and coordination role to play within the Department and across the nation, relative to this mission. However, such a mission cannot be accomplished by OMH alone. We need the active engagement and sustained efforts of all stakeholders working together with us and each other to effect the necessary changes at every level and across all sectors over time. These stakeholders include racial and ethnic minority communities and those who serve them, other HHS and Federal entities, academic and research institutions, State and Tribal governments, faith- and community-based organizations, private industry, philanthropies and many others. We also need to examine what we are doing, identify what must be done differently and determine how best to work together – within and across our respective disciplines, areas of interest, organizational/institutional or geographic boundaries and spheres of influence – to enhance our individual and collective effectiveness and impacts.

The *Strategic Framework for Improving Racial and Ethnic Minority Health and Eliminating Racial and Ethnic Health Disparities* (*Framework*) presented here is intended to help guide, organize and coordinate the systematic planning, implementation and evaluation of efforts within OMH, HHS and across the nation to achieve better results relative to minority health improvements and health disparities reductions. The *Framework* reflects current knowledge and understanding of the nature and extent of health disparities, their causes or contributing factors, effective solutions and desired outcomes and impacts. It reinforces the importance of having and using science and knowledge as the basis for planning and implementing our program-, research-, or policy-oriented actions and activities. The *Framework* also suggests the need to adequately evaluate our efforts so that new knowledge can be used for continuous improvement. In addition, the *Framework* infers the need to fund our efforts accordingly, and to explore ways to enhance efficient use of programmatic and research funds as well as other resources and assets at our disposal.

Several aspects of this framework are worth highlighting:

1. By using a logic model approach, which builds upon current science and expert consensus about racial/ethnic minority health/health disparities and systems problems, contributing or causal factors and strategies that work, the *Framework* provides the rationale for efforts funded and conducted as well as for the kinds of outcomes and impacts needed . This approach can be used as a guide to move us toward a common set of objectives and goals.
2. In addition to identifying the usual determinants of health, the *Framework* emphasizes the role that "systems-level factors" play in promoting or inhibiting the effectiveness of strategies and practices aimed at improving racial and ethnic minority health or reducing racial and ethnic health disparities. These systems factors include: the nature and extent of available resources and how they are used, coordination and collaboration through partnerships and communication, leadership and commitment through strategic visioning and sustained attention, user-centered design in which the products and services of the system are conceived with the needs of their users in mind and the use of science and knowledge to inform programs and policies.
3. Ultimately, the *Framework* presents a vision - and provides the basis - for a "systems approach" to addressing racial/ethnic minority health problems within and outside of HHS. A systems approach implies that all parties engaged, in this case, in racial/ethnic minority health improvement and health disparities reduction are, themselves, part of a 'system' or 'nested' systems. As such, each party considers the causal or contributing factors and problems it is most likely to be able to impact with its particular strengths and talents. Resources and assets can then be coordinated and leveraged in more systematic and strategic ways, to achieve a range of outcomes and impacts needed so that, together, all parties can more effectively and efficiently contribute to and achieve long-term objectives and goals. This focus on systems applies as well to how various fields of research work together for greater effectiveness and efficiency to address weaknesses and gaps in scientific knowledge. A systems approach to working across diverse research disciplines may be better able to illuminate our understanding about the nature and extent of minority health and health disparities problems, especially for small population groups, the relative

importance of and interrelationships between causal or contributing factors, more effective ways to break the causal chain that produces greater burdens of preventable disease and premature death among racial and ethnic minorities and the means for measuring desired outcomes and assessing progress.

We believe that the structure and approach outlined in the *Framework* offers a rational and systematic, yet broad and flexible, way of viewing and informing our efforts to achieve the OMH and, in reality, the national mission. We hope that the *Framework* will provide context for the actions needed by OMH and its partners across HHS and the nation to better leverage resources, establish priorities for ensuring effectiveness of programs and activities funded and conducted, enable identification and promotion of best practices and concrete solutions at all levels and serve as the foundation for a national results-oriented culture on racial and ethnic minority health improvement and the elimination of racial and ethnic health disparities.

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# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

**The Strategic Framework**

In this section...Introduction

## I. Introduction

The Challenge. – The United States is a diverse nation. According to 2000 Census data (U.S. Census Bureau, 2000), the population of the United States grew by 13 percent over the last decade, and has increased in diversity at an even greater rate. Racial and ethnic minorities are among the fastest growing of all communities in the country and today comprise approximately 33 percent of the total U.S. population (U.S. Census Bureau, 2006a, 2). It is projected that, by 2050, 50 percent of the population will be non-White (U.S. Census Bureau, 2004).

Data on health status point to the fact that there is significant evidence of poor health outcomes among racial/ethnic minority populations with respect to premature death and preventable disease. The poor health outcomes for racial/ethnic minorities are reflected in the pervasiveness of health disparities (Note: This paper will often use the term "health disparities" to refer to the more precise, but longer term, "disparities in health care and health status.") that exist. For example:

- The prevalence of high blood pressure–a major risk factor for coronary heart disease, stroke, kidney disease and heart failure – is nearly 40 percent greater in African Americans than Whites (an estimated 6.4 million African Americans have hypertension); and cardiovascular and renal disease damage are more frequent and severe (HHS, 20[illegible]). In addition, African Americans continue to experience a higher rate of strokes, more severe strokes and continue to be twice as likely to die from a stroke than White Americans (HHS, 2000a, G-11).
- Racial and ethnic minority groups, especially the elderly, are disproportionately affected by diabetes. On average, African Americans are 2.1 times as likely as Whites to have diabetes (CDC, 2006a, Table 55). African Americans with diabetes are also more likely than Whites to experience complications of diabetes, such as amputations of lower extremities (CDC, 2006a) and end-stage renal disease (CDC, 2006b). On average, American Indians/Alaska Natives are 2.3 times as likely as non-Hispanic Whites of a similar age to have diabetes (Barnes et al, 2005). Hispanics are 1.7

times as likely to have diabetes as Whites (Lethbridge-Cejku et al, 2006), with Mexican Americans-the largest Hispanic subgroup - more than twice as likely (NCHS, 2006a, Table 55).

- African Americans are 21 percent more likely to die from all types of cancer than Whites, adjusting for age (NCHS, 2006a, Table 29). African American men are more than 50 percent likelier to die from prostate cancer than are Whites (Ries et al, 2006, Tables I-23 and I-24). In addition, while breast cancer is diagnosed 10 percent less frequently in African American women than in White women (Ries et al, 2006, Tables I-20 and I-21), African American women are 36 percent more likely to die from the disease (Ries et al, 2006, Tables I-23 and I-24). In other minority communities, cancer also takes a disproportionate toll. Among Hispanics, women are 2.2 times more likely to be diagnosed with cervical cancer than non-Hispanic White women (NCHS, 2006b, Table 53). Asian/Pacific Islander women are 2.7 times as likely to fall ill from stomach cancer as non-Hispanic White women (NCHS, 2006b, Table 53), and Asian American men suffer from stomach cancer 93 percent more often than do non-Hispanic White men (Ries et al, 2006, Tables I-20 and I-21).
- Mexican American and African American mothers are more than 2.5 times as likely as non-Hispanic White mothers to begin prenatal care in the third trimester, or not receive prenatal care at all (NCHS, 2006b, Table 7).
- Among adults ages 18 to 64, nearly half of Hispanics (49 percent) and more than one of four African Americans (28 percent) were uninsured during 2006, compared with 21 percent of Whites and 18 percent of Asian Americans ((Beal et al, 2007). African Americans and Hispanics also experience differential access to a regular doctor or source of care, with approximately 43 percent of Hispanics and 21 percent of African Americans reporting that they do not have a regular doctor or source of care, compared with 15 percent of Whites and 16 percent of Asian Americans (Beal et al, 2007).

These health issues have been key public health concerns at the Federal level since the *1985 Secretary's Task Force Report on Black and Minority Health* (HHS, 1985) under then Secretary of Health and Human Services Margaret Heckler. However, data demonstrate that these disparities remain formidable challenges today. Reports of progress on the "reducing health disparities" goal of *Healthy People 2000* (HHS, 1990) showed that, in many respects, racial/ethnic minority populations have remained in relatively poor health, and continue to be underserved by the health care system. In many cases, the health gaps identified in the 1985 *Task Force Report* have grown (NCHS, 2001, 8)..The need to address racial and ethnic minority health status and health disparities was reinforced in the two overarching goals of *Healthy People 2010*: to increase the quality and years of healthy life for *all* U.S. populations, and to eliminate health disparities, including those that affect racial and ethnic minorities (HHS, 2000a). The challenge for the U.S. is to adequately address poor racial/ethnic minority health status and persistent racial/ethnic health disparities at a time of rapidly increasing racial and ethnic diversity. Successfully meeting this challenge will promote the continued strength and vitality of the Nation.

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**OMH's Role and Responsibilities.** - The Office of Minority Health (OMH) resides within the Office of Public Health and Science (OPHS), in the Office of the Secretary of the U.S. Department of Health and Human Services (HHS). Its creation was one of the most significant outcomes of the 1985 *Task Force Report* (HHS, 1985). OMH is a key player in the Federal effort to improve racial/ethnic minority health and to reduce and, ultimately, eliminate racial/ethnic disparities in health care and health status. The OMH mission is "to improve the health of racial and ethnic minority populations through the development of health policies and programs that will help eliminate disparities". (Note: Racial and ethnic minorities encompassed in OMH's mission include Black or African Americans, Asians, Native Hawaiians or Other Pacific Islanders, American Indians and Alaska Natives and Hispanics.) This mission statement points to the two key action areas-policies and programs-through which OMH serves as the focal point within HHS for efforts to improve racial/ethnic minority health and eliminate racial/ethnic health disparities.

While OMH is the focal point within HHS for racial/ethnic minority health and health disparities efforts, it is not the only Federal agency involved in efforts to address racial/ethnic minority health and health disparities. Within HHS, a number of agencies and operating divisions engage in extensive activities to improve racial/ethnic minority health and reduce racial/ethnic health disparities. They fund a range of racial/ethnic minority health- and health disparities-related efforts, including health services to underserved (often racial/ethnic minority) communities, community-based health education and health communication campaigns and programs, biomedical, behavioral and social science research and health services and community-based prevention research. Such efforts also extend outside of HHS to other public- and private-sector organizations that have a stake in improving the health of racial/ethnic minorities and addressing racial and ethnic health disparities. In spite of these efforts, there is still much room for improvement.

# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

## II. Background on the *Framework*

**The Strategic Framework**

In this section...Background

- Purpose
- Approach
- Considerations and Limitations

Purpose of the Strategic Framework - The purpose of this strategic framework is to guide and organize the systematic planning, implementation, and evaluation of OMH and other efforts aimed at improving racial/ethnic minority health-and reducing and, ultimately, eliminating racial/ethnic health disparities. Efforts include those aimed directly at racial/ethnic minority health problems, but also those that support a "systems approach" to addressing such problems across the country. This systems approach has not been previously available in efforts targeted to racial/ethnic minority health and health disparities issues.

OMH, through the application of a strategic framework, can sharpen the focus, coordination and dissemination of its work, as well as that of its partners inside and outside of HHS. The ultimate goal, for all stakeholders, is that individual and collective efforts on behalf of racial/ethnic minority health will be more evidence-based and will use available resources effectively and efficiently. The strategic framework provides:

- Rationale for efforts conducted and supported: The *Framework* can provide a rational basis for identifying and developing effective strategies, practices, and other efforts that are conducted and supported by OMH, its partners and other stakeholders across the country. The *Framework* does this by drawing on existing science and knowledge about the nature and extent of the long-term problems that OMH must address, the factors that contribute to those problems and the effectiveness of various strategies and practices in addressing those problems.
- Support for increased quantity and enhanced quality of evaluations of the effectiveness of efforts: The *Framework* will strengthen OMH's evaluation efforts with its grantees and other partners. Increased quantity and quality of evaluations will help OMH assess whether racial and ethnic minority health improvement and health disparity reduction efforts (funded or supported by OMH and others) are really

making a difference and are producing meaningful results.
- Basis for enhancing effectiveness and efficiency: The *Framework* can promote the effectiveness and efficiency of efforts by OMH and others to improve racial/ethnic minority health and reduce health disparities through more coordinated and systematic actions.

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Approach to Developing the Strategic Framework - To maximize clarity, a logic model approach is employed for developing the strategic framework. Logic models originate from the evaluation field as a way to plan, implement and evaluate programmatic efforts, and to provide the theory or rationale, undergirding what is being done (HHS, 1999; Taylor-Powell, Jones, and Henert, 2002). Similarly, the *Framework* presents the rational basis for efforts related to racial/ethnic minority health and health disparities by tying together the following components typically found in logic models (Note: Numerous sources exist for information on the use of logic models to enhance program performance. Examples include, but are not limited to, the following sources identified in OMH's evaluation planning guidelines: The Centers for Disease Control and Prevention at http://www.cdc.gov/eval/resources.htm#logic%20model; the University of Wisconsin Cooperative Extention at http://www1.uwex.edu/ces/lmcourse; and the W.K. Kellogg Foundation at http://www.wkkf.org/Pubs/Tools/Evaluation/Pub3669.pdf [PDF, 1.4MB].)

- *Long-term problem(s)* to be addressed
- *Factors* that must be addressed, which contribute to the problem(s)
- *Strategies and practices*, and supporting resources, which can be mobilized to address the factors and the problems
- *Measurable outcomes and impacts* that can be expected to result from implementing the strategies and practices and
- *Long-term objectives and goals* that can be achieved by effectively producing impacts on the factors and the problems.

Figure 1 is a graphic depiction of the general structure of the strategic framework, which builds upon each of these five components.

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Figure 1. A graphic depiction of the general structure of the strategic framework

Developing a strategic framework using a logic model development process emphasizes five steps, which correspond to each of the components in Figure 1: (1) examination of the *long-term problems* that OMH and others are trying to address, (2) review of the *major factors known to contribute to or cause the long-term problems*, (3) identification of promising, best and/or evidence-based *strategies and practices* known to impact the causal or contributing factors, (4) presentation of measurable *outcomes and impacts* that might be expected from the strategies and practices and (5) assessment of the extent to which *long-term objectives and goals* have been achieved.

As the components of the *Framework* - using this five-step logic model approach-were developed, extensive literature reviews and environmental scans were conducted to identify what is known-and not known - about the long-term problems, contributing or causal factors, effective strategies and practices to address the factors and identification and measurement of expected outcomes and impacts. As necessary, targeted reviews of the literature from fields other than public health and medicine (e.g., systems research) were also carried out to inform OMH's understanding of the content needed in the *Framework*. In this way, the components and subcomponents of the *Framework* build on existing science and knowledge.

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Considerations and Limitations in Developing the *Framework* - The five-step process outlined above results in a strategic framework for addressing racial and ethnic minority health improvements and reducing and, ultimately, eliminating racial and ethnic health disparities. However, several points must be made regarding the task of identifying "best" or evidence-based strategies and practices:

- First, many strategies and practices address multiple contributing factors and may contribute to multiple outcomes and impacts. There is not a one-to-one correspondence or a strictly linear relationship between contributing factors, strategies and practices and outcomes/impacts.
- Second, there is not adequate scientific evidence to demonstrate the effectiveness of all the strategies and practices that are considered effective. Thus, for some strategies or practices, it will be necessary to rely on expert opinion regarding what might be effective, and to continue to stress the importance of sound and systematic evaluation to determine the effectiveness of particular approaches, interventions or activities in producing desired results.

Given these limitations and the certainty that any framework will be used within a complex, public policy and decision-making environment, this framework should be viewed as a dynamic, evolving document that provides *guidelines for action* rather than as a linear, predictable model for problem-solving and decision-making.

In addition, the utility of this framework does not end with the achievement of some objectives and goals. Rather, results can and should be used to inform OMH and its partners on their level of success in improving racial/ethnic minority health and tackling health disparities. Thus, any knowledge gained can be incorporated into the continuing efforts of all stakeholders. This process will help OMH, its grantees and other partners consistently monitor and adjust program and policy efforts in ways that will result in greater effectiveness, efficiency and success. The logic model approach used in the *Framework* and its general structure can, thus, also serve as a guide for action in a number of ways, and for a variety of public and private entities.

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# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

**The Strategic Framework**
- Preface
- Introduction
- Background on the Framework
- The Strategic Framework
- Next Steps
- Conclusions
- References
- Complete Framework (print version)

In this section...Framework
- Begin with Long-Term Problems
- Address Contributing Factors
- Support Effective Strategies and Practices
- Measure Intermediate Outcomes
- Achieve Long-Term Objectives and Goals

## III. The Strategic Framework

The *Framework* is presented in five sections, organized sequentially into the components presented in the graphic depiction of its general structure shown in Figure 1. Each component of the *Framework*, and the corresponding step toward its development, is discussed separately. The major elements within each of these sections are drawn from the literature and briefly outlined and discussed below.

### Step 1: Begin with Long-Term Problems

There are two sets of long-term problems that OMH and its partners must continue to address: (1) racial and ethnic minority health problems and (2) systems issues that inhibit the ability to effectively impact racial/ethnic minority health problems. These long-term problems are depicted graphically in Figure 2.

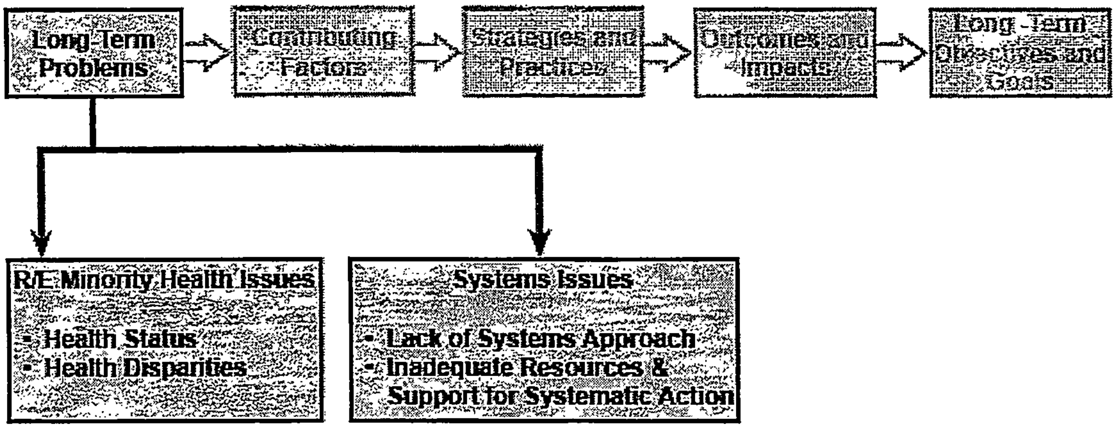

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Figure 2. Long Term Problems.

- *Racial and ethnic minority health problems* fall into two categories: racial/ethnic minority health status and, related to that, racial/ethnic health disparities. Racial/ethnic minority health status problems encompass preventable morbidity and premature mortality experienced by racial and ethnic minority individuals and groups without reference to others. Racial and ethnic health disparities entail differences in health status and health care that often reflect a greater burden of morbidity and mortality on racial and ethnic minorities as compared to the majority population.
- *Systems issues* encompass a wide variety of conceptual, organizational, structural and process-related variables that influence the ability to adequately and effectively address complex problems – and that can exacerbate these problems, or constitute problems in their own right. These variables include the availability of adequate resources to support the systems and the strategies and practices aimed at the problems and contributing factors, the extent to which systems support strategies and practices that are evidence-based as well as systematic planning and evaluation of actions undertaken, the extent to which the systems (and the strategies/practices) are well-coordinated and strategically directed, and the extent to which existing stakeholder groups are willing to work together as parts of an interconnected system. This need for a 'systems approach' and systematic actions applies broadly across all efforts conducted for the purpose of improving minority health and reducing health disparities. It also applies specifically to research and evaluation efforts to address gaps and weaknesses in science and knowledge about the nature and extent of racial and ethnic minority health problems and effective solutions to such problems.

The two racial/ethnic minority health issues-health status and health disparities-parallel and link to the two principal goals of *Healthy People 2010* . (HHS, 2000b) Thus, success in addressing racial/ethnic minority health issues will contribute to the achievement of the two central goals of *Healthy People 2010* .

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## Step 2: Address Contributing Factors

Since the factors contributing to poor racial/ethnic minority health-and to racial/ethnic health disparities-are many and complex, they have been organized into three categories or levels : individual-level factors, environmental-/community-level factors and systems-level factors.

- *Individual-level factors* include the knowledge and attitudes that individuals have about health risks, disease prevention, and treatment, the skills that individuals have to put knowledge into practice, the individual behaviors that have an impact on one's own health or the health of others, and the genetic factors that may enhance or reduce individual susceptibility to particular health conditions. In the graphic representation of the contributing factors component of the *Framework* (see Figure

3), individual-level factors are identified as knowledge, attitudes, skills, behaviors and biological or genetic risks.

- *Environmental- and community-level factors* include the physical environment (both natural and built), social and cultural characteristics of a community, and other economic, political and organizational/institutional conditions that are not generally within the control of specific individuals but provide the context of their lives. These factors may be either protective of, or pose risks to, health. Such factors include, but are not necessarily limited to: natural and physical hazards or biochemical risks, crime and violence, cultural values and norms that influence individual behavior and can protect or hinder the health and well-being of residents within communities, bias and discrimination, housing conditions and residential segregation, access to and quality of health care as well as schools, parks and recreational sites, nutritious food sources, transportation and other goods and services, communication networks and infrastructure, family and social networks or other supports for diverse segments of the community, low-income and poverty, unemployment, and the lack of health insurance. For purposes of framework development, environmental- and community-level factors are divided into those related to the physical environment, the social environment or economic barriers, with the social environment subdivided into community values, community assets or community involvement (see Figure 3). (Note: Because these factors are so complex and interrelated, many public health and social science researchers investigate and discuss such factors in combination, rather than as the discrete categories that are shown in this particular framework. The literature (see, for example, Kawachi, Kennedy, and Wilkinson, 1999) is replete with examples of the associations between socioeconomic status (SES) and morbidity/mortality-and the significant implications of SES for health. While problems related to low SES also affect White populations, the greatest impact is on racial/ethnic minorities who are overrepresented in the lower socioeconomic categories.)
- *Systems-level factors* include the kinds of systems that a community, state, region or nation might have (or not have), and approaches used (or not used), for identifying the problems or needs- health-related or otherwise-in their respective jurisdictions and for directing resources to address the problems or needs. Whether such systems and approaches (including public health and health care systems and approaches) *effectively* address such problems or needs depends upon the presence or absence of certain factors that are characteristic, or key components, of systems-oriented, systematic and strategic thinking and actions. These systems-level factors include, but are not limited to: the adequacy, appropriateness and mix of components, resources and assets; the effectiveness of efforts to configure, coordinate, and leverage such components, resources and assets, the extent to which leadership and commitment are provided to direct and sustain the components and the use of resources and assets, especially as guided by a vision and a strategic plan, the nature and extent of information- and knowledge-sharing and supportive infrastructure, the extent to which systems-and the products or services provided by such systems-are designed, implemented and evaluated with the needs of their users and beneficiaries

in mind, and the continued, coordinated and effective production of research and evaluation results that are widely shared and adopted for continuous improvement. As depicted in Figure 3, in the strategic framework, systems-level factors are organized into five major categories: components and resources, coordination and collaboration, leadership and commitment, user-centered design and science and knowledge.

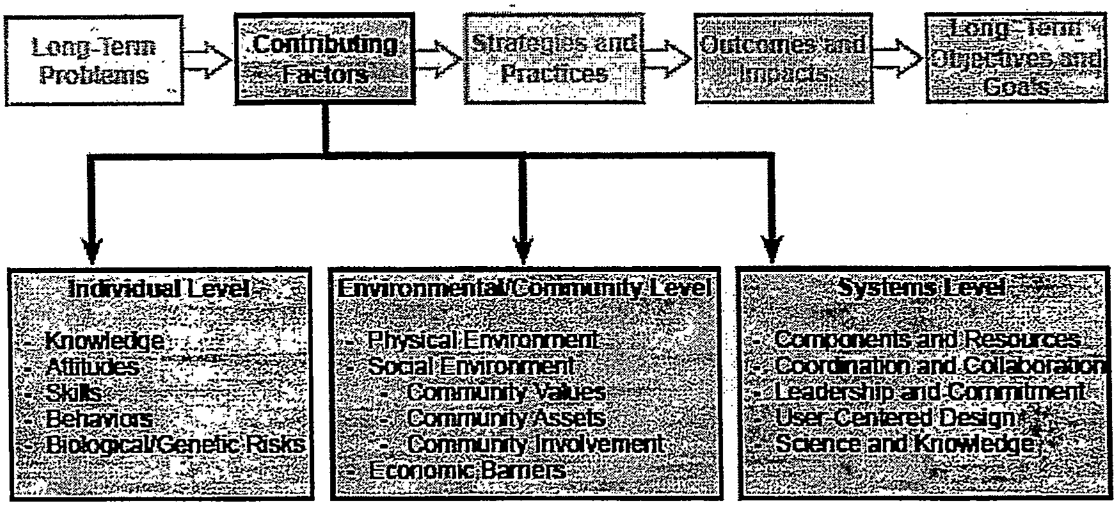

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Figure 3. Contributing factors.

These three levels, or sets, of factors interact to form the context for considering health outcomes in general (see Evans and Stoddart, 1990; Green and Kreuter, 1999; Green, Potvin, and Richard, 1996), including those specific to racial/ethnic minority health improvement and health disparities reduction. A good example of an interacting factors model that is organized into levels or categories is the Determinants of Health Model in *Healthy People 2010* (HHS, 2000c). In this model, key categories or factors include biology, behavior, social environment, physical environment, policies and interventions and access to quality health care. The determinants, or factors, approach to health is used herein to synthesize some of what the literature, research and expert opinion have identified as the key factors that contribute to racial/ethnic minority health problems and disparities in health status and health care. (Note: Approaches to population health that describe relationships and interactions between multiple determinants of health at the individual and environmental/community levels and how they affect health or illness are sometimes referred to as "ecological models" of health.)

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### Step 3: Support Effective Strategies and Practices

The contributing factors identified above form the basis for the targets to be addressed by a range of strategies and practices employed by OMH and its partners. The strategies and practices discussed in this document represent what current evidence and expert consensus suggest to be successful in impacting contributing factors. Those strategies and practices that address the contributing factors and fit into OMH's mission are emphasized. It is important to note that many of the strategies and practices may address several factors at the same time or in sequence, rather than only one factor. A number of strategies and practices are also often effectively combined with others, in more comprehensive approaches. In a number of cases, new strategies or practices need to be developed and tested, as guided by available science and practice. Figure 4 is a graphic depiction of the necessary relationship between the strategies and practices supported and the individual-, environmental-/community-, and/or systems-level factor(s) that cause or contribute to the problem(s) to be solved.

- *Strategies and Practices to Address Individual-Level Factors* - Approaches that address individual-level factors include efforts to increase knowledge, promote positive attitudes, and improve skills that affect decisions about health-related behavior. A broad range of informational/educational methods and materials, dissemination channels and venues may be used (e.g., written materials, including popular and professional publications, radio and television broadcasts, computer- and web-based technologies, mass media campaigns, and one-on-one or group-oriented education, counseling and training in schools, clinics, worksites and community settings). With respect to biological and genetic risks, individual-level efforts include informational, screening and counseling strategies and practices. Strategies and practices may be aimed at a variety of individuals and groups of individuals, including, but not limited to, those who are racial/ethnic minorities themselves, those meeting some other particular characteristic (e.g, age range, gender, health literacy level) and those who interact with or serve minorities (e.g., health care providers). Effective efforts tend to reflect integrated approaches that address a combination of individual-level factors as well as their interactions with environmental factors that inhibit or support desired behaviors. In addition, health messages are more readily accepted if they do not conflict with existing cultural beliefs and practices, and take into account unique historical and cultural experiences of target audiences, including racial and ethnic minorities.

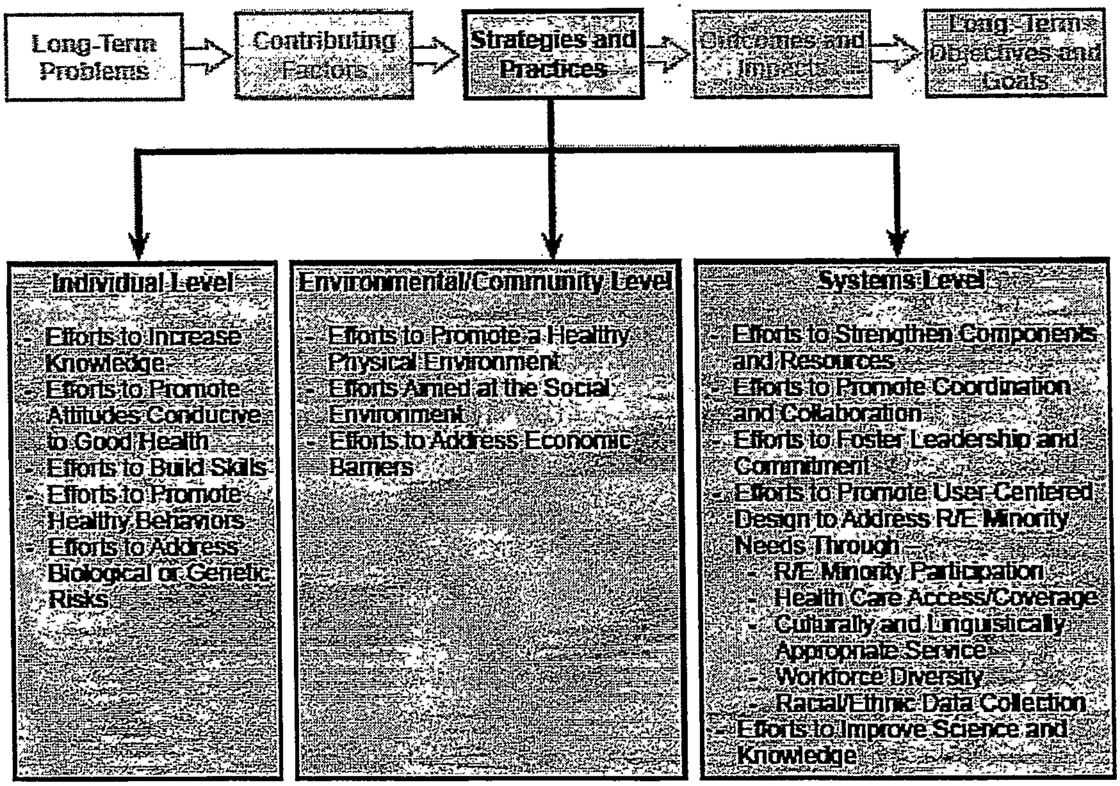

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Figure 4. Strategies and Practices.

- *Strategies and Practices to Address Environmental- and Community-Level Factors* – The strategies and practices included in this category are aimed at those factors that extend beyond individuals, and shape the broader communities and environments within which people live, work and play. Examples of such efforts are: (1) promotion of a healthy physical environment through the development of policies that promote public health and safety, (2) fostering of a positive social environment by nurturing community values and norms conducive to good health, strengthening community capacity and "assets" for general well-being, and/or increasing community involvement, supports and networks (i.e., "social capital") via opportunities for civic engagement and positive social interaction that promote self-reliance, buffer stress and otherwise protect the health and well-being of diverse members in the community, and (3) provision of health care financing and other initiatives that provide support to poor, low-income and underserved populations (e.g., children's health insurance for low-income families, implementation of prescription drug coverage for Medicare beneficiaries). Many other program efforts have tried to link multiple community-based strategies and practices together to address the interactive nature of all of the environmental- and community-level factors influencing health.
- *Strategies and Practices to Address Systems-Level Factors* – A review of systems literature and a research synthesis of "effective" public health and health care systems found that effective systems aimed at complex problems have certain characteristics in common. The systems-level strategies and practices recommended in the *Framework* include efforts to:

- Establish, increase and strengthen system components and resources, such as infrastructure, staffing and funding to ensure specific attention to racial/ethnic minority health and health disparities. This often involves obtaining resources from mixed funding streams in order to leverage assets and expand the resource base.
- Promote coordination, collaboration and partnerships to build relationships and trust, allow for pooling and leveraging of resources, expertise and talent, and foster synergies that benefit all involved parties. Such coordination and collaboration requires strong information and communications systems and infrastructure.
- Foster and ensure leadership and commitment, including the development and implementation of strategic plans that provide vision and direction, set priorities and coordinate and target resources. Ideally, strategic plans for addressing minority health and health disparities should draw on existing data on minority groups, incorporate input and feedback from community partners, build upon the best of existing and emerging evidence of successful strategies and practices, structure activities around expected outcomes and impacts tied to goal-setting processes (e.g., *Healthy People 2010*) at the State and Federal levels, and employ performance assessment and evaluation results for continuous improvement. Legislative or regulatory initiatives, executive orders and other administrative mandates comprise another important set of strategies for ensuring sustained attention and commitment to minority health and health disparities issues.
- Promote user-centered design to address racial/ethnic minority needs Racial/ethnic minorities may be disproportionately impacted by such experiences as lack of access to the public goods and services that are important for health and well-being, limited health care coverage or the inability to pay for health services, lack of trustworthiness on the part of health care and research institutions, racial/ethnic bias or discrimination, cultural and linguistic barriers, and lack of respect because of racial, ethnic, cultural or linguistic differences. Recommended strategies and practices to address these concerns include efforts that: increase participation of racial/ethnic minorities in planning, implementation, monitoring and evaluation of programs and initiatives intended to meet their needs (i.e., community-based participation), increase health care access and coverage, increase availability of culturally and linguistically appropriate services (CLAS), increase workforce diversity, and improve the collection, analysis and use of racial and ethnic data for performance monitoring and quality improvement purposes.
- Improve science and knowledge about successful strategies and practices through increased and enhanced research, demonstrations and evaluation (RD&E). This includes RD&E efforts that strengthen knowledge and understanding about: the nature and extent of minority health/health disparities problems, especially for small or hard-to-reach populations for which data continue to be lacking, the mechanisms by, and extent to, which

systems factors inhibit the ability to address minority health and health disparities, the relative importance of the various factors that cause or contribute to the long-term problems and how interactions between these factors promote or inhibit health, effective interventions that not only improve racial/ethnic minority health, but actually reduce racial/ethnic health gaps among populations, effective systems and evidence-based systems approaches to addressing minority health/health disparities problems, and effective methods for disseminating results of research, "translating research into practice and policy" and "putting practice into research" (making research results "practitioner-centered"). Transdisciplinary approaches to research, which can inform more multi-faceted solutions to the long-term problems at hand are also emphasized.

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## Step 4: Measure Intermediate Outcomes and Long-Term Impacts

This step identifies measurable outcomes and impacts that might be expected to take place following implementation of the indicated strategies and practices. Such outcomes and impacts relate to the contributing factors. Generally, outcomes refer to short-term results (e.g., increased awareness and knowledge about disease prevention or risk reduction) and impacts refer to long-term results (e.g., reduced morbidity or mortality). The outcomes and impacts include those for which there is actual research evidence as well as those based on expert judgment.

In many current efforts to address racial/ethnic minority health and health disparities problems, the strategies and practices have not been clearly tied to desired or intended outcomes and impacts. Nor have adequate and appropriate evaluations been performed to determine if, indeed, the strategies and practices produce meaningful results. This is a major shortcoming. It is necessary to structure future minority health and health disparity efforts so that they will be more health outcome- and impact-oriented. It is also important to determine the outcomes and impacts of systems-oriented strategies and practices on efforts to affect health outcomes and impacts. Identifying the outcomes and impacts expected from programmatic and policy-oriented minority health/health disparities efforts-as well as systems approaches to addressing minority health/health disparities issues-will inform, and be informed by, future research and evaluations. The *Framework* identifies and organizes a range of outcomes and impacts that might be expected, with reference to the contributing factors and the strategies and practices already discussed. These outcomes and impacts are organized into three categories, or levels, as depicted in Figure 5.

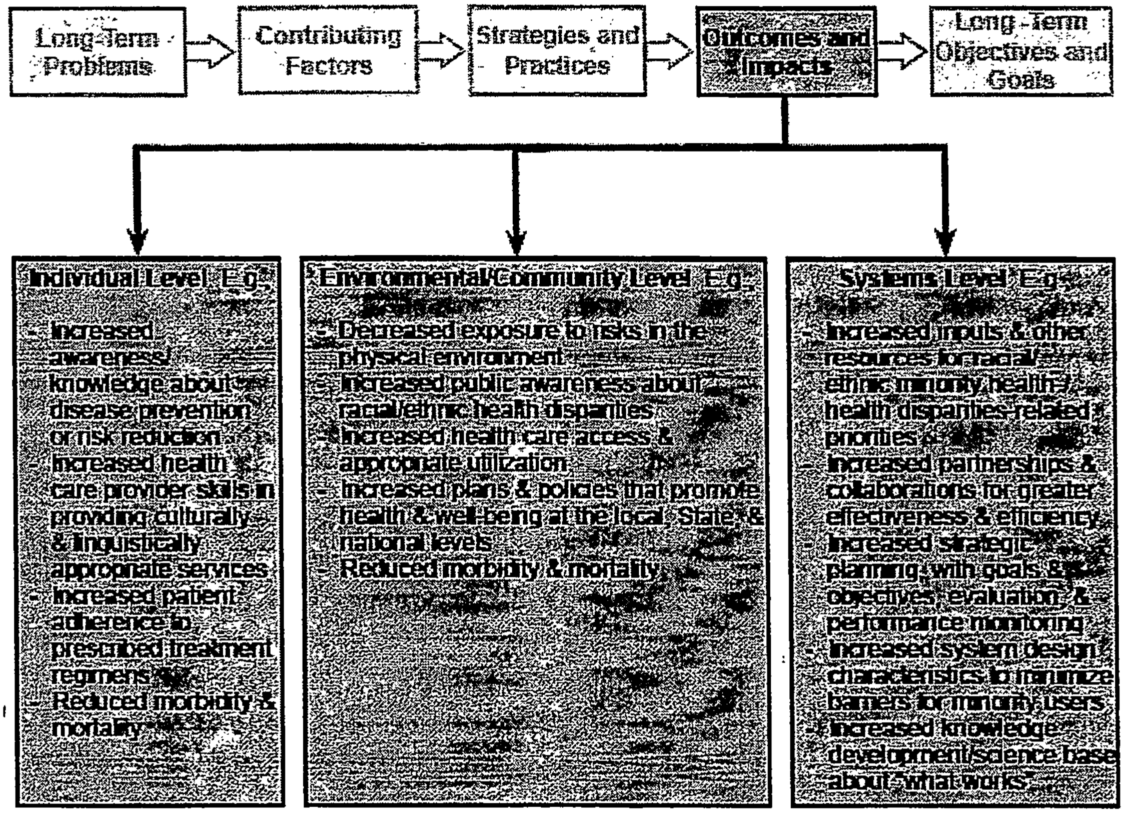

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Figure 5. Outcomes and Impacts

A wide range of short-term, intermediate and longer-term outcomes and impacts are possible and desirable at the individual, environmental/community and systems levels to move OMH and other stakeholders toward long-term objectives and goals. The desired or expected results are dependent upon the kinds of strategies and practices being planned and implemented, the factors and problems to be affected, the populations being targeted and the settings in which interventions are taking place. Some examples of the general outcomes and impacts that might be produced by the strategies and practices are outlined below.

*Individual-Level Outcomes and Impacts*

- Increased awareness/knowledge about disease prevention, risk reduction and treatment and management for racial/ethnic minorities
- Improved attitudes/beliefs conducive to health and health-seeking behaviors among racial/ethnic minorities
- Improved attitudes/beliefs among health care/human service providers and researchers conducive to meeting the needs of racial/ethnic minorities
- Increased skills for racial/ethnic minorities to adopt healthy lifestyle behaviors
- Increased skills for public health/health care providers and other service professionals to provide culturally and linguistically appropriate services (CLAS)
- Increased patient satisfaction with patient-provider communications and interactions.

- Increased patient adherence to prescribed treatment regimens
- Increased engagement in/adoption of healthy lifestyle and appropriate health-seeking behaviors; reduced engagement in/adoption of risky behaviors
- Reduced morbidity and mortality

*Environmental- and Community-Level Outcomes and Impacts*

- Decreased exposure to risks in the physical environment
- Increased awareness/knowledge about racial/ethnic minority health problems and racial/ethnic health disparities among racial/ethnic minorities, among public health/health care providers and service professionals and in the general public
- Increased health-conducive changes in community attitudes, values and norms
- Increased community assets that are protective of the health and well-being of its residents (e.g., health centers in underserved communities, neighborhood restaurants and grocers with healthy food options, faith-based organizations, gathering places)
- Increased number of active organizations and family or social networks that meet the social needs and promote the general health and well-being of racial/ethnic minority populations in the community (e.g., church groups, social clubs, recreational and after-school programs)
- Increased health care access and appropriate utilization
- Increased number of plans and policies that promote and protect health and well-being at the community, state and national levels, in general, and for racial/ethnic minorities, in particular
- Increased engagement in/adoption of healthy lifestyle and appropriate health-seeking behaviors, reduced engagement in/adoption of risky behaviors
- Reduced morbidity and mortality

*Systems-Level Outcomes and Impacts*

- Increased inputs, assets and other resources allocated for racial/ethnic minority health and health disparities-in general and for specific priorities
- Increased dedicated assets and other resources for minority health/health disparities (including, but not limited to, state offices of minority health) and related priorities (as reflected in administrative, legislative, budgetary and other mandates)
- Increased formal partnerships and collaboration leading to coordination/leveraging of resources for greater efficiency, and enhanced effectiveness of minority health/health disparities initiatives
- Increased strategic planning and implementation of plans, with clearly articulated goals and objectives, for racial/ethnic minority health improvement and health disparities reduction
- Increased integration of evaluation, performance measurement and monitoring, and continuous improvement in planning and implementation of racial/ethnic minority health and health disparities efforts

- Increased collection, dissemination and use of racial/ethnic data for planning, quality assurance and performance monitoring/improvement purposes (e.g., to assess whether clinical care guidelines for specific diseases are being employed consistently and appropriately, to address health care disparities)
- Improved system design characteristics that are directed to specific racial/ethnic minority health needs, such as the need to address cultural and linguistic differences, promote trust and trustworthiness, etc., (with measures that focus on, for example, increased involvement/participation of racial/ethnic minorities or representatives in health care quality and research initiatives, increased adoption of CLAS standards by health plans, and/or increased diversity in the public health/health care workforce)
- Increased knowledge development/science base about successful strategies and practices for improving racial/ethnic minority health and reducing health disparities
- Increased dissemination and diffusion of evidence-based strategies and practice to improve racial/ethnic minority health and reduce health disparities
- Increased formal partnerships and collaboration across research disciplines leading to coordination/leveraging of research dollars and more multi-faceted approaches to impacting factors that contribute to poor racial/ethnic minority health outcomes and health disparities
- Increased and improved outcomes and impacts at the individual and environmental/ community levels

The identification of expected outcomes and impacts is an important part of the planning, implementation and evaluation processes needed in minority health- and health disparities-related efforts conducted or supported by OMH and its partners. Once desired or expected outcomes and impacts are identified, the process of determining performance measures or indicators of progress in achieving such outcomes and impacts can occur. With the identification and selection of performance measures or indicators of the expected outcomes or impacts, the effectiveness of the strategies and practices in producing the desired results can then be evaluated. Hence, the identification of outcomes and impacts within the strategic framework becomes the basis for identifying and developing performance measures as well as the kind of evaluation needed to promote an outcome or results orientation in the efforts being funded or otherwise supported by OMH and other stakeholders.

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## Step 5: Achieve Long-Term Objectives and Goals

An important part of the strategic framework is its focus on long-term objectives and goals, including those in *Healthy People 2010*. (Note: OMH encourages and supports efforts that contribute to the long-term objectives and goals specified in Healthy People 2010, especially those that are of particular relevance to racial/ethnic minority populations and systems-related priorities.) OMH, states, communities and other stakeholders can use this framework to guide the selection of problems, factors and strategies/practices that can be linked to short-term, intermediate- and long-term objectives and goals, based on identified outcomes and impacts. And, as shown in Figure 6, these objectives and goals can be set, if desired, for the individual, environment/community and/or systems level(s). With the collection of the appropriate output, outcome and impact data, stakeholder organizations can evaluate the extent to which the objectives and goals have been attained.

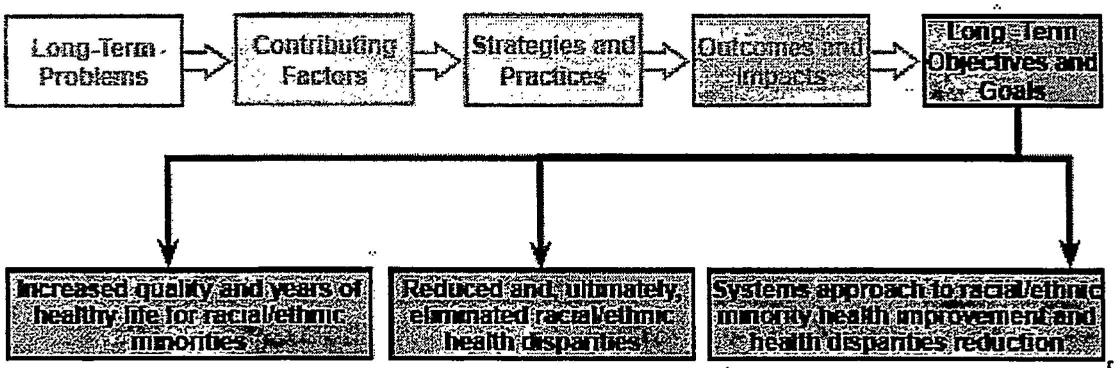

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Figure 6. Long-Term Objectives and Goals.

To the extent that strategies and practices result directly or indirectly in impacts on the determinants of health, and achieve health outcomes, more progress will be made toward the long-term goals of improving racial/ethnic minority health and eliminating racial/ethnic health disparities. Such efforts will necessitate a systems approach and a concerted effort to build and deploy evidence-based practice in order to promote continuous improvement based on coordinated and strategic application of the most current science and knowledge and to mobilize the resources and talents of all stakeholders.

# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

## IV. Next Steps: Using the *Framework* to Support Evaluation and Evidence-Based Practices

**The Strategic Framework**

The *Framework* clearly identifies five steps that must be taken to ensure that strategies and practices aimed at improving racial/ethnic minority health and reducing racial/ethnic health disparities are effective. The five steps include: (1) identify the long-term problems, (2) identify the key factors that contribute to those long-term problems, (3) identify or develop strategies and practices that effectively address the contributing factors and the long-term problems, (4) identify expected outcomes and impacts and determine appropriate measures or indicators of such results, and (5) document progress in achieving agreed-upon objectives and goals. The *Framework* highlights many of the relationships between and among these five steps, and suggests a variety of ways in which the *Framework* can be used at a national, state, Tribal, regional or local level.

While health status is the ultimate measure of health disparities, the intermediate outcomes-representing key steps along the path toward greater equity in health care and health status-must be based on the kind of rationale and model presented in this document. This is a model that explicitly encompasses the full range of multiple and complex factors that contribute to poor health for many racial/ethnic minorities and high levels of racial/ethnic health disparities. This model is unique in that it includes the need for a "systems approach" to addressing racial/ethnic minority health problems (i.e., working together as an interconnected system) and the lack of systematic planning, implementation and evaluation of current efforts as a separate set of long-term problems that can have profound and persistent impacts on racial/ethnic minority health status and health disparities. Given their great importance, these systems issues must be addressed as problems in their own right, with attendant strategies and practices that are already proven or that need to be developed and rigorously evaluated. Improvements in systems that have population-wide scope can accelerate progress.

The strategic framework is simply structured, and its structure permits flexibility in its application by various stakeholders to different situations and for different purposes. First and foremost, the *Framework* can be used by OMH, other HHS entities and HHS partners to focus programmatic and policy-oriented actions that are based on existing science and knowledge about the problems and contributing factors to be addressed and about strategies and practices known to be effective in producing desired outcomes and impacts. Secondly, the *Framework* can also provide the basis for a protocol to systematically evaluate OMH-funded and other activities in a way that produces more consistent information on what grantees and others are actually doing to improve racial/ethnic minority health status and reduce racial/ethnic health disparities. (Note: As part of its Spring 2007 grant cycle, OMH issued its new Evaluation Planning Guidelines for Grant Applicants to strengthen evaluation within its grant programs. These guidelines were informed by the strategic framework and serve as the preliminary version of OMH's evaluation protocol for its state-based and other funded efforts.)

In addition, through more systematic and rigorous research and evaluation, the *Framework* can facilitate more targeted and efficient methods for identifying and developing best or evidence-based practices, and can strengthen the justification for directing resources toward such efforts. Any effort to identify best practices, however, requires a set of criteria by which to make that judgment. The work of established, respected, scientific expert bodies within and outside of HHS-such as, the U.S. Preventive Services Task Force, the Task Force on Community Preventive Services, and the British-based Cochrane Collaboration-can inform this process. Both the *Guide to Clinical Preventive Services* (U.S. Preventive Services Task Force) and the *Guide to Community Preventive Services* (Task Force on Community Preventive Services) provide examples of how expert opinion-used as the basis for some strategies and practices where scientific evidence of their effectiveness is not adequate-and empirical evidence can be reconciled.

Thus, the *Framework* can promote use of existing science and knowledge while concurrently fostering the development of new evidence of effective strategies and practices for continuous improvement.

# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

## V. Conclusions

**The Strategic Framework**

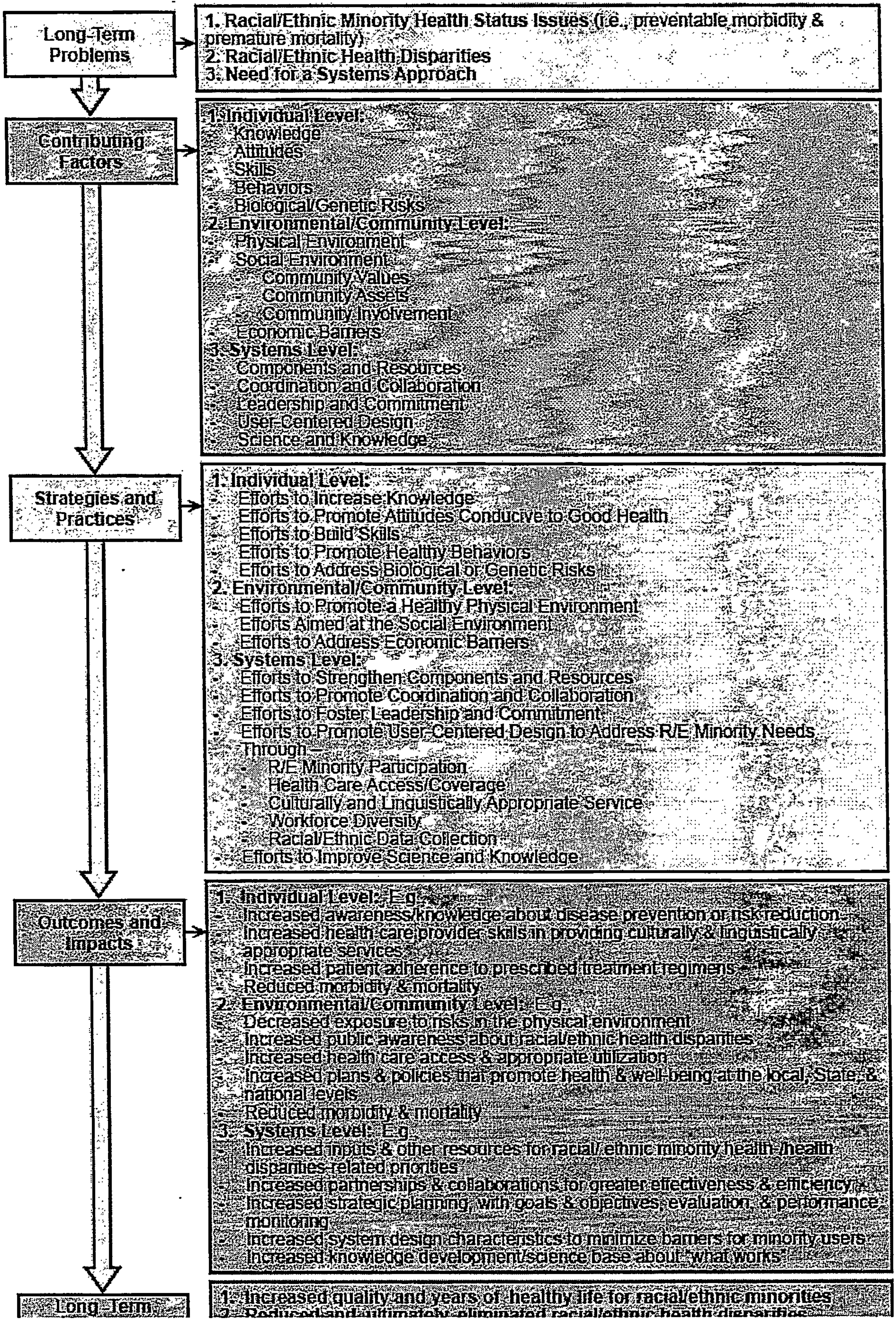
The *Framework* presented in this document is intended to help OMH, its partners and other stakeholders to use a more systems-oriented and strategic approach, based on existing science and knowledge, to attack the problems related to racial/ethnic minority health and health disparities. In the short run, this framework is being used by OMH to guide the development of a protocol for the evaluation of activities being funded in the states and elsewhere to improve racial/ethnic minority health and reduce racial/ethnic health disparities. In the longer run, this strategic framework can help in multiple ways:

- First, the *Framework* can help enhance the understanding of policymakers, policy analysts, researchers, practitioners and others about the key strategic components that must be addressed in developing policies or programs that affect racial and ethnic minority populations. These components are identified as the major categories and subcategories in the strategic framework.
- Second, the *Framework* can help deepen understanding about the many ways in which the components relate to one another. These relationships are multiple and complex, but the strategic framework has been designed to make it easier to articulate these multiple and complex relationships, as they play out in concrete situations within communities, states, Tribes and the nation.
- Third, the *Framework* will make it easier to identify areas and issues that need more input-whether by improved research, data systems, coordination in the use of research results, provision of services or training of practitioners-if progress is to be made in improving racial/ethnic minority health and reducing or eliminating racial/ ethnic health disparities.
- Fourth, the *Framework* can evolve and improve, both in its structure and in its details, through the full participation of interested parties at the national, state, Tribal and local levels, and in both the public and the private sectors.
- Finally, the *Framework* can give rise to more systematic planning, testing, documentation and use of evidence-based strategies and practices that really work. Because of its flexibility, the *Framework* makes it clear that progress in developing and using evidence-based strategies and practices can arise from any number of

> sources. The *Framework* can provide users with a better understanding of the exact problems and factors to be addressed, the kinds of components of strategies and practices that may best contribute to effectiveness, the measures of outcomes and impacts that are appropriate and feasible and the kinds of goals and objectives that are realistic and achievable.

Improving the health of racial and ethnic minorities and reducing and, ultimately, eliminating the burden of health disparities will require a multi-faceted process sustained over many years. This process must be guided by systems-oriented, strategic and systematic approaches.

## A Strategic Framework For Improving Racial/Ethnic (R/E) Minority Health & Eliminating R/E Health Disparities



**Long-Term Problems**

1. Racial/Ethnic Minority Health Status Issues (i.e., preventable morbidity & premature mortality)
2. Racial/Ethnic Health Disparities
3. Need for a Systems Approach

**Contributing Factors**

1. Individual Level:
- Knowledge
- Attitudes
- Skills
- Behaviors
- Biological/Genetic Risks

2. Environmental/Community Level:
- Physical Environment
- Social Environment
  - Community Values
  - Community Assets
  - Community Involvement
- Economic Barriers

3. Systems Level:
- Components and Resources
- Coordination and Collaboration
- Leadership and Commitment
- User-Centered Design
- Science and Knowledge

**Strategies and Practices**

1. Individual Level:
- Efforts to Increase Knowledge
- Efforts to Promote Attitudes Conducive to Good Health
- Efforts to Build Skills
- Efforts to Promote Healthy Behaviors
- Efforts to Address Biological or Genetic Risks

2. Environmental/Community Level:
- Efforts to Promote a Healthy Physical Environment
- Efforts Aimed at the Social Environment
- Efforts to Address Economic Barriers

3. Systems Level:
- Efforts to Strengthen Components and Resources
- Efforts to Promote Coordination and Collaboration
- Efforts to Foster Leadership and Commitment
- Efforts to Promote User-Centered Design to Address R/E Minority Needs Through—
  - R/E Minority Participation
  - Health Care Access/Coverage
  - Culturally and Linguistically Appropriate Service
  - Workforce Diversity
  - Racial/Ethnic Data Collection
- Efforts to Improve Science and Knowledge

**Outcomes and Impacts**

1. Individual Level: E.g.,
- Increased awareness/knowledge about disease prevention or risk reduction
- Increased health care provider skills in providing culturally & linguistically appropriate services
- Increased patient adherence to prescribed treatment regimens
- Reduced morbidity & mortality

2. Environmental/Community Level: E.g.,
- Decreased exposure to risks in the physical environment
- Increased public awareness about racial/ethnic health disparities
- Increased health care access & appropriate utilization
- Increased plans & policies that promote health & well-being at the local, State, & national levels
- Reduced morbidity & mortality

3. Systems Level: E.g.
- Increased inputs & other resources for racial/ ethnic minority health-/health disparities-related priorities
- Increased partnerships & collaborations for greater effectiveness & efficiency
- Increased strategic planning, with goals & objectives, evaluation, & performance monitoring
- Increased system design characteristics to minimize barriers for minority users
- Increased knowledge development/science base about "what works"

**Long-Term**

1. Increased quality and years of healthy life for racial/ethnic minorities
2. Reduced and ultimately eliminated racial/ethnic health disparities

[D]

Chart. A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities.

# A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities

**The Strategic Framework**
Preface
Introduction
Background on the Framework
The Strategic Framework
Next Steps
Conclusions
References
Complete Framework (print version)

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# National Standards on Culturally and Linguistically Appropriate Services (CLAS)

The CLAS standards are primarily directed at health care organizations; however, individual providers are also encouraged to use the standards to make their practices more culturally and linguistically accessible. The principles and activities of culturally and linguistically appropriate services should be integrated throughout an organization and undertaken in partnership with the communities being served.

The 14 standards are organized by themes: Culturally Competent Care (Standards 1-3), Language Access Services (Standards 4-7), and Organizational Supports for Cultural Competence (Standards 8-14). Within this framework, there are three types of standards of varying stringency: mandates, guidelines, and recommendations as follows:

CLAS mandates are current Federal requirements for all recipients of Federal funds (Standards 4, 5, 6, and 7).

CLAS guidelines are activities recommended by OMH for adoption as mandates by Federal, State, and national accrediting agencies (Standards 1, 2, 3, 8, 9, 10, 11, 12, and 13).

CLAS recommendations are suggested by OMH for voluntary adoption by health care organizations (Standard 14).

Standard 1
Health care organizations should ensure that patients/consumers receive from all staff member's effective, understandable, and respectful care that is provided in a manner compatible with their cultural health beliefs and practices and preferred language.

Standard 2
Health care organizations should implement strategies to recruit, retain, and promote at all levels of the organization a diverse staff and leadership that are representative of the demographic characteristics of the service area.

Standard 3
Health care organizations should ensure that staff at all levels and across all disciplines receive ongoing education and training in culturally and linguistically appropriate service delivery.

Standard 4
Health care organizations must offer and provide language assistance services, including bilingual staff and interpreter services, at no cost to each patient/consumer with limited English proficiency at all points of contact, in a timely manner during all hours of operation.

Standard 5

Health care organizations must provide to patients/consumers in their preferred language both verbal offers and written notices informing them of their right to receive language assistance services.

Standard 6

Health care organizations must assure the competence of language assistance provided to limited English proficient patients/consumers by interpreters and bilingual staff. Family and friends should not be used to provide interpretation services (except on request by the patient/consumer).

Standard 7

Health care organizations must make available easily understood patient-related materials and post signage in the languages of the commonly encountered groups and/or groups represented in the service area.

Standard 8

Health care organizations should develop, implement, and promote a written strategic plan that outlines clear goals, policies, operational plans, and management accountability/oversight mechanisms to provide culturally and linguistically appropriate services.

Standard 9

Health care organizations should conduct initial and ongoing organizational self-assessments of CLAS-related activities and are encouraged to integrate cultural and linguistic competence-related measures into their internal audits, performance improvement programs, patient satisfaction assessments, and outcomes-based evaluations.

Standard 10

Health care organizations should ensure that data on the individual patient's/consumer's race, ethnicity, and spoken and written language are collected in health records, integrated into the organization's management information systems, and periodically updated.

Standard 11

Health care organizations should maintain a current demographic, cultural, and epidemiological profile of the community as well as a needs assessment to accurately plan for and implement services that respond to the cultural and linguistic characteristics of the service area.

Standard 12

Health care organizations should develop participatory, collaborative partnerships with communities and utilize a variety of formal and informal mechanisms to facilitate community and patient/consumer involvement in designing and implementing CLAS-related activities.

Standard 13

Health care organizations should ensure that conflict and grievance resolution processes are culturally and linguistically sensitive and capable of identifying, preventing, and resolving cross-cultural conflicts or complaints by patients/consumers.

Standard 14

Health care organizations are encouraged to regularly make available to the public information about their progress and successful innovations in implementing the CLAS standards and to provide public notice in their communities about the availability of this information.

For more information, visit:

- National Standards on Culturally and Linguistically Appropriate Services (CLAS) in Health Care (Final Report)
- National Standards for Culturally and Linguistically Appropriate Services in Health Care (Executive Summary)
- Normas nacionales para servicios cultural y lingüísticamente apropiados en la atención sanitaria (Resumen ejecutivo)
- Cultural Competency Site

# POLICIES

*Recommendations from the Interagency Committee for the Review of the Racial and Ethnic Standards to the Office of Management and Budget Concerning Changes to the Standards for the Classification of Federal Data on Race and Ethnicity*
AGENCY: Executive Office of the President, Office of Management and Budget (OMB), Office of Information and Regulatory Affairs
view document

*Executive Order No. 13166: Improving Access to Services for Persons with Limited English Proficiency* - The White House, Office of Management and Budget (OMB) Released the Benefit-Cost Report of Executive Order No.13166 (Improving Access to Services for Persons with Limited English Proficiency)(Aug.2000), designed to improve access to federally conducted programs and activities and programs and activities of recipients of Federal funding for persons, who as a result of national origin, are limited in their English proficiency (LEP). More

*Policy Guidance on the Prohibition Against National Origin Discrimination as It Affects Persons With Limited English Proficiency* - Office for Civil Rights (OCR) issued internal guidance to its staff in January 1998 on a recipient's obligation to provide language assistance to LEP persons. That guidance was intended to ensure consistency in OCR's investigation of LEP cases. This current guidance clarifies for recipient/covered entities and the public, the legal requirements under Title VI that OCR has been enforcing for the past 30 years. More

*Inclusion of Race and Ethnicity in U.S. Department of Health and Human Services' Data Collection Activities* - The Department has adopted a policy that requires all HHS-sponsored data collection and reporting systems to include standard racial and ethnic categories. In addition, the Department has established a policy to implement the Office of Management and Budget's (OMB) revised standards for classifying race and ethnicity in government statistics, making it mandatory for federal data collectors to separate out data on Native Hawaiians and other Pacific Islander groups from Asian American data. These inclusion policies will help monitor HHS programs to determine that Federal funds are being used in a nondiscriminatory manner and to promote the availability of standard racial and ethnic data across various agencies.

*Executive Order on Improving Access to Federally Assisted and Federally Conducted Programs and Activities for Persons with Limited English Proficiency* - The Federal government is committed to improving the accessibility of Federally-assisted and Federally-conducted programs and activities for eligible persons with limited-English proficiency.

*Title VI Prohibition Against National Origin Discrimination As It Affects Persons With Limited English Proficiency Policy Guidance* - Although Title VI of the Civil Rights Act of 1964 prohibits discrimination against persons with limited English proficiency, there are statutes in many states that have "English only" requirements. The use of state funds to provide linguistic access services is strictly prohibited by these states. There is a perception that even Federal funds cannot be used for the provision of linguistic access services within English only states. This continues to be litigated at the state and Federal levels. English, Spanish, and Chinese languages versions are available.

# CHAPTER 21

# *Cultural Competency*

ANA NÚÑEZ, MD*
CANDACE ROBERTSON, MPH

## INTRODUCTION AND DEFINITIONS

### Cultural Competence

Health-care providers aspire to attain finite sets of skills not only in clinical behaviors such as palpation and auscultation, but also in provider–patient communication. "Clinical competence" implies achievement of the level of skills needed to diagnose disease and deliver care. "Cultural competence" has come to represent the ability of health-care providers to interact with patients who are different from themselves. This difference implies ethnicity, but from a broader perspective encompasses differences that include gender, race, age, religion, culture, language, education, socioeconomic status, and permutations of these parameters.

Cultural competence has been described, variously, as knowledge, attitude, and skills (educational perspective)[1] about health-related beliefs and cultural values (socioeconomic perspective), disease incidence and prevalence (epidemiologic perspective), and treatment efficacy (outcomes perspective).[2] It has also been defined as "a set of behaviors, knowledge, attitudes, and policies that come together in a system, organization, or among health professionals that enables effective work in cross-cultural situations."[3]

Health-care providers must be able to shift from a problem- or disease-focused perspective to the human and contextual perspective of the patients who present to them. They must also be able to recognize and acknowledge their own biases, prejudices, and stereotypes. This change of perspective includes considering how patients' concerns might influence communication and clinical assessments. To succeed in this more patient-centered approach, providers must enhance the communication skills necessary to negotiate effectively and collaborate with patients to optimize outcomes that work within the patients' world.

### Cross-Cultural Efficacy and Cultural Humility

Cross-cultural efficacy and cultural humility provide two additional perspectives for examining the knowledge, attitudes, and skills needed in the health-care setting to bridge the gap between the science of medicine and the art of healing.

Cross-cultural efficacy focuses on the dynamic between the patient and the provider.

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*The McGraw-Hill Companies acknowledge the substantial editorial contributions of Donna M. Frassetto and Nancy N. Woelfl in preparation of this chapter.

This perspective emphasizes the acquisition of skills as an ongoing process rather than the attainment of a finite set of skills at one point in time, and that neither the caregiver nor the patient culture is preferred. The traditional medical encounter involves the intersection of three cultures: the culture of the physician, the culture of the patient (which is rarely the same as that of the physician), and the medical culture that provides the context for the interaction. In the cross-cultural efficacy model, the emphasis for health-care providers is on learning to see their own culture and understand the impact of their behaviors on others whose culture is different, as well as the impact of the patients' behaviors on the provider.

Cultural humility, described by Tervalon et al,[4] sheds light on the important role of health-care provider insight and awareness in the clinical encounter. In this perspective, the provider is encouraged to engage in regular self-evaluation and self-critique. The goal is to shift the power differential in patient–physician interactions and develop balanced relationships with individuals and populations.[4]

The power differential plays a role in the provider–patient interaction. In some settings, the goal of the provider–client interaction is developmental and advocacy focused. For example, when a client initiates psychotherapy, the client is at the low end of the power scale and the psychologist at the high end. If progress is made, the client becomes more empowered and better skilled in self-care, resulting in increased power on his part and a decrease on the provider's scale. In general, the consumer movement has shifted encounters away from a paternalistic (adult–child) approach to one that is more equitable (adult–adult). Nonetheless, the provider, with his or her knowledge and skills, retains more power in the interaction.

There are advantages and disadvantages to this dynamic. However, in general, the less collaborative a provider, the more likely it is he or she will truncate communication with the patient. For example, telling patients they must take their medicine is not an unreasonable thing to do. Patients may readily consent but not, however, change their behavior. A more collaborative approach would involve asking a patient whose condition has not improved after medication was prescribed whether he or she has taken the medicine and what problems were experienced. This approach creates an opportunity to openly discuss the matter, which may lead to greater understanding and compliance.

The consumer movement may also influence health practitioners' perceptions of the need to enhance skills in this area because insured patients have a choice as to which provider they see. If clinicians seem unresponsive, patients can go elsewhere, as described in the following example.

> A female obstetrician/gynecologist practiced in a 17-member group. She suggested to her colleagues, all of whom were male, that gender communication skills were important in care. Her colleagues were not interested until insurance coverage changed and a large number of patients left the practice. The other members of the group then quickly expressed interest in hiring a consultant to teach them gender-based communication skills.

Patients' value and belief systems, behaviors, and health-care practices are critical factors influencing the success of a clinical encounter. Differences in recognition of symptoms, health-seeking behaviors, communication and expression of symptoms, ability to understand treatment plans or instructions, expectations of care, and adherence to prevention efforts and treatment regimens contribute to disparities in health and to poor health outcomes.[5] Failure to address the cultural aspects of care that have an impact on health and health care is clearly detrimental: Patients who are minorities experience higher rates of disease, disability, and death, and often receive a lower quality of care compared with nonminorities.[6]

## ▶ COMPONENTS OF CULTURAL COMPETENCE

Whether one uses the term *cultural competence*, *cross-cultural efficacy*, or *cultural humility*, the ultimate goal of efforts to incorporate these approaches into practice is to better prepare health-care providers to recognize, understand, and manage sociocultural issues that emerge within the clinical encounter.[7] All three approaches require knowledge, attitudes, and skills.

## Knowledge

Cultural competence efforts seek to increase providers' knowledge of cultural beliefs, practices, and changing attitudes toward health care and health-seeking behaviors. Recognizing disparities in the incidence and occurrence of disease, especially among racial and ethnic patient populations, is also an important aspect of the cultural competency knowledge base. Three examples illustrate why awareness is an important factor in reducing disparities and improving outcomes.

1. Although breast cancer occurs less often in African American than Caucasian women, African American women experience a higher mortality rate. There is debate as to the genetic and physiologic mechanisms of the disease in African American women, but delays in obtaining treatment and barriers to care may play a role in the different outcomes seen in this patient population.
2. The onset of prostate cancer may occur earlier in African American men than in men of other ethnic and racial groups. Despite recommendations for screening evaluations to begin at age 40, many African American men are not screened even though there is an opportunity to do so when they seek care for other conditions.
3. Many studies that have evaluated cardiac care have demonstrated differential care based on gender and ethnicity.[8–13] These differences persist even when controlling for income and insurance coverage.[14]

Race and ethnicity are not the only contributors to health disparities. Providers must also be familiar with gender differences in occurrence. As an example, ankylosing spondylitis was once thought to occur almost exclusively in men (10:1 ratio). Research later determined that women also developed the disease, but its manifestation was less severe and more likely to be overlooked. A male predominance still exists, but the ratio is 3:1. Both Caucasian and Native American men are at increased risk for this disease.[15]

Patient compliance with treatment regimens is influenced by health-care beliefs and group norms developed within the family system. Clinician education about health-related topics may not change the patient's core health beliefs, which are internalized. But clinicians can help patients verbalize their beliefs so they can collaborate on a mutually acceptable treatment plan. Data alone will not sway values, attitudes, or beliefs.

At times, it is not just single patients with whom clinicians negotiate. Social relationships may be linear, collateral, or individual. In medical culture, the social relationship traditionally has been individualistic; that is, clinicians prefer to relate to the patient one-to-one. In other cultures, the social relationship is one-to-many or one-to-family. With the exception of pediatricians, clinicians are not uniformly comfortable opening the examination room door to find more than one person in the room, or having a family member as the chief informant. Yet, if patients prefer that decision making occur within the family context rather than as the sole responsibility of the individual, it is beneficial to the encounter if the clinician is skilled at communicating and negotiating with more than one person and able to address the health issue with a varied audience.

## Attitude

Addressing attitudinal issues (eg, enhancing self-awareness of one's attitudes toward people of different racial, religious, or socioeconomic backgrounds) can minimize the influence of stereotypes and beliefs on the recognition, diagnosis, and treatment of disease, enabling clinicians to provide better care. Attitudinal components of cultural competence are often the most challenging areas in which to educate health-care providers. Relevance and interest are important factors in learner motivation, but there is often still a great deal of provider resistance to discussing issues of culture and diversity in health care. Some health professionals experience anger toward perceived preferential treatment of minorities; conversely, others feel guilt. Still others deny differences exist or generalize that "everyone is just the same; we are all human."

Discussions of cultural issues must address racism and a "blame the victim" mentality that is sometimes seen in health care. If these issues are not discussed in a nonjudgmental context, larger attitudinal objectives are unlikely to be attained. These objectives include but are not limited to:

1. Understanding the importance of cultural issues in optimal health-care delivery;
2. Awareness of others as having both similar and dissimilar characteristics;
3. Developing comfort with issues of difference;
4. Increasing self-awareness in dealing with cross-cultural situations;
5. Developing an ability to acknowledge issues that include stereotyping and bias; and
6. Avoiding the presumption of understanding without asking.

The issue of stereotyping is particularly challenging for health-care providers. The very skills and competencies that are fostered during training may contribute to this issue. Much of the learning process in health professions education is based on identification and classification of phenomena. For example, a streptococcal infection appears as a gram-positive coccus under the microscope. Pattern recognition is integral to diagnosis, and this mindset is so well developed in health-care providers that they subconsciously look for patterns in populations and apply them to individuals.

Training in medicine oriented toward facts, evidence, and disease does not translate well into an understanding of the role individual and cultural influences play in patient behavior and the clinical encounter.

## Skills

To incorporate cultural knowledge and culturally sensitive attitudes into care delivery, health professionals must be able to integrate, synthesize, and apply them in the form of skills. These skills include:

1. Integrating knowledge and attitudes by demonstrating respect and validating other cultures;
2. Applying knowledge and attitudes to discover the cultural context of the health-care problem as well as patient needs, expectations, and culturally appropriate resources;
3. Adapting communication skills to situations in which English is not the common language between health-care provider and patient;
4. Demonstrating proficiency in the use of interpreters; and
5. Considering the influence of culture on all aspects of care delivery including negotiation, problem solving, diagnosis, management, and treatment to achieve optimal health-care outcomes.

The following example illustrates the importance of these skills in everyday patient care:

> A Mexican American man, who was a hospital anesthesiologist, needed to have knee arthroscopy. He was admitted to the outpatient surgery unit, where a third-year medical clerk obtained his medical history. During the examination, the *clerk* asked the patient whether he lived with his family, and the patient replied he did not. The clerk did not pursue further questions about the patient's family.
>
> Before the procedure, the orthopedic surgeon decided to review the patient's chart. He

was surprised to see the student had listed the patient as single and living alone, given that the surgeon had met the man's wife and son at hospital functions. The patient's cultural interpretation of "living with family" meant living with his parents. Since this was not true, he had answered that he did not live with family.

As this example illustrates, something as simple as the word "family" can have many meanings, with implications for health care.

Other skills that are not always included in cross-cultural effectiveness training include demonstrated ability to work as a member of a team with other health professionals and the ability to recognize situations in which patient advocacy is needed. The issues health-care providers must address in providing patient care often require resources that extend beyond the individual clinician. Some health-care providers are evaluated on their level of team performance but this is not always the case for physicians. A team approach to health service delivery not only provides more resources, but also prevents individual clinician "burn-out." For appropriate patient advocacy, the provider must be able to assess not only instances when the patient does not fit into the system, but also situations in which the system does not fit the patient.

Increasing proficiency in this area leads to improved communication skills, enabling providers to effectively ask patients questions about race or ethnicity, family, religion, relationships, immigration experiences, social support, and other life factors that may influence their health-care beliefs, practices, and health-seeking behaviors. These skills ultimately enhance the patient–provider encounter and better equip providers with the tools necessary to treat patients in a culturally appropriate manner.[6] Research has demonstrated that provider–patient communication directly influences patient satisfaction, patient compliance, and health outcomes.[7] Enhancing cultural competence among health-care providers also provides health care that is more responsive to the needs of diverse populations, enhancing the quality of this care and recipients' satisfaction with care.[6]

## ▶ WHY ADDRESS CULTURAL ISSUES IN CARE?

The gap between patient and provider expectations is not new. Historically the literature provides examples of disparities in care due to ethnicity and gender. Prior to introduction of the informed consent process, abuse of patients' rights often occurred as a result of what appeared to be compelling scientific questions. Physicians and scientists are motivated to find problems and solve them. Patients, on the other hand, want healers, sometimes miracle workers, and certainly desire physicians who never err. Patients often want to be heard, to be understood, and to have physicians understand the larger context of their lives. Physicians face the tension between being scientists and being healers. Armed with facts, data, and technology, they are trained to know. Experts on the working of the human body, they are less comfortable addressing aspects of the patient encounter that seem intangible and cannot be measured.

Multicultural education has emerged in response to the need to provide health professionals with the skills required to meet the needs of an increasingly diverse patient population that expects holistic care and views cultural identity as an integral component of self.

## ▶ HEALTH DISPARITIES

Despite improvements in the overall health of Americans and continued advances in medical and scientific research, health disparities persist for ethnic and racial minorities in the United States, particularly in regard to health promotion and prevention. Racial differences exist in the incidence and prevalence of health conditions, access to health care, health outcomes, and treatments received. Poverty, gender bias, racism, language differences, homophobia, housing status, lack of sick leave, child-care needs, health insurance, domestic violence, substance abuse, and homelessness are variables that contribute to the health disparities observed in minority populations.[16]

More than 30 million residents of the United States do not speak English as their primary language. Research has shown that Spanish-speaking patients discharged from emergency departments are less likely than their English-speaking counterparts to "understand their diagnoses, prescribed medications, special instructions, plans for follow-up care, [or to] be satisfied with their care or willing to return if they had problems."[17] Research has also shown that patients with limited English proficiency are less likely to receive eye, dental, or physical examinations as well as mammograms, breast examinations, and Pap smears.[17]

Additional variables, including stereotypes about minority women and particular health beliefs, may also lead to poor medical care and treatment outcomes.[18] Differences in the diagnostic studies and therapies prescribed for minority patients have been observed in coronary artery angioplasty, bypass surgery, and cancer treatment. Minorities are less likely to receive best-practice therapies, even when confounding variables such as insurance status, income, and severity of disease are controlled. Similar patterns have been described in the principal diagnostic procedure performed on patients, the history and physical examination. Therapeutic disparities such as these are associated with poor health outcomes.[19]

Culturally diverse populations are at increased risk for premature mortality, morbidity, and disability. These increased rates have been attributed to barriers such as lack of health insurance, inaccessible "free" clinics, language differences, cultural conflicts, and lack of trust.[20] Minorities are less likely to be screened, diagnosed, referred, treated, or insured.[21]

Table 21–1 outlines the prevalence of selected risk factors and chronic illnesses among four minority groups. Native Americans have the highest prevalence of risk factors for chronic disease, exceeding even that of other minorities. Increased incidence of obesity, smoking rates, cardiovascular disease, hypertension, high cholesterol, and diabetes are observed in Native American populations.[22] In many tribes, diabetes has become a major cause of morbidity and mortality,[23] and tobacco use is higher among American Indians and Alaskan Natives than other minority groups.[22] African Americans and Hispanic Americans continue to experience disproportionate rates of diabetes as well.

## Cardiovascular Diseases and Asthma

Disparities in the occurrence of hypertension, cardiovascular disease, stroke, and asthma are seen among minorities. Hypertension occurs at higher rates among African Americans and Native Americans of both genders than among other racial and ethnic groups.[24] The prevalence of hypertension among African Americans is 40% higher than in whites. Research reports similar disparities between Hispanic populations and non-Hispanic whites. In addition to higher rates of hypertension, minorities tend to develop the disease at an earlier age and are less likely to receive treatment to control it.[25]

Death rates for heart disease are more than 40% higher among African American populations than among whites. Death rates from heart disease are generally higher overall in men than in women, but women have poorer outcomes immediately after myocardial infarction. Forty-four percent of women die within 1 year of myocardial infarction versus 27% of men. Additionally, disparities in income and education levels are associated with differences in the occurrence of heart disease. Families in the lowest income levels report limitation in activity due to chronic disease that is three times that of the highest income families. Americans who reside in rural areas have higher rates of heart disease than Americans residing in urban areas.[26]

Use of antihypertensive drugs, particularly angiotensin-converting enzyme inhibitors,

**TABLE 21-1.** Prevalence of Selected Risk Factors and Chronic Diseases Among Four Miniorty Populations, by Race and Ethnicity

| | Women | | | |
|---|---|---|---|---|
| **Risk Factor or Chronic Disease** | American Indian %(n = 1040) | Black %(n = 7735) | Hispanic %(n = 2722) | Asian %(n = 2549) |
| Obesity | 37.7 | 37.6 | 28.4 | 3.1 |
| Current smoking | 36.8 | 20.4 | 11.2 | 3.3 |
| Cardiovascular diseases | 13.0 | 9.4 | 5.6 | 5.5 |
| Hypertension | 36.8 | 40.9 | 22.4 | 17.6 |
| High cholesterol | 33.5 | 34.2 | 28.9 | 23.3 |
| Diabetes | 19.7 | 14.5 | 8.4 | 4.7 |

| | Men | | | |
|---|---|---|---|---|
| **Risk Factor or Chronic Disease** | American Indian %(n = 751) | Black %(n = 3218) | Hispanic %(n = 1535) | Asian %(n = 1655) |
| Obesity | 40.1 | 26.5 | 26.6 | 2.7 |
| Current smoking | 42.6 | 29.3 | 26.8 | 34.4 |
| Cardiovascular diseases | 16.4 | 9.9 | 7.4 | 7.5 |
| Hypertension | 38.5 | 34.5 | 20.5 | 16.1 |
| High cholesterol | 37.1 | 31.4 | 35.7 | 31.4 |
| Diabetes | 16.8 | 11.6 | 7.1 | 4.8 |

Adapted from Centers for Disease Control and Prevention (CDC). Health Status of American Indians compared with other racial/ethnic minority populations—selected states, 2001–2002. *MMWR, Morb Mortal Wkly Rep* 2003;52(47):1148–1152.

increases the risk of stroke by 40% in African Americans when compared with use of diuretics alone.[27] Although stroke rates for the population at large have been declining, the decline is not as significant in the African American population. Racial differences in stroke morbidity and mortality are even greater than those for coronary heart disease. The age-adjusted stroke death rate for African Americans is almost 80% higher than that of whites, with the highest rates seen among African American women born prior to 1950.[26] Among children, African Americans have a relative risk for stroke of 2.12 when compared with white children.[28] This is explained in part by the higher incidence of sickle cell disease in African American children, an illness that has no counterpart among white children.

According to the American Heart Association, women are more likely than men to have a stroke within 6 years of a heart attack[28] and have a one-in-five lifetime risk of stroke versus a one-in-six lifetime risk for men.[29] This translates into an excess of 40,000 female deaths per year from stroke-related causes.

The rate of asthma among preschool children is increasing more quickly than that of any other age group. African American children are twice as likely to be both diagnosed with asthma and hospitalized for it.[30] A study of child Medicaid beneficiaries with asthma reported that African American children had worse asthma status based on physical and emotional health scores, symptoms, and missed days of school. Latino children also had increased school absences and, along with African American children, were less likely to use inhalers and more likely to rely on home nebulizers.[31]

Death from asthma is two to six times more likely to occur among African Americans and Hispanics than whites. The death rate from asthma among children doubled from 1979 to

1993 and was slightly higher among women than men.

Asthma hospitalization rates among children, young adults, and women are high. African American patients are hospitalized at rates three times higher than whites and along with inner-city asthma patients, use emergency departments most often. African Americans are four times more likely than white patients to visit an emergency department for asthma treatment.[26]

Boudreaux et al[32] reported that black and Hispanic patients with asthma were hospitalized more often than whites, used emergency departments more frequently, had lower mean peak expiratory flow rates, and were more likely to report severe symptoms 2 weeks after discharge. Apter et al[33] observed that race, low educational achievement, and lower household income were associated with poor patient compliance. In a study exploring the contributions of race and income to disparities in asthma prevalence among children, Akinbami et al[34] found that although there was no difference in asthma prevalence between racial and poverty groups, asthma morbidity, activity limitations, and severity of limitations were increased among African American and poor children.[34]

### Organ Donation

Although notable among all groups, the problem of insufficient organ donation rates is particularly acute among minority communities. Studies of donors by race indicate that 70% of donors are Caucasian, while approximately 13% are African American; 13%, Hispanic; 2%, Asian; and 2%, other or multiracial.[35] Minorities, however, constitute approximately half of the persons on national transplant waiting lists, including almost 24,000 African Americans; 13,000 Hispanics and Latinos; and 4500 Asians and Pacific Islanders.

Various reasons have been reported for the apparent disparity in donor rates. These include lack of knowledge about organ donation, religious beliefs, distrust of the health-care community, fears about premature declaration of death, and the perception that organs of racial and ethnic minorities will not go to members of these communities who need them.[36] Callender et al[37] reported several variables that contribute to the shortage of minority donors, particularly African Americans. These include lack of community awareness regarding the great need for transplants within the African American community, religious beliefs such as "wanting to be whole when you go to heaven," awareness of the Tuskegee study and fear of being used as a guinea pig, fear that signing an organ donor card could result in premature death, and racism (ie, the belief organs donated by African Americans would go to Caucasian patients).[37]

Decreased donation rates among Hispanic donors are also a concern, given the rapid demographic growth of the Hispanic population. Frates and Garcia Bohrer explored barriers to organ and tissue donation[38] and reported deterrents similar to those for African American patients.[36,37] A common theme was reluctance to discuss dying and plans for death. Hispanic Americans also indicated lack of knowledge related to organ donation procedures; fear that declaring themselves donors meant health-care professionals would not try as hard to save them and would allow them to die so their organs could be harvested; and the wish to die with all body parts intact.

## ▶ EDUCATION TO REDUCE HEALTH DISPARITIES

Cultural diversity continues to present many challenges for health-care professionals. The Institute of Medicine and the Office of Minority Health recommend increasing awareness of racial and ethnic disparities by integrating cross-cultural education into the training of all current and future health professionals.[39] Health-care providers must be able to address these issues in a comprehensive manner across the life span. Patient mistrust of the health-care system, socioeconomic variables, physician bias, impaired physician–patient communication, and lack of cultural competence among health-care professionals all contribute to the disparities described in this chapter.[19]

Lack of cultural competence has been reported as a major barrier to eliminating health disparities.[40] Culturally competent care moves beyond biologic parameters to a more holistic approach, and seeks to increase knowledge, change attitudes, and hone clinical skills.[41] Culture shapes the way in which individuals rationalize their world and provides a lens through which they create meaning.[1] We are all influenced by and belong to multiple cultures that include and extend beyond race and ethnicity.[42] An examination of individual biases and effective cross-cultural communication skills are paramount to the elimination of intercultural barriers and the optimal delivery of health care to diverse people.

Cultural competence education seeks to create an understanding and appreciation of cultural differences and similarities as well as the impact of these factors on the patient. Cultural competence can enhance patient trust and communication, improving overall health outcomes.[43] The ultimate goals of culturally sensitive environments are to decrease medical errors and safety concerns,[40] to improve and increase patient compliance, and to reduce health disparities.

## ▶ CULTURALLY EFFECTIVE SYSTEMS OF CARE

Whether at the practice or the health system level, cultural effectiveness is difficult to achieve. The health-care environment is not inherently a respectful place. Time constraints and limited resources exacerbate this problem. Some hospitals, for example, encourage house officers to draft discharge orders at the time of admission to improve efficiency. The attitude of "not my job" plays a role as well. Young physicians often feel that asking, "Who lives at home with you?" is the responsibility of a social worker, not a busy resident. Shrinking resources to provide ancillary services may shift the onus of responsibility back to a time-challenged provider. Civility, much less cultural competence, becomes a scarce commodity in these situations.

This mentality of scarcity can restrict providers' ability to affirm the successes of others and may even lead them to feel satisfaction at their misfortune (ie, cultural bullying). Problem-solving ability, even when there is a solution, becomes limited as well. The danger of operating under this type of mindset is the competition it fuels and the belief that, "with only so much to go around," the successes of one person always come at the expense of another. For health-care providers with a scarcity mentality, the allocation of more resources toward one person or group may be seen as leaving fewer resources for others. A generation of providers is thus created that may have trouble sharing resources, accepting change, planning positively, and believing the best about other people.[44]

Among the consequences of this mentality for medicine is the stereotyping of certain groups and strategic limitation of the resources available to them. Under the façade of limited resources, judgments regarding the provision of services are made on racial, ethnic, or socioeconomic grounds. When differences come to be viewed negatively, the opportunity to develop creative solutions to the challenges of providing care to diverse populations is lost. Some argue that health-care resources are expensive and there is a need for even more limits than currently exist. This view is not necessarily unrealistic from a national or global perspective. However, when an individual practitioner acts on the belief that denying resources to a particular group of patients is justified, the result will be negative health outcomes.

Finally, if an entire practice, hospital, or other health-care setting does not engage all staff members in the effort to enhance cultural skills, patients may never reach the health-care provider, no matter how skilled and effective he or she is. Feelings must be elicited and acknowledged so staff trainees can evaluate their impact and move beyond them to establish common goals for creation of a culturally inclusive care environment. What values, beliefs, and perceptions do the staff hold concerning a "good" patient and a "bad" one? Discussions of systematic bias within institutions, although emotionally challenging, are an essential component of the dialogue about cultural competence.

None of these steps can be accomplished in a single presentation or event related to cultural competence. The process requires leadership, commitment, and directed growth toward a plan for transforming the health-care organization into one that fully embraces the diversity of patients and dedicates itself to improving health delivery for all people. The value of this effort for institutions that undertake it will be optimization of its strengths and a high level of patient satisfaction.

## Incorporating Cultural Change Initiatives into Practice

Several models have been proposed as ways to initiate cultural competency training programs. The LEARN model incorporates the following aspects: *L*isten with sympathy and understanding; *E*xplain your point of view in understandable, nonmedical language; *A*cknowledge and discuss similarities and differences to your approach and viewpoint; *R*ecommend a mutually acceptable course of action; *N*egotiate an agreement.[45] CRAASSH, an acronym for *C*ulture, *R*espect, *A*ssess, *A*ffirm, *S*ensitivity, *S*elf-Awareness, and *H*umility, is a model developed by the National Center for Primary Care at Morehouse School of Medicine that emphasizes the importance of the following components:

1. Cultural dynamics and the expression of the many variables that influence culture;
2. Demonstrating respect by asking questions, addressing patients appropriately, respecting personal boundaries and space, and expressing respect for and seeking to learn about the patient's culture;
3. Assessing health beliefs, knowledge, literacy (described in *Healthy People 2010* as "The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions"), care-seeking behaviors, and relevant relationships (who is important to the patient, what role that person plays in the patient's life, and how the patient would like that person to be included);
4. Affirming the positive values and characteristics of other cultures by recognizing the expertise and experience that the patient offers and reframing cultural differences to address positive characteristics that contribute to practices we may often view as different;
5. Offering sensitivity through awareness of cultural nuances, historical, political, religious, and social concerns, and differences in models of disease and health;
6. Examining one's personal attitudes and biases through identifying personal norms and values; and
7. Exhibiting a measure of humility in recognizing that cultural competence is not a finite skill set that is acquired but rather a life-long journey and commitment.[46]

Encouraging patients to talk about what they believe and how they actually behave is an essential element of cultural communications. If patients disclose broader contextual information about their lives rather than simply reiterating the health-care providers' instructions, the health professional may gain insights that lead to greater patient compliance with prescribed therapies. In clinical care, it is more important to listen to the patient than to operate from "cultural FAQs," as illustrated by the following example:

> A senior medical student who worked in a health center that provided care for underserved Latinos met with a teenage mother who

had come with her infant to the clinic. Around the infant's neck was a leather amulet that the student recognized from a health beliefs and practices lecture she had had. She told the mother, "I know what that is—it's a charm to keep your baby from harm." The teen responded, "No, it's just a thing my grandma put on the baby."

In this case, inquiring about the patient's belief would have been more helpful than assuming it. As a result of what the Latino woman may have perceived as stereotyping, the medical student probably lost a valuable opportunity to educate and alert the young mother to the danger of infant strangulation.

### Before and After the Patient Encounter

These techniques can be incorporated into clinical practice at several points. Fundamentally, clinicians can address these issues before or after patient encounters.

Before the patient encounter, health-care providers can scan the literature for evidence-based information on disparities that highlights racial, ethnic, and gender differences. They can clarify racial and ethnic sample composition for clinical trials of new medications to assess whether it resembles their practice population. They can link to sites that give ethnically specific data and use it as a guide to formulating differential diagnoses. Clinicians can engage in continuing education that increases their knowledge base with respect to cultural issues relevant to patients in their care. If engaged in research, health-care providers can learn about community- and culturally responsive research strategies that optimize patient "buy-in" and avoid research that could be perceived as exploitative.

### During the Clinical Encounter

Although some authors have suggested that a portion of the history be dedicated to cultural questions,[5] rather than marginalizing the inquiry, these issues can be incorporated into the initial examination (Tables 21–2 and 21–3). During this time, the maximal amount of information is obtained about the patient's world. Sensitive issues are often divulged later, after rapport is developed, affording another opportunity to explore the patient's beliefs, health practices, and expectations.

### During Clinical Problem-Solving

Clinicians can employ additional strategies for patient encounters that involve challenges to care delivery, such as less-than-optimal compliance, failure to understand health-care instructions, or an impasse in resolving the active medical condition. Learning about the cultural context of care enhances clinician understanding of the complexity, reality, and humanity of patients. Too often, cultural issues are viewed as barriers to be overcome. Although a deficit approach to cultural issues in care undermines the value of diversity, it is important to recognize that clinicians are primarily problem solvers. Thus, in refractory cases, it is useful to explore culture and health practices as the following example shows: The blood pressure of an Asian Indian woman with hypertension and diabetes was poorly controlled using three antihypertensive agents. After multiple changes to medication schedules, patient education, consultation evaluations, and a secondary workup for hypertension, the patient made a casual comment about the difficulty she had in swallowing pills. The clinician followed up by asking how the patient compensated for this long-standing problem, to which she responded that she placed all of her pills in a candy jar and during the course of the day, as she walked around her home, she randomly took a few pills. The woman's perception of cause and effect, onset of action of medicine, and control was probably not a cultural habit, but a result of miscommunication between the provider and patient.

The clinical encounter provides several points of entry at which clinicians can include cultural influences on health care and discuss their impact with the patient. Inquiring about health practices rather than assuming behavior

▶ **TABLE 21-2.** Techniques to Incorporate Cultural Issues into Care in the Physical Exam and Care Delivery

| Portion of History | Inquire About | Example |
|---|---|---|
| Chief complaint and history of presenting illness | What health beliefs are conveyed with the presentation, patient' understanding, and expectations?<br>What are health perceptions about risk? | "What do you think is the cause of this?"<br>"What do you feel might work or not work?" |
| Past Medical and Surgical History | What has the patient's experience been in the medical system?<br>What is the relative importance that the patient places on medical versus surgical care?<br>Are mental health issues divulged or even addressed as health issues? | "What do you think put you at risk for the illness(es) you had?"<br>"In your encounters in hospitals or offices, have their been good and bad experiences? if so, tell me about them." |
| Family history | Beyond disease-specific questions, broaden the inquiry to ask the patient about his or her ancestry, where ancestors came from, and what illnesses patient perceives he or she is at risk for based on genetics. Introducing the idea that different peoples have different opinions and approaches to health can lead to a direct question about the relationship between ethnicity or family background and health. | "I am sure that you are aware that your genes influence your health risk. What ancestry are you? (Or, "Where did your ancestors [or your family] come from?")<br>"Do you feel that there is a relationship between your health and your ethnicity or family background?" |
| Social history | Address wellness and illness in questions.<br>In terms of health habits, ask about self-care that the patient learned in the home.<br>Inquire into social support, and obtain information about the patient's world.<br>Specifically ask about the role of spiritually in health, as the patient may be reluctant to share this with health-care providers. Ask if the patient participates in religious practices that could influence his or her health care.<br>When asking about smoking, drug, or alcohol usage, include questions about family of origin and current family habits as well (broaden the circle to the world beyond the individual).<br>Inquire about self-care in stress reduction. | "What did you learn growing up, about taking care of your health?"<br>"Who all lives at home with you?" (This inquiry has more impact than, "Are you married or do you have a partner.")<br>"Tell me about your family"<br>"Some people who are observant of their religion perform fasts for periods of time or have traditions that are important to know about, since it may influence taking medications at certain times. Are there any cultural or religious practices that might influence your health or health care?<br>When you are very stressed out, how do you take care of yourself?<br>Who helps you when you need help? Who are your emergency contact people and how are they connected to you?" |

**TABLE 21-2.** (*Continued*)

| Portion of History | Inquire About | Example |
|---|---|---|
| | Ask who else needs to be included in the discussion of the patient's health. This acknowledges that some patients have cultural systems that are community or group focused, so that the clinician needs to shift from a 1-to-1 orientation to a 1-to-group and needs to know how to communicate with that group in order to make progress in a clinical case. | |
| Nutrition | Ask the patient to describe what he or she ate the previous day.<br>Inquire if there are changes in the patient's diet associated with festivities, customs, or traditions that you need to know about. | "Often the food we eat may have hidden salt or fat that we are unaware of—especially foods we grew up with. Are their certain types of ethnic foods or seasoning that you eat or use frequently [sofrito, curry, etc.]?" |
| Medications, including alternative and over-the-counter drugs | Inquire about the use of any types of supplements or medications, including over-the-counter products, home remedies and salves, and alternative or complementary therapies. | "In addition to prescription medicine, do you use any over-the-counter medicines or health aids?"<br>"Do you use any alternative or complementary health practices, such as acupuncture, chiropractic care, herbal medicine, and so on?" |
| Prevention | A typical patient attitude toward prevention in the United States is, "if it isn't broken, don't fix it." Patients may bring culturally embedded attitudes and perceptions of health screening and prevention.<br>Motivation for health screening should be framed in a positive way, avoiding fear tactics.<br>Some health screening habits (self-breast or testicular examinations) may be viewed as immodest. Education and negotiation will facilitate progress. | "If you stop smoking, you will be able get to the bus in time, rather than miss it because you are winded." This statement is more positive than warning the patient that he or she will develop lung cancer, which, in some cultural groups, is interpreted as akin to putting a curse on the patient. |
| Sexual history | Extend usual questions about sexual activity, sexually transmitted diseases, and gynecologic or urologic issues to explore the status and attitudes of intimate relationships, attitudes toward sexuality and safe sex (especially as it relates to attitudes of femininity or | "Have you heard of the term 'safe sex'? What does it mean to you?"<br>"Tell me about your relationship—are you satisfied with it? What about being intimate?" |

(*Continued*)

▶ **TABLE 21-2.** *(Continued)*

| Portion of History | Inquire About | Example |
|---|---|---|
| | masculinity), and gender role and expectations, and delve into screening for violence or abuse. | |
| Allergies | Beyond differentiating true allergies from intolerances, explore the health beliefs of the patient. | "What was it about your reaction to the medicine that made you feel you were allergic?" |
| Review of systems | As areas are focused on, attend to the importance or significance the patient places on the system. Some areas may be perceived as more important, as uncomfortable to discuss, or as having additional meaning. | "When I asked about constipation or diarrhea, you seemed especially uncomfortable. As clinicians, we have to ask a lot of personal questions.<br>Is there something about this body area that concerns you?<br>"Is there anything else you would like to tell me about?" |

▶ **TABLE 21-3.** General Issues in the Physical Examination

| Issue | Culturally Competent Provider Action | Example |
|---|---|---|
| Modesty | Adequately cue the patient to what will occur next in the examination, and explore areas where she or he seems reluctant. | "I need to perform a testicular [breast] examination next. First, I will [....] The reason is[....]" |
| Number of people in the examination room | Inquire if the patient wants someone to be in the room with him her during the examination.<br>There are some limitations that patients and their family may prefer in terms of discordance of genders of the patient and provider. For example, some female patients will refuse examinations, including gynecologic, if the provider is male. | "I strive to give privacy to my patients in the physical examination, but if you want someone in the room with you, please let me know."<br>If there is no way to attend to the same-gender request of the patient and family, then inform them and negotiate whether getting care at this point in time is a higher priority than waiting for another provider. Include the dominant male family member if the female patient wishes him to be in the room. |
| Health care delivery | Emphasize personal interest in what the patient is actually likely to do or has done, recognizing that change happens slowly and that sharing the truth about behaviors is what is most important. | "What were you able to do or not do?"<br>"How are you handling the medications? Any problems or questions?"<br>"Tell me what you really are doing" |

based on knowledge about culturally based health habits eliminates the danger of misattribution. One clinician, for example, told an African American patient with hypertension to cut salt pork out of her diet. The patient, a practicing Muslim woman, said nothing but left the encounter offended because she did not eat pork. The clinician was trying to convey the relationship between salt consumption and blood pressure control. Instead of noting that foods high in salt can raise blood pressure and inquiring whether there were any foods, such as salt pork or soy, that the patient ate on a regular basis, the clinician incorrectly attributed the patient's suboptimal control to a food that she did not eat.

## ▶ NATIONAL ISSUES

How does emphasis on cultural competence fit into national trends? In rulings on affirmative action, higher courts have, by and large, eliminated programming to increase the likelihood that ethnic minorities have access to education and related career opportunities. Other forces are moving away from larger social goals for racial equity, believing disparities in education, the workplace, and health care have been resolved. The group that appears to have benefited most from affirmative action was white women.[47,48] Over the past 10 years, the shareholder movement has pushed corporate boards into being more responsible, thus prompting them to "change their complexion."[49] Throughout the 1980s and 1990s, there was a rise in the inclusion of "nonnormative" individuals, although this trend may be declining.[47] As the doors of affirmative action close to women, they also close to those disproportionately affected by health disparities, leaving them without a seat at the table to influence institutional policy.

How, then, do health professionals advocate for reductions in health disparities? How do they, for example, help patients who have no insurance choose whether to take medications for cardiac problems or diabetes, when they can afford only one? These challenges speak to the larger issue of a culturally effective health-care system and move the debate from the confines of the individual provider's office to the larger arena of health-care delivery.

Cultural competence at one level can be seen to deal with the "haves" and the "have nots." As the numbers of working under- and uninsured swell and the middle class shrinks, the at-risk population becomes larger. The current "safety net" is not sufficient to help the number of under- and uninsured people in the United States who do not have health care. According to the US Census, between 15% and 30% of the population was uninsured in 2003. The segment of the population with employment-based health coverage dropped from 70.1% in 1987 to 64.2% in 2002. In 2001 and 2002, both the number and percentage of Americans covered by health insurance declined.[50]

The United States must transform its health-care financing network into a realistic and tenable health-care system that provides better access to health care for all its citizens.

## ▶ SUMMARY AND RECOMMENDATIONS

Cultural effectiveness is an essential clinical competence, a goal to be pursued rather than a discrete end point. It is an ongoing process of learning and skill building, of refining and improving upon.[1] By allowing patients to disclose their lives, experiences, and the personal factors that influence them, health professionals can develop strategies to address the whole patient, not just his or her disease. By enhancing communication between patients and clinicians, health care professionals can also elicit information that can change the course of a clinical encounter. Moreover, with added knowledge and skills, health professionals can craft solutions in a number of "languages" of cultural relevance, affording patients a number of ways to connect with care, ultimately decreasing health disparities and improving wellness in patients.

Educational objectives can be defined by beginning at the end and asking, "What do you want to achieve?" Once that is clarified, the best way to measure the objectives can be identified. There needs to be consensus among health-care providers, health industry administrators, governmental officials, and patients that health disparities need attention, education, and research. From the individual student to the largest managed care organization, a dedicated effort needs to be put into place, involving resources and measurements of impact, to train clinicians working in offices and hospitals. Organizations need to be receptive to the change needed to encourage culturally responsive and appropriate health care for diverse patients. Table 21–4 summarizes the main points about cultural competency that have been outlined in this chapter. Recommendations to help achieve the goal of a culturally responsive health-care system are summarized in Table 21–5.

▶ **TABLE 21–4.** Summary of Main Points Regarding Cultural Competency

Patients' value and belief systems, behaviors, and health-care practices are critical to a successful clinical encounter

Disparities in the recognition of symptoms, health-care–seeking behaviors, communication and expression of symptoms, ability to understand treatment plans or instructions, expectations of care, and adherence to prevention efforts and treatment regimens each contribute to disparities in health and poor health outcomes

World-views, family systems, and barriers to care are important aspects of knowledge-based issues for culturally effective care delivery

To provide quality health-care, providers must recognize the individual and cultural influences that affect a patient's behavior

Physicians must recognize and understand the layers of influence that culture imparts on peoples' health in order to deliver high quality care and eliminate health disparities

The entire office, hospital, or other health-care setting must include all members (office staff as well as health-care professionals) in the effort to enhance the medical encounter and provide a culturally appropriate experience

▶ **TABLE 21–5.** Summary of Recommendations

- Adoption and evaluation of health professional education and of health professional societies' principle of cross-cultural effectiveness in care, with input from the intended communities at need
- Resources for training that enable implementation of effective curricula
- Development of a system of rewards for individuals, organizations, hospitals, and systems that deliver high-quality, culturally effective care
- Annual evaluation of progress on health disparities
- Ongoing assessment of health policy issues as they affect populations and culturally effective care
- Development of a strategic plan for a health-care system crafted by stakeholders (health-care professionals, industry, government), with a realistic implementation plan
- Resources, including training for interpreter services
- Requirement of second-language training for health-care professionals
- Investment in language technology and software that aids in traversing the linguistic and literacy gaps in patient care
- Evaluation and implementation of a functional, interconnecting public health infrastructure with sufficient resources to achieve realistic goals

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# CHAPTER 25

# *Trust, Medical Care, and Racial and Ethnic Minorities*

VANESSA NORTHINGTON GAMBLE, MD, PhD

## ▶ INTRODUCTION

Trust is the cornerstone of the provider–patient relationship and the foundation for quality health-care delivery and outcomes. It is an element of constructive relationships between investigators and participants in biomedical research. Trust also plays a role in sustaining public support for health-care professionals, biomedical research, and public health.

The American public's trust in medicine has declined over the past several decades. Reasons behind this decline include the increased penetration of managed care, limits on patient choice, the growth of for-profit medicine, the growing medical sophistication of patients, and media coverage of medical errors and research scandals.[1–3] Research suggests this lack of trust is particularly acute in racial and ethnic minority communities.[4] Thus, the erosion of trust is a significant obstacle in efforts to improve the health of minority communities that must be addressed if we are to eliminate racial and ethnic disparities in health and health care.

This chapter examines the complex relationship among trust, racial and ethnic minorities, and health care. It provides an overview of the topic, reviews the literature on the topic, and offers some recommendations on how to develop a trustworthy health-care system that benefits racial and ethnic minorities.

## ▶ TRUST AND HEALTH CARE

In recent years, a growing body of research has examined the concept of trust in health care: its definition, components, impact, and measurement. As of yet, there is not a universally accepted definition or conceptual model of trust. But there are definitions that provide a useful conceptualization of the topic. Rotter defines trust as "an expectancy held by a person or group that the word, promise, verbal or written statement of another person or group can be relied upon."[5] Mechanic and Schlesinger state that "trust refers to the expectation of the public that those who serve them will perform their responsibilities in a technically proficient way (competence), that they will assume responsibility and not inappropriately defer to others (control), and that they will make patients' welfare their highest priority (agency)."[6]

There are two broad categories of trust: interpersonal trust and social trust. Interpersonal trust refers to trust in individuals such as physicians and other health-care professionals. Goold cogently described the importance of trust in the physician–patient relationship when she asked, "Without trust, how could a physician expect patients to reveal the full extent of their medically relevant history, expose themselves to the physical exam, or act on recommendations for tests or treatments?"[7] Interpersonal trust usually comes as a result of direct personal experience with an individual. Social trust refers to trust in collective institutions such as hospitals, health plans, or health-care professions. Social trust usually arises not only as a result of personal interactions, but also from collective relationships, media portrayals, and historical experiences. Although the two categories are interrelated, they are not mutually exclusive. For example, an individual may trust his or her own personal physician, but not trust the generic "medical profession." Or, a person might seek care from an unknown provider affiliated with a particular hospital because he or she trusts the reputation of the facility. Trust is not a static process, but rather an ongoing, dynamic one that is created through consistent positive relationships.[8] Mechanic reminds us that trust is also fragile and can be "easily challenged by a discomforting act or by a changing social situation."[1]

Researchers have identified trust as a factor critical for positive health outcomes.[9–11] It has been associated with increased patient and physician satisfaction, improved provider–patient communications, greater adherence to medical recommendations, and continuity of primary care. Trust may also help reduce health-care costs because it may obviate the need for additional tests and referrals that patients request in order to feel reassured about physicians' recommendations and diagnoses.[12] Patients themselves have identified factors such as caring and comfort, technical competence, and good communication skills as some of the physician behaviors that engender trust.[12]

## ▶ RACE, TRUST, AND MEDICAL CARE

Research has demonstrated that racial and ethnic minorities have lower levels of trust in medical providers and in medical institutions than do white Americans. Distrust can lead to decreased patient satisfaction, low enrollment in clinical trials, greater reluctance to seek medical care, poorer patient adherence to treatment recommendations, and increased unwillingness to donate organs. Hence, distrust can adversely affect health outcomes and contribute to racial and ethnic disparities in health and health care.

Most of the studies that have examined trust, health care, and racial and ethnic minorities have focused on African Americans. Research has demonstrated that African Americans have lower levels of social trust toward medical institutions than do white Americans. For example, in a 2000 study that examined the attitudes of 781 African American and 1003 white cardiac patients, LaVeist et al found that patients' perceptions of the existence of racism in the medical care system and their level of medical mistrust were significant predictors of patient satisfaction. In this study, African Americans were more likely to perceive racism in the health-care system and report distrust in clinical settings, and thus expressed less satisfaction with their medical care.[4]

Research by Boulware et al underscores the need to better understand minority patients' attitudes toward the various components of the health-care system rather than the system in general. In a 2003 study, they analyzed the attitudes of 118 Maryland residents (42% non-Hispanic black and 58% non-Hispanic white) toward physicians, health plans, and hospitals.[13] Their results demonstrated that the levels of trust differed according to the object of trust. They found that African Americans were nearly half as likely to express trust in their physicians as whites and were 20% less likely than whites to express trust in hospitals. Paradoxically, African Americans were twice as likely to express trust in their health plans. The researchers hypothesize that perceptions of distrust may be more pervasive in situations where race cannot be hidden. Thus, the finding about increased trust in health plans might be explained by the fact that the respondents rarely had face-to-face interactions with health plan personnel, a situation that yields racial anonymity and perhaps less fear of racial discrimination. This research also revealed that the black participants had greater concerns about personal privacy.

Studies have also suggested that African Americans have lower levels of interpersonal trust toward physicians and have demonstrated that they fear that physicians might, because of their race, make decisions that are detrimental to them.[10,14] Still it should be noted that these analyses have demonstrated that most African Americans do trust their physicians, but a significant minority do not. When asked in a 1999 study whether they trusted their primary nephrologist's judgment about their medical care, African Americans responded "somewhat or not at all" more often (men, 22%; women, 24%) than whites (men, 11%; women, 12%).[15] Concerns about raced-based discrimination in the physician–patient relationship may affect the level of trust that minority patients initially offer physicians who are not of the same race. Research has shown that race concordance between patient and physician is positively correlated with higher perceptions of quality of care, communications, patient satisfaction, and participatory decision making.[16–19] Such research makes plain that for many African Americans, their relationship with their physicians is not solely a medical one, but a racialized one that carries with it experiences born out of this country's legacy of racism and racial discrimination. Indeed, racial bias has been demonstrated to play a role in physicians' interactions with minority patients.

Researchers have also analyzed African Americans' attitudes toward particular measures such as organ donation and have found lower levels of trust.[20,21] African Americans are less likely to be organ donors—attitudes that are based, in part, on their beliefs about their differential treatment in the medical care system and the devaluation of black lives in the United States. One study found that more African Americans (37.9%) agreed that physicians would be less likely to save their lives if they were known to be organ donors than did white Americans (21.2%).[21] African Americans disproportionately suffer from chronic kidney disease and develop it at an earlier age than white populations. Therefore, the demonstrated paucity of live and cadaveric kidney donations from African Americans significantly contributes to the disparities in the mortality and quality of life of African Americans with kidney disease.

Participation of racial and ethnic minorities in medical and public health research studies is a critical component of efforts to eliminate health disparities. Trust is a critical factor determining whether a person will enroll in a research study.[22] However, members of minority groups express low levels of trust toward research. Using data from a national telephone survey, Corbie-Smith et al found that in comparison to white Americans, African Americans were more likely not to trust their physician to fully explain research participation (41.7% versus 23.4%); more likely to believe that they had been used as participants in an experiment without their permission (79.2% versus 51.9%) and more likely to express concerns that someone like them would be used as guinea pigs without their permission (24.5% versus 8.3%).[23] In an earlier study, Corbie-Smith et al found that a lack of trust among African Americans led to strains in the informed consent process.[24] They demonstrated that distrust led African Americans to believe that informed consent was solely geared toward persuading them to participate in clinical trials, not to protect them. Corbie-Smith et al concluded that informed consent seemed to hinge on the presence or absence of interpersonal trust.

Despite the burgeoning diversity of America's racial and ethnic minorities, most of the research into trust has focused almost exclusively on African Americans. There is a critical need to assess the attitudes of other racial and ethnic minorities. However, preliminary research suggests that other racial and ethnic minorities are also more distrustful of the health-care system than are white Americans. One study that assessed the attitudes of African American and Hispanic women regarding their willingness to undergo breast cancer screening revealed racial differences. It found that Hispanic and African American women were less likely to perceive the testing as beneficial, and that Hispanic women were the most opposed to screening before adjustment for other sociodemographic factors. The lower levels of trust of the African American and Hispanic women were also associated with less adherence to recommended breast screening protocols, suggesting that a lack of trust may be a barrier to racial and ethnic minorities seeking preventive care.[25]

Other studies suggest the existence of lower levels of trust in Asian, Hispanic, and Native American communities. Research has demonstrated that Hispanics are less willing to donate organs than are whites.[26] Culturally sensitive organ recruitment programs could play a role in increasing organ donation from minority communities. For example, a study conducted on Native American reservations revealed that Native Americans were more likely to donate if asked by a health care worker from their own culture.[27] Native Americans have also expressed distrust of genetic research. Other studies have demonstrated that Asian Americans are less likely than white Americans to be satisfied with their care and less likely to have trust in their physician.[28,29] Ngo-Metzger et al found that rates of dissatisfaction and loss of trust were higher in Asian Americans who thought that their physicians did not listen to them or did not understand their backgrounds or values.[28] These findings underscore the importance of cross-cultural education and communication skills in promoting trust in clinical settings.

Research has also indicated that it is important to take both race and gender into consideration to obtain a fuller understanding of issues of trust and racial and ethnic minorities. Doescher et al found racial and ethnic disparities in perceptions of physician style and trust.[14] Both African American and Hispanic patients reported less positive perceptions of physicians than did white patients; the differences, however, were most pronounced in African American and Hispanic men. In a telephone survey that examined the attitudes of 399 Baltimore residents, Boulware et al found racial and gender differences in willingness to donate blood and cadaveric organs.[20] African American (41%) and white (59%) women were less likely to be willing to donate blood than African American (66%) and white (86%) men. In addition, a majority of the white respondents had agreed to be cadaveric organ donors, whereas only a minority of the African American respondents had. Sixty-five percent of the white men surveyed had signed up to be organ donors, as had 60% of the white women. In contrast 38% of the African American women surveyed had signed up to be organ donors and only 19% of the African American men had. Mistrust of hospitals and concerns about hospital discrimination explained most of the differences in willingness to donate blood, whereas religious beliefs and spirituality explained most of the differences observed in willingness to donate organs among the four groups.

## ▶ WHY THE DISTRUST?

The reasons underlying the erosion of trust of the general public toward medicine also affect the attitudes of racial and ethnic minorities; however, given their lower levels of trust, additional causes must be considered. A complex interplay of social, political, cultural, and historical factors influence the expectations, beliefs, attitudes, and behaviors that patients bring to the health-care system.

Historical examination helps shed light on the attitudes of racial and ethnic minorities toward medical care and medical research. The Tuskegee Syphilis Study, the 40-year US government study (1932–1972) in which 399 black men from Macon County, Alabama, were deliberately denied effective treatment for syphilis in order to document the natural history of the disease is frequently cited as the primary source of distrust, particularly among African Americans. However in an article on the history of African American attitudes toward medical arch, Gamble has noted that the distrust dated public revelations of the Tuskegee hilis Study and that African Americans' at ies toward medical care and research are more complex than can be attributed to one orical event.[30] They are also rooted in other orical experiences, such as slavery and legal d segregation, as well as contemporary racial mination.

Moreover, empirical research about the in nce of the Tuskegee Syphilis Study is equiv l. A 1997 telephone survey of 218 African ericans and 203 white Americans from Jef son County, Alabama, found that 52% of African Americans and 46% of the whites ew about the Study. Twenty-two percent of African Americans stated that the Study de them less willing to participate in a re arch study, compared with 10% of white spondents.[31] In contrast, a 2000 study found at awareness of the Tuskegee Syphilis Study d not influence an individual's willingness to ticipate in a clinical trial.[32] The researchers sed their findings on ten focus groups con ucted with 103 African Americans also from labama. A 2002 survey of 91 African Ameri ans and 88 white Americans from Detroit also ound racial differences in knowledge about e Tuskegee Syphilis Study.[33] Eighty-one per ent of African Americans and 28% of whites ad knowledge of the Study. This research re ealed that white respondents were more likely han African American respondents to be will ng to participate in medical research and that frican Americans were less likely to believe at all racial and ethnic groups shared the ks and burdens of medical research. The re earchers, however, found that knowledge of e Tuskegee Syphilis Study alone did not in uence the willingness of an individual to par cipate in a research study. Furthermore, al hough many African Americans know about the uskegee Syphilis Study, many hold inaccurate ews about it. For example, a persistent myth out the study is that the men were injected th syphilis. Nonetheless the Study is part of e collective memory of many African Americans and continues to exert a profound impact on mind-sets of many African Americans because it has become a symbol of their mistreatment by both the federal government and the medical profession.[30,34–36]

The histories of other racial and ethnic minorities also help further our understanding of the foundations of distrust. US immigration policies have influenced the attitudes of Latinos toward medical care. In 1994, California voters approved Proposition 187, which denied undocumented immigrants (or those suspected of being so) access to state services, including health care and public education. The referendum never went into effect because it was declared unconstitutional at the federal district court level and Governor Gray Davis decided not to appeal this decision. Despite the failure of Proposition 187, undocumented immigrants in California and in other locations often view health-care workers as agents of immigration authorities and therefore are often reluctant to access health-care services.[37]

The experiences of Latina women as victims of reproductive abuse have also contributed to attitudes of distrust. For example, in a study conducted in 1969 at a family planning clinic in Austin, Texas, poor mostly Chicana women received what they believed to be contraceptives. However 76 patients, without their knowledge, received placebos. Those who became pregnant were not provided with abortion services even after they requested them.[38] In addition, there is evidence of high rates of sterilization of Puerto Rican women, both in New York City and in Puerto Rico; and of Chicanas in California and in the Southwest.[39] The International Planned Parenthood Federation and the Puerto Rican government waged a sterilization campaign on the island that proved so successful that by 1968, more than one third of women of childbearing age on the island had been sterilized, the highest percentage in the world at the time.[40] Puerto Rican women were used extensively during the 1950s as research subjects in early clinical trials of birth control pills, intrauterine devices, and contraceptive foam.[39]

Research abuses have also occurred in Native American communities. A sterilization effort on Indian reservations during the 1970s left more than 25% of Native American women sterile. Between 1973 and 1976, physicians at four Indian Health Service hospitals sterilized more than 3000 women without obtaining adequate consent.[40] The distrust of Native Americans toward medical institutions must be understood in the context of the abrogation of treaty rights, the desecration of sacred burial grounds, and the history of off-reservation boarding schools.[41]

Notwithstanding the importance of these historical events, the most critical factor in understanding the attitudes of minorities toward medical providers and institutions is the continuing discrimination and unequal treatment of racial and ethnic minorities in today's society. An ever-growing body of research has definitively demonstrated racial and ethnic disparities in access to care and quality of care. To offer just a few examples, relative to whites, African Americans—and in some cases Hispanics—are less likely to receive appropriate cardiac procedures; less likely to receive hemodialysis and kidney transplantation; less likely to receive state-of-the art care for human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS); and more likely to receive lower quality preventive services even when variations such as insurance status, income, age, and coexisting condition are taken into account.[42–44] In addition, trust is a social contract that builds over time, and a lack of health insurance negatively affects the continuity of care. Racial and ethnic minorities are significantly less likely than white Americans to have health insurance. In 2002, approximately 32% of Latinos were uninsured. In comparison, 20% of African Americans, 18% of Asian Americans, and 12% of white Americans did not have health insurance.[45]

This research confirms the beliefs of members of minority groups that their race or ethnicity may determine the quality of their health care. Distrust, it seems, may result from experientially based expectations for care. A 1999 study commissioned by the Kaiser Family Foundation found that 67% of the African Americans surveyed stated that they were very or somewhat concerned that they or a family member would be treated unfairly in the future when they sought medical care because of their race or ethnicity.[46] Fifty-eight percent of the Latinos polled were very or somewhat concerned that they or a family member would be treated unfairly when they sought health care. In contrast, only 24% of whites in the survey stated that they were very or somewhat concerned that they or a family member would be treated unfairly because of their race or ethnicity. A 2002 Kaiser Family Foundation survey revealed that minority physicians also believe that racial and ethnic minorities receive poorer health care than do white Americans.[47] This survey found that 77% of African American physicians, 52% of Latino physicians, 33% Asian physicians, and 25% of white physicians said that the health-care system very or somewhat often treated people unfairly based on their race and ethnicity. To be sure, individuals who have experienced racism or perceive racism in the health-care system are less likely to place trust in the system.

## ► STEPS TOWARD A TRUSTWORTHY HEALTH-CARE SYSTEM

Crawley offers an important corrective to the distrust literature.[48] She notes that most of the research on trust and minority communities has focused on the attitudes of these populations toward providers and health-care institutions. Crawley criticizes such an approach as inadvertently promoting stereotypes that minority Americans are inherently mistrustful. Such stereotyping, she argues, might convince researchers to curtail their efforts to recruit minorities into clinical trials or lead clinicians to omit full explanations of treatment options for minority patients because of a belief that they would be nonadherent to therapeutic recommendations.

Crawley views distrust as a breach of trust and calls for a paradigm shift that focuses on trustworthiness rather than on distrust. Such a shift puts the onus on health-care professionals and health-care institutions to address the problem of trust. It encourages them to look within their own environments and institutions for the sources of untrustworthiness. Her work prompts the critical question, "What have health-care professionals and health-care institutions done to demonstrate that they deserve the trust of racial and ethnic minorities?"

There are several steps that health-care professionals and health-care institutions can take to create a trustworthy health-care system for racial and ethnic minorities. Initiatives that help staff and institutions to provide care in a culturally competent fashion need to be advanced and supported. Cultural competence education can help providers better understand the histories, culture, experiences, preferences, and health behaviors of their minority patients. Increasing physicians' knowledge of the African American experience, including the Tuskegee Syphilis Study and the history of racism in this country, would help them better understand the perceptions of some of their African American patients. Cultural competence could also help health-care professionals bridge cultural divides by providing them with a better understanding of a racial or ethnic minority group's views of symptoms and illness. For example, knowledge of the health behaviors of Asian populations could help providers see that distrust of the Western health-care system and patients' perceptions that Western practitioners are critical of Asian health beliefs can manifest as lack of adherence, ranging from refusal to follow treatment recommendations to reluctance to consult Western physicians.[49] But cultural competence must go beyond the creation of training programs; it must become part of the institutional fabric of the US health-care system. The February 2000 decision of the Liaison Committee on Medical Education, the body responsible for accrediting medical schools, to mandate that cultural competence be a criterion for medical school accreditation is an example of an important step in the institutionalization of cultural competence.

Research has demonstrated that health-care professionals need good communication skills to facilitate the development of trusting relationships with patients. Thus, it is important that health-care professionals have training that advances communication skills emphasizing honesty, respect, and inclusiveness. To promote the importance of good communication skills for quality health care, it may be necessary to have the assessment of such skills as a requirement of professional certification.

Studies have also shown that language barriers can adversely affect the development of trusting relationships with racial and ethnic minorities. Health-care institutions should create programs that address the needs of their patients with limited English proficiency (LEP), especially in light of the nation's changing demographic shifts. According to data from the National Health Law Program, 15 states have had a greater than 100% LEP growth between 1990, and 2000. Under Title VI of the Civil Rights Act and its implementing regulations, health-care providers who receive federal funds have a legal obligation to ensure that people with LEP have meaningful access to health services. Failure to do so would constitute discrimination based on national origin. However, many health-care providers and institutions have opposed the implementation of Title VI because they view it as an unfunded mandate. In addition, many providers do not know the expectations of Title VI and how to implement this federal mandate. Overcoming language barriers is critical to the development of trust. Thus, it is important that health-care institutions and providers develop efficient and cost-effective practices that implement Title VI.

Health-care providers and institutions can also improve the levels of trust of minority patients by supporting efforts to diversify the health-care professions and to eliminate racial and ethnic disparities in health care. Research has demonstrated that racial and ethnic concordance between patient and provider was associated with more positive satisfaction with the care received. Patients believed that these visits were more participatory, supportive, and less discriminatory—in other words, more trustworthy. At a time when affirmative action and diversity initiatives are increasingly under attack, it is important that health-care providers and institutions advocate for the continuation of diversity programs and make the case that such programs are critical for the provision of quality health care. Likewise, it is important that health-care providers and health-care institutions be visible supporters of efforts to eliminate racial and ethnic disparities in health care. Such advocacy would demonstrate to racial and ethnic minority patients that health-care providers and health-care institutions acknowledge the disparate treatment that they may receive in the health-care system and are prepared to address the problem.

Research into understanding the role of trust in improving the quality of care is in its early stages of development, especially with regard to minority populations. More studies need to be done to develop validated measurement instruments and to better elucidate the mechanisms of the ways in which trust influences health care. Much of the research on trust in minority populations has focused on African Americans, resulting in a significant research gap with respect to other minority populations. In addition, most of the research has concentrated on the role of physicians in influencing trust; more work is needed to understand the role of other health-care professionals.

Another critical step in the development of a trustworthy health-care system for minority populations is for health-care providers and health-care institutions to provide mechanisms for community consultation, evaluation, and collaboration. They must develop strong relationships with members of minority communities so that community members can assist them in determining sources of distrust and activities to address and overcome them. For example, researchers may think that the source of distrust is the Tuskegee Syphilis Study when it may in fact be a local or institutional breach of trust. By consulting members of minority communities, health-care providers and health-care institutions clearly demonstrate that they respect the needs, thoughts, and experiences of racial and ethnic minorities and understand that trust is something that should be earned, not assumed.

On May 16, 1997, President Bill Clinton apologized for the Tuskegee Syphilis Study in a White House ceremony. The legacy of distrust that has become associated with the Syphilis Study prompted the campaign for the apology. Commenting on the need for the apology, Dr. David Satcher, then Surgeon General and Assistant Secretary for Health and Human Services remarked, "The distrust is hurting us. I think we've got to really focus on it."[50] Those words still hold today.

## ▶ Case Study

Mrs Elizabeth Jones is a 79-year-old black woman with a history of high blood pressure and diabetes. A widow, she is a retired high school principal who is very active in her church and volunteers in the Foster Grandparent program. One evening she develops paralysis on the left side of her body and her family rushes her to the local hospital, where she is diagnosed with a stroke and is admitted to the hospital's intensive care unit in stable condition. She is conscious but has difficulty speaking and cannot move her left arm or leg. The next day, she is visited by the neurology team, which includes the attending physician, chief resident, junior resident, and two medical students. All members of the team are white and none has ever met Mrs Jones. Dr Charles, the attending physician, greets her, "Hello Elizabeth. How are you doing today?" During his visit with Mrs Jones, Dr Charles does not make eye contact with her or her son who is in the room. He talks about her medical condition with the other members of the team as if the family were not there. He approaches the issue of end-of-life care. He asks her if she would want her heart restarted if it stopped. He also asks her whether she would want life support systems withheld if her condition were to drastically worsen. She says that she does not know. "Well we need to have these things on your chart as soon as possible," the attending replies. At this point the son confronts the physician because of the disrespectful manner in which his mother has been treated. "First of all, her name is Mrs Jones, not Elizabeth. You are asking these questions about withholding treatment because she is an elderly black woman. I am sure that you do not ask white patients these questions. I know that black patients receive different care than white patients. You think that because she is black that she is poor and cannot pay for her treatment. That is why you are asking these questions. She does have insurance." As he leaves the room, Dr Charles responds, "Black and white patients receive the same care. This is not a racial issue."

Later that afternoon, Mrs Jones's primary physician, Dr Ruggere, who is also white, comes to visit her. She has been his patient for more than 10 years. "Hello, Mrs Jones. Hello Mr. Jones," he says as he sits down on her bed. Holding her hand, he discusses her medical condition and her fears. He too approaches the issue of end-of-life care. "For several years we have discussed what you would want done if you became critically ill and could not make decisions for yourself. I know that you have also discussed this with Reverend Morris. I know that this is a difficult discussion for you, but we need to move toward making some decisions." The son again raises his concerns about the differences between the treatment of black and white patients. Dr Ruggere asks why he thinks this. The son explains that black lives are not often valued as much as white lives. "The Tuskegee Syphilis Study showed that. I have also read some newspaper articles about recent medical research that confirms that black patients are treated differently than white patients." "Yes, I know about the Syphilis Study and am familiar with those recent medical studies. I understand your concerns," Dr Ruggere responds. He reassures Mr Jones that his mother, along with the family, not physicians, would be making the decisions. Mrs Jones says that she is afraid to have this discussion without other family members being present. "I understand," Dr Ruggere replies. "Why don't we call your daughter and other son, and perhaps Reverend Morris and I can meet with them later." Mrs. Jones's son thanks the physician and agrees to set up a family meeting.

## ▶ SUMMARY AND RECOMMENDATIONS

Trust is the cornerstone of the provider–patient relationship and the foundation for quality health-care delivery and outcomes. It is also an element of constructive relationships between investigators and participants in biomedical research. Caring and comfort, technical competence, and good communication skills have been identified as physician behaviors that engender trust.

Research has documented that racial and ethnic minorities have lower levels of trust in medical providers and in medical institutions than do white Americans. Distrust can adversely affect health outcomes and contribute to racial and ethnic disparities in health and health care. It leads to decreased patient satisfaction, low enrollment in clinical trials, greater reluctance to seek medical care, poorer patient adherence to treatment recommendations, and increased unwillingness to donate organs. Race concordance between patient and physician is positively correlated with higher perceptions of quality of care, communications, patient satisfaction, and participatory decision making.

**▶ TABLE 25–1.** Summary of Recommendations

- Initiatives that help health-care professionals and institutions to provide culturally competent care should be advanced and supported
- Health-care professionals need training to develop communication skills that emphasize honesty, respect, and inclusiveness
- Efficient and cost-effective measures that implement Title VI of the Civil Rights Act should be developed to serve racial and ethnic minorities with limited English proficiency
- Health-care providers and institutions must become visible advocates of efforts to increase the diversity of the health-care profession and to eliminate racial and ethnic disparities in health
- More research must be conducted to better understand the role of trust in improving the quality of care for minority patients; this research must include all minority populations
- Health-care providers and institutions need to have strong relationships with the communities that they serve. Mechanisms for community consultation, evaluation, and collaboration must be developed

Most of the research on issues of trust in minority communities has focused almost exclusively on African Americans. There is a critical need to assess the attitudes of other racial and ethnic minorities. Preliminary research suggests that other racial and ethnic minorities are also more distrustful of the health-care system than are white Americans.

Race and gender play roles in the development of trust: African American and Hispanic men report less positive perceptions of physicians. The erosion of trust in minority communities is a complex interplay of social, political, cultural, and historical factors. Empirical research on the impact of the Tuskegee Syphilis Study is equivocal.

Trustworthiness, rather than distrust, may be a more useful conceptual framework to discuss the relationship of minority populations to the health-care system. It shifts the onus to health-care professionals and health-care institutions to address the problem of trust. Health-care professionals and health-care institutions can initiate several activities to create a trustworthy health-care system for racial and ethnic minorities. Recommendations aimed at achieving this goal are summarized in Table 25–1.

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# CHAPTER 29

# *Community Health Centers*

MARGARET K. HARGREAVES, PhD
CAROLYNE W. ARNOLD, ScD
WILLIAM J. BLOT, PhD

## ▶ INTRODUCTION

This chapter reviews the historical development of community health centers (CHCs) in the United States, their provision of basic health services to uninsured and poor in both urban and rural areas, and their promise in population-based health research. Originating in the neighborhood health center concept of the 1960s, CHCs today provide health and social services to more than 14 million individuals, nearly two thirds of whom belong to minority groups. CHCs also play a role in decreasing health disparities by becoming a nidus for health disparities research.

Special attention is paid to the Southern Community Cohort Study (SCCS), an ongoing investigation into the higher rates of incidence and mortality from most forms of cancer among African Americans. Recruitment into the SCCS is now taking place at CHCs across the South. The study serves as an example of collaborative CHC-based research into determinants of health disparities and indicates the potential for CHC-led involvement in the development of community-supported measures aimed at disease prevention.

## ▶ FEDERALLY QUALIFIED HEALTH CENTERS SYSTEM

The federally qualified health centers (FQHC) system is perhaps the single most significant component of the health-care delivery system designed to correct health disparities. The FQHC system targets a range of vulnerable populations such as the elderly, children, the poor, the uninsured, the homeless, migrant laborers, and individuals living with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS). The cornerstones of the system are CHCs. CHCs are operated by a variety of nonprofit organizations, local health departments, health and hospital departments, religious or faith-based organizations, medical schools, and other local government entities. Costs are covered through a variety of sources: private insurance, Medicare, Medicaid, children's health programs, sliding fee scales based on the patient's family income and size, foundation or corporate grants, government contracts, and other funds.[1,2]

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## Origin and Evolution of Community Health Centers

Contemporary CHCs represent an enduring legacy of the War on Poverty, the surviving heirs of the neighborhood health center (NHC) movement of the 1960s and early 1970s. Responding to the imperative to eradicate poverty and recognizing the reinforcing, self-perpetuating cycle of poverty on health, on March 16, 1964, President Lyndon B. Johnson, in a special message to Congress, introduced a program that came to be known as the War on Poverty. Shortly thereafter, Congress passed Public Law 88-452, the Economic Opportunity Act. Its declaration of purpose established public policy in relation to the elimination of poverty. The Act, divided into seven titles, was to provide employment and training opportunities for the poor and to provide community-developed, consumer-directed self-help programs through community action programs that aimed at the "maximum feasible participation of members of the community."[3]

One of the most far-reaching and unique features of CHCs has been the staunch involvement of community residents in the planning, development, and governance of health centers. The concepts of "community-developed," "consumer-directed," "maximum feasible participation" gave voice to community residents in decision making in community organizations. It opened new sources of psychological, financial, and political power as the poor found themselves having a say in, and in some instances even controlling, the programs and institutions that affect their lives.[3,4]

Originally, the Act did not concern itself with the development of a health services delivery system. Its intent was to establish social service programs that would enhance the productive ability of the poor and facilitate their transition from welfare to work. However, physicians H. Jack Geiger and Count Gibson, who were on the faculty of Tufts Medical School, saw the inextricable tie between the productive ability of the poor and their health status. They sought funding to establish a demonstration project, Clinic 8S, in which the social conditions affecting health would be addressed.[3]

Viewing medical services as one vital component of the broader context of health and social well-being was a novel idea at the time. Although the Economic Opportunity Act was essentially an antipoverty program of services, Geiger and Gibson made a persuasive case that medical services were merely another social service. The Office of Equal Opportunity (OEO) agreed, believing the provision of both health-care and job opportunities to neighborhood residents were important, and money was made available to demonstrate this new model of health-care delivery. Thus, OEO's involvement in health-care delivery and the development of the NHCs was born.

In 1965, Geiger and Gibson established the first NHC in the United States in Columbia Point, an isolated, largely black, low-income housing project in Boston.[3,4] Having worked in the civil rights movement in the early 1960s, Geiger and Gibson were also acutely aware of the special problems of rural poverty and the lack of health services in rural areas. Working with local residents in Mound Bayou, Mississippi, they established the Delta Health Center, the first rural health center in the country. A confluence of health and social legislation, including the enactment of Medicare and Medicaid legislation, also occurred in the same year as the initiation of NHCs.

## Community Health Center Growth, Change, and Adaptation

NHCs were designed to meet the health and social needs of the poor and the at-risk. Their development filled a chasm in the infrastructure of the health-care system and addressed health disparities in minority populations. By the early 1970s, the OEO-NHC program was at its peak, with an estimated 200 NHCs nationwide. In the mid-1970s, the program was renamed the Community Health Center Program, and its scope was narrowed to concentrate on the delivery of medical care, with less emphasis on the social roles of NHCs. CHCs were encouraged to expand their services to the nonpoor.[1] By the early 1980s, the number of CHCs grew to approximately 800,[5] and today there are more than 1000 FQHCs and 3500 health center delivery sites in rural and urban settings, serving more than 14 million people.[6]

The goal of NHCs and subsequently CHCs was to provide comprehensive ambulatory services—preventive and rehabilitative as well as curative—to the poor living in inner cities and rural areas, services that were to be delivered sensitively, to be affordable and of high quality, and to intervene in the cycle of poverty. Although each center reflected its own community, they shared common characteristics. For example, in urban areas, they provided access and care to medically underserved, inner-city minority groups. In rural areas, CHCs more often served poor populations of mixed racial composition.[7] They used physicians, nurses, social workers, and community health workers in multidisciplinary team practice. Community health workers—indigenous neighborhood residents—were a new type of health worker that combined basic nursing with social service and outreach skills. In fact, CHCs pioneered in the training and employment of nurse practitioners and physician assistants.

Over the years, as with most organizations, political, policy, and priority shifts necessitated that CHCs adapt to the changing political, social, and economic conditions and take on new roles. By the early 1980s, CHCs focused on urban and rural medically underserved populations, and later in the decade, the strategies for the CHC program expanded to serve only high-need areas, work closely with state governments and medical societies, support only well-managed projects, promote self-sufficiency in projects, and help projects adapt to changing conditions.

In the 1990s, the age of managed care, some CHCs became affiliated with health maintenance organizations (HMOs) and other managed care forms. In 2002, President George W. Bush announced the Health Center Initiative. Over 5 years, the initiative proposed to add 1200 new facilities, eventually doubling the numbers of patients served.[8]

## ▶ COMMUNITY HEALTH CENTERS AND THE TREATMENT OF MINORITIES

### Population Served

CHCs are now positioned to target medically underserved individuals and families throughout the United States. The target populations include 42 million uninsured Americans, 62 million rural Americans, and 78 million racial and ethnic minorities.[8] Of the more than 14 million people now served, 36% are white and 64% belong to minority groups. Of the total, 35% are Hispanic; 25%, African American; 4%, Asian and Pacific Islander; and 1%, American Indian and Alaska Native,[9] although the percentages vary considerably by area of the country, with much higher percentages of African American participants in the South. Nearly one third of patients served have limited English proficiency.[6] Almost 40% of these patients are uninsured; the remainder have Medicaid (36%), Medicare (7%), private (15%), or other public sources (3%) of insurance. The incomes of almost 70% are at the federal poverty level and below.[6]

### Services Provided

CHCs serve a high-risk, low-income population that is expected to grow over the coming years. By virtue of their mission, CHCs must meet five unique requirements to be funded.[9] They must:

1. Be located in high need areas;
2. Provide comprehensive services;
3. Be open to all, regardless of income and insurance status;
4. Be governed by community boards; and
5. Follow rigorous administrative, clinical, and financial operational methods.

Services provided include not only primary and preventive health care, obstetric and gynecologic care, dental services, mental health and substance abuse services; radiologic and laboratory services, pharmacy, hearing and vision screening, and blood tests, but also supportive or so-called enabling services. These include case management, health education, parenting education, nutrition education, outreach, interpretation or translational services, transportation, and home visits,[10] which enable clients to achieve health-care goals. New roles assumed by CHCs, such as participation in Health Disparities Collaboratives (discussed later), contribute to that achievement.

### Impact on Health Disparities

With such activities, there is growing recognition that CHCs are contributing to a decrease in health disparities. Recent analyses conducted by the National Association of Community Health Centers indicate that CHCs are contributing to quality health care that is satisfying to its clients[11]—clients who are also experiencing decreases in health disparities beyond those experienced by the general population. CHCs increase access to care and have been reported to reduce disparities in access to mammograms, and to decrease racial and ethnic differences in infant mortality rates, early prenatal care, tuberculosis, diabetes, and overall mortality.[12–13] According to Tommy Thompson, Secretary for Health and Human Services, "CHCs are the most effective tools to reduce health disparities."[14]

## ▶ COMMUNITY HEALTH CENTERS AND HEALTH DISPARITIES RESEARCH

### Community Health Centers As Population-Based Centers for Health Research

The CHC network provides basic health services to a segment of US society, namely the poor and uninsured, that is often underrepresented in health research. Although the centers' primary functions relate to health care, CHCs can also engage in the conduct of research to evaluate the causes and prevention of chronic and acute illnesses. In some ways CHCs can serve as ideal laboratories for population-based research because they provide unique access to underserved populations; have earned the trust, respect, and appreciation of the populations served; and have or can arrange for the infrastructure and professional staffing needed for epidemiologic, behavioral, clinical, and other health studies.

The initiation of such research was in part stimulated by the Health Disparities Collaboratives, a national initiative for CHCs developed by the Bureau of Primary Health Care, Health Resources and Services Administration, and Department of Health and Human Services in 1999 to improve health outcomes for chronic conditions among the medically vulnerable.[10] The initiative is structured around the chronic care model, defined as a "population-based module that relies on knowing which patients need care, assuring that they receive knowledge-based care, and actively aiding them to participate in their own care."[15,16]Conditions addressed include diabetes, cardiovascular disease, cancer, asthma, depression, HIV, and prevention. The initiative is also based on the Plan-Do-Study-Act cycles from the continuous quality improvement field.[17] There were major challenges to implementing the collaborative, including need for more time and resources, difficulty developing computerized patient registries, team and staff turnover, and need for more administrative support.[17]

### Southern Community Cohort Study

Our recent experience with CHCs as sites for health research arises from the conduct of the Southern Community Cohort Study (SCCS). The SCCS is a National Institutes of Health-funded epidemiologic investigation into the determinants of disparities in cancer incidence

and mortality.[18] Plans call for a total of nearly 100,000 individuals, aged 40 to 79, to be recruited into the cohort over a 5-year span. More than two thirds of the participants will be African American, and more than half will be recruited from CHCs located in the states of Mississippi, Alabama, Georgia, Florida, South Carolina, Tennessee, and Kentucky, with possible future expansion to a broader geographic area.

The goals of the SCCS are to better understand the causes of cancer and other common illnesses so that measures aimed at disease prevention can be developed. In particular, the study aims to discover what underlies the disparities in cancer risk, including why people living in the Southeast experience higher rates of several types of cancer and why African Americans experience a disproportionate burden of cancer and other chronic diseases. As a cohort study, the SCCS will be able to evaluate, in addition to cancer, various potential risk factors for and determinants of the elevated risks of heart disease, hypertension and stroke, renal disease, diabetes, and other chronic illnesses among African Americans.

As noted elsewhere in this monograph, cancer mortality rates tend to be elevated among African Americans. Figure 29–1 illustrates the nearly 50% higher total cancer death rate among black men versus white men, with a similar but somewhat smaller disparity for women.[19] As seen in Figures 29–2 and 29–3, most individual cancers demonstrate the mortality disadvantage.[19] The higher mortality rates among African Americans tend to arise from a higher incidence of cancer, compounded by a poorer rate of survival once the cancer is diagnosed.[20]

The SCCS will study various potential contributors to the cancer differentials, including:

- Use of various tobacco products
- Diet (food groups, foods, macronutrients, micronutrients)
- Physical activity
- Personal and family medical history
- Over-the-counter and prescription medications
- Access to health care and barriers to health-care services

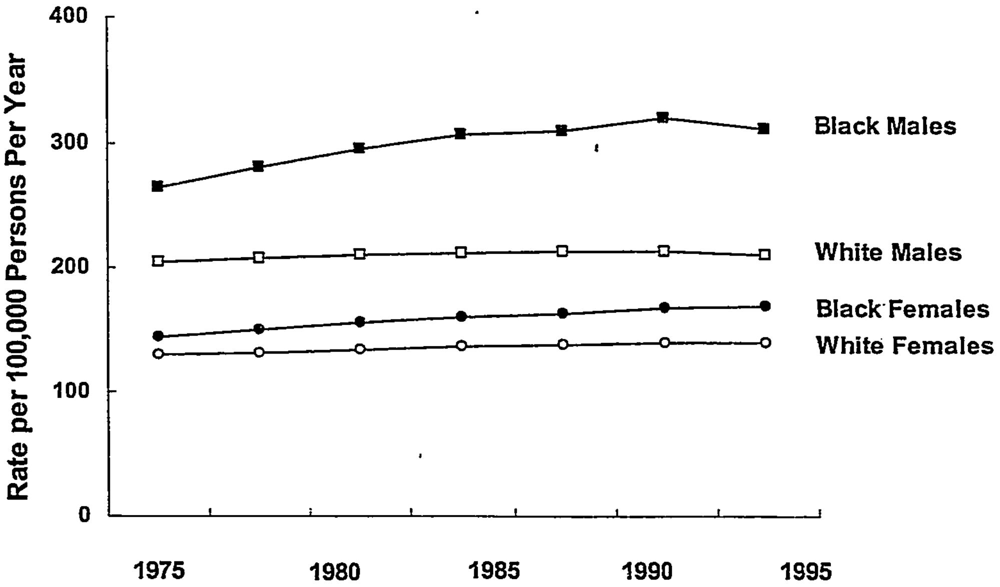

Figure 29–1. Trends in age-adjusted US total cancer mortality rates by sex and race. (Adapted by Blot from Ref. 19.)

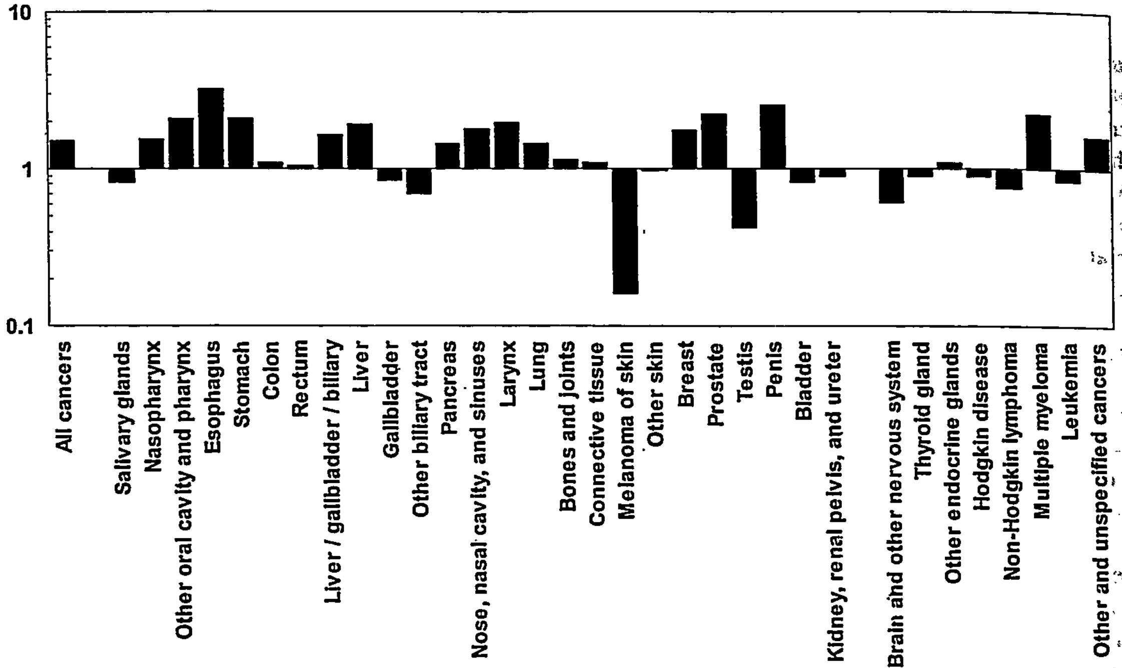

**Figure 29-2.** Ratios of national age-adjusted mortality rates for specific cancers among African American and white men, 1970 through 1994. (From Ref. 19.)

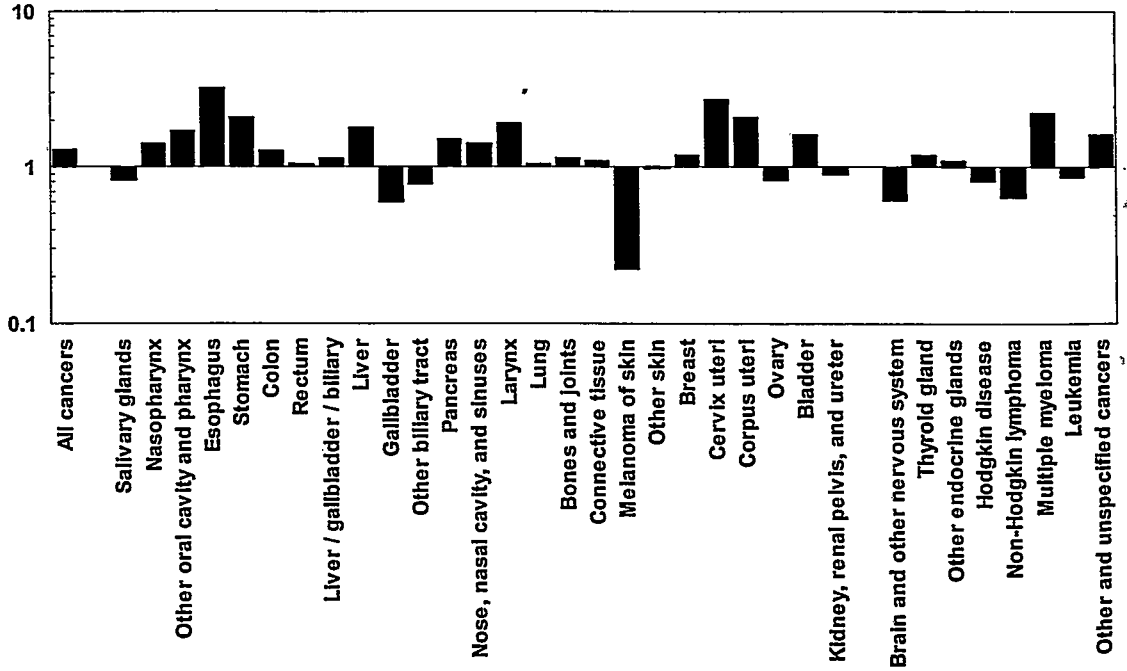

**Figure 29-3.** Ratios of national age-adjusted mortality rates for specific cancers among African American and white women, 1970 through 1994. (From Ref. 19.)

- Reproductive patterns
- Body size and obesity
- Occupational exposures
- Stress, depression, and social support
- Hormones
- Genetic predispositions

As of early 2004, more than 25,000 participants, including over 20,000 African Americans, have been recruited from CHCs throughout the South. At enrollment, comprehensive interview data, as well as blood and mouth cell samples, are collected from participants. Over the years, the cohort members will be periodically recontacted for follow-up information about changes in behaviors. The cohort rosters also will be linked with the National Death Index and with state cancer registries to identify deaths and incident cancers. Eventually, the interview data and frozen biologic specimens will be used to perform analyses assessing disease risk factors, including the interaction between endogenous susceptibility traits and exogenous environmental exposures.

CHC involvement has been critical in the planning, operation, and success of the SCCS. The NIH grant has thus far enabled funding to 25 CHCs in areas shown in Figure 29–4, with plans to more than double this number and expand into North Carolina, Virginia, West Virginia, Arkansas and Louisiana.

**Figure 29–4.** Initial community health centers in the Southern Community Cohort Study (SCCS).

The SCCS and CHCs are natural partners because both share a common goal of promoting and protecting the health of populations that traditionally have had limited resources. CHCs bring together the exact populations (poor, minority, and rural) that have been greatly underrepresented in medical research. Furthermore, the trusting environment in which to conduct health studies offered by the CHCs is important to counteract the mistrust sometimes directed toward researchers.

During the course of the SCCS, successful enrollment at the CHCs has been enhanced by having the support of the center's administration and health professionals. This has been achieved in simple ways that have key effects, such as the CHC preparing a letter of support for the study that can be shown to clinic patients, providing space for the interview and for displaying SCCS posters and brochures, and having staff who are knowledgeable about the study, its goals, and its importance.

CHCs have provided a fertile setting for recruitment. The SCCS clinic interviewers approach age-appropriate visitors to the center, introduce themselves, and provide information about the study. After obtaining informed consent from participants, the interviewers administer a specially designed computer-assisted interview that takes about 1 hour. The study takes advantage of existing CHC facilities for blood collection, with interviewers coordinating with CHC phlebotomists for blood sampling or collecting mouth rinse samples themselves. The biosamples are then sent via overnight delivery to Vanderbilt University Medical Center for long-term storage and later bioassay.

Table 29–1 shows selected characteristics of the initial participants in the SCCS. The educational level of these adults, aged 40 to 79 years, is low: approximately one third have a high school diploma, one third have lesser schooling, and the remaining third have greater schooling. Income is also low (median: approximately $14,000 annually). Participants tend to have a high prevalence of obesity and diabetes and a current smoking rate that is nearly double the national average. Hence, the population under study is at high risk for several chronic illnesses. Communication with the cohort participants about poor health behaviors (such as smoking) is under way, and selected targeted interventions are planned.

▶ **TABLE 29–1.** Characteristics of Initial SCCS Participants

| Indicator | Level |
|---|---|
| Median education | 12 years |
| Median income | $ 14,000 |
| Percent obese (BMI ≥ 30) | 44% |
| Percent diabetes | 21% |
| Percent parental history of cancer | 33% |
| Percent female ever had mammogram | 83% |
| Percent male ever had PSA screening | 43% |
| Median time of last visit to dentist | 51 months |
| Percent current smoker | 45% |

BMI = body mass index; PSA = prostate-specific antigen.

The CHC network has provided an ideal base for epidemiologic research on cancer and other common illnesses disproportionately afflicting African American and low-income populations. This model is suitable for expansion to other etiologic and preventive research endeavors.

## Community Health Centers and Intervention Approaches

The Health Disparities Collaboratives and the SCCS are, respectively, excellent general and specific initiatives for the CHCs. The former tends to strengthen the service approach advocated by CHCs, and the latter, the research infrastructure, particularly with respect to etiologic studies. There is also room to test intervention approaches based on accepted behavioral models. The collaboratives demonstrate that many CHCs can be brought together to accomplish mutual objectives relating to diseases that occur with great frequency in these centers. The SCCS has demonstrated that the CHCs can participate in epidemiologic research. This experience and those of the collaboratives can be replicated to test true experimental designs. The CHC provides an excellent environment for the conduct of low-risk clinical trials and the community-based approach that is advocated as the best approach to a low-literacy, high-risk population. Many CHCs have demonstrated they can coordinate several projects at once; many are conducting several collaboratives simultaneously,[21] while others may be lead[22] or collaborating[23] institutions on large-scale REACH 2010 population-based projects.

▶ **TABLE 29-2.** Summary of Major Findings Regarding Community Health Centers (CHCs)

- CHCs have evolved to provide basic health services to the uninsured and underserved in the United States
- Since the 1960s, CHCs have expanded in size and scope and now operate in over 3500 delivery sites nationwide
- Many CHCs provide services mainly to minorities, especially African Americans
- CHCs can serve as population-based centers for health research in populations often underrepresented in previous studies
- The Southern Community Cohort Study (SCCS) is a federally funded research project, now ongoing in CHCs throughout the South, to assess reasons for disparities in cancer and other diseases
- To date over 30,000 participants have been enrolled in the SCCS, providing a low-income cohort to be followed for future health outcomes
- CHCs may provide optimal settings for various research activities, including interventions to reduce the burden of cancer and other diseases in high-risk groups

The literature offers few examples of projects and programs designed to determine barriers to behavioral change or to test behavior change models for the population targeted by the CHCs. Nevertheless, CHCs offer enormous potential to help carry out research and establish the scientific basis for interventions to reduce health risks among all segments of the US population, especially those most in need. With the increased number of centers projected as a result of the new congressional initiatives, CHC-based research will assume even greater importance.

## ▶ SUMMARY AND RECOMMENDATIONS

Table 29–2 summarizes key points outlined in this chapter. Recommendations to ameliorate current disparities are provided in Table 29–3.

▶ **TABLE 29-3.** Summary of Recommendations for National Interventions to Ameliorate Current Disparities

- The 5-year initiative to double the number of CHCs should be expedited because of the great need for health services among its client populations
- CHC participation should be encouraged in population and behavior research that has potential to decrease health disparities in the long term
- Appropriations for population, behavior, and intervention research initiatives should be increased to assess the determinants and means of reduction of health disparities
- Community-academic partnerships should be fostered to help develop Research Centers of Excellence where practical and effective methods for improving preventive and therapeutic health services can be initiated and evaluated

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# CHAPTER 34

# *The Role of Government in Minority Health: A Surgeon General's Perspective*

DAVID SATCHER, MD, PhD

## ▶ INTRODUCTION

From the founding of the United States to the present day, the right to good health and well-being has been a basic tenet the nation holds dear. The US Constitution, with its affirmation of the right to "life, liberty, and the pursuit of happiness," implies the right to the pursuit of good health. The best example in modern history of this nation's commitment to the right to good health is the role the government plays at the federal, state, and local levels as it seeks to provide increased protection of citizens from the spread of infectious diseases. I was privileged to spend nearly 9 years serving the American people in leadership in the Public Health Service—5 years as director of the Centers for Disease Control and Prevention (CDC) and 4 years as Surgeon General of the United States, 3 of which I concurrently served as Assistant Secretary for Health. Today I am more convinced than ever of the need for government to remain vigilant in protecting the health of its citizens.

Attitudes toward governmental services vary widely from person to person. I often illustrate this by relating what some consider to be the two biggest lies in history. The first one is, "The check is in the mail." The second one is, "We are from the government and we're here to help." However, I agree with those who believe that government is perhaps the only institution that can be representative of and responsible to all the people. Implied in this statement is the belief that, regardless of race, creed, color, gender, religion, social standing, or sexual preference, the US government has a responsibility to protect the health of all of its citizens. Throughout my tenure in government, whether it was as director of the CDC, Surgeon General of the United States, or Assistant Secretary for Health, this was a responsibility I took very seriously.

When I began as director of the CDC in 1993, one area we focused on closely was immunization rates, believing that government had the responsibility to ensure that all of its citizens were immunized. That year, just over 50% of US children were being immunized by 2 years of age, and the rates for African American, Hispanic, and American Indian children were much lower than those for their majority counterparts. There were also striking variations in immunization rates in certain regions of the country. For example, immunization rates for children up to age 2 in the state of Vermont, which has a population that is over 95% white, approached 70%; but in the city of Detroit, which is predominately African American, the immunization rate for children in the same age group was less than 30%. Disparities also existed in adult immunization rates, despite the fact that Medicare covered immunizations. Concern over these and the many other examples of health disparities, coupled with the government's responsibility to promote the health of all of its citizens, led me to adopt a new approach for eliminating disparities. In the year 2000, we made the task of eliminating health disparities among different racial and ethnic groups one of the two goals of *Healthy People 2010,* the nation's health plan for the decade leading up to 2010.[1]

In this chapter, I explore the critical role government plays in social programs aimed at improving health and health outcomes for minority groups and the underserved. One thing is clear: the US government continues to play a significant role in protecting and enhancing the health of citizens at the local, state, and federal levels. In fact, over 50% of the current expenditures for health care in the United States are made by the government or the public sector.[2] This level of expenditure by the government provides significant leverage in the nature of health services delivered. Beyond that, the interaction between public and private sectors increasingly is shaping the nature of health expenditures and services.

## ► A BRIEF HISTORY OF THE GOVERNMENT'S ROLE IN PUBLIC HEALTH AND HEALTH CARE

There is a long history of governmental involvement in the nation's health. In 1798, President John Adams signed the Act of Congress that gave rise to the Marine Hospital Service. This service grew out of a concern for the health of merchant seamen, who often became ill or disabled during their voyages at sea. In many cases, the diseases they contracted were contagious and could spread throughout the communities to which they returned. One of the better-known examples occurred with the yellow fever epidemic of 1793 in Philadelphia. It is also one of the best-documented events in public health history. It was so notable that, in 1998, the Public Health Service, which grew out of the Marine Hospital Service, revisited the Philadelphia sites hardest hit by the epidemic as part of its bicentennial commemoration.[3]

In its early years, the Marine Hospital Service consisted of several hospitals located near ports where merchant seamen embarked and disembarked. In 1871, out of concern for controlling the spread of major infectious diseases, including yellow fever, tuberculosis, and smallpox, Dr John Maynard Woodworth was appointed as the nation's first Supervising Surgeon. In 1873 his title became Surgeon General. His responsibility was to coordinate a national response to this threat and provide leadership for the Marine Hospital Service. He began by appointing a corps of physicians to assist him, which he assigned to the various marine hospitals. In 1889, this corps of physicians officially became known as the Commissioned Corps, which consists today of 6000 health professionals of various training. As responsibilities for the Marine Hospital Service grew in scope and complexity, its name was changed in 1912 to the Public Health Service and its oversight assigned to the Surgeon General.[3]

In 1953, the Department of Health, Education and Welfare (DHEW) was established under President Dwight D. Eisenhower and a Secretary appointed to oversee it. The Public Health Service became a part of DHEW and reported to the Secretary directly or to the Assistant Secretary for Health, although for many years the Surgeon General retained all of his authority. In 1979, the Department of Education Organization Act was signed into law, which provided for a separate Department of Education. This resulted in a name change from the Department of Health, Education and Welfare to the Department of Health and Human Services (DHHS). In 1995, the Social Security Administration was split off to became a separate agency. This time the department's name did not change because it continued to be responsible for services to the elderly and to children.[3]

The government's role in health and health care, in part, is defined by the various DHHS agencies. Figure 34–1 shows how the department is organized and defines its role in areas such as research, prevention, quality oversight,

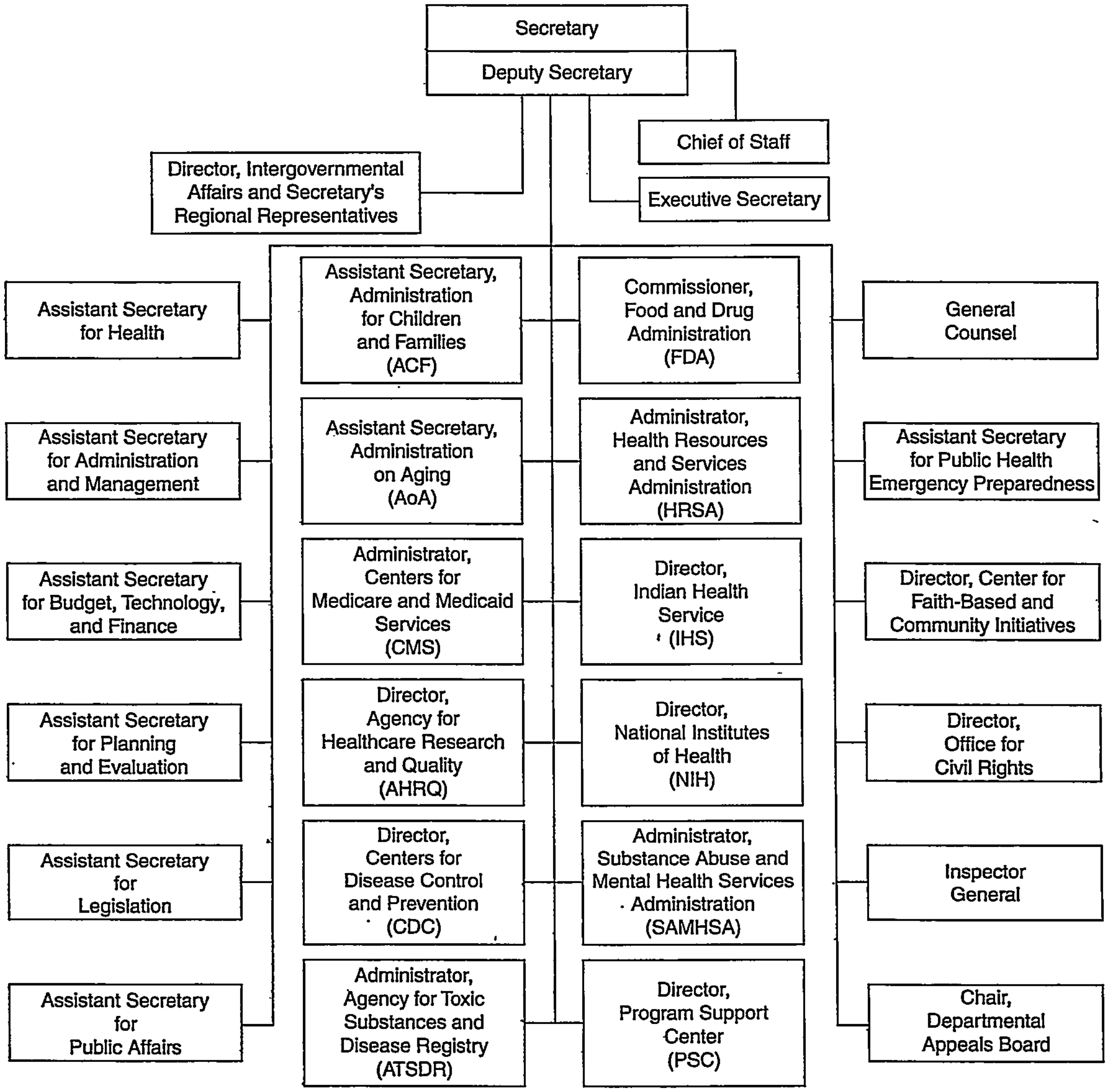

**Figure 34–1.** Organizational structure of the US Department of Health and Human Services.

regulation, and health care for the poor and elderly.

## ▶ MAJOR GOVERNMENTAL AGENCIES INVOLVED IN MINORITY HEALTH

The major governmental programs dealing with the health and health care of the American people are centralized within DHHS. By far, the Centers for Medicare and Medicaid Services (CMS) (formerly the Healthcare Financing Administration or HCFA) incurs the largest governmental expenditures to support health care for the elderly through Medicare and health care for the poor through Medicaid. Although Medicare is a federal program funded by a trust established though payroll taxes, Medicaid is jointly funded by federal and state governments based on a formula involving proportional contributions that vary from state to state. Participation among African Americans and other minorities in Medicare is fairly proportionate to their representation in the overall population, but the same is not true for Medicaid. Minorities are generally over represented in Medicaid programs, due to their higher rate of poverty when compared with the majority population. Recent Medicare reform legislation expanded Medicare to include prescription drug coverage for the elderly through a complex formula that is beyond the scope of this discussion. This is the first time since the establishment of Medicare in 1965 that such a major reform has taken place. Dually eligible persons covered under both Medicare and Medicaid because of their age and low-income status will receive prescription drug coverage through the Medicare Prescription Drug Benefit instead of Medicaid. It is not yet clear how this will affect the ability of these individuals to access drugs compared with the present coverage through Medicaid.[4]

Other DHHS programs influencing the care of minorities are funded through the Health Resources and Services Administration (HRSA). One of HRSA's most significant roles is the funding of community health centers, which provide health care in underserved communities. HRSA also funds the National Health Service Corps in an effort to increase the representation of physicians and other health professionals in underserved communities, and it supports the funding of medical education for minority groups. In addition, HRSA funds loan forgiveness programs and other strategies aimed at increasing the representation of minorities in the health professions, tying it to a commitment to underserved communities.[5]

The Indian Health Service (IHS) provides health care to Native Americans on reservations through contractual arrangements with tribal governments. A major challenge confronting this arrangement is delivery of health-care services. Today more than half the Native American population lives outside of the reservations in primarily urban communities, making them ineligible for IHS coverage. The IHS has in recent years received funding from the CDC and the National Institutes of Health (NIH) to implement programs for the prevention, early detection, and treatment of diabetes, a disease that disproportionately affects the Native American population. These programs are developing innovative strategies aimed at preventing the onset of type 2 diabetes, as well as detecting the disease early in its course to prevent complications such as end-stage renal disease.[6]

As the nation's prevention agency, the CDC targets many of its programs to minority communities, where health problems have a disproportionate impact. For example, in 1993 when I began as director of the CDC, we set a goal of increasing childhood immunization rates from just over 50% to 75% by 1996. Because low-income minority communities tended to have the lowest immunization rates for children 2 years of age and under, we focused a great deal of energy on them. Among other things we partnered with such organizations as the Congress of National Black Churches, the Women, Infants and Children Program (WIC), and other established programs that were well positioned to reach low-income communities. Perhaps one of the best examples of CDC programs targeted to minority communities is the Racial and Ethnic Approaches to Community Health (REACH) program, which was conceived in 1998 as part of the federal initiative to eliminate disparities in health. To date more than 40 communities have been funded through this program to develop innovative approaches for reducing and ultimately eliminating disparities in health.[7]

Within the US government is the largest research institution in the world: the National Institutes of Health (NIH). This is the agency through which the government funds most biomedical research. During a 5-year period from 1997 through 2002, Congress doubled the NIH budget from $13 billion to $27 billion, further strengthening its ability to influence research. There has been concern that not enough NIH-funded research has targeted disparities in health that affect minority communities. In January 1999, the Institute of Medicine (IOM) released a report[8] that looked at disparities in research relative to cancer. This report demonstrated that the level of NIH research funding that would influence cancer rates in minorities was, in fact, inadequate.[8] As a result, in 2000 Congress passed legislation establishing the National Center on Minority Health and Health Disparities (NCMHD) at NIH. This center not only makes grants for research geared toward the reduction and ultimately the elimination of disparities but also works with the other NIH institutes to support the targeting of research funding to problems that disproportionately affect minorities. For a 1-year period, from 2002 through 2003, all NIH institutes underwent a strategic planning process to define how they would work to better target their resources toward the elimination of health disparities. This plan represents a major step forward in NIH's efforts to focus on the elimination of disparities in health.[9]

Using funding from Congress and through DHHS, the IOM completed and released a report in 2002 entitled, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare.*[10] This report documented disparities in the quality of health care received by minorities in the United States. These disparities persisted even when studies controlled for differences in socioeconomic status, insurance coverage, and the nature of the complaints with which patients presented.[10] The major DHHS agency concerned with the quality of health care is the Agency for Healthcare Research and Quality (AHRQ). AHRQ has now funded several Centers of Excellence in health-care quality research or disparities. As part of the national effort to eliminate disparities, in 1999 the agency was also mandated by Congress to submit an annual report tracking health disparities, entitled the *National Healthcare Disparities Report.*[11] The 2004 report on the quality of care and disparities was met with much concern by members of Congress as well as by persons in the private sector. Representative Henry Waxman (D-CA), members of the Congressional Black Caucus, and others expressed concern that the report lacked a sense of urgency when it came to the elimination of disparities and significantly downplayed the magnitude of the problem and the nature of the concern. A major concern centered on the danger of losing momentum and a sense of urgency and importance regarding the nation's efforts to confront and eliminate disparities.

## ▶ THE NATION'S HEALTH PLAN: HEALTHY PEOPLE 2010

In 1979, Surgeon General Julius Richmond, while also serving as Assistant Secretary for Health, issued a report on health promotion and disease prevention in the United States.[12] His report led to the beginning of the strategy of planning for the health of the American people by issuing goals and objectives for each decade and monitoring progress toward them. The nation is now in its third decade of the Healthy People initiative, as it works toward the goals of Healthy People 2010. In my role as Assistant Secretary for Health and Surgeon General, I oversaw the development of the 2010 plan, which hinges on two goals: (1) increasing the quality and years of healthy life, and (2) eliminating disparities in health among different racial and ethnic groups.

Supporting Healthy People 2010's two goals are 467 objectives. The majority are measurable and can therefore be used to monitor the nation's progress throughout the decade. Several objectives are not measurable and are labeled "developmental" because they lack the baseline information necessary to track and monitor progress.

Perhaps no Healthy People goal has received as much attention and targeted support as the goal of eliminating disparities in health. This goal has sparked a spirit of rejuvenation in public health, as both the public and private sectors have become engaged in achieving it. As stated earlier, Congress acted to create the NCMHD at NIH, and it has begun to fund Centers of Excellence for the elimination of disparities. The NCMHD is also working with other institutes at NIH on the development of their strategic plans and targeting their resources to elimination of health disparities. NIH obviously must be a major player if the nation is to be successful with this goal of Healthy People 2010. In addition to funding communities through its REACH program to develop models for the elimination of disparities in health, CDC also plays a major role in health promotion and disease prevention, especially in dealing with the nation's epidemic of overweight and obesity. This epidemic disproportionately affects African American and Hispanic women and children.

When Healthy People 2010 was launched in 2000, it was also the first time any Healthy People plan included leading health indicators (LHIs). With assistance from the IOM, 10 LHIs were defined, which are geared toward helping communities target their efforts as they become involved in working to reach the goals of Healthy People 2010. One or two measurable objectives are associated with each LHI. The indicators can be grouped into three categories: (1) health system, (2) environment and environmental quality, and (3) lifestyle. Included in the health system category are access to quality health care, access to mental health care, and access to immunizations. Two indicators are included under the category of environment and environmental quality: injury and violence prevention, and the enhancement of environmental quality as it affects individuals physically, socially, and spiritually. Included under the lifestyle indicators are physical activity, overweight and obesity, tobacco use, substance abuse, and responsible sexual behavior.

These LHIs, in and of themselves, represent an opportunity for better communicating to the American people the goals of Healthy People 2010 and the strategies that must be implemented to reach the goal of eliminating disparities in health. For example, although the lifestyle indicators focus attention on individual responsibility for being physically active and eating right, it is also clear there are major community responsibilities for providing access to healthy lifestyles. If, for example, communities do not provide safe places for people to walk or engage in physical activities or if there are no parks in the neighborhoods, the community is not living up to its responsibility for promoting healthy lifestyles. Likewise, if schools do not require physical education for all students from kindergarten through grade 12, then they are not living up to their responsibility to promote healthy lifestyles. It is clear from both examples that minorities will be disproportionately affected, because they are more likely to live in urban areas where there are fewer parks, trails, and safe areas to be physically active, and children in minority groups are most likely to reside in communities that lack the resources to support physical activities in their schools.

Another major barrier to eliminating disparities in health is the US health-care system itself— a system that excludes over 43 million uninsured people, including 36% of Hispanics and over 25% of African Americans.[13] Likewise, inadequate emphasis on health promotion and disease prevention also has a major impact on the health of minorities. At present, less than 3% of the national health budget is spent on population-based prevention, and those who suffer most from this neglect are clearly minorities. Another major concern with the health system is the underrepresentation of minorities in the health professions, which leads to other problems, including distrust and the inability of the system to relate to different cultures. Whereas underrepresented minorities make up 25%–30% of the US population, they constitute only 10% of health-care professionals.[14] Unfortunately, the future does not look bright, given that government programs to correct this underrepresentation have been losing support as challenges to affirmative action continue to mount. The importance of increasing the number of minorities in the health professions cannot be overstated because of the added benefits they bring to the system overall. It is clear that minority health professionals are more likely to care for other minorities, more likely to practice in underserved communities, and more likely to accept patients on Medicaid. These advances do not just benefit people in minority groups, they benefit the nation's health system as a whole.

Finally, the role of government in programs to improve minority health can be viewed from the perspective of the functions of public health. In a landmark report released in 1988, the IOM defined the following three functions of public health: assessment, assurance, and policy development. In carrying out these functions, the IOM declared that public health was in disarray.[15] But it also noted it was not too late for government to get it right. Nowhere is that challenge and opportunity more clear than in the Healthy People 2010 goal of eliminating disparities in health among different racial and ethnic groups.

In the area of *assessment,* we look to governmental programs—especially the CDC's National Center for Health Statistics (NCHS)—to define the health status of minorities as a baseline for setting measurable objectives and to monitor progress in the reduction and ultimate elimination of disparities in health. For example, in 1999, the infant mortality rate for white infants was 5.8 per 1000; for black infants, it was 14 per 1000 births, a mortality rate that is 2.4 times higher.[16]

As we implement programs in communities throughout the country to reduce disparities in health, we look to data from NCHS to measure the ultimate impact on this national figure. This function of assessment also applies to areas such as cardiovascular disease, cancer, diabetes, human immunodeficiency virus (HIV) infection, and acquired immunodeficiency syndrome (AIDS).

The role of government does not end with assessment. The second role of public health as defined by the IOM was that of *assurance.* The assurance of access to basic health services such as immunizations, prenatal care, and emergency medical care has often defined public health for many people. For the millions of Americans who are uninsured and underinsured, public hospitals, community health centers, and Medicaid have been critical elements of public health assurance.

Although African Americans and Hispanics in the United States comprise about 25% of the population, they account for over 50% of the uninsured. When asked if they have a personal physician or health-care provider, over one third of African Americans and almost half of Hispanics say they do not.[17]

Too often public health programs, such as public hospitals and Medicaid, are the first to be cut when there are budgeting problems at the state level. Yet it is clear that without reasonable access to care, minorities will always lag behind in health status. Disparities in health cannot be eliminated without governmental assurance of access to care.

In great part, the role of *assurance* includes the assurance of a diverse health professional workforce. If health professionals do not speak the language of patients or understand their culture, then access is not a reality for those patients. Studies also show that minority health professionals are more likely to care for minorities, more likely to practice in underserved communities, and more likely to accept Medicaid for payment. Thus, the continued underrepresentation of minorities in the health professions is also a failure of assurance on the part of the government. HRSA programs, such as the National Health Service Corp, which tie scholarships or loan repayment for medical or dental education to a period of service in underserved communities, enhance access to care and represent the public health function of assurance.[5]

Central to all functions of government or public health is policy development. Public health generally conducts or supports research needed to aid policy development. It also communicates information in such a way as to improve the understanding of policy makers and their constituents about the need for policy, the effectiveness of existing policy, and the indications for new policies. This can be illustrated by considering the points of attack for the elimination of disparities in health. These points of attack include access to quality health care, environmental quality, lifestyle enhancement, and research to identify cases and interventions that might be effective.

At present, the United States stands alone among industrialized countries in not providing universal access to health care. As previously discussed, this lack of access disproportionately affects minorities. In 2000, the annual report of the World Health Organization (WHO)[18] ranked the US health system below 36 other member nations, despite the fact that the United States spends more money overall, more per capita, and a greater percentage of its gross national product on health care than virtually any other country in the world. The WHO report pointed to two major weaknesses in the US health system: the lack of universal access, as indicated by the fact that so many people are excluded from the health system, and the lack of balance in the system, as reflected in the fact that over 90% of US health-care expenditures are for treating diseases and their complications, many of which are preventable. At the same time, the United States spent just 2% of its health budget on population-based prevention.[18]

The policy changes necessary to assure universal access to care and a more balanced health system are critical to achieve the goal of eliminating disparities in health among the different racial and ethnic groups that comprise the population of the United States and to ensure that the protections of the US Constitution extend equally to all of its citizens.

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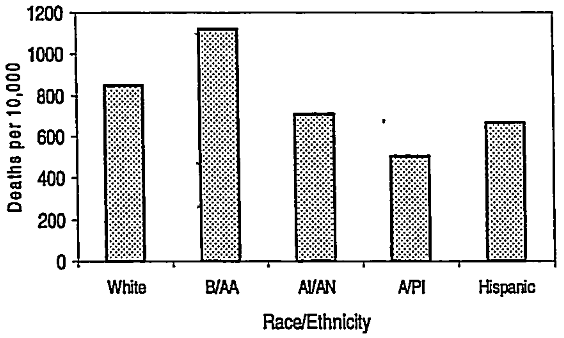

**Figure A-7.** Age-adjusted mortality rates per 10,000 people by race or ethnicity, United States, 2000 (A/PI, Asian or Pacific Islander; AI/AN, American Indian or Alaska Native; B/AA, black or African American.) (*Source: National Center for Health Statistics, 2003.*)

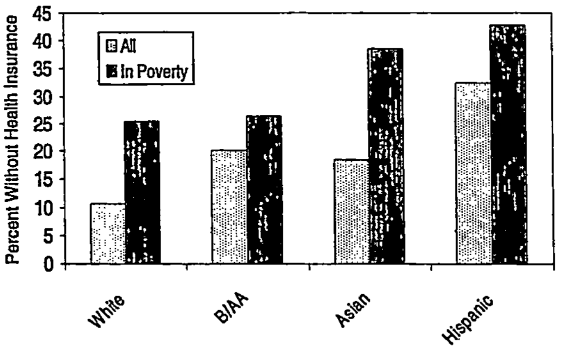

**Figure A-9.** Percent of people without health insurance by race or ethnicity and poverty status, United States 2002. (B/AA, black or African American.) (*Source: US Census Bureau, 2003.*)

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# Blacks, Hispanics Less Apt to Get Best Heart Failure Care

**By Alan Mozes**
*HealthDay Reporter*

FRIDAY, March 6 (HealthDay News) -- When black and Hispanic Medicare recipients suffer severe heart failure, they are less likely than their white counterparts to be treated with the most cutting-edge treatment available, a new analysis suggests.

## Latest Heart News

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"We found that there were real but modest differences between racial and ethnic groups in the use of the most advanced devices for the treatment of severe heart failure, even after considering all the medical and diagnostic factors when providing those treatments," explained the study's author, Dr. Steven A. Farmer, a fellow of cardiovascular medicine in the cardiovascular division of the Hospital of the University of Pennsylvania in Philadelphia.

In this case, the treatment in question is actually a combination of two interventions: the insertion of a small, battery-powered, implantable defibrillator (ICD) to regulate heart rhythms; and "cardiac resynchronization therapy" (CRT), a newer approach that relies on a special pacemaker that realigns heartbeats whenever the normally simultaneous pulsing of the right and left ventricle falls out of sync.

Farmer's team, which reports the finding in the March issue of *Heart Rhythm Journal*, noted that the combined treatment, known as CRT-D, is appropriate for 15% to 20% of heart failure patients.

The authors further noted that congestive heart failure strikes more than 5 million Americans each year. Racial and ethnic minorities are particularly vulnerable, with

2005 figures from the U.S. Department of Health & Human Services indicating that more than a quarter of all deaths in those groups are attributable to heart disease, making cardiovascular illness the number one killer of blacks and Hispanics.

In particular, the department noted that black men have a 30% greater risk of dying from heart disease than non-Hispanic whites -- even though a smaller proportion of blacks than white actually have heart disease (10 vs. 12%).

The current findings are based on a national comparison of more than 108,000 white, black and Hispanic cardiac patients who received care for severe heart failure between 2005 and 2007 at one of more than 1,000 hospitals across the United States.

All the patients were enrolled in the National Cardiovascular Data Registry, which by definition meant that all were Medicare patients and all had received either ICD alone or the combined CRT-D treatment.

Despite the fact that minority patients were actually more likely to qualify for the combined approach than white patients, the authors found that blacks and Hispanics were nonetheless more likely to receive just the defibrillator device. By contrast, white patients were more likely to get the double therapy -- whether or not they met the treatment guidelines.

Farmer and his colleagues specifically found that among white patients considered "eligible" for CRT-D, 79% got the treatment. However, among blacks, that figure fell to 77%, and among Hispanics it fell further, to 75%.

"Now certainly these are not whopping differences," Farmer noted. "They're modest, and other studies have shown this kind of difference in the past. But what's new here is that all the many factors that typically might account for the differences we did see -- being uninsured, the lack of availability of a particular device, patient preferences, the specific medical condition being handled -- cannot explain it."

"This is because," he continued, "all the patients in our study were from a group where everyone had gone to a doctor and gotten diagnostic testing, and everyone was already set to get treatment for their heart failure with a device of some kind. And an expensive device at that. It's just that you were more likely to get the most sophisticated and most expensive device if you were white."

"So this initial study," Farmer said, "shows that there are differences in treatment by race that are not accounted for by medical factors. And we are now doing additional studies to look at all the economic and socioeconomic factors at the hospital level that might account for this, at least in part."

Dr. Paul Underwood, former president of the Association of Black Cardiologists and medical director at Boston Scientific Corp., said the findings are not unexpected.

"I can't say one would be really surprised, if we looked at disparities in terms of cardiovascular disease and morbidity across race in this country," he noted.

"So, yes, here we may not yet know what the exact answer is, which factors working together are contributing to the problem," Underwood said. "But what is clear is that there is a lot of work that needs to be done in terms of leveling the playing field in terms of providing options for treating cardiovascular disease."

SOURCES: Steven A. Farmer, M.D., Ph.D., fellow, cardiovascular medicine, cardiovascular division, Hospital of the University of Pennsylvania, Philadelphia; Paul Underwood, M.D., interventional cardiologist, Boston, former president, Association of Black Cardiologists, Atlanta, and medical director, Boston Scientific Corp.; March 2009 *Heart Rhythm Journal*

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# Physician–Patient Racial Concordance, Continuity of Care, and Patterns of Care for Hypertension

Thomas R. Konrad, PhD, Daniel L. Howard, PhD, Lloyd J. Edwards, PhD, Anastasia Ivanova, PhD, and Timothy S. Carey, MD, MPH

To assess the effects of physician–patient racial concordance and continuity of care on hypertension outcomes, we described patterns of care for hypertension; we used cross-tabulations and repeated measures (generalized estimating equations) analyses with panel survey data from elderly persons interviewed and examined in 1987 and 1990. Continuity of care was associated with recognition of hypertension, receipt of medication, and lower incidence of undetected hypertension. Physician race had little effect, but continuity is important for successful management of hypertension in older persons. (*Am J Public Health*. 2005;95:2196–2190. doi:10.2105/AJPH.2004.046177)

Despite progress in hypertension management, African American persons[1,2] have lower rates of recognition, treatment, and control of hypertension than do White persons.[3,4] Elderly persons have similar hypertension treatment rates but poorer control than do younger persons. Demographic dissimilarities underlie doctor–patient communication difficulties affecting health outcomes,[5–11] whereas patient–provider racial concordance correlates with patient participation in care, satisfaction, and treatment adherence.[12–19] Stability in doctor–patient relationships correlates with patient satisfaction and access to care.[1] This study assessed how physician–patient continuity and racial concordance[5,20] affect hypertension diagnosis and medication use in White and African American elderly patients.

## METHODS

The Piedmont Health Survey of the Elderly conducted in-home interviews and recorded blood pressure readings in 4162 persons aged 65 years or older in 1986 to 1987 (approximately 80% response) and followed up 3536 surviving older persons in 1990.[21,22] Our subsample (1834 African American individuals; 1533 White individuals) excluded respondents who lacked critical survey responses (n=25) or who named unidentifiable, out-of-state, or nonphysician practitioners (n=45) or non-White, non–African American physicians (n=99).

Named physicians were matched to licensure files. Anonymous physicians' race, age, gender, graduation year, and specialty were linked to the Piedmont Health Survey of the Elderly files that had respondents' care site location, demographics, trichotomized self-reported health ("poor" or "fair" vs combined "excellent" and "good"), chronic illness indices[23] (hypertension, diabetes, heart disease, stroke, cancer), and dichotomized Katz scale.[24] Physician affiliation was (1) discontinuous (naming no physician at least once), (2) switching physicians (naming different physicians at each survey), or (3) continuous (naming same physician both times). A 4-valued racial concordance measure compared physician with patient race. Methods for measuring hypertension-related outcomes are described in Table 1.[25]

Descriptive comparisons used $\chi^2$ and $t$ tests. For each repeated outcome, a multivariate linear model was fit with generalized estimating equations, allowing assessment of the effects of multiple predictors across time for each analysis.[26,27] Initial analyses tested associations between outcomes and respondent–physician racial dyads and continuity of care; subsequent models controlled for respondent and physician characteristics. Analyses of 2-way interactions between care source, racial dyad, and continuity of care aimed to detect subgroup effects. Subject clustering within physicians was assessed by alternating logistic regression[28] to detect patterns of physician clustering of repeated binary outcomes within subjects. Clustering within physicians showed weak or no statistical significance and was not reported.

We incorporated Piedmont Health Survey of the Elderly weights into multivariate analyses when possible, but weighting had to include respondents not meeting inclusion criteria. Some strata lacked variation in physician characteristics or had only 1 physician yielding apparent "missing" cases in analyses, affecting more than 31% of the baseline sample. Hence we report full final models run without survey weights; we adjusted for sample design; showed adjusted odds ratios, significance levels, and confidence intervals in a table; and used footnotes for significant covariates. Given numerous statistical tests, $P<.01$ was considered statistically significant, with $.01<P<.05$ considered a trend. We used SAS software (SAS Institute Inc, Cary, NC).

## RESULTS

### Descriptive

The cohort size declined mostly through mortality (Table 1). Surviving respondents lost spouses; had higher income, better health status, and higher illness scores; and had more nursing home use and functional declines than they did at baseline. More older persons reported regular care sources in 1990; fewer named local private physicians who were younger and trained more recently than 1987. More than 10% named no physician at either survey; 24% named none at 1 survey. Twenty-five percent switched physicians; 38% had the same physician each time. African American physician–patient dyads decreased over time, replaced by White physician–African American patient dyads. Severe hypertension was comparable at each survey.

No racial differences were evident in age, gender, employment, or disease severity. Fewer African American individuals were married, and, as a group, they had less education, income, and private insurance and more Medicaid. Self-reported health improved, whereas impairment increased for both groups, but racial disparities persisted. Racial groups had parity in "usual source of care" in 1990, but White patients were more likely seeing nearby private physicians; public sources cared for 1 in 3 African American patients and only 1 in 10 White patients. More African American individuals than White individuals lacked

**TABLE 1—First and Second Wave Survey Variables, by Race of Respondents and Characteristics of Their Physicians: 1987 and 1990**

| | Wave 1 (n=4136) | | Wave 2 (n=3536) | | | |
|---|---|---|---|---|---|---|
| | African American (n=2261) | White (n=1875) | African American (n=1943) | White (n=1593) | Probability 1987[a] | Probability 1990[b] |
| Demographic characteristics | | | | | | |
| Male | 34.9 | 35.0 | 33.4 | 33.8 | NS | NS |
| Age, y, mean | 73.6 | 73.5 | 76.4 | 76.2 | NS | NS |
| Years of education, mean | 7.3 | 10.0 | 7.4 | 10.1 | .0001 | .0001 |
| Married | 33.8 | 43.7 | 31.1 | 40.0 | .0001 | .0001 |
| Currently working | 11.5 | 12.2 | 8.7 | 9.3 | NS | NS |
| Income categories, $ | | | | | | |
| 0-3999 | 30.6 | 11.1 | 19.5 | 7.3 | .0001 | .0001 |
| 4000-6999 | 43.4 | 29.5 | 48.7 | 26.7 | | |
| 7000-14 999 | 18.6 | 28.3 | 22.6 | 30.2 | | |
| ≥15 000 | 7.4 | 31.2 | 9.2 | 35.9 | | |
| Medicaid insurance | 11.0 | 3.3 | 18.1 | 6.3 | .0001 | .0001 |
| Medi-gap insurance | 32.7 | 73.7 | 31.0 | 66.7 | .0001 | .0001 |
| Resided in rural area | 56.1 | 46.6 | 57.4 | 46.8 | .0001 | .0001 |
| Health and functional status | | | | | | |
| Self-reported health status | | | | | | |
| Excellent or good | 48.6 | 58.3 | 52.4 | 60.4 | .0001 | .0001 |
| Fair | 36.3 | 28 | 36.1 | 29.4 | | |
| Poor | 15.1 | 13.7 | 11.5 | 10.2 | | |
| Severity of illness categories | | | | | | |
| Good | 23.0 | 24.1 | 30.8 | 30.5 | NS | NS |
| Fair | 51.5 | 51.2 | 43.7 | 42.3 | | |
| Poor | 25.5 | 24.8 | 25.5 | 27.3 | | |
| ≥1 ADL limitation | 13.5 | 10.7 | 21.9 | 18.7 | .0062 | .0207 |
| Diagnosed health condition | | | | | | |
| Heart condition | 13.1 | 17.3 | 15.8 | 18.6 | .0001 | .0001 |
| Diabetes | 24.2 | 15.3 | 26.0 | 16.9 | .0001 | .0001 |
| Stroke | 9.6 | 8.1 | 10.4 | 9.7 | .0245 | .0675 |
| Cancer | 7.5 | 16.8 | 8.1 | 19.2 | .0001 | .0001 |
| Use of health services | | | | | | |
| Ever in a nursing home | 1.1 | 2.9 | 5.5 | 7.8 | .0001 | .0064 |
| Lived in same county where care provided | 56.4 | 75.2 | 48.1 | 63.7 | .0001 | .0001 |
| No usual source for care | 5.3 | 4.0 | 3.2 | 2.6 | .0394 | NS |
| Received care in public clinic or hospital or emergency department | 34.9 | 9.3 | 34.7 | 10.4 | .0001 | .0001 |
| Received care in private office or hospital | 59.6 | 86.4 | 53.6 | 77.7 | .0001 | .0001 |
| Physician characteristics | | | | | | |
| Male | 88.5 | 94.6 | 87.9 | 94.0 | .0001 | .0001 |
| Age, y, mean | 49.9 | 52.7 | 47.3 | 48.9 | .0001 | .0015 |
| ≥65 | 13.5 | 12.9 | 9.6 | 6.2 | | |
| 36-64 | 73.6 | 82.1 | 71.5 | 82.3 | | |
| ≤35 | 12.9 | 15.0 | 18.9 | 11.5 | | |
| Years since medical school graduation, mean | 22.7 | 26.9 | 19.8 | 22.7 | .0001 | .0001 |
| Generalist[c] | 63.3 | 72.5 | 53.8 | 65.1 | .0001 | .0001 |

*Continued*

**TABLE 1—*Continued***

| | | | | | | |
|---|---|---|---|---|---|---|
| Continuity of care | | | | | | |
| No physician in 1987 or 1990 | NA | NA | 14.9 | 5.5 | NA | .0001 |
| Physician in 1987 or 1990 but not both | NA | NA | 27.5 | 20.3 | NA | .0001 |
| Same physician in 1987 and 1990 | NA | NA | 30.4 | 46.7 | NA | .0001 |
| Dependent variables | | | | | | |
| Measured blood pressure[d] | | | | | | |
| Normal | 8.6 | 9.2 | 10.7 | 10.3 | | |
| Prehypertensive | 35.0 | 37.0 | 38.2 | 42.3 | | |
| Stage 1 | 34.4 | 34.3 | 30.1 | 30.9 | | |
| Stage 2 (severe)[e] | 22.0 | 19.6 | 21.0 | 16.6 | .0605 | .0023 |
| Told about high blood pressure by physician[f] | 63.2 | 50.4 | 63.7 | 53.5 | .0001 | .0001 |
| Taking high blood pressure medication[f] | 80.9 | 82.9 | 80.2 | 76.0 | NS | .0312 |

*Note.* NS = not significant; ADL = activity of daily living; NA = not applicable.

[a] *P* values from $\chi^2$ and *t* tests for African American and White comparisons for 1987.

[b] *P* values from $\chi^2$ and *t* tests for African American and White comparisons for 1990.

[c] Family practice, general practice, internal medicine, geriatrics

[d] When these data were collected in 1986 and 1990, the prevailing guidelines, the 1984 Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure, recommended a modest treatment regimen for the elderly. This recommendation was that among those with existing systolic blood pressure higher than 160 mm Hg, drug treatment, even in the presence of nonpharmacological therapy, should be considered on an individual basis. Thus, although the clinical guidelines were less aggressive during the time of the data collection compared with the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) recommendations, disparities in care among racial groups would have the same implications in both periods. Blood pressure, as measured in both 1986 and 1990, was the average of 2 consecutive readings but was collapsed into 4 ordered JNC-7 categories: (1) normal, (2) prehypertensive, (3) mild (stage 1), and (4) severe (stage 2). Hypertension was categorized as stage 1 (systolic = 140–159 mm or diastolic = 90–99 mm) or stage 2 (systolic ≥ 160 mm or diastolic ≥ 100 mm). All other readings were categorized as either prehypertensive (systolic = 120–139 mm and diastolic = 80–89 mm) or "normal" if readings were below those levels.

[e] $\chi^2$ test for stage 2 hypertension versus all other states combined.

[f] "Yes" and "suspect or possible" answers to the question "Has a doctor ever told you that you have high blood pressure?" at either survey were coded as self-reported hypertension and prompted inquiry about the subject's taking blood pressure medication. Undetected hypertension was ascribed to respondents whose field readings were consistent with hypertension but who did not report at either survey that a physician had said that they had high blood pressure. The subset with high enough readings were considered to have undetected stage 2 (i.e., severe) hypertension.

regular physicians at both surveys (14.9% vs 5.5%) or named a physician only once (27.5% vs 20.3%). Conversely, more White patients than African American patients had the same physician across surveys (46.7% vs 30.4%). More African American persons reported that a physician had told them they had high blood pressure. Adverse racial differences were largest for severe hypertension, widening between surveys.

### Multivariate Analyses

Table 2 shows no significant effects on measured hypertension. There was a tendency for those with discontinuity in care to have had undetected hypertension more often than did those with continuity of care. Compared with White patients with White physicians, African American patients had a lower incidence of undetected hypertension (and of severe hypertension) regardless of physician race. Elderly persons with discontinuous care were more likely to have undetected severe hypertension, but those naming generalist physicians also may have been at risk for having severe hypertension previously undetected. Those who lacked or had switched physicians received fewer hypertension diagnoses and, if diagnosed, took fewer medications compared with those keeping the same physician.

Interaction tests suggested that African American respondents who switched physicians may have been more likely to be taking hypertension medications if their new physician was White ($P < .02$). African American patients whose usual care sources were public clinics and who had African American physicians may have been more likely to have been taking hypertension medications than were African American patients using White physicians or private practitioners ($P < .03$). Those experiencing discontinuity in physician care and whose usual care sources were public clinics were more likely to have been taking medication ($P < .001$) than were those who had discontinuous care but from a private practitioner.

### Conclusion

Unlike cross-sectional, retrospectively self-reported "usual person and place" surveys, we measured longitudinal patient–physician relationships with 2 temporally separated respondent reports, minimizing error in physician characteristics by combining survey and license data. Study limitations include small numbers in one southern state, which omitted non–African American, non-White physicians and patients. Cumulative reduction in cases for multivariate analyses came from a few missing values in many predictors.

Consistent with other chronic disease studies,[29] continuity of care entailed better outcomes. Ongoing physician affiliation improved hypertension detection and medication use once diagnosed. Rates of detection in individuals changing physicians sometimes were midway between those without physicians and those keeping the same physician. African American individuals' elevated hypertension diagnosis risk was unaffected by physicians' race, suggesting widespread awareness

**TABLE 2—Generalized Estimating Equations Logistic Regression Analyses: Relations of Continuity and Racial Dyads to Hypertension-Related Outcomes: 1987 and 1990**

| | | Racial Dyad[a] | | | Continuity of Care[b] | |
|---|---|---|---|---|---|---|
| | | African American Physician | | White Physician | | |
| Regression Model: Dependent Variable | No. | African American Respondent OR (95% CI) | White Respondent OR (95% CI) | African American Respondent OR (95% CI) | No Named Physician: 1987, 1990, or Both OR (95% CI) | Different Physician in 1987 and 1990 OR (95% CI) |
| Ordinal logistic regression: measured hypertension levels[c] | 2075 | 0.97 (0.80, 1.19) | 1.14 (0.52, 2.48) | 0.89 (0.74, 1.07) | 1.06 (0.84, 1.33) | 1.00 (0.84, 1.20) |
| Binary logistic regression: undetected hypertension[d] | 1332 | 0.43* (0.30, 0.60) | 0.47 (0.14, 1.63) | 0.49* (0.36, 0.68) | 1.47*** (1.02, 2.13) | 1.31 (0.98, 1.76) |
| Binary logistic regression: undetected severe hypertension[e] | 596 | 0.28* (0.14, 0.54) | 0.35 (0.04, 3.50) | 0.44** (0.24, 0.78) | 2.46** (1.30, 4.66) | 1.22 (0.73, 2.04) |
| Binary logistic regression: ever told of high blood pressure[f] | 2016 | 1.87* (1.43, 2.44) | 1.03 (0.42, 2.50) | 2.00* (1.56, 2.56) | 0.71* (0.53, 0.95) | 0.74* (0.59, 0.93) |
| Binary logistic regression: currently taking hypertension medication[g] | 1999 | 1.41 (0.95, 2.07) | 1.53 (0.46, 5.05) | 1.05 (0.74, 1.49) | 0.44* (0.29, 0.66) | 0.64* (0.47, 0.88) |

*Note.* OR = odds ratio; CI = confidence interval.

[a] For racial dyad, the omitted reference category for this 4-valued variable is "White patient with White physician." The other 3 values are shown in column headings in the table.

[b] For continuity of care, the omitted reference category is same physician named in 1987 and 1990 surveys (i.e., continuous care). The other 2 values are shown in column headings in the table.

[c] Significant covariates predicting measured hypertension include the passing of time (i.e., second survey; OR = 1.06; $P < .001$); education (OR = 1.04/y; $P < .001$); being currently employed (OR = 1.31; $P < .05$); receiving Medicaid (OR = 1.27; $P < .05$); and having a stroke (OR = 0.66; $P < .01$).

[d] Significant covariates predicting undetected hypertension include being male (OR = 2.04; $P < .001$); being older (OR = 1.03/y; $P < .01$); claiming fair self-rated health (OR = 0.73; $P < .05$); and not having heart disease (OR = 0.65; $P < .001$), stroke (OR = 0.48; $P < .001$), or cancer (OR = 0.60; $P < .001$).

[e] Significant covariates predicting undetected severe hypertension include being male (OR = 2.89; $P < .001$); being older (OR = 1.04/y; $P < .05$); having fair (OR = 0.60; $P < .05$) or poor (OR = 0.32; $P < .01$) self-reported health; having stroke history (OR = 0.37; $P < .01$); and receiving care by a generalist physician (OR = 0.55; $P < .05$).

[f] Significant covariates predicting self-reported hypertension include the passing of time (i.e., second survey; OR = 1.04; $P < .001$); being male (OR = 0.44; $P < .001$); being younger (OR = 0.97/y; $P < .001$); having elevated blood pressure measurement (OR = 3.96; $P < .001$); having heart problems (OR = 1.62; $P < .001$) or stroke (OR = 2.36; $P < .001$); and having fair (OR = 1.50; $P < .001$) or poor (OR = 1.44; $P < .05$) health status.

[g] Significant covariates predicting use of hypertension medication include being male (OR = 0.70; $P < .05$) and having income less than $1000 per year (OR = 2.45; $P < .01$).

$^{*}P < .001$; $^{**}P < .01$; $^{***}P < .05$.

of African American persons' worse cardiovascular disease prognoses.[4,30] African American patients had a lower risk of having undetected severe (stage 2) hypertension, but elderly patients lacking physicians had a higher hypertension risk. Patient–physician racial concordance effects seemed contextually conditioned (e.g., African American patients using public sources of care may use medication more often if their physician is African American, whereas African American patients who switched physicians may use medication more often if their new physician is White).

Regular access to a usual care source and sustained affiliation with a physician can improve the management of hypertension in older African American and White patients. Because African American Medicare beneficiaries are cared for by a subset of African American physicians often in challenging practice situations,[31] better understanding of hypertension care may require more longitudinal study of physician availability and the dynamics of physician selection in addition to racial concordance and continuity of care. ■

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## About the Authors

*Thomas R. Konrad and Timothy S. Carey are with the Cecil G. Sheps Center for Health Services Research at the University of North Carolina, Chapel Hill. Daniel L. Howard is with Shaw University, Raleigh, NC. Lloyd J. Edwards and Anastasia Ivanova are with the Department of Biostatistics, School of Public Health, University of North Carolina, Chapel Hill.*

*Requests for reprints should be sent to Thomas R. Konrad, PhD, Cecil G. Sheps Center for Health Services Research, UNC-CH, 725 MLK Blvd/Airport Rd CB 7590, Chapel Hill, NC 27599-7590 (e-mail: bob_konrad@unc.edu).*

*This brief was accepted June 3, 2005.*

## Contributors

T R. Konrad and D.L. Howard originated the study. T R. Konrad supervised the creation of the databases and participated in all aspects of the study design, analysis, interpretation of results, and writing of the brief. D.L. Howard reviewed the literature, developed the conceptual framework, wrote initial drafts, and reviewed subsequent drafts of the brief. L.J. Edwards contributed to the study design, initiated and conducted the statistical analysis, contributed to the writing of the brief, and reviewed drafts of the brief. A. Ivanova reviewed the databases and contributed to the study design and analysis. T.S. Carey contributed to the writing of the brief and reviewed drafts of the brief.

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# Racial Differences in Incident Heart Failure among Young Adults

*Kirsten Bibbins-Domingo, Ph.D., M.D., Mark J. Pletcher, M.D., M.P.H., Feng Lin, M.S., Eric Vittinghoff, Ph.D., Julius M. Gardin, M.D., Alexander Arynchyn, M.D., Cora E. Lewis, M.D., O. Dale Williams, Ph.D., and Stephen B. Hulley, M.D., M.P.H.*

## ABSTRACT

*Background* The antecedents and epidemiology of heart failure in young adults are poorly understood.

*Methods* We prospectively assessed the incidence of heart failure over a 20-year period among 5115 blacks and whites of both sexes who were 18 to 30 years of age at baseline. Using Cox models, we examined predictors of hospitalization or death from heart failure.

*Results* Over the course of 20 years, heart failure developed in 27 participants (mean [±SD] age at onset, 39±6 years), all but 1 of whom were black. The cumulative incidence of heart failure before the age of 50 years was 1.1% (95% confidence interval [CI], 0.6 to 1.7) in black women, 0.9% (95% CI, 0.5 to 1.4) in black men, 0.08% (95% CI, 0.0 to 0.5) in white women, and 0% (95% CI, 0 to 0.4) in white men (P=0.001 for the comparison of black participants and white participants). Among blacks, independent predictors at 18 to 30 years of age of heart failure occurring 15 years, on average, later included higher diastolic blood pressure (hazard ratio per 10.0 mm Hg, 2.1; 95% CI, 1.4 to 3.1), higher body-mass index (the weight in kilograms divided by the square of the height in meters) (hazard ratio per 5.7 units, 1.4; 95% CI, 1.0 to 1.9), lower high-density lipoprotein cholesterol (hazard ratio per 13.3 mg per deciliter [0.34 mmol per liter], 0.6; 95% CI, 0.4 to 1.0), and kidney disease (hazard ratio, 19.8; 95% CI, 4.5 to 87.2). Three quarters of those in whom heart failure subsequently developed had hypertension by the time they were 40 years of age. Depressed systolic function, as assessed on a study echocardiogram when the participants were 23 to 35 years of age, was independently associated with the development of heart failure 10 years, on average, later (hazard ratio for abnormal systolic function, 36.9; 95% CI, 6.9 to 198.3; hazard ratio for borderline systolic function, 3.5; 95% CI, 1.2 to 10.2). Myocardial infarction, drug use, and alcohol use were not associated with the risk of heart failure.

*Conclusions* Incident heart failure before 50 years of age is substantially more common among blacks than among whites. Hypertension, obesity, and systolic dysfunction that are present before a person is 35 years of age are important antecedents that may be targets for the prevention of heart failure. (ClinicalTrials.gov number, NCT00005130 [ClinicalTrials.gov] .)

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SPECIAL ARTICLE

# Primary Care Physicians Who Treat Blacks and Whites

Peter B. Bach, M.D., M.A.P.P., Hoangmai H. Pham, M.D., M.P.H.,
Deborah Schrag, M.D., M.P.H., Ramsey C. Tate, B.S., and J. Lee Hargraves, Ph.D.

## ABSTRACT

**BACKGROUND**

In the United States, black patients generally receive lower-quality health care than white patients. Black patients may receive their care from a subgroup of physicians whose qualifications or resources are inferior to those of the physicians who treat white patients.

**METHODS**

We performed a cross-sectional analysis of 150,391 visits by black Medicare beneficiaries and white Medicare beneficiaries 65 years of age or older for medical "evaluation and management" who were seen by 4355 primary care physicians who participated in a biannual telephone survey, the 2000–2001 Community Tracking Study Physician Survey.

**RESULTS**

Most visits by black patients were with a small group of physicians (80 percent of visits were accounted for by 22 percent of physicians) who provided only a small percentage of care to white patients. In a comparison of visits by white patients and black patients, we found that the physicians whom the black patients visited were less likely to be board certified (77.4 percent) than were the physicians visited by the white patients (86.1 percent, P=0.02) and also more likely to report that they were unable to provide high-quality care to all their patients (27.8 percent vs. 19.3 percent, P=0.005). The physicians treating black patients also reported facing greater difficulties in obtaining access for their patients to high-quality subspecialists, high-quality diagnostic imaging, and nonemergency admission to the hospital.

**CONCLUSIONS**

Black patients and white patients are to a large extent treated by different physicians. The physicians treating black patients may be less well trained clinically and may have less access to important clinical resources than physicians treating white patients. Further research should be conducted to address the extent to which these differences may be responsible for disparities in health care.

From the Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York (P.B.B., D.S., R.C.T.); and the Center for Studying Health System Change, Washington, D.C. (H.H.P., J.L.H.). Address reprint requests to Dr. Bach at the Health Outcomes Research Group, Memorial Sloan-Kettering Cancer Center, 1275 York Ave., Box 221, New York, NY 10021.

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THE ELIMINATION OF RACIAL AND ETHNIC disparities in health care is one of the two goals of the initiative Healthy People 2010 (the other being to increase the quality and years of healthy life), but the causes underlying these disparities have not been established.[1] Because patients who are members of minority groups and white patients to some extent reside in different locations and seek their care in different settings, it is possible that doctors who treat these patients may differ with regard to both their clinical qualifications and their clinical resources. We hypothesized that such discrepancies account for the pervasiveness of racial and ethnic disparities in health care.

Several studies support this hypothesis. In a study of primary care physicians in New York City comparing physicians who had patient panels in which less than 50 percent were members of minority groups with physicians whose patient panels included more than 50 percent minority-group patients, Gemson et al. found that those who treated a greater proportion of minority-group patients were less knowledgeable about preventive care practices and less likely to be board certified.[2,3] Schneider et al., in a study of managed-care plans, observed that physicians working for plans in which black patients were heavily enrolled provided primary care of a lower quality to all patients in the plan than did physicians working for plans in which fewer black patients were enrolled.[4] Differences in qualifications and competency between physicians treating black patients and those treating white patients have also been described with regard to cardiovascular surgery and the care of patients infected with the human immunodeficiency virus.[5,6]

We studied a nationally representative sample of primary care physicians who treated patients enrolled in Medicare, the nation's largest health insurance plan. We focused on primary care physicians, because they are largely responsible for the coordination of care, often counsel patients regarding the need for referrals to specialists and for diagnostic tests and therapies, and provide continuity of care for many patients with complex diseases. Studies have suggested that poor performance by physicians in these domains may lead to disparities in preventive care, evaluation of symptoms, treatment, and outcome.[7-13]

## METHODS

### DATA

We combined data from two main sources in order to investigate the relation of primary care physicians' training and resources to the race of patients to whom they provide "evaluation and management" services.

#### *Data on Physicians*

The Community Tracking Study Physician Survey is a biannual telephone survey conducted by the Center for Studying Health System Change of a nationally representative sample of physicians who are not federally employed. The survey is conducted in 60 randomly selected metropolitan statistical areas and is supplemented by a national sample. In 2000–2001 (round 3 of the survey), the response rate among physicians was 59 percent. Details of the survey are available at www.hschange.org/index.cgi?data=04; many of the findings have been described previously.[14-17] The survey included only physicians who reported providing at least 20 hours per week of direct patient care in an office-based or hospital-based practice, including at sites of the Bureau of Primary Health Care of the Department of Health and Human Services. Residents and fellows were excluded. Our study included the participating physicians whose primary specialty was family practice or general practice, general internal medicine, or geriatrics (which we subsumed under the category of internal medicine).

#### *Data on Patient Visits*

The Medicare program provides health insurance for 97 percent of Americans who are 65 years of age or older. In 2001, the program covered 40 million persons, 86 percent of whom were enrolled under Part A and Part B indemnity insurance (fee for service), in which providers submit detailed claims to the Centers for Medicare and Medicaid Services for reimbursement for services rendered.[18] Data were obtained from the 2001 "5 percent carrier file," which contains claims histories of a representative sample of 5 percent of Medicare beneficiaries. We analyzed line items for "evaluation and management" that were identified according to the Berenson–Eggers Type of Service Codes used by Medicare: M1A (office visits — new patient), M1B (office visits — established patient), and M6 (consultations); but we excluded items with the Healthcare Common Procedure Coding System codes 99381, 99411, 95115, 99391, 95117, 99236, 99262, 99251, 99255, 99261, 99254, G0175, 99253, and 99252. (Information about the codes is available at www.cms.hhs.gov/data/betos.[19]) We limited our analysis to data on black Medicare beneficiaries and white Medicare beneficiaries (as documented in Medicare files) 65 years of age or older. Other racial or ethnic categories included in the Medicare data — Hispanic, Asian, North American Native, other, and unknown — are less well studied and less reliable.[20-23]

### *Linkage of Data*

Data on physicians and patient visits were linked with the use of the physicians' unique provider identification number, which is recorded on claims submitted to Medicare.[24] Of 5859 primary care physicians who were interviewed by telephone as part of the Community Tracking Study Physician Survey, 5627 (96.0 percent) had a unique provider identification number. Of these physicians, 729 (13.0 percent) were not associated with claims that appeared in the 2001 Medicare 5 percent carrier file, and 543 (9.6 percent) were associated only with claims that were ineligible for our study — for services other than evaluation and management, or for services rendered to patients who were not black or white and 65 years of age or older. A total of 4355 physicians (77.4 percent) and 43,032 patients were included in our study, and together they contributed 44,756 unique physician–patient pairs (a few patients saw more than one physician included in our study) and 150,391 visits to our analysis. The number of visits per physician ranged from 1 to 304 (median, 24; interquartile range, 10 to 48). These data were used to derive national estimates that reflected the characteristics of 87,803 primary care physicians and of the 58 million visits (by 54 million white patients and 4 million black patients) for evaluation and management that these physicians provided to black and white Medicare beneficiaries 65 years of age or older in the United States in 2001.

### CHARACTERISTICS OF PRIMARY CARE PHYSICIANS

On the basis of their responses to the Community Tracking Study Physician Survey, physicians were characterized according to their demographic characteristics, setting of the practice and mix of payers, medical education, specialty, whether or not they were board certified, and ability to provide access to necessary health care resources for their patients. The demographic characteristics included age, sex, and self-declared race or ethnic background. Information on payer mix and practice setting was based on the reported percentage of revenue the practice derived from Medicare, Medicaid, and managed-care plans, the number and specialties of the physicians in the practice, whether or not physicians provided care for which they received reduced compensation or no compensation ("charity" care), location in an urban area (00-03) or a rural area (04-09), according to metropolitan statistical area codes in the Area Resource File,[25] and the income level in the area where the practice was located, according to data from the Census Bureau for 2000 on the median income within the area of a ZIP Code. The site of the physicians' medical education was dichotomized as either the United States, including Puerto Rico, or elsewhere. Board certification was determined for the physicians' primary specialty. Data on each of these measures were missing for less than 1 percent of physicians.

To gain insight into the ability of physicians in the study to provide access to resources for their patients, we analyzed physicians' responses to five questions in the following form: "How often are you able to obtain access for your patients to [type of service] when you think it is necessary?" The five types of service were "subspecialists of high quality," "ancillary services of high quality," "nonemergency hospital admissions," "adequate number of inpatient days," and "high-quality diagnostic imaging." The physicians could respond "always," "almost always," "frequently," "sometimes," "rarely," and "never." On the basis of the distribution of the responses, and on our belief that providing high-quality care requires reliable access to such services, we dichotomized the responses into "always" (in which "always" and "almost always" were subsumed) or "not always" (in which the remaining responses were subsumed). Less than 0.25 percent of the responses were missing or in a category not listed, such as "don't know," and were not included in the analysis.

Physicians were asked to respond to two statements: "It is possible to provide high-quality care to all my patients," and "The level of communication I have with specialists about the patients I refer to them is sufficient to ensure the delivery of high-quality care." We dichotomized the responses into "agree" (in which "strongly agree" and "somewhat agree" were subsumed) or "disagree" (in which "strongly disagree" and "somewhat disagree" were subsumed). Less than 3 percent of the responses were missing, "neither agree nor disagree," or in a category not shown, such as "don't know"; these responses were not included in the analysis.

### STATISTICAL ANALYSIS

The unit of analysis was the patient visit. For statistical purposes, the visits were nested within unique physician–patient pairs. Some patients saw more than one physician and therefore contributed to more than one physician–patient pair. Many physicians were part of multiple physician–patient pairs, since they saw multiple patients (individual physicians who saw both black patients and white patients are represented in the counts of both visits by black patients and visits by white patients).

The distribution of visits by black patients and visits by white patients among physicians was estimated by means of logistic regression, with random effects for each physician, with the use of SAS software (version 8.12). The estimated random effects were used to calculate the proportion of black patients in each physician's Medicare patient panel. This approach was used to correct for sampling error.

The responses to the questions in the Community Tracking Study Physician Survey were evaluated with the use of SUDAAN software (version 7.0), to accommodate the multilevel design of the survey.[26] Associations between the patient's race and the physician's characteristics were analyzed with the use of unadjusted logistic regression, with the patient's race as the outcome. Associations between the patient's race and the physician's self-reports of access to resources were analyzed with the use of both unadjusted and adjusted logistic regression. In the primary analysis, the race of the patient was the outcome. In the secondary analysis, performed with the use of cumulative logistic regression, the race of the patient was the predictor and the physician's response to the survey question was the ordered outcome.

In the adjusted analysis, we included measures of the payer mix, with binary variables for the categories of charity care and urban or rural location and continuous variables for the proportion of revenue the practice derived from Medicare, Medicaid, and managed-care plans; median income within the area of the ZIP Code of the practice; and the level of the availability of resources in the county in which the practice was located, according to the 2001 Area Resource File. For the analysis of the physicians' ability to gain access to specialists, the measure of available resources was the number of patient care surgeons and medical subspecialists per capita. For the analysis of the physicians' ability to gain access to nonemergency admission and hospital days, the measure of available resources was the number of short-term hospital beds per capita. For the analysis of the physicians' ability to gain access to high-quality imaging, the measure of available resources was the number of patient care radiologists per capita. In a separate analysis (data not shown), adjusted for the median income within the ZIP Code of the patient's residence rather than the ZIP Code of the physician's practice, our findings were similar to those reported here.

To evaluate whether the characteristics of the population of primary care physicians in the geographic area where black patients and white patients received care were similar to those of the physicians who actually saw black patients and white patients in that area, we analyzed data on physicians' characteristics with the use of two geographic categories used in the Dartmouth Atlas of Health Care project: the Hospital Service Area (a small geographic unit) and the Hospital Referral Region (a larger geographic unit) (information on these categories is available at www.dartmouthatlas.org). We analyzed data on all physicians included in our study and generated weighted averages of these characteristics with respect to the geographic location of the visits with black patients and white patients.

Our findings are reported after weighting, which was performed to render them nationally representative. All P values are two-sided. The study was approved by the Center for Medicare and Medicaid Services under Data Use Agreement number 12993. The institutional review board officer at Mathematica Policy Research who oversees the conduct of the Community Tracking Study approved the confidentiality provisions of our study and determined that the Medicare data linkage did not violate the guidelines of the Community Tracking Study.

## RESULTS

### DISTRIBUTION OF VISITS

The distribution of visits by Medicare patients who were white or black among primary care physicians is shown in Figure 1, ordered according to the proportion of black patients in each physician's practice. The height of the bars reflects the number of visits by white patients and black patients. The cumulative-distribution Lorenz curves indicate that the bulk of visits by black patients are clustered among physicians whose patient panels include a higher percentage of blacks, whereas only a small percentage of visits by white patients are with these physicians. Visits by white patients are mostly with physicians who provide only a small amount of care to black patients. Of primary care physicians, 78 percent (68,311 physicians) with a relatively small proportion of black patients in their practice account for 78 percent of the visits by white patients but only 20 percent of all visits by black patients, whereas the remaining 22 percent of primary care physicians (19,492) account for 80 percent of all visits by black patients and 22 percent of visits by white patients. If visits by black patients and white patients were equally distributed among physicians, the Lorenz curves in Figure 1 would be superimposed on each other.

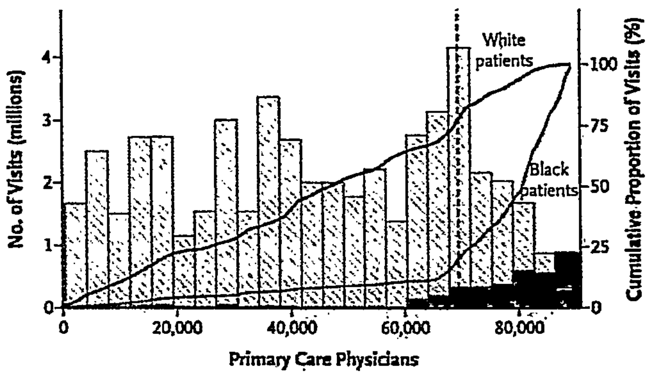

**Figure 1. Estimated National Distribution of Visits to Primary Care Physicians by White Medicare Beneficiaries and Black Medicare Beneficiaries.**

The physicians are shown in order of the proportions of their Medicare patients who are black, as opposed to white. The estimated number of visits by white patients (white hatched bars) and black patients (orange hatched bars) is indicated for each group of physicians, with the width of each bar encompassing 3600 physicians. The cumulative proportion of visits by white patients and by black patients is shown by the cumulative-distribution Lorenz curves. To the right of the vertical dashed line are the 19,492 primary care physicians (22 percent of all primary care physicians) who account for 80 percent of the visits by black Medicare patients and 22 percent of visits by white Medicare patients. To the left of that line are the 68,311 primary care physicians (78 percent of all primary care physicians) who account for 78 percent of all visits by white Medicare patients but only 20 percent of all visits by black Medicare patients.

### CHARACTERISTICS OF PHYSICIANS

Both primary care physicians treating black patients and those treating white patients were typically near 50 years of age, male, non-Hispanic, and working in solo or two-physician practices in an urban location (Table 1). Even though the majority of visits by both black patients (59.7 percent) and white patients (85.3 percent) were to white physicians, visits by black patients were markedly more likely than visits by white patients to be to black physicians (22.4 percent vs. 0.7 percent). Physicians treating black patients provided more charity care, derived a higher percentage of their practice revenue from Medicaid, more often practiced in low-income neighborhoods, and were less likely to have obtained board certification in their primary specialty (77.4 percent vs. 86.1 percent, P=0.02) than physicians treating white patients.

### ACCESS TO IMPORTANT HEALTH CARE SERVICES

The physicians' assessment of their ability to provide particular aspects of care to their patients also differed with respect to the race of the patient (Table 2). When physicians were asked if they were able to provide access to high-quality care for all of their patients, 27.8 percent of physicians treating black patients responded that they could not do so ("disagreed"), as compared with 19.3 percent of physicians treating white patients. They were also more likely than physicians treating white patients to report that they could "not always" provide access for their patients to subspecialists of high quality (24.0 percent vs. 17.9 percent), high-quality diagnostic imaging (24.4 percent vs. 16.6 percent), nonemergency hospital admissions (48.5 percent vs. 37.0 percent), and high-quality ancillary services (36.6 percent vs. 27.7 percent). These findings were significant in both unadjusted and adjusted analyses; the finding with regard to access to specialists was not significant in the cumulative logistic-regression analysis (data not shown).

### GEOGRAPHIC DIFFERENCES AND PHYSICIANS' CHARACTERISTICS

We assessed whether the differences between physicians treating black patients and those treating white patients were associated with the characteristics of physicians practicing in the geographic areas where black patients and white patients received their care (Table 3). This type of geographic

Table 1. Characteristics of Primary Care Physicians According to Visits by White and Black Medicare Beneficiaries.*

| Characteristic of Physicians | Visits by White Patients | Visits by Black Patients | Odds Ratio (95% CI)† | P Value |
|---|---|---|---|---|
| No. of physician–patient pairs | 41,545 | 3211 | | |
| Mean age | 48.3±0.27 | 49.1±0.66 | 1.01 (1.00–1.02) | 0.18 |
| Sex — % (no. of pairs) | | | | |
| Male | 85.6 (34,860) | 82.3 (2491) | 0.78 (0.60–1.02) | 0.07 |
| Female | 14.4 (6685) | 17.7 (720) | 1.00 | |
| Race — % (no. of pairs) | | | | |
| White | 85.3 (35,824) | 59.7 (1947) | 1.00 | <0.001‡ |
| Black | 0.7 (370) | 22.4 (650) | 39.9 (21.1–75.3) | |
| Asian | 11.2 (3939) | 15.7 (483) | 1.69 (1.02–2.81) | |
| Other | 2.7 (1067) | 2.3 (98) | 0.81 (0.44–1.52) | |
| Hispanic ethnic background — % (no. of pairs) | | | | |
| Yes | 3.6 (1458) | 2.8 (97) | 0.78 (0.51–1.20) | 0.26 |
| No | 96.4 (39,925) | 97.2 (3103) | 1.00 | |
| Type of practice — % (no. of pairs) | | | | |
| Hospital or medical school | 16.3 (7428) | 16.5 (781) | 1.00 | 0.29 |
| Solo or two-physician | 42.2 (15,331) | 47.5 (1237) | 1.11 (0.79–1.56) | |
| Group | 34.8 (15,011) | 29.7 (868) | 0.84 (0.60–1.18) | |
| HMO | 1.3 (659) | 0.6 (45) | 0.48 (0.24–0.95) | |
| Other | 5.4 (3116) | 5.7 (280) | 1.04 (0.74–1.45) | |
| Location of practice — % (no. of pairs) | | | | |
| Urban | 73.0 (34,256) | 72.9 (2744) | 1.00 (0.45–2.32) | 0.99 |
| Rural | 27.0 (7289) | 27.1 (467) | 1.00 | |
| Income in area of practice | | | | |
| Mean ±SE | $52,963±777 | $44,045±1876 | 0.97 (0.95–0.99) | <0.001 |
| No. of pairs | 40,722 | 3039 | | |
| Provide some charity care each mo — % (no. of pairs) | | | | |
| Yes | 78.8 (31,317) | 83.4 (2452) | 1.35 (0.98–1.85) | 0.06 |
| No | 21.2 (10,228) | 16.6 (759) | 1.00 | |
| Source of practice revenue — % (no. of pairs) | | | | |
| Medicare | 42.0±0.69 (41,545) | 40.8±1.46 (3211) | 1.00 (0.99–1.00) | 0.43 |
| Managed care | 37.0±1.10 (41,545) | 35.0±1.82 (3211) | 1.00 (0.99–1.00) | 0.14 |
| Medicaid | 9.3±0.37 (41,545) | 13.4±0.73 (3211) | 1.03 (1.02–1.04) | <0.001 |
| Primary care specialty — % (no. of pairs) | | | | |
| Internal medicine | 56.1 (20,898) | 65.4 (1884) | 1.00 | 0.26 |
| Family practice | 39.9 (18,881) | 30.4 (1173) | 0.65 (0.39–1.09) | |
| General practice | 4.0 (1766) | 4.2 (154) | 0.90 (0.58–1.39) | |
| Medical education — % (no. of pairs) | | | | |
| Graduate of U.S. medical school | 81.9 (34,531) | 79.2 (2528) | 0.85 (0.60–1.18) | 0.32 |
| Graduate of foreign medical school | 18.2 (7014) | 20.8 (683) | 1.00 | |
| Board certification — % (no. of pairs) | | | | |
| Board certified | 86.1 (36,570) | 77.4 (2644) | 0.55 (0.33–0.92) | 0.02 |
| Not board certified | 13.9 (4822) | 22.6 (559) | 1.00 | |

* Plus–minus values are means ±SE. Number of pairs refers to the number of physician–patient pairs. Means and percentages for a given characteristic reflect weighted estimates and may not bear a numerical relation to the number of pairs. CI denotes confidence interval, and HMO health maintenance organization. A group practice was considered to include three or more physicians.

† For categorical variables, the odds ratio represents the likelihood that the patient in a given physician–patient pair, represented by a visit, is black as opposed to white. For continuous variables, the odds ratio represents the likelihood that the patient in a given physician–patient pair is black as opposed to white for each unit of increase (i.e., one year of age, $1,000 of income in the location of the practice, or an increase of 1 percent in the revenue of the practice).

‡ Hypothesis tests excluded 8 of the 60 sites in the Community Tracking Study Survey, because not all race or ethnic group combinations were present in these sites.

**Table 2. Primary Care Physicians' Perceptions of the Quality of Care Provided in Relation to the Race of Patient.***

| Index of Quality of Care | Visits by White Patients | Visits by Black Patients | Unadjusted Odds Ratio (95% CI)† | P Value | Adjusted Odds Ratio (95% CI)† | P Value |
|---|---|---|---|---|---|---|
| Access to high-quality specialists — % (no. of pairs) | | | | | | |
| Always | 82.1 (33,271) | 76.0 (2437) | 0.69 (0.47–1.01) | 0.05 | 0.67 (0.46–0.99) | 0.04 |
| Not always | 17.9 (8189) | 24.0 (774) | 1.00 | | 1.00 | |
| Access to high-quality diagnostic imaging — % (no. of pairs) | | | | | | |
| Always | 83.4 (34,443) | 75.6 (2449) | 0.62 (0.42–0.91) | 0.01 | 0.60 (0.43–0.84) | 0.003 |
| Not always | 16.6 (7082) | 24.4 (762) | 1.00 | | 1.00 | |
| Access to nonemergency hospital admission — % (no. of pairs) | | | | | | |
| Always | 63.0 (23,414) | 51.5 (1613) | 0.62 (0.48–0.81) | <0.001 | 0.69 (0.53–0.90) | <0.001 |
| Not always | 37.0 (13,946) | 48.5 (1261) | 1.00 | | 1.00 | |
| Access to an adequate number of inpatient days — % (no. of pairs) | | | | | | |
| Always | 63.4 (24,058) | 55.1 (1549) | 0.71 (0.50–1.00) | 0.05 | 0.74 (0.52–1.05) | 0.08 |
| Not always | 36.6 (13,761) | 44.9 (1328) | 1.00 | | 1.00 | |
| Access to high-quality ancillary services — % (no. of pairs) | | | | | | |
| Always | 72.3 (29,556) | 63.4 (2039) | 0.66 (0.47–0.95) | 0.02 | 0.69 (0.49–0.97) | 0.03 |
| Not always | 27.7 (11,875) | 36.6 (1168) | 1.00 | | 1.00 | |
| Able to deliver high-quality care to all patients — % (no. of pairs) | | | | | | |
| Agree | 80.7 (32,588) | 72.2 (2398) | 0.62 (0.44–0.87) | 0.005 | 0.68 (0.48–0.95) | 0.02 |
| Disagree | 19.3 (7960) | 27.8 (688) | 1.00 | | 1.00 | |
| Have good communication with subspecialists — % (no. of pairs) | | | | | | |
| Agree | 88.5 (34,773) | 85.9 (2573) | 0.79 (0.55–1.13) | 0.19 | 0.77 (0.54–1.09) | 0.14 |
| Disagree | 11.5 (5638) | 14.1 (584) | 1.00 | | 1.00 | |

* Number of pairs refers to the number of physician–patient pairs. Values are weighted and may not bear a numerical relation to the number of pairs. CI denotes confidence interval.

† For each variable, the odds ratio represents the likelihood that the patient in a given physician–patient pair, represented by a visit, is black as opposed to white. Adjusted odds ratios have been adjusted for payer mix, with binary variables for the categories of charity care and urban or rural location and continuous variables for the proportion of revenue the practice derived from Medicare, Medicaid, and managed-care plans; median income within the area of the ZIP Code of the practice; and the level of the availability of resources of the county in which the practice was located, according to the 2001 Area Resource File.

explanation of the quality of health care has been explored in other studies of racial differences in health care.[27,28]

The degree of racial concordance between patient and physician appeared greater than what would be expected if the local availability of physicians of different races were the only explanation of the matching of the patient's and physician's race (Table 3). Of visits by black patients in our study, 22.4 percent were to physicians who were black, whereas in the Hospital Service Areas and Hospital Referral Regions, the percentage of black physicians was lower — 12.5 percent and 6.7 percent, respectively — a finding that supports the hypothesis that black patients preferentially seek care from primary care physicians of their own race.[29,30]

Other characteristics of the primary care physicians treating white patients and those treating black patients were similar to the overall population of primary care physicians in the geographic areas where the visits occurred. For example, 77.4 percent of visits by black patients were to physi-

**Table 3. Characteristics of Primary Care Physicians Who Treated White Patients and Those Who Treated Black Patients and of the Overall Population in the Areas Where Visits Occurred.***

| Variable | White Patients | | | Black Patients | | |
|---|---|---|---|---|---|---|
| | Patient Visits | Average in Hospital Service Area | Average in Hospital Referral Region | Patient Visits | Average in Hospital Service Area | Average in Hospital Referral Region |
| | *percentage of physicians* | | | | | |
| **Physician characteristic** | | | | | | |
| Race | | | | | | |
| White | 85.3 | 81.5 | 80.1 | 59.7 | 69.7 | 75.2 |
| Black | 0.7 | 2.5 | 3.5 | 22.4 | 12.5 | 6.7 |
| Asian | 10.3 | 13.0 | 13.2 | 15.7 | 13.0 | 14.8 |
| Other | 2.5 | 3.0 | 3.2 | 2.3 | 4.8 | 3.3 |
| Board certified | 86.1 | 85.5 | 85.1 | 77.4 | 77.7 | 80.1 |
| **Index of quality of care** | | | | | | |
| Access to services | | | | | | |
| High-quality specialists | 82.1 | 79.7 | 79.2 | 76.0 | 76.6 | 78.8 |
| Diagnostic imaging | 83.4 | 81.1 | 80.7 | 75.6 | 76.7 | 79.6 |
| Hospital admission | 63.0 | 62.3 | 62.0 | 51.5 | 56.1 | 59.5 |
| Days in hospital | 63.4 | 61.8 | 61.4 | 55.1 | 55.7 | 58.6 |
| Ancillary services | 72.3 | 69.6 | 69.2 | 63.4 | 63.9 | 66.9 |
| Able to provide high-quality care | 80.7 | 79.8 | 79.7 | 72.2 | 75.3 | 77.9 |
| Good communication with subspecialists | 88.5 | 86.1 | 85.3 | 85.9 | 84.8 | 85.3 |

* Location is defined according to categories used in the Dartmouth Atlas of Health Care Project as the Hospital Service Area (a small geographic unit) and the Hospital Referral Region (a larger geographic unit). Data show percentages of responses of primary care physicians participating in the Community Tracking Study Physician Survey in 2000 and 2001. Each patient visit is categorized according to whether the patient is white or black.

cians who were board certified; the average rates of board certification in the areas where the visits occurred were 77.7 percent according to the Hospital Service Area and 80.1 percent according to the Hospital Referral Region.

## DISCUSSION

We evaluated the hypothesis that differences between primary care physicians who treat black patients and those who treat white patients play a role in health care disparities. We found that visits by black patients were highly concentrated among a small subgroup of primary care physicians, were more often with physicians who were not board certified in their primary specialty, and were more often with physicians who reported facing obstacles in gaining access to high-quality services for their patients. Each of these observations potentially has implications for disparities in health care.

In our study, the great majority of the visits by black patients (80 percent) were to a small group of primary care physicians (22 percent of the total), whereas the remaining physicians (78 percent) accounted for the majority of visits by white patients. This finding indicates that the care of black patients and white patients rests to a large extent in the hands of different physicians. Disparities in health care could emerge if these two groups of physicians differed in their ability to provide high-quality care, either because of differences in their clinical training or because of differences in their access to resources. In addition, our study shows that it would be possible to identify physicians who treat black patients or who treat white patients through claims databases.

The differences in the rates of board certification between the two groups of physicians support the notion that the poorer quality of care received by black patients may in part result from the fact that their physicians are less well trained than those who mostly treat white patients. For instance, the rates of screening for most diseases are lower among black patients than among white patients, and black patients more often than white patients receive diagnoses when diseases are at a relatively advanced stage. Previous research has shown that physicians who scored poorly on their licensure examinations or who are not board certified in their specialty are less likely to follow screening recommendations and more likely to prescribe symptom-directed treatment, rather than diagnosis-directed treatment — tendencies that may result in delayed diagnoses.[31-35]

The differences in physicians' reported ease of access to services for their patients point to additional mechanisms underlying health care disparities. Differences in access to subspecialists, imaging studies, nonemergency hospital admission, and ancillary services might help explain why black patients see fewer subspecialists and receive less timely treatment for complex chronic illnesses than do white patients.[36-39]

Our findings should be interpreted within the context of the data that we analyzed. The responses of physicians regarding access to resources are necessarily subjective and reflect the physicians' experience with all their patients, not only with the Medicare patients included in our analysis. Moreover, we cannot be certain of the extent to which differences in physicians' responses signify differences in the care that their patients received, because we did not examine patients' outcomes. We could not consider the role of some other identified deficiencies in primary care of black patients. For example, predominantly black communities have fewer primary care doctors than predominantly white communities; black patients are more likely than white patients to receive care in inpatient and emergency-department settings, rather than outpatient settings; and a larger fraction of visits for primary care by black patients are to physicians with whom the patients do not have an established relationship.[40-42]

Because health care disparities are pervasive and because the disparities are not due solely to differences in the patients' insurance coverage, hypotheses regarding the role of physicians in their genesis have emerged. One hypothesis is that most physicians, because they are not black, lack the necessary cultural competence needed to treat black patients effectively.[43] To redress this problem, many organizations have recommended that the physician workforce be enriched with more physicians who are members of minority groups and that training in cultural competence be mandated.[44] Our findings provide an indication of the extent to which black patients are currently receiving care from black physicians and of the extent to which these patients appear to make a special effort to do so.[45-49]

Without vitiating these hypotheses, our findings reveal other imbalances in the health care system that may underlie disparities in the delivery of health care. Black patients in the Medicare program, and presumably other black patients as well, are treated by a group of physicians who may differ in important ways from the physicians who treat white patients. That these differences reflect characteristics of the physicians who practice where black persons and white persons receive care suggests that our findings are the result of the distribution of physicians in the United States and not patients' choice. Further research is needed to evaluate the extent to which differences in training and resources between physicians who treat black patients and physicians who treat white patients affect patients' outcomes. Then, we could explore whether efforts to reduce disparities in the provision of health care should be focused on improving the care that physicians who treat black patients are able to deliver.

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# RACIAL DISPARITIES AND SITE OF CARE

Peter B. Bach, MD, MAPP

Numerous studies have demonstrated that minority patients receive poorer quality health care than non-minorities. The mechanisms underlying this problem have not been identified, but the pervasiveness and consistency of racial and ethnic differences in healthcare quality have led most investigators to identify at most one or two overarching causes. To some, the consistency of these findings supports a hypothesis that physicians are at the heart of the problem. It is posited that due to sub-conscious biases, more overt prejudice, or cultural insensitivity, physicians do not treat minority patients as well as they treat non-minority patients. This hypothesis has received a great deal of attention, both in reviews from the Institute of Medicine and position statements from the American Medical Association and National Medical Association. In this paper, I review several studies that have focused on an alternative potential mechanism of racial and ethnic disparities in health care; which is based more on inequities in the structure of the healthcare system, rather than inequities in the treatment patterns of individual physicians. Determining the relative contribution of each of these mechanisms to racial and ethnic disparities in health care should be a priority. (*Ethn Dis.* 2005;15[suppl 2]:S2-31–S2-33)

**Key Words:** Racial Disparities, Physician Bias, Healthcare Inequities

From Memorial Sloan-Kettering Cancer Center, New York, New York.

Address correspondence and reprint requests to Peter B. Bach, MD, MAPP; Memorial Sloan-Kettering Cancer Center; 1275 York Avenue, Box 221; New York, NY 10021; 646-735-8137; 646-735-0011 (fax); bachp@mskcc.org

## INTRODUCTION

Decades of research have demonstrated two related deficiencies in the United States healthcare system. The quality of care in the United States is low overall[1,2]; and particular vulnerable groups of patients, such as those who are non-White, poor, or elderly, systematically receive lower quality care than their less vulnerable counterparts.[3–7] Most of these studies have focused on large, representative datasets and examined either determinants of quality or the quality of care provided to vulnerable groups, but not both. As such, the relative contribution of variations in quality overall to variations in quality between vulnerable and less vulnerable patients have not been disaggregated. As emphasized in a recent Request for Applications from the National Institutes of Health:

> "the documentation of wide-spread disparities. . . has been an important contribution of outcomes and effectiveness research. Nevertheless, these insights have infrequently led to significant improvements in racial and ethnic disparities, in part, because the causes of and contributing factors to these inequalities are inadequately understood."[8]

In this article, I review several recent studies, in which researchers have endeavored to identify to what extent variations in care between vulnerable and less vulnerable patients are explained by systemic variations (ie, structural variations) in quality of care. Although these studies use both different analytic methods and analyze different metrics, they all have the same basic intent, which can be summarized in epidemiologic terms: to determine to what extent variations in care quality between patient groups are confounded by variations in quality of care settings. The studies also all focus on patients divided by their race or ethnicity.

## REVIEW OF STUDIES

### Differences in the Healthcare System Quality by Patient Race/Ethnicity

Bach et al evaluated primary care physicians who treated Black and White Medicare beneficiaries in 2001.[9] The purpose of the study was to first determine to what extent Black and White Medicare beneficiaries were treated by different groups of physicians, and then to determine if there were systematic differences between the two groups of physicians. In this analysis, the investigators observed that the care of Black and White Medicare beneficiaries rests to a large extent in the hands of different physicians, with the care of 80% of Blacks being provided by only one-fifth of all physicians. When comparing the physicians treating Blacks and Whites, the authors found that the physicians treating Blacks were less likely to be board- certified in their primary specialty, and more likely to report that they faced obstacles when trying to refer their patients to specialists for imaging tests or for elective hospital admission. Most of these findings were paralleled in analyses focusing on the geographic areas where Blacks and Whites received care, in that the physicians treating Blacks and Whites mirrored those who worked in the neighborhood in general. This study provides some evidence that the disparities in care received by Blacks and Whites may in part be due to differences in the qualifications or resources of their providers. However, this study neither demonstrated that the physicians treating Blacks and Whites actually provided different quality of care to their patients, nor did it deter-

**Table 1. Association between patient race and hospital volume**

| Hospital Volume | Very Low | Low | Medium | High | Very High |
|---|---|---|---|---|---|
| Pancreatectomy (% Blacks) | 8.7 | 8.0 | 6.8 | 6.0 | 5.0 |
| Esphagectomy (% Blacks) | 12.0 | 7.6 | 6.7 | 6.5 | 5.5 |

mine to what extent racial disparities are explained by this difference in treating physicians.

Chandra and Skinner evaluated sites of cardiac care for Blacks and Whites experiencing a myocardial infarction, in order to address a similar set of hypotheses.[12] In this study, the investigators also examined only Medicare beneficiaries. They found that 50% of Black care occurred in a subset of hospitals in which only 14% of non-Blacks received care, and also cited a related study showing that the quality of the myocardial infarction care was lower at the hospitals where Blacks were more likely to go. This study not only shows that Blacks and Whites receive their care to a great extent from different providers in different settings, but also supports the hypothesis that the differences in site of care are probably linked to differences in care quality. However, the investigators did not determine to what extent care differences between Blacks and Whites were due to the differences in care settings.

Birkmeyer et al have performed several analyses of surgical outcomes, showing that when care is stratified by either the procedure volume of the hospital or the performing surgeon, outcomes are superior in association with higher volume.[10,11] Coupled with this finding, Birkmeyer et al have shown that the volume of a procedure performed at a particular hospital is inversely associated with the percentage of patients treated at that hospital who are Black. The findings are shown for esophagectomy and pancreatectomy in Table 1, the two procedures for which volume is associated with the greatest difference in outcome. This study provides similar information to that emerging from the study of Chandra and colleagues.[12] Blacks receive their care to some extent in lower quality facilities than Whites. The extent to which this pattern explains disparities in outcome is not defined.[13]

## Studies That Use Stratified Analyses to Disaggregate System Effects

There are not too many studies that have performed this type of analysis, perhaps because it is difficult to accumulate enough high-quality data to permit for the construction of multiple strata that contain a sufficient number of events. However, stratified analyses can allow an investigator to directly determine to what extent healthcare disparities are due to differences in care setting. Schneider et al[4] examined care received by Black and White Medicare beneficiaries enrolled in Health Maintenance Organizations (HMOs), as indicated by performance on 'HEDIS' measures (a set of measures proposed by the National Committee on Quality Assurance). The example they cited for differences in treatment of Blacks and Whites and its relation to care setting focused on mammography. Overall, race was associated with mammography rates, which differed by 8% between White and Black women aged 65 to 75 (70.9% vs 62.9% respectively, $P<.001$). The investigators stratified the 294 HMO plans in the study based on the proportion of Blacks enrolled, which served to separate those plans who provided most of the care to Blacks from those that provided only a small amount of care to Blacks. The investigators observed that in those plans with the greatest number of Black patients, the mammography rates were only 60% for Whites and 58% for Blacks. In those plans with the fewest number of Black patients, the White and Black mammography rates for women were much higher: 76% and 74%, respectively. This study suggests that an important source of healthcare disparities is the site of care, in that the investigators documented that Blacks and Whites were treated in different settings, that the care provided in settings where Blacks received more care was lower quality overall, and that the aggregate differences in care between Blacks and Whites overall was explained by differences in care setting.

## Studies That Use Multi-Variable or Hierarchical Modelling to Disaggregate Structural Effects from Race/Ethnicity Effects

Some other studies have used multivariable methods to disaggregate the effects of treatment site from the effects of race. Skinner et al, for instance, examined rates of knee arthroplasty for several groups of Medicare beneficiaries, noting that the rates of knee arthroplasty for White men were more than twice that for Black men (4.82 vs 1.84 per 1000).[15] The investigators then assessed whether the fact that Blacks and Whites reside in different geographic regions of the country explains the overall large difference, under the hypothesis that the overall quality of care probably varies between regions. Specifically, they hypothesized that Blacks predominantly reside in regions with low rates of knee arthroplasty, while Whites reside in regions with high rates of arthroplasty. Stratifying at the level of the Hospital Referral Region, the investigators demonstrated that clustering of Black patients in low arthroplasty regions led to 25% of the total racial differences in care quality.

Bradley et al analyzed data from a

representative sample of patients with acute myocardial infarction, analyzing at the hospital level, rather than the small geographic unit. The authors observed that overall times, with variances adjusted for clustering of patients within hospital, were greater for Blacks than Whites in terms of time for 'door to drug' (+7.3 minutes, 6.4–8.3) and 'door to balloon' (+18.9 minutes, 16.5–21.4). Then, they re-analyzed their findings in hierarchical models that included random effects for each hospital, and found that the difference between Blacks and Whites was explained by 14% and 33%, respectively. This result is consistent, the authors argued, with overall differences reflecting in part "differences between the hospitals in which patients were treated."[14]

In both of these studies, statistical methods were used to account for the clustering of Blacks and Whites in different care settings, and in each case, less than half of the difference in care quality between Blacks and Whites appears to be due to differences in care setting or geographic location.

## DISCUSSION

Determining the causes of health disparities is an important first step in the creation of programs to reduce them. At the time of the Institute of Medicine's report on Unequal Treatment, few studies had examined to what extent differences in treatment might be due to differences in care settings between Blacks and Whites. Moreover, the hypothesis was not really widely considered. Since that time, a number of studies have provided evidence that suggests that at least some of healthcare disparities are due to such differences. To the extent that Whites and Blacks receive their care in different settings and those settings vary in their quality, specific interventions might be considered to improve the care in those latter settings. However, more studies are needed before that determination can be made.

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Robert Wood Johnson Foundation

# Early Origins of Health Disparities

## Burden of Infection, Health, and Socioeconomic Status in U.S. Children

This article examined the relationship between socioeconomic status and rates of chronic infection in children. Infection or inflammation in children may predispose them to chronic disease and play a role in later-life health disparities.

Researchers used biomarker data from the Third National Health and Nutrition Examination Survey (NHANES) to relate information on children's common chronic infections with height-for-age and asthma to their socioeconomic status.

Key Findings:

- Higher rates of infection were associated with lower family income, lower levels of parental education, and belonging to a racial/ethnic minority.
- Burden of infection was associated with lower height-to-age ratios, suggesting childhood growth and development may be related to infectious environments.

The rate of chronic infection in children varies by socioeconomic conditions and may lead to health disparities early in life.

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# Early origins of health disparities: Burden of infection, health, and socioeconomic status in U.S. children

Jennifer Beam Dowd[a,*], Anna Zajacova[b], Allison Aiello[b]

[a] Hunter College, School of Health Sciences, and CUNY Institute for Demographic Research, 425 E. 25th St., New York, NY 10010, USA
[b] University of Michigan, Ann Arbor, MI, USA

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ABSTRACT

Recent work in biodemography has suggested that lifetime exposure to infection and inflammation may be an important determinant of later-life morbidity and mortality. Early exposure to infections during critical periods can predispose individuals to chronic disease, in part through the reallocation of energy away from development needed for immune and inflammatory responses. Furthermore, markers of inflammation are known to vary by socioeconomic status in adults and may contribute to overall socioeconomic health inequalities, but little is known about how the sources of this inflammation differ over the life course. This paper uses novel biomarker data from the Third National Health and Nutrition Examination Survey (NHANES III) to test the association of the burden of common chronic infections (*Helicobacter pylori* (*H. pylori*), cytomegalovirus (CMV), herpes simplex virus-1 (HSV-1), hepatitis A and hepatitis B) with height-for-age and asthma/chronic respiratory conditions in U.S. children ages 6 and older, and the association of these chronic infections to children's socioeconomic status. A higher burden of infection is found to be associated with lower height-for-age as well as an increased likelihood of asthma net of race/ethnicity, family income, and parental education. Children with lower family income, lower parental education, and non-white race/ethnicity have a higher likelihood of infection with several individual pathogens as well as the overall burden of infection. Differential exposure and/or susceptibility to infections may be one mechanism through which early social factors get embodied and shape later-life health outcomes.

## Background

Recent work in biodemography has suggested that reductions in lifetime exposure to infection and inflammation may have been an important determinant of cohort declines in later-life morbidity and mortality. Crimmins and Finch argue that cohorts with lower infectious disease mortality in childhood can be characterized by a "cohort morbidity phenotype" that links their early-life experience to later-life cohort mortality patterns (Crimmins & Finch, 2006; Finch & Crimmins, 2004). More broadly, life-course epidemiology has drawn attention to the potential long-term impacts of early-life exposures for the development of chronic disease (Ben-Shlomo & Kuh, 2002). Social scientists are also increasingly drawing links between early-life conditions and later-life outcomes (Case, Fertig, & Paxson, 2005; Hayward & Gorman, 2004; Heckman, 2006), however, the precise biological pathways linking early-life conditions to later-life outcomes are not well understood.

Early exposure to infections during critical periods is thought to predispose individuals to chronic disease, in part through the reallocation of energy away from development needed for immune and inflammatory responses (McDade, 2005). Early environments may model immune and inflammatory responses for the remainder of the life course. It is well known that socioeconomic status (SES) is consistently associated with adult health outcomes. Childhood socioeconomic status may shape early-life exposures such as chronic infections, with potentially important implications for later chronic disease. Infections may have a direct impact not only on adult health, but also on future socioeconomic outcomes. For example, *in utero* exposure to the 1918 flu pandemic has been found to increase the risk of health outcomes including cancer, hypertension, and heart disease, as well as lower educational attainment and income (Almond, 2006; Almond & Mazumder, 2005). These results illustrate the potential for early-life infections to influence human capital accumulation as well as health, reinforcing health inequalities across the life course.

In contemporary cohorts, markers of inflammatory proteins such as C-reactive protein (CRP) have been found to vary by socioeconomic status in U.S. adults (Alley et al., 2006; Loucks et al.,

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[*] Corresponding author. Tel.: +1 734 358 6473.
*E-mail address:* jdowd@hunter.cuny.edu (J.B. Dowd).

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2006; Ranjit et al., 2007). The sources of these differences in adult inflammation are less clear, but differences in pathogen burden are one possibility (Zhu, Quyyumi, Norman, Csako, et al., 2000). Infections elicit an inflammatory response from the innate immune system upon entry into the body, and chronic infections may elicit a persistent inflammatory response (Eskandari & Sternberg, 2002; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Segerstrom & Miller, 2004).

Seroprevalence rates of several persistent infections have been found to differ among adults by race/ethnicity and socioeconomic status in the U.S. (Dowd, Aiello, & Alley, 2008; McQuillan et al., 2004; Zajacova, Dowd, & Aiello, in press). If differences by socioeconomic status or race/ethnicity exist in the early acquisition of lifelong chronic infections, this might contribute to later-life health inequalities in two ways: through direct links to later-life health and/or through effects on cognitive functioning and human capital accumulation. Currently, little is known about whether differences in chronic infections exist during the critical early ages in U.S. children.

### *Infections and chronic disease*

In addition to the idea that the lifelong burden of infection may help explain cohort changes in life expectancy over the last century (Finch & Crimmins, 2004), there is growing epidemiological evidence linking specific chronic infections to chronic disease outcomes in contemporaneous populations. For example, herpesviruses such as cytomegalovirus (CMV) and herpes simplex virus type 1 (HSV-1) have been linked to inflammatory processes, cardiovascular disease, frailty, cognitive outcomes, and Alzheimer's disease (Aiello et al., 2006; Itzhaki, Wozniak, Appelt, & Balin, 2004; Liu et al., 2006; Schmaltz et al., 2005; Sorlie et al., 2000). Focusing earlier in the life course, recent work has suggested a link between fetal exposure to herpesviruses and preterm birth (Gibson et al., 2008). Exposure to CMV and HSV-1 is very common in early life (Staras et al., 2006), with average seroprevalence in the U.S. close to 50% in the 20–29 age group, rising to 89% by ages 70–79 (Staras et al., 2006). Although infection with CMV and HSV-1 often passes undiagnosed because of their asymptomatic properties, these viruses remain latent in the host for life, with risk of reactivation due to stress and aging (Koch, Solana, Rosa, & Pawelec, 2006). Most people will be infected with these viruses by the time they reach older ages, but it is possible that individuals infected earlier in life will face a greater pro-inflammatory toll over their life course.

In addition to herpesviruses, several other pathogens have been linked to the development of chronic disease. *Helicobacter pylori* (*H. pylori*) can lie dormant in the body for decades until the bacteria-host equilibrium is disturbed. Besides its well-known role in peptic ulcer disease, *H. pylori* is the major risk factor for gastric cancer. *H. pylori* has also been implicated in the development of stroke and ischemic heart disease through suggested pathways including chronic inflammation, lipid alterations, and endothelial dysfunction (Manolakis, Kapsoritakis, & Potamianos, 2007). *H. pylori* has also been explicitly implicated in growth impairment in children (Mohammad, Hussein, Coward, & Jackson, 2008; Prentice & Darboe, 2008). Hepatitis B virus (HBV), known for its role in chronic liver disease, has been hypothesized to contribute to artherogenic diseases via systemic effects on immune response and colonization of vascular tissues, though the evidence for its association with stroke and myocardial infarction is mixed (Ishizaka et al., 2002; Rong et al., 2007; Sung, Song, Choi, Ebrahim, & Davey Smith, 2007). Hepatitis A (HAV), though commonly thought to be eliminated from the body after acute infection, may also persist in the host or establish a chronic, subclinical inflammatory condition. Seropositivity to hepatitis A was found to be associated with both coronary artery disease (CAD) and elevated C-reactive protein (CRP) levels in U.S. adults, after controlling for age, race, sex, smoking, diabetes, cholesterol, hypertension, other infections, and occupational status (Zhu, Quyyumi, Norman, Costello, et al., 2000). Beyond the impact of individual infections, there is developing evidence that the presence of multiple chronic infections may contribute to disease through an overall downregulation of immune function and a systemic pro-inflammatory environment (Elkind & Cole, 2006; Espinola-Klein et al., 2002; Fernandez-Real et al., 2006; Zhu, Quyyumi, Norman, Csako, et al., 2000).

### *Infections and health outcomes in children*

#### *Height*

Although much prior research has focused on links between infections and adult chronic health outcomes, the health costs of early infections may manifest themselves earlier in the life course. One potential marker of the costs of infection is differences in growth, which has rarely been explored in children in developed countries. Crimmins and Finch suggest that cohort differences in infectious burden are reflected in differences in adult height as a result of the high metabolic demands of the inflammatory response (Crimmins & Finch, 2006). Pro-inflammatory cytokines such as TNF-alpha and Interleukin-6 released in response to infection may directly affect the process of bone remodeling required for long bone growth, and direct viral infection of osteoclasts and osteoblasts has also been detected (Stephensen, 1999). Other mechanisms through which chronic infections are thought to affect growth include lower food intake, impaired nutrient absorption and direct nutrient loss (Stephensen, 1999). Height may also be a useful marker of broader health capital. Adult height has been of interest to economists due to its consistent relationship with wages, performance on cognitive tests, and longevity (Case & Paxson, 2006; Deaton, 2007).

#### *Asthma*

Asthma causes considerable morbidity in U.S. children and is the third leading cause of hospitalization in persons 18 or under in the United States (Eder, Ege, & von Mutius, 2006). Debate around the secular trend in increased asthma and other allergic diseases has focused on the "hygiene hypothesis," the idea that modern under-exposure to infectious agents may lead to immature and pro-allergic immune responses (Liu, 2007; Strachan, 1989). On the other hand, asthma is an inflammatory airway condition that may be exacerbated by infection-induced production of pro-inflammatory cytokines such as IL-6, which have been found to contribute to the structural remodeling of the airway wall in chronic asthma (Rodel et al., 2000). The expected association of infectious burden with reported asthma in U.S. children is thus not clear a priori.

This paper seeks to bring together these different lines of research with novel biomarker data to test (1) whether the burden of common chronic infections including *H. pylori*, cytomegalovirus (CMV), herpes simplex virus-1 (HSV-1), hepatitis A virus (HAV) and hepatitis B virus (HBV) is related to socioeconomic status in U.S. children ages 6–16, and (2) whether this infectious burden is associated with height-for-age or reported asthma/chronic respiratory conditions in U.S. children.

## Data

The analyses are based on data from the National Health and Nutrition Examination Survey (NHANES III), collected between 1988 and 1994. NHANES III contains a cross-sectional representative sample of the U.S. civilian non-institutionalized population, with an oversample of Mexican-Americans and non-Hispanic blacks. Data were collected in household face-to-face interviews and medical examinations, which included the collection of blood and urine for laboratory tests. Data were collected in two phases, phase 1 from 1988 to 1991 and phase 2 from 1991 to 1994. Each phase was designed to be individually nationally representative. Details of the sampling design and protocol are available from National Center for Health Statistics (Gunter, Lewis, & Koncikowski, 1996). For the youth sample, there was over a 90% response rate to the initial interview portion of survey (Schafer et al., 1996) and 6936 children age 6–16 were included in the interview sample. Of these, 606 (8.7%) were missing data on family income. Those missing income data were more likely to be Mexican-American and have less parental education than those not missing. Of the remaining 6330 respondents, 1407 (22.2%) did not have their blood drawn during the medical examination. Higher child's age and non-white race/ethnicity were associated with a greater likelihood of having blood drawn. Of the 4923 respondents with blood drawn, 4342 (88.2%) had data on at least one infection although 198 (4.6%) were missing data on one or more of the three infections that were tested in both survey waves and all age groups (CMV, HAV, HBV). Those missing data for one or more of these infections were slightly more likely to be black, but did not significantly differ in family income or education, nor did they significantly differ in average height-for-age or reported asthma/chronic respiratory conditions. *H. pylori* was only tested on samples from phase 1 of the survey, so all analyses directly including *H. pylori* have a smaller samples size ($N = 1962$). Each phase of the survey was designed to be separately nationally representative, so missingness by phase can be considered completely at random. Similarly, HSV-1 was only tested on samples of children 12 and over, limiting analyses including HSV-1 to a sample size of 1379. We excluded additional observations with missing data on parental education ($N = 23$) and either one of the two health outcomes ($N = 7$). There were no missing values on age, gender, race, and region. The final number of observations used in analyses was 4319.

## Measures

### Sociodemographics

Childhood socioeconomic status was measured using the years of education of the household reference person and annual family income. Family income was coded as the midpoint of each of the 26 reported categories (using $65,000 for the incomes above $50,000) and adjusted for inflation between the two NHANES III phases using the Consumer Price Index. Income was log-transformed due to the skewness of the distribution. Education was measured as the highest completed year of schooling and was used in models as a continuous predictor or as a trichotomized measure, with less than 12 years, 12 years (reference), and more than 12 years. Race/ethnicity was categorized into four groups (non-Hispanic white (reference), non-Hispanic black, Mexican-American, and Other). Other control variables included age (in years), sex (male as reference), and region of residence (Northeast as reference).

### Individual infections

We used seropositive status for *H. pylori*, CMV, HSV-1, HBV, and HAV, coded as 1 = seropositive, 0 = seronegative. *H. pylori* serologic testing was done using a commercial Immunoglobulin G (IgG) Enzyme-Linked ImmunoSorbent Assay (ELISA) (Wampole Laboratories, Cranbury, NJ) (NHANES III second laboratory data file documentation, Series 11, No. 2A, 1998). *H. pylori* testing was conducted on samples from phase 1 only. CMV specific IgG seropositivity was measured with an ELISA (Quest International Inc., Miami, FL) (NCHS, 2006). Solid-phase enzymatic immunodot assays were used to detect antibody seropositivity to HSV-1 (NHANES III second laboratory data file documentation, Series 11, No. 2A, 1998). HSV-1 serostatus was obtained only for respondents ages 12 and older. Hepatitis B serostatus was determined by core antigen enzyme-linked immunoassay (CORAB, Abbott Laboratories) (Gunter et al., 1996). Hepatitis A serostatus was determined using a commercially available enzyme immunoassay (HAVAB-EIA, Abbott Laboratories, Abbott Park, Illinois) (Bell et al., 2005).

### Burden of infection

Serostatus of *H. pylori*, CMV, HSV-1, HAV, and HBV was used to construct a latent infection burden variable using a confirmatory factor analysis.

### Outcomes

Height was measured at the medical examination. The value was converted into a sex- and age-specific z-score, based on the 2000 CDC growth charts. Chronic respiratory conditions were measured by parental report of whether a doctor ever said the child had asthma or chronic bronchitis (0 = no, 1 = yes).

Descriptive statistics for the analysis sample are shown in Table 1. Among U.S. children aged 6–16, seroprevalence of *H. pylori* was 26.4%, CMV 38.5%, hepatitis A 9.9%, and hepatitis B 1.8%. Among children ages 12–16, seroprevalence of HSV-1 was 41.6%. Almost 15% of children have been told by their doctor that they have asthma or chronic bronchitis. The average educational attainment for a reference person in the household was 12.5 years and the mean family income was just over $37,000. The distribution of race reflects closely the total population distribution in this age group, with non-Hispanic white children comprising 67.8% of the sample, non-Hispanic black children 14.5%, Mexican-American children 8.3% and other race/ethnic groups 9.4%.

## Methods

First, we calculated means (s.e.) and proportions for key analysis variables. Next we estimated tetrachoric (polychoric) correlations among the five infection seropositivity status indicators and used a likelihood ratio test to determine whether the correlations were statistically significant. Logit models were then used to estimate the association of race/ethnicity, education, and income with seropositivity to individual infections, as well as the association

**Table 1**
Descriptive statistics; children age 6–16, NHANES III.

| | Mean or proportion | Standard error |
|---|---|---|
| Age | 11.1 | (0.10) |
| Household size | 4.7 | (0.06) |
| Income (Infl.-adjusted dollars) | $37,104.4 | (1273.9) |
| Education of head (years) | 12.5 | (0.13) |
| Female | 49.0% | |
| Race | | |
| Non-Hispanic white | 67.8% | |
| Non-Hispanic black | 14.5% | |
| Mexican-American | 8.3% | |
| Other race/ethnic groups | 9.4% | |
| Infections – proportion seropositive | | |
| *H. pylori* | 26.4% | |
| CMV | 38.5% | |
| HSV-1 | 41.6% | |
| HAV | 9.9% | |
| HBV | 1.8% | |
| Health outcomes | | |
| Asthma/chronic bronchitis | 14.8% | |
| Height (age-specific z-scores) | 0.18 | (0.03) |

Weighted, $N = 4319$.
Note: *H. pylori* = *Helicobacter pylori*, CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus.

between the infections and the dichotomous asthma/chronic respiratory illness measure. Linear regression models were employed to estimate the relationship between socioeconomic status and infection burden, as well as the association of individual infections and the infection burden with the age-specific height z-scores.

Confirmatory factor analysis (CFA) was used to construct an infection burden index using information from the five individual infection serostatus dummies. The advantages of using CFA to construct the infection burden, as opposed to alternatives such as a crude summation or mean index, relate to its handling of measurement error and missing data. Within the CFA framework, the burden of infection is conceptualized as a latent (unobserved) variable measured by a number of observed variables, referred to as factor indicators. The measurement error in the factor indicators is included in the regression model that describes their association with the latent variable. The second major advantage to CFA concerns the practical constraints of the NHANES III data, where some infections have only been measured in a subset of the sample (for instance, *H. pylori* was assessed only during phase 1 (1988–1991) of the survey). CFA allowed us to use all observations with one or more infection data points by using a full-information maximum likelihood estimation under the assumption of ignorable missingness. The model calculated a latent infection burden score for each individual using the posterior distribution of the burden variable, based on the model and the data specific to the person.

We also estimated a full structural equation model where the latent infection burden was a predictor of health outcomes. The findings were substantively equivalent to those shown here and are available from the authors.

Analyses were conducted using Stata 10.0 (2007, StataCorp, College Station, TX) and Mplus version 5.1 (2008, Muthén and Muthén, Los Angeles, CA), with proper adjustments for the NHANES III complex survey design.

## Results

### *Associations among individual infections*

Table 2a shows tetrachoric correlations among the five individual infections. The correlations show a moderate positive association between most infection pairs. Correlations among *H. pylori*, CMV, and HSV-1 are generally stronger (0.25–0.37) than those with hepatitis A and B (ranging from 0.04 to 0.29). Overall, these results suggest some degree of clustering of individual infections that might indicate a shared environment of pathogen exposure or susceptibility.

Table 2b shows results from the confirmatory factor analysis (CFA) used to construct the index of latent infection burden. The factor loadings show that the burden construct explained a moderate but statistically significant proportion of variance in the observed infections. The *R*-squared values for the individual infections ranged from 11% for hepatitis B to 38% for HSV-1. All factor loadings were statistically significant. The standardized factor loadings for *H. pylori*, CMV, and HSV-1 were higher (0.54–0.62), as might be expected from the correlation analysis above, while the loadings for hepatitis A and B were smaller (0.34–0.36). The model had an adequate fit to the data based on multiple indices (Hu & Bentler, 1998). The chi square test was not significant (6.6 for 4 d.f.), CFI = 0.97, and RMSEA = 0.01.

**Table 2a**
Correlations among individual infections: children age 6–16, NHANES III.

| | *H. pylori* | CMV | HSV-1 | HAV | HBV |
|---|---|---|---|---|---|
| *H. pylori* | 1 | | | | |
| CMV | $0.25^{***}$ | 1 | | | |
| HSV-1 | $0.37^{***}$ | $0.37^{***}$ | 1 | | |
| HAV | $0.29^{***}$ | $0.20^{***}$ | 0.04 | 1 | |
| HBV | $0.24^{***}$ | $0.16^{***}$ | $0.26^{***}$ | 0.09 | 1 |

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
Note: weighted. The *p*-values are from a likelihood ratio test of no correlation.
*H. pylori* = *Helicobacter pylori*, CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus.

**Table 2b**
Confirmatory factor analysis of infection burden: children age 6–16, NHANES III.

| | Factor loadings | | |
|---|---|---|---|
| | Unstandardized | Standardized | $R^2$ |
| *H. pylori* | 1.00 | 0.57 | 0.33 |
| CMV | $0.94^{***}$ | 0.54 | 0.29 |
| HSV-1 | $1.08^{***}$ | 0.62 | 0.38 |
| HAV | $0.64^{***}$ | 0.36 | 0.13 |
| HBV | $0.59^{**}$ | 0.34 | 0.11 |
| Model fit indices | | | |
| Chi square (d.f.) | 6.63 (4) n.s. | | |
| CFI | 0.97 | | |
| RMSEA | 0.01 | | |

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
*H. pylori* = *Helicobacter pylori*, CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus.

### *Social correlates of infection*

Fig. 1 shows age- and sex-adjusted prevalence of the individual infections by race and education category. The figure shows educational gradients in prevalence for most individual infections, and higher overall levels of infection for non-Hispanic black and Mexican-American children. Fig. 2 shows the mean burden of infection, operationalized as the mean latent factor score from the CFA, for each category of parental education by race. Educational gradients are evident within each race, as well as higher overall levels of infection burden for non-Hispanic blacks and Mexican-Americans.

The first 5 columns in Table 3 report associations between sociodemographic characteristics and each infection based on individual logit models for seropositivity of each infection. Column 6 in Table 3 also show similar results from linear regression models predicting the value of the latent infection burden. These models are all simultaneously adjusted for race/ethnicity, parental education, and family income, and additional control variables. The likelihood of being infected with *H. pylori* and HSV-1 is significantly higher for non-Hispanic black compared to non-Hispanic white children. The odds of seropositivity to CMV, HSV-1, and hepatitis A, are also higher for Mexican-American children and 'other' race children compared to non-Hispanic white children. 'Other race' children also have a much higher likelihood of seropositivity for hepatitis B. In addition to race/ethnicity, parental education is significantly associated with the likelihood of infection for three pathogens: *H. pylori*, HSV-1, and hepatitis B. Controlling for parental education and race/ethnicity, increased family income is associated with lower odds of infection for CMV, HSV-1, and hepatitis A. The results for the infection burden are in the same direction but stronger than those of the individual infections. All other race/ethnic groups have a significantly higher infection burden compared to non-Hispanic whites. Parental education and family income are both significantly inversely related to the burden of infection after adjustment for race/ethnicity.

### *Relation of infections to asthma and height-for-age*

Table 4 shows results from logit models of the individual infections' associations with the likelihood of reporting asthma/

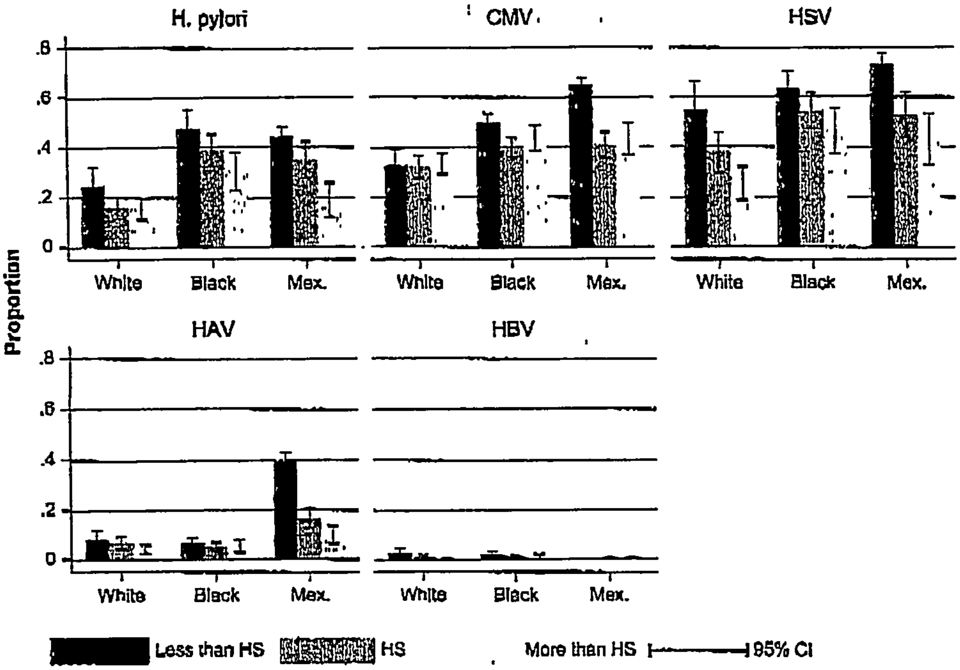

Fig. 1. Age and sex-adjusted prevalence of persistent infections, by race and parental education: children age 6–16, NHANES III. Note: *H. pylori* = *Helicobacter pylori*. CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus, white = non-Hispanic white, black = non-Hispanic black, Mex. = Mexican-American. parental education refers to the educational attainment of the household head.

chronic bronchitis. Linear regression is used to predict age-specific height z-scores. The first column for each outcome (model 1) reports age- and sex-adjusted relationships, the second column (model 2) reflects results adjusted for age, sex, race, education and income, household size, and region of residence. The coefficients on all infections are positive with regards to asthma, suggesting increased odds of reporting asthma in the presence of infections, though only one infection reaches statistical significance (hepatitis A in model 2). In the models of height, the coefficients on all infections, both unadjusted and adjusted, are negative, suggesting a decrease in age-specific height with the presence of an infection. CMV and hepatitis A significantly predict lower age-specific height in unadjusted models, with only hepatitis A remaining significant after adjustment for race/ethnicity, income, and education.

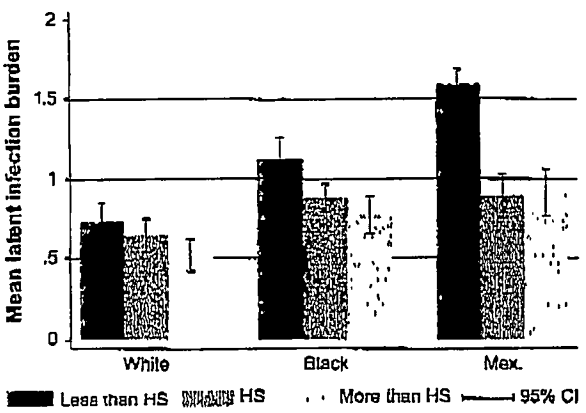

Fig. 2. Mean infection burden by race and parental education: children age 6–16, NHANES III. Note: white = non-Hispanic white, black = non-Hispanic black, Mex. = Mexican-American, parental education refers to the educational attainment of the household head. The figure shows the mean infection burden factor score by race and education. The factor score indicating infection burden was calculated using the five infection indicators and standardized with a mean of one and a variance of one.

In Table 5, a higher infection burden is associated with an increased likelihood of reporting asthma/chronic respiratory problems and lower age-specific height. Model 1 shows the association of infection burden with each health outcome adjusting for age and gender. The coefficients show that a one standard deviation increase on the infection burden scale is associated with a 16% increase in the odds of reporting asthma or chronic bronchitis. The second model shows that no demographic or socioeconomic factors included in the analyses are significantly associated with reported asthma. Adjusting for all predictors in model 3 does not change the coefficient of infection burden substantially. Adjusting for race and parental socioeconomic status, each standard deviation increase in infection burden increases the odds of asthma/chronic respiratory conditions by 22%. In the age- and sex-adjusted height model, each standard deviation increase in infection burden is associated with a 0.11 standard deviation decrease in age-specific height. Race and household size, but not parental education and income, are associated with height, with non-Hispanic black children found to be taller and Mexican-American and 'other race' children shorter than their white counterparts. While these factors explain some of the effect of infection burden (model 3), the association remains significant. Since genetic potential is also an important determinant of height, we estimated an additional model (not shown) adding controls for mother's and father's height. Parental height, as expected, strongly predicts child height. Its inclusion reduces the coefficient of infection burden to −0.035, with a $p$-value = 0.19. It is possible, however, that inclusion of parental height in this case is an over-adjustment, since in addition to genetic transmission of height, there is likely to be intergenerational correlation of pathogen burden via direct parent–child transmission or shared environments that affect both parental and child height.

## Discussion

To our knowledge, this is the first study to examine the relationship between the burden of chronic infections and

**Table 3**
Associations between infections and sociodemographic characteristics: children age 6–16, NHANES III.

| | *H. pylori* | CMV | HSV-1 | HAV | HBV | Infection burden |
|---|---|---|---|---|---|---|
| Age | 0.09$^{***}$ (0.02) | 0.04$^{***}$ (0.01) | 0.02 (0.07) | 0.03 (0.04) | 0.06 (0.06) | 0.02$^{***}$ (0.01) |
| Female | −0.16 (0.14) | 0.24$^{**}$ (0.11) | 0.03 (0.14) | 0.13 (0.20) | −0.23 (0.33) | 0.06 (0.04) |
| Non-Hispanic black | 0.83$^{***}$ (0.19) | 0.12 (0.14) | 0.37$^{***}$ (0.14) | −0.38 (0.27) | 0.73 (0.54) | 0.15$^{***}$ (0.05) |
| Mexican-American | 0.12 (0.20) | 0.55$^{***}$ (0.15) | 0.58$^{***}$ (0.19) | 0.85$^{***}$ (0.31) | −1.00 (0.67) | 0.33$^{***}$ (0.07) |
| Other race | 0.43 (0.30) | 0.96$^{***}$ (0.30) | 0.75$^{**}$ (0.36) | 1.00$^{**}$ (0.39) | 2.78$^{***}$ (0.42) | 0.55$^{***}$ (0.13) |
| Education of head | −0.08$^{***}$ (0.03) | −0.03 (0.02) | −0.11$^{**}$ (0.04) | −0.05 (0.04) | −0.13$^{*}$ (0.07) | −0.03$^{***}$ (0.01) |
| Income (log) | −0.15 (0.10) | −0.21$^{***}$ (0.06) | −0.32$^{***}$ (0.10) | −0.29$^{**}$ (0.11) | 0.19 (0.25) | −0.12$^{***}$ (0.03) |
| Household size | 0.04 (0.05) | 0.14$^{***}$ (0.04) | 0.11$^{**}$ (0.05) | 0.14$^{***}$ (0.05) | 0.19$^{*}$ (0.11) | 0.07$^{***}$ (0.01) |
| N | 1962 | 4185 | 1379 | 4258 | 4257 | 4319 |

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
Shown are coefficients and standard errors.
Note: each column present results from a separate model. Results for single infections are from logistic models, results for infection burden from a linear regression model. Reference category for gender is male, and for race is non-Hispanic white. Infection burden was calculated using confirmatory factor analysis using the five individual infections and was standardized with a mean of zero and a variance of one. All models are adjusted for sampling design and control for region of residence. The sample sizes differ across infections because not all blood sera were tested for each infection.
*H. pylori* = *Helicobacter pylori*, CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus.

socioeconomic status in U.S. children. The results show that family income, parental education, and race/ethnicity are significantly associated with the likelihood of infection with several persistent infections in U.S. children aged 6–16, as well as the overall burden of multiple infections. These differences in the burden of infection at early ages might have important implications for chronic diseases later in life, through pathways such as an increase in lifetime immune and inflammatory burden.

Since our data were cross-sectional, we could not directly examine the impact of these infections on later-life outcomes. Instead, we examined whether the burden of infection is associated with outcomes at younger ages. While a relationship between these infections and health in childhood is not necessary for the emergence of a relationship between early infections and chronic disease later in the life course, these analyses allow us to look for evidence of any early biological costs of infection. We found evidence that the burden of infection was associated with shorter height-for-age and an increased likelihood of reporting asthma or chronic respiratory conditions. These results suggest that even in the context of relatively contemporary cohorts (aged 6–16 in 1988–1994) of U.S. children, infectious environments encountered early in life may be affecting growth and future health outcomes. Since height has also been found to be associated with educational attainment and wages, early infectious burden may contribute to future economic disadvantage as well. Prospective studies that measure early-life infectious exposure and inflammation should in the future be linked to educational and economic outcomes to test these pathways, similar to work that has investigated the association of low birth weight to these outcomes (Black, Devereux, & Salvanes, 2007; Case et al., 2005; Conley & Bennett, 2000).

This paper seeks to bring together several disparate literatures to shed light on a novel life-course risk factor for health inequalities in the United States. Crimmins and Finch have suggested that lifelong chronic inflammation resulting from early infectious environments might contribute to cohort differences in mortality. Their work focused on differential infectious environments over time or across countries with different levels of development. We extend this approach by looking for potential sources of differences in inflammatory burden within cohorts, specifically differences by race/ethnicity and family income and education. One strength of this study is the use of individual data measuring seropositivity to infections, as opposed to previous work looking at infant mortality rates as a proxy for early-life infectious exposures. A limitation of the current study comes from the fact that the particular infections available to us are imperfect proxies for the overall pathogen and inflammatory burden. Depending on how representative these infections are of the overall pathogen environment of an individual, our infection burden index could have considerable measurement error, potentially biasing our estimates downward. We have used confirmatory factor analysis in order to model these infections as imperfect proxies of the overall pathogen burden of an individual.

Epidemiological research suggests a potential role for persistent infections in the development of inflammation-related diseases of aging. Given our finding of significant socioeconomic differences in U.S. children in several lifelong persistent pathogens, future work should examine the sources of differential rates of seropositivity among U.S. children. With current NHANES III data, it is impossible to distinguish whether different rates are a result of increased *exposure*, increased *susceptibility*, or both. While *H. pylori*, hepatitis A and hepatitis B all have some hygiene and sanitation related etiologies, CMV and HSV-1 are extremely prevalent pathogens spread through very casual contact similar to other common viruses such as colds. It is therefore less obvious why rates of these viruses would differ by social factors in the U.S. While household size was associated with an increased likelihood of several infections, it did not alter the relationship between SES or race/ethnicity and the infections. It is possible that in groups with historically higher rates of infection who predominantly live and work together, higher levels would persist over time. Environmental factors associated with socioeconomic status such as household crowding or use of public transportation, could contribute directly to exposure risk. Suppressed immune function as a result of stress, poor nutrition, smoking, or other environmental exposures could

**Table 4**
Gross and net associations of individual infections with health outcomes: children age 6–16, NHANES III.

| | Asthma/chronic bronchitis | | Height (age-specific z-scores) | |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 1 | Model 2 |
| *H. pylori* | 0.15 (0.34) | 0.21 (0.36) | −0.13 (0.09) | −0.09 (0.08) |
| CMV | 0.19 (0.18) | 0.25 (0.20) | 0.12$^{**}$ (0.05) | −0.04 (0.05) |
| HSV-1 | 0.19 (0.21) | 0.25 (0.23) | −0.13 (0.11) | −0.01 (0.11) |
| HAV | 0.38 (0.26) | 0.49$^{*}$ (0.28) | −0.45$^{***}$ (0.11) | −0.33$^{***}$ (0.10) |
| HBV | 0.62 (0.55) | 0.70 (0.45) | −0.42 (0.26) | −0.25 (0.25) |

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
Shown are coefficients and standard errors.
Note: each coefficient reflects results from a separate regression model. Model 1 adjusts for age and gender. Model 2 adjusts for age, gender, race, household size, family income, education of the household head, and region. Results for asthma were estimated using logistic regression. Results for height were estimated using OLS. All models were adjusted for sampling design.
*H. pylori* = *Helicobacter pylori*, CMV = cytomegalovirus, HSV-1 = herpes simplex virus type 1, HAV = hepatitis A virus, HBV = hepatitis B virus.

**Table 5**
The association between infection burden and health outcomes: children age 6–16. NHANES III.

| | Asthma/chronic bronchitis | | | Height (age-specific z-scores) | | |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Infection burden | 1.16* (0.10) | | 1.22* (0.13) | −0.11*** (0.03) | | −0.07* (0.03) |
| Age | 1.01 (0.03) | 1.01 (0.03) | 1.01 (0.03) | 0.01 (0.01) | 0.00 (0.01) | 0.01 (0.01) |
| Female | 0.75 (0.13) | 0.77 (0.13) | 0.76 (0.13) | −0.13* (0.06) | −0.13* (0.06) | −0.12* (0.06) |
| Non-Hispanic black | | 0.93 (0.17) | 0.90 (0.16) | | 0.21*** (0.06) | 0.22*** (0.06) |
| Mexican-American | | 0.81 (0.18) | 0.76 (0.18) | | −0.25*** (0.09) | −0.23** (0.09) |
| Other race | | 1.08 (0.47) | 0.96 (0.46) | | −0.24** (0.10) | −0.21** (0.10) |
| Education of head | | 1.01 (0.03) | 1.02 (0.03) | | 0.01 (0.01) | 0.01 (0.01) |
| Income (log) | | 0.89 (0.07) | 0.92 (0.07) | | 0.04 (0.04) | 0.03 (0.04) |
| Household size | | 0.95 (0.05) | 0.93 (0.05) | | −0.07*** (0.02) | −0.07*** (0.02) |
| *N* | 4318 | 4318 | 4318 | 4313 | 4313 | 4313 |

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
Shown are odds ratios for asthma, OLS regression coefficients for height and standard errors.
Note: results for asthma were estimated using logistic regression. Results for height were estimated using OLS. Model 1 estimates the effect of infection burden on a health outcome, adjusting for age and gender. Model 2 adjusts for age, gender, race, education of the household head, family income, household size, region, and rural/urban classification. Model 3 estimates the effect of infection burden on a health outcome, net of the same set of predictors. Reference category for gender is male, and for race is non-Hispanic white. Infection burden was calculated using confirmatory factor analysis using the five individual infections and was standardized with a mean of zero and a variance of one.

increase susceptibility to infections given equal levels of exposure. Low social status as well as indicators of psychosocial stress has been linked to increased risk of respiratory infections in humans and other primates in experimental studies (Cohen, 1999, 2005; Cohen, Doyle, Turner, Alper, & Skoner, 2004; Cohen et al., 1997). Much less is known about the links between social status, stress, and susceptibility to infections in the broader U.S. population. Low social class was associated with lower secretory immunoglobulin (sIgA), cited as a first line of defense against infection, in a large community sample in Scotland (Evans et al., 2000). Taken together, these studies suggest that psychological stress associated with low SES could down-regulate various aspects of the cellular immune response, increasing susceptibility to infection. These ties are speculative at this time with respect to the current findings, and future work should aim to build evidence regarding the sources of such early differences in infection rates.

NHANES III biological specimen testing also pre-dated high sensitivity C-reactive protein testing, and therefore we were unable to directly test the links between SES, infections, and inflammation in U.S. children. As new data become available, we are eager to directly test whether differences in chronic infections contribute to differences in inflammatory burden amongst U.S. children, and whether these differences might help explain differences in chronic disease later in life.

With regards to height-for-age, our results suggest that the relationship between infectious environments and height may not be a historical relic or exist only in developing countries. The relationship between early environments and height has often been expressed in terms of net nutrition, to which infections detract. In theory infections might take less of a toll on height in countries or cohorts where undernutrition is less of a concern. It is perhaps more surprising then to find any evidence that infections and height are linked in U.S. children in 1988–1994, though we did not examine food intake directly. It is possible that particular micronutrients affected by infections are more important in this regard than total calories, or it could be that other mechanisms regarding the effects of inflammation on bone remodeling might be at play.

One important limitation of this work is that there are other explanations for the relationship between infections and height that are difficult to exclude with these data. Rather than a direct link between infections and height in the children measured, the association could reflect an association between the overall health of the mother and the height of the child. The mother herself may have been affected by early infectious environments, and these infections may also be more likely to be passed on to the child without directly affecting his height. In sensitivity analysis, the relationship between infectious burden and height-for-age weakened with the inclusion of both mother's and father's height. We also tested whether the child's infectious burden predicted the mother's height, which would have suggested a more intergenerational story, but these results were not significant (not shown). To test whether general frailty that could be related to both susceptibility to infections and height might be a factor, we tested an indicator for the child being born low birth weight (<2500 g). While being born low birth weight was associated with lower height-for-age, it did not alter the association between burden of infection and height-for-age and was not predictive of pathogen burden. While these tests suggest that our results are robust to some alternative explanations for our results, we cannot causally link infections and height from these data.

Our finding that an increased burden of infection is associated with a higher likelihood of reporting asthma or chronic respiratory problems is consistent with recent evidence from the U.K. that a decline in cold viruses was associated with declining rates of asthma between 1993 and 2003, thought to be due to the role these viruses played in exacerbating respiratory problems (Urquhart, Anderson, & McKenzie, 2008). While our infection burden measure did not include any cold or respiratory viruses, to the extent that they share common exposure, transmission, or susceptibility pathways with our measured pathogens, they might have been picked up in our latent infection burden index. Evidence regarding the hygiene hypothesis is decidedly mixed, and other research has shown an inverse relationship between infections such as *H. pylori* and asthma and allergy (Chen & Blaser, 2007; Ponsonby & Kemp, 2008). Our measure included reported asthma combined with other chronic respiratory problems that by definition might have involved respiratory infections sharing common pathways with our measure of infection burden. Moreover, it is likely that the timing and intensity of exposure to pathogens are important for the relationship between infections and atopic diseases such as asthma, which prospective data would be better-suited to investigate.

In sum, a high lifetime burden of chronic infections may lead to overall heightened inflammation and earlier development of chronic disease and mortality. The social distribution of these infections and their combined burden is thus an important topic for research on health disparities. This paper suggests that disparities in infectious burden may begin early in life in the U.S. and these infections may also manifest themselves in children's growth and development early in life, contributing to the intergenerational transmission of health inequalities.

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# Progress Review

## *Access to Quality Health Services*

U.S. Department of Health & Human Services—Public Health Service

*June 15, 2006*

In the first session in the second series of assessments of *Healthy People 2010*, ADM John O. Agwunobi, Assistant Secretary for Health, chaired a focus area Progress Review on Access to Quality Health Services. He was assisted by staff of the lead agencies for this *Healthy People 2010* focus area—the Health Resources and Services Administration (HRSA) and the Agency for Healthcare Research and Quality (AHRQ). In his introduction to the Progress Review participants, ADM Agwunobi noted that the Access objectives address services within four components of the healthcare system: clinical preventive care, primary care, emergency services, and long-term and rehabilitative care. He stated that ensuring high standards and readily available care is essential to achieving the two overarching goals of *Healthy People 2010*—eliminating health disparities and increasing quality and years of life for all Americans. Also participating in the review were representatives of other U.S. Department of Health and Human Services (HHS) offices and agencies.

The complete text for the Access to Quality Health Services focus area of *Healthy People 2010* is available online at www.healthypeople.gov/document/html/volume1/01access.htm. For comparison, the report on the first-round progress review (held on June 4, 2002) is archived at www.healthypeople.gov/data/2010prog/focus01/2002fa01.htm The meeting agenda, tabulated data for all focus area objectives, charts, and other materials used in the Progress Review can be found at a companion site maintained by the National Center for Health Statistics (NCHS)/Centers for Disease Control and Prevention (CDC): www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa01-atqhs2.htm.

### Data Trends

Richard Klein of the NCHS Division of Health Promotion Statistics summarized the status of the 16 *Healthy People 2010* objectives in the Access focus area as follows: little progress on a large scale overall, but no notable retrograde movements; new data since the first-round Progress Review for five objectives; no updates since the baseline for five objectives; and, as reported in the earlier Progress Review, one objective (1-12; 24-hour toll-free access nationwide to poison control centers) with a target that has been met. In general, relative health disparities between population groups have remained much the same, even when their objectives have registered progress overall. However, increases in disparity were noted for Hispanics with regard to having a source of ongoing care (Obj. 1-4) and a usual primary care provider (Obj. 1-5). About three quarters of objectives and subobjectives with data beyond the baseline year are moving toward their targets. Mr. Klein then reported in greater detail on progress achieved toward meeting the targets of selected objectives in the focus area.

The proportion of persons under age 65 with health insurance varied from 83 percent to 84 percent from 1997 (baseline) to 2004. Among poor people, the proportion increased from 66 percent in 1997 to 69 percent in 2004.

Certain age groups showed improvement in coverage during that time span: an increase from 86 percent to 91 percent among persons aged 10 to 14 years and an increase from 80 percent to 85 percent among those aged 15 to 19 years. The 2010 target is 100 percent (Obj. 1-1). In 2001, the first year for which data became available on subobjectives 1-3a, b, c, and d, the age-adjusted proportion of adults aged 18 and older who had been counseled by their provider about four kinds of health behaviors varied by the targeted behavior as follows: physical activity or exercise—45 percent (target 54 percent); diet and nutrition—43 percent (target 56 percent); smoking cessation—66 percent (target 72 percent); and risky drinking—11 percent (target 17 percent). For the first three behaviors, the highest proportion of counselees was in the 45- to 64-year age group; for the fourth behavior, risky drinking, the highest proportion was in the 65- to 74-year age group (16 percent), with only 7 percent of young adults aged 18 to 24 years receiving counseling. In another component of this objective, 24 percent of females aged 15 to 44 years received counseling about unintended pregnancy in 2002, compared with 19 percent in 1995. The target is 50 percent (Obj. 1-3f). Also,.40 percent of females aged 45 to 57 years received counseling about management of menopause in 2001, the first year for which data became available. The target is 42 percent (Obj. 1-3h).

In 2003, 78 percent of the total population had a usual primary care provider, a small proportional increase from 77 percent in 1996. Among racial and ethnic groups for whom data were available in 2003, Hispanics, at 63 percent, ranked lowest in access to primary care providers. Males, at 74 percent, lagged behind females, at 81 percent, and adults with less than a high school education had a comparatively low access rate of 68 percent. In terms of disability status, 85 percent of persons with activity limitations had a usual provider, marking a comparatively large contrast with the 77 percent of persons without activity limitations who had such a provider. The target for all groups is 85 percent (Obj. 1-5). In 2001, 12 percent of the total population experienced difficulty or delay in obtaining needed health care, the same percentage as in 1996. The target is 7 percent (Obj. 1-6). Notable among the groups that experienced relatively high degrees of difficulty or delay were Hispanics (14 percent); females (13 percent, compared with males at 10 percent); the poor (19 percent); and people with activity limitations (19 percent). In the school year 2003–2004, the proportion of degrees granted by health profession schools to members of under-represented racial and ethnic groups was as follows: American Indians/Alaska Natives—0.5 percent, compared with 0.6 percent in 1996–1997; blacks—7.4 percent, compared with 6.5 percent in 1996–1997; and Hispanics—5.9 percent, compared with 5.2 percent in 1996–1997. The targets for these groups are, respectively, 1.0 percent, 13.0 percent, and 12.0 percent (Objs. 1-8a, c, d). In 2003, the rate of hospital admissions for uncontrolled diabetes in people aged 18 to 64 years was 7.8 per 10,000 people, compared with 7.2 per 10,000 in 1996. In terms of health insurance status, the rate for Medicaid patients was 30.0 per 10,000, compared with 3.9 per 10,000 for privately insured patients, and 6.7 per 10,000 for uninsured patients. These rates show a relatively large increase from 1996, when the rate for Medicaid admissions had been 23.5 per 10,000. The target is 5.4 per 10,000 people (Obj. 1-9b).

In 2002, the first year for which data became available, 30 states had in place processes to monitor and evaluate trauma system outcomes. The target is all 50 states and the District of Columbia (Obj. 1-13h). In 2001, data also became available on the age-adjusted proportion (9.6 percent) of persons aged 65 and older with long-term care needs who do not have access to home health care. The proportion of blacks in that category without such access was 17.3 percent and of Hispanics, 14.8 percent. Among the poor, 13.6 percent lacked access, compared with 7.7 percent of those with middle or high income. Persons in the category who lived outside metropolitan statistical areas (MSAs) fared relatively better (at 7.5 percent lacking access) than those within MSAs (10.4 percent lacking access). The target is 7.7 percent (Obj. 1-15a).

### Key Challenges and Current Strategies

In the presentations that followed the data overview, the principal themes were introduced by representatives of the two co-lead agencies—Elizabeth Duke, Administrator of HRSA, and Carolyn Clancy, Director of AHRQ. These agency representatives set the stage for discussions among participants in the review by identifying a number of barriers to achieving the objectives and citing activities under way to meet these challenges, including the following:

#### *Challenges*

- The costs of early death and poor health among the uninsured are estimated to total between $65 billion and $130 billion. An April 2006 survey found that half of all young adults in the United States go without health insurance and that more than 15 million Americans were uninsured for 4 consecutive years.
- Almost 50 percent of bankruptcy filings are due to medical expenses. Over a 10-year period ending in the early part of this decade, healthcare costs in the United States rose an average of 8 percent yearly.
- About 20 percent of the U.S. population reside in localities federally designated as Health Professional Shortage Areas (HPSAs). Shortages in the healthcare workforce, especially in nursing, have a negative impact on continuity of care, patient waiting times, and access to after-hours care.
- Underuse of multidisciplinary teams in primary care and the continued use of a system focused on disease care rather than on health care in a broader sense create an environment that discourages any counseling dialog between providers and patients.
- From 1993 to 2003, the population increased by 12 percent. During this period, emergency room visits increased by 27 percent, and 425 emergency departments were closed, imposing increasing strain on those that remain. Hospitals that are still open have a smaller total number of inpatient beds than a decade ago. Emergency department overcrowding has also depleted the surge capacity needed to deal with a natural disaster or terrorism event.
- In some instances, expanded access to health care can result in increased rates of adverse health outcomes (e g., diagnosis of previously undiagnosed conditions, doctor visits, hospitalizations, etc.).
- The aging of the population makes long-term care (LTC) services increasingly important. Persons with LTC needs require the help of other persons to perform activities associated with personal care and the routine needs of daily living.

### *Strategies and Opportunities*

- The *2005 National Healthcare Quality Report (2005 NHQR)* is a comprehensive national overview of the quality of health care in the United States. With 179 measures to monitor progress, the *2005 NHQR* focuses on 46 core measures that represent the most important and scientifically sound measures of four components of quality—effectiveness, patient safety, timeliness, and patient centeredness. The *2005 NHQR* is a product of collaboration among agencies across HHS, in which AHRQ plays a leading role.

- The companion *2005 National Healthcare Disparities Report (2005 NHDR)* uses the same core measures as the *2005 NHQR* to monitor the nation's progress toward eliminating disparities in both quality and access to health care for both the general population and for congressionally designated priority populations. The *2005 NHDR* includes an additional 13 core measures of access and adds two components of quality to the *2005 NHQR's* four core measures. The additional components are facilitators and barriers to health care and healthcare utilization.

- AHRQ's initiative on health information technology (HIT) includes more than $166 million in grants and contracts in 41 states to support and stimulate investment in HIT, especially in rural and underserved areas. AHRQ also works with HRSA to integrate HIT systems in health centers to improve patient safety.

- HRSA has been engaged since 2001 in an unprecedented expansion of the health center network. To date, 865 health center sites have been created or expanded, for a total of about 3,800 sites throughout the system. The number of patients treated each year by community, migrant, homeless, public housing, and school-based health centers increased by nearly 2.9 million, from about 10 million in 2001 to about 14 million in 2005. The latest estimate is that, in 2006, the system will serve 14.6 million patients who are mostly minorities of low income.

- HRSA's Diabetes Prevention Pilot Collaborative has greatly reduced the time required to translate scientific gains to practice, improved the success rate of treating prediabetic patients, and reduced the untoward consequences of failure to treat such patients with full success. HRSA's pilot projects typically ensure a high degree of patient involvement in their own care and provide for a team approach in their healthcare providers' followup strategies.

- With its headquarters in HRSA, the National Health Service Corps (NHSC) marks its 35th anniversary this year and is currently fielding more than 3,900 physicians, dentists, nurses, and other healthcare professionals to deliver primary health care in HPSAs to more than 5 million people nationwide. Almost four out of five NHSC clinicians remain in the communities to which they are assigned after their term of service is over, a testament to their commitment to their medically underserved patients.

- A national toll-free telephone number (1-800-222-1222) able to access 61 poison control centers is fully operational 24 hours a day in all states, Puerto Rico, and the District of Columbia. Dialing the number connects a caller to a poison control center in his or her geographic area.

- The year 2006 is the fifth consecutive year that HRSA has provided funding through the Hospital Preparedness Program to health departments in all states and territories. Currently four metropolitan areas also receive funding. This year, the program's focus is on efforts to improve the capability of local and regional healthcare systems to address a variety of public health and health promotion topics.

- AHRQ has developed an elder-care-based knowledge transfer partnership with the Administration on Aging, CDC, and the Centers for Medicare and Medicaid Services to establish and support a learning network for teams of state and local officials and program managers to increase the use of evidence-based prevention in community-based settings that are linked to public health and clinical settings.

### Approaches for Consideration

Participants in the review made the following suggestions for public health professionals and policymakers to consider as steps that might enable further progress to be made toward achievement of the objectives for Access to Quality Health Services:

- To provide a sharper focus for public policy, continue research on efforts to quantify Goal 1 of *Healthy People 2010*, "Increase quality and years of healthy life," recognizing the wide range of issues of measurement and interpretation that are involved with developing summary measures of health.

- Encourage the use of health information technology, which is conditioned on continuing education to foster the acceptance and proficiency in the use of such tools.

- In all programs relating to clinical care, seek to foster and strengthen the recognition and application of sound public health concepts and practices.

- To aid in controlling and decreasing the prevalence of chronic diseases, promote the concept and application of a "medical home" for people with chronic illnesses (i.e., a customary setting for interaction with primary care providers). Make use of clinical and community linkages in these efforts.

- Encourage healthcare institutions to make greater use of financial incentives (e.g., rewards and bonuses) to effect improvement in the performance of healthcare providers they employ.

- In public information and outreach activities relating to accessibility and quality of healthcare services, highlight proven best practices in a succinct and pointed form that lends itself to wide media coverage.

- Whether healthcare professionals are in private practice or in institutional settings, seek to make them aware of the central and critical role they play in ensuring that patients have timely and effective access to health services. Work to decrease the communication gaps that exist.

- With a view to reducing and eliminating health disparities, explore in greater depth the interplay of varying factors in the lives of Hispanics in the United States—such as location, background, immigration status, folk practices, literacy, conditions of employment, income, and education—which can disadvantage them in obtaining access to high-quality health care.

- With healthcare costs rising less steeply than in the past, seize the opportunity to direct additional resources to the translation into practice of lessons learned about enhancing access to quality health services.

**Contacts for information about *Healthy People 2010* focus area 1—Access to Quality Health Services:**

- Health Resources and Services Administration—Samara Lorenz, samara.lorenz@hrsa.hhs.gov

- Agency for Healthcare Research and Quality—Claire Kendrick, ckendric@ahrq.gov

- Office of Disease Prevention and Health Promotion (coordinator of the Progress Reviews)—Lenee Simon, lenee.simon@hhs.gov

[Signed August 15, 2006]
Admiral John O. Agwunobi, M.D., M.B.A., M.P.H.
Assistant Secretary for Health

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# Control of CVD risk factors has improved, but disparities between ethnic groups persist

APRIL 20, 2009 | Fran Lowry

**Boston, MA** - From 1999 to 2006, the control of blood pressure, blood glucose, and cholesterol improved for adults with cardiovascular disease and diabetes, but disparities in health outcomes between racial, ethnic, and socioeconomic lines persisted. However, **Medicare** coverage after age 65 years significantly reduced these disparities, according to a report published in the April 21, 2009 issue of the *Annals of Internal Medicine*.

"Our findings suggest that quality improvement has occurred, but it hasn't led to reductions in disparities. In other words, the tide is rising, it is lifting all boats, but there are still many left behind," lead author **Dr J Michael McWilliams** (Harvard Medical School, Boston, MA) told **heart*wire***. "Our results also tell us that making access to healthcare in the US universal would result in healthier Americans."

McWilliams and his colleagues sought to determine whether disease control for adults with cardiovascular disease and diabetes had improved from 1999 to 2006 and, if so, whether that improvement led to decreased racial, ethnic, and socioeconomic disparities in disease control. They also asked whether Medicare coverage at age 65 decreased any disparities in disease control.

## Blacks, Hispanics, undereducated still lag behind

The investigators analyzed data on 6000 adults from the **National Health and Nutrition Examination Survey** (NHANES) 1999 to 2006. The adults ranged in age from 40 to 85 years and had at least one of the following conditions: diabetes, hypertension, coronary heart disease, or stroke. Information on control of blood pressure, hemoglobin $A_{1c}$ levels, and cholesterol levels were obtained for whites, blacks, Hispanics (born in the US), and socioeconomic status as determined by education level (high school vs non-high school graduates).

During this time period, absolute improvements in control rates were 10.3% for blood pressure control, 21.0% for glycemic control, and 19.2% for cholesterol control.

However, results for blacks, Hispanics, and less educated adults, although improved, remained worse than for whites. Between whites and Hispanics, the gap in glycemic control widened significantly (p=0.042).

**Rates of disease control among ethnic and socioeconomic groups**

| Group | Blood pressure <140/90 mm Hg (%) | Hemoglobin $A_{1c}$ <7.0 (%) | Total cholesterol level <200 mg/dL (%) |
|---|---|---|---|
| **White** | 52.8 | 58.1 | 50.7 |
| **Black** | 44.4 | 41.6 | 54.1 |
| **Hispanic** | 42.5 | 37.8 | 46.4 |
| **High school grad** | 51.9 | 57.7 | 51.9 |

| | | | |
|---|---|---|---|
| **Non-high school grad** | 48.6 | 42.8 | 48.3 |

## Medicare narrowed the gap

Once individuals became eligible for Medicare, disparities in disease control narrowed. Black-white differences in systolic blood pressure were smaller among adults aged 65 to 85 years (reduction in difference 4.2 mm Hg; p=0.009). Black-white differences in hemoglobin $A_{1C}$ levels were also smaller after age 65 (reduction in difference 0.7%; p=0.005), as were Hispanic-white differences (reduction in difference 0.7%; p=0.007). Differences in hemoglobin $A_{1C}$ between less and more educated adults were reduced by 0.5% (p=0.03).

The authors cite the cross-sectional design of their study, which did not allow them to follow individual participants as they became older and eligible for Medicare. They were also unable to adjust for mortality-rate trends, which may have altered the outcome for some of the groups in the analysis.

Nevertheless, the study has important policy implications, they say.

"We need more targeted efforts for racial and ethnic minorities, not just for Hispanics, where the gap in glycemic control widened, but in other groups," McWilliams told **heart*wire***. "But the good news is that Medicare coverage is associated with fairly dramatic reductions in these disparities. This suggests that, even though current quality-improvement efforts may have not reduced disparities, universal coverage might."

## Universal coverage is not enough

Agreeing with McWilliams, **Dr Ashwini R Sehgal** (Case Western Reserve University, Cleveland, OH) commented in an accompanying editorial [2] that the findings "provide strong circumstantial evidence that universal health insurance coverage sharply narrows disparities."

Sehgal writes that McWilliams and colleagues nicely contrast the effects of improving the quality of healthcare with the effects of acquiring health insurance. "While their findings add to existing evidence that improving access to care does not completely eliminate disparities, they also suggest that covering the uninsured is key to reducing health disparities in the US," he writes.

He adds that eliminating disparities will require other interventions, such as targeting the needs of minorities, the poor, and other disadvantaged groups.

Asked for additional comment by **heart*wire***, **Dr Brian Smedley** (Joint Center for Political and Economic Studies, Washington, DC) echoed Sehgal, saying that the study is important but that it highlights the fact that disparities still exist.

What the study did not address, however, is the fact that healthcare resources are poorly distributed, he said.

"Racial groups remain segregated, and healthcare providers are few and far between in underserviced, poor neighborhoods. There are fewer providers who are willing to accept Medicaid.

Even when they do, they tend to lack the resources to provide state-of-the-art medical care. So maldistribution of medical care exacerbates the lack of insurance coverage," said Smedley. "Extending insurance is important but not necessarily sufficient to reduce disparities. If we can address the maldistribution and the social and economic conditions, then we may make inroads into better healthcare for all."

**Sources**

1. McWilliams JM, Meara E, Zaslavsky AM, et al. Differences in control of cardiovascular disease and diabetes by race, ethnicity, and education: US trends from 1999 to 2006 and effects of Medicare coverage. *Ann Intern Med* 2009; 150:505-515.
2. Sehgal AR: Universal health care as a health disparity intervention. *Ann Intern Med* 2009; 150:561-562.

**Related links**

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- Racial disparities seen in adding CRT pacing therapy to ICDs in heart failure
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- Statistics show a drop in heart-disease rates for women, but ethnic gaps still exist, and obesity a growing problem
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Acute Ischemic Heart Disease

# Do race-specific models explain disparities in treatments after acute myocardial infarction?

Ashish K. Jha, MD, MPH,[a,b] Douglas O. Staiger, PhD,[c] F. Lee Lucas, PhD,[f] and Amitabh Chandra, PhD[c,d]
*Boston and Cambridge, MA; Hanover, NH; and Portland, ME*

**Background** Racial differences in healthcare are well known, although some have challenged previous research where risk-adjustment assumed covariates affect whites and blacks equally. If incorrect, this assumption may misestimate disparities. We sought to determine whether clinical factors affect treatment decisions for blacks and whites equally.

**Methods** We used data from the Cardiovascular Cooperative Project for 130709 white and 8286 black patients admitted with an acute myocardial infarction. We examined the rates of receipt of 6 treatments using conventional common-effects models, where covariates affect whites and blacks equally, and race-specific models, where the effect of each covariate can vary by race.

**Results** The common-effects models showed that blacks were less likely to receive 5 of the 6 treatments (odds ratios 0.64-1.10). The race-specific models displayed nearly identical treatment disparities (odds ratios 0.65-1.07). We found no interaction effect, which systematically suggested the presence of race-specific effects.

**Conclusions** Race-specific models yield nearly identical estimates of racial disparities to those obtained from conventional models. This suggests that clinical variables, such as hypertension or diabetes, seem to affect treatment decisions equally for whites and blacks. Previously described racial disparities in care are unlikely to be an artifact of misspecified models. (Am Heart J 2007;153:785-91.)

Racial differences in healthcare are widely known; however, the reasons behind these differences are not as well understood. Although clinicians and policy makers worry that these healthcare disparities might reflect provider decisions to treat blacks and whites differently, others question whether the studies are adequately rigorous.[1-3] Critics suggest that inadequate accounting for confounders or inappropriate statistical approaches might overestimate the gaps in care between black and white Americans.[1,4]

Past research focused on accounting for potential confounders, such as patient choice,[5,6] economic differences,[7,8] or differences in access to care[9], but less on the use of appropriate statistical technique. To account for baseline differences between blacks and whites, most studies use multivariate modeling techniques that assume covariates, whose values often differ strikingly, affect blacks and whites equally. For example, in evaluating racial differences in cardiovascular treatments, investigators usually adjust for baseline differences in hypertension rates, assuming that the impact of hypertension on cardiovascular therapy is the same for whites and blacks. However, if physicians weigh the presence of hypertension differently in blacks and whites, simply including this covariate in a multivariable model would be inadequate.

Given the priority and substantial resources dedicated to the issue of racial differences in healthcare, it is critical that the measured racial gap in care not be the partial consequence of inadequate statistical techniques. Specifically, the assumption of "common-effects," that covariates such as hypertension or diabetes affect physician treatment decisions for blacks and whites equally, needs to be tested. If this assumption is not correct, understanding how certain covariates impact physician decisions to treat blacks and whites might offer insights into why racial disparities exist. In addition, the true magnitude of racial disparities in healthcare would need to be carefully reexamined. Alternatively, if the assumption is correct, clinicians and policy makers can dismiss this argument as a potential mechanism for explaining disparities and focus on ensuring equitable care. Therefore, we examined how

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*From the [a]Department of Health Policy and Management, Harvard School of Public Health, Boston, MA, [b]VA Boston Healthcare System, Boston, MA, [c]John F Kennedy School of Government, Harvard University, Cambridge, MA, [d]Dartmouth Medical School, Hanover, NH, [e]Department of Economics, Dartmouth College, Hanover, NH, and [f]Center for Outcomes Research and Evaluation, Maine Medical Center, Portland, ME*

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*Reprint requests: Ashish K. Jha, MD, MPH, Department of Health Policy and Management, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115*

*E-mail: ajha@hsph.harvard.edu*

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well common-effects models perform compared with other approaches and whether previous findings of disparities would change meaningfully if we used race-specific models that allowed for covariates to have differential effects based on race.

## Methods

### Data collection

To determine whether racial differences in treatment might be due to race-specific effects of comorbidities, we used data from the Cooperative Cardiovascular Project (CCP), which collected detailed chart-based clinical data on Medicare patients admitted to a hospital for acute myocardial infarction (AMI). The CCP data collection process, detailed elsewhere,[10,11] is briefly described here. The CCP used administrative data to identify patients admitted with an AMI (*International Classification of Diseases, Ninth Revision, Clinical Modification*, principal diagnosis of 410.xx, excluding episodes with a fifth digit of 2, which designates a subsequent episode of care). Among patients with multiple myocardial infarctions (MIs) during the study period, only the first AMI was examined. Our sample consisted of all Medicare beneficiaries admitted during an 8-month period between 1994 and 1995.[11] Detailed clinical data were abstracted from each patient's chart using a standard protocol. For our analysis, we included only whites or blacks and excluded all patients who were transferred from another emergency room or acute care facility.[12]

### Variables

For each admission, we categorized patients into 1 of 5 age categories: 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85 to 99. To be consistent with prior work using these data, we converted the most continuous variables into categorical ones using cutoffs previously chosen.[13] Specifically, we defined hypotension as systolic blood pressure less than 100 mm Hg; renal function, as measured by creatinine levels, into 3 categories (<1.5, 1.5-1.9, or ≥2.0 mg/dL); anemia as hematocrit level less than 30%; low albumin as a level less than 3.0 mg/dL; low ejection fraction as that less than 40%; and high creatine kinase (CK) as a level greater than 1000.[13]

### Outcomes

We examined 6 treatments for blacks and whites as our outcomes: the receipt of reperfusion (defined as thrombolysis or percutaneous coronary interventions [PCIs]) within 6 hours, aspirin during the hospitalization, β-blocker during hospitalization, cardiac catheterization within 30 days of admission, PCI within 30 days of admission, and coronary artery bypass graft (CABG) surgery within 30 days.

**Table I.** Characteristics of patients in the CCP

| | **Whites, N = 130709, Mean (95% CI)** | **Blacks, N = 8286, Mean (95% CI)** |
|---|---|---|
| Demographics | | |
| Age | 76.7 | 75.6 |
| Female sex (%) | 48.9 | 58.8 |
| Admitted from a nursing home (%) | 5.8 | 6.1 |
| Limited mobility (%) | 18.7 | 26.2 |
| Had DNR on file at admission (%) | 9.7 | 6.2 |
| Clinical history | | |
| Previous revascularization (%) | 17.5 | 9.9 |
| Previous myocardial infarction (%) | 29.5 | 29.0 |
| History of CHF (%) | 21.5 | 27.2 |
| Diabetes (%) | 29.6 | 42.1 |
| Hypertension (%) | 60.5 | 79.5 |
| Current tobacco smoker | 14.4 | 17.8 |
| History of a low EF (%) | 3.7 | 4.5 |
| Metastatic cancer (%) | 0.8 | 0.9 |
| History of PVD (%) | 10.3 | 12.6 |
| History of COPD (%) | 20.7 | 17.8 |
| Dementia (%) | 6.1 | 8.3 |
| Clinical features at presentation | | |
| Atrial fibrillation | 9.8 | 6.8 |
| Received CPR (%) | 3.4 | 4.2 |
| Non-Q-wave MI | 40.2 | 42.7 |
| Anterior location of MI | 30.7 | 30.9 |
| Inferior location of MI | 19.6 | 15.9 |
| Other location of MI | 9.4 | 10.5 |
| Heart block (%) | 15.9 | 14.1 |
| Congestive heart failure (%) | 28.5 | 33.2 |
| Hypotension (%) | 3.8 | 3.6 |
| Cardiogenic shock (%) | 2.3 | 2.0 |
| Elevated CK (%) | 30.2 | 33.4 |
| Albumin <3.0 mg/dL (%) | 4.4 | 6.9 |
| Creatinine >2.0 mg/dL (%) | 15.4 | 17.8 |
| Hematocrit <30% (%) | 4.5 | 9.1 |

All differences were significant at *P* value less than .001, except for the following characteristics: admitted from a nursing home, previous myocardial infarction, history of low ejection fraction, metastatic cancer, anterior location of AMI, hypotension, and cardiogenic shock. *CHF*, Congestive heart failure; *EF*, ejection fraction; *PVD*, peripheral vascular disease; *COPD*, chronic obstructive pulmonary disease; *CPR*, cardiopulmonary resuscitation.

### Statistical analysis

For each of the 6 treatments outlined, we estimated 2 alternative random-effects models to ascertain whether different clinical factors, such as hypertension or diabetes, affect blacks and whites differently. The first model was the conventionally used common-effects model, where we estimate the effect of each covariate on the receipt of treatment for blacks and whites together. Using the models' coefficients and associated standard errors, we adjusted for baseline differences between blacks and whites using age, sex, and each of the covariates available in the CCP that were likely to be associated either with the predictor (race) or one of the outcomes (receiving therapy for AMI). The full list of covariates in our model, presented in Table I, were selected based upon (1) availability within the CCP database, (2) likelihood of influencing physician treatment decisions, and (3) use in prior studies using these data.[10,11,13]

In our second approach, we estimated race-specific models where the effect of each covariate could vary by race. This was accomplished through the inclusion of an additional set of variables, where we included each of the covariates

**Table II.** Rates of treatments (and 95% CI) using race-specific versus common-effect coefficients to adjust* for baseline differences

| | Reperfusion within 6 h | Aspirin | β-Blocker | Cardiac catheterization | PCI | CABG within 30 d |
|---|---|---|---|---|---|---|
| Treatments of patients in the CCP | | | | | | |
| Actual rate for blacks (%) | 11.9 (11.2-12.6) | 77.6 (76.7-78.5) | 42.4 (41.4-43.5) | 39.2 (38.1-40.2) | 12.3 (11.6-13.0) | 8.9 (8.3-9.5) |
| Actual rate for whites (%) | 18.4 (18.2-18.6) | 78.3 (78.1-78.5) | 45.6 (45.4-45.9) | 46.6 (46.3-46.8) | 18.1 (17.9-18.3) | 13.7 (13.5-13.9) |
| Predicted rates using models with common-effects coefficients | | | | | | |
| Predicted rate for blacks (%) | 13.3 (12.6-14.0) | 79.6 (78.7-80.5) | 43.4 (42.4-44.4) | 42.1 (32.9-35.3) | 14.0 (13.3-14.8) | 9.2 (8.6-9.8) |
| Predicted rate for whites (%) | 18.3 (18.1-18.5) | 78.1 (77.9-78.3) | 45.6 (45.3-45.8) | 46.4 (46.1-46.6) | 17.9 (17.7-18.1) | 13.7 (13.5-13.8) |
| OR† | 0.68 (0.65, 0.72) | 1.10 (1.03, 1.19) | 0.92 (0.88, 0.95) | 0.84 (0.81, 0.87) | 0.75 (0.70, 0.79) | 0.64 (0.59, 0.69) |
| Predicted rates using models with race-specific coefficients | | | | | | |
| Predicted rate for blacks (%) | 12.7 (11.8-13.6) | 79.3 (78.3-80.3) | 42.7 (41.5-44.0) | 41.2 (40.2-42.3) | 13.8 (12.9-14.7) | 9.5 (8.7-10.3) |
| Predicted rate for whites (%) | 18.3 (18.0-0.18.5) | 78.1 (77.9-78.3) | 45.6 (45.3-45.8) | 46.4 (46.1-46.6) | 17.9 (17.7-18.1) | 13.6 (13.5-13.8) |
| OR† | 0.65 (0.60, 0.70) | 1.07 (1.01, 1.14) | 0.89 (0.85, 0.94) | 0.81 (0.78, 0.85) | 0.73 (0.68, 0.79) | 0.66 (0.60, 0.73) |

*Adjusted for age, sex, source of admission (nursing home, other facility), level of mobility, the presence of a DNR at admission, previous revascularization, prior MI, history of any of the following: CHF, diabetes, hypertension, low ejection fraction, metastatic cancer, peripheral vascular disease, chronic obstructive pulmonary disease, or dementia. Also adjusted for the presence of any of the following at admission: atrial fibrillation, location of MI, heart block, CHF, hypotension, cardiogenic shock, elevated creatine kinase, low albumin, elevated creatinine, or low hematocrit.

†Blacks compared with whites.

interacted with the race indicator variable. Because the common-effects model is nested within the race-specific model (the former lacks the race interactions effects, which are included in the latter), we examined whether predicted values from these 2 models and the resultant odds ratios (OR) on race were substantively different. To formally evaluate whether the 2 models yielded statistically different predictions, we performed a Wald test to determine if the interactions effects were jointly equal to zero.[11] We also computed likelihood-ratio tests to assess the fit of the 2 models and noted that the results were indistinguishable from the conclusion of the Wald tests. The statistical approach to our models is explained in greater detail in the Technical Appendix.

We report bootstrapped standard errors for the predictions based on 100 replications. In all of our random-effects models, we clustered our standard errors at the level of the hospital referral region. The standard errors reported are not sensitive to whether we clustered at this level, the level of a given hospital, or used generalized estimating equations to perform the analysis. We used these standard errors to compute 95% confidence intervals (CIs) for the adjusted rates at which whites and blacks receive each treatment.

All analyses were conducted using STATA 9.0, College Station, TX.

## Results

Of the 138 995 Medicare beneficiaries hospitalized for AMI in the CCP database, 8286 (6.0%) were blacks. Black Americans were younger, more likely to be female, admitted from a nursing home, have limited mobility, and less likely to have a "do not resuscitate" (DNR) on file at the time of admission (Table I). Blacks had higher rates of hypertension, diabetes, tobacco use, and other comorbidities associated with higher cardiovascular risk. Finally, there were important racial differences in clinical presentation that are outlined further in Table I.

Blacks had lower unadjusted rates of reperfusion within 6 hours of admission and β-blocker use, although the rates of aspirin use were comparable between the 2 groups. By 30 days after admission, black patients had significantly lower rates of cardiac catheterization, PCI, and CABG surgery (Table II).

The common-effects multivariable model demonstrated that blacks were less likely to receive 5 of the 6 therapies (all but aspirin during hospitalization, rows 3 and 4, Table II) with ORs (comparing blacks to whites) that varied from 0.64 (95% CI 0.59-0.69) for CABG within 30 days to 1.10 (1.03-1.19) for aspirin during hospitalization. Our examination of treatment differences using race-specific prediction models revealed nearly identical results (rows 6 and 7, Table II). The predicted rates for whites using race-specific models were nearly identical for each of the 6 outcomes. The predicted rates for blacks using "black-specific" models were also comparable, though generally lower, than using common-effects models (Table II). Finally, the ORs for the common-effects models were nearly identical to those from the race-specific models (rows 5 and 8, Table II), with race-specific models usually demonstrating a slightly larger racial gap in care. Similar results

**Table III.** Effect of selected patient characteristics on likelihood of receiving 3 selected treatments

| | Catheterization | | Reperfusion | | β-Blocker | |
|---|---|---|---|---|---|---|
| | OR, blacks | OR, whites | OR, blacks | OR, whites | OR, blacks | OR, whites |
| Female | 0.91* | 0.75* | 0.93 | 0.93 | 1.00 | 0.99 |
| Age | | | | | | |
| 70-74 y | 0.75 | 0.81 | 0.94 | 0.85 | 0.91 | 0.96 |
| 75-79 y | 0.57 | 0.59 | 0.82 | 0.70 | 0.81 | 0.89 |
| 80-84 y | 0.33* | 0.27* | 0.57 | 0.48 | 0.87 | 0.83 |
| ≥85 y | 0.09 | 0.09 | 0.31 | 0.28 | 0.62 | 0.70 |
| Previous revascularization | 1.40 | 1.24 | 1.20 | 0.97 | 1.04 | 1.01 |
| Dementia | 0.35 | 0.28 | 0.30 | 0.52 | 0.99 | 0.89 |
| Metastatic cancer | 0.19 | 0.23 | 0.62 | 0.26 | 0.99 | 0.97 |
| History of peripheral vascular disease | 1.00 | 0.94 | 0.86 | 0.81 | 1.01 | 1.07 |
| History of chronic obstructive pulmonary disease | 0.84* | 0.71* | 0.82 | 0.78 | 0.55 | 0.53 |
| History of previous angiogram | 1.37 | 1.32 | 1.00 | 1.09 | 1.62 | 1.81 |
| Atrial fibrillation at admission | 0.73 | 0.71 | 0.82 | 0.82 | 0.85 | 0.79 |
| CPR at admission | 0.42 | 0.48 | 0.55 | 0.57 | 0.74 | 0.72 |
| Anterior MI | 0.99 | 0.94 | 4.50 | 4.09 | 1.04 | 1.03 |
| Inferior MI | 0.97 | 1.0 | 4.39 | 4.79 | 1.05 | 1.02 |
| Other MI | 0.66 | 0.69 | 0.81 | 0.68 | 0.64 | 0.75 |
| Heart block at admission | 0.85 | 0.84 | 0.74 | 0.75 | 0.68 | 0.78 |
| Hypotension at admission | 0.80 | 0.78 | 1.46 | 1.54 | 0.47 | 0.50 |
| Elevated CK at admission | 1.03 | 0.98 | 2.75 | 2.78 | 1.25 | 1.20 |
| Admitted from a nursing home | 0.32 | 0.33 | 0.56 | 0.46 | 0.73 | 0.72 |
| Admitted from another institution | 1.11 | 0.74 | 0.92 | 0.73 | 1.14 | 0.95 |
| Unable to walk | 0.22* | 0.35* | 0.37 | 0.51 | 0.57 | 0.69 |
| Walk with assistance | 0.58 | 0.56 | 0.61 | 0.61 | 0.88 | 0.84 |
| Low albumin at admission | 0.94 | 0.80 | 1.05 | 0.98 | 0.81 | 0.82 |
| High bilirubin at admission | 0.59 | 0.66 | 0.48 | 0.64 | 0.73 | 0.88 |
| Low hematocrit at admission | 0.65 | 0.56 | 0.61 | 0.56 | 0.87 | 0.81 |
| Previous MI | 0.83 | 0.78 | 1.06* | 0.87* | 1.12 | 1.02 |
| History of CHF | 0.61 | 0.59 | 0.58 | 0.61 | 0.62 | 0.62 |
| History of diabetes mellitus | 0.99* | 0.81* | 1.02* | 0.78* | 0.93 | 0.86 |
| History of hypertension | 1.18 | 1.15 | 1.17* | 0.96* | 1.46 | 1.39 |
| History of low ejection fraction | 1.02* | 0.71* | 0.81 | 0.75 | 0.90 | 0.80 |
| History of peripheral vascular disease | 1.00 | 0.94 | 0.86 | 0.81 | 1.01 | 1.07 |
| Current tobacco smoker | 0.94 | 0.91 | | | | |
| CHF at admission | 0.70 | 0.69 | 0.63 | 0.63 | 0.63 | 0.62 |
| Shock at admission | 1.28 | 1.12 | 1.36 | 1.64 | 0.52 | 0.49 |
| DNR at admission | 0.27 | 0.25 | 0.67 | 0.71 | 0.69 | 0.67 |
| Renal dysfunction | | | | | | |
| Creatinine 1.5-2.4 mg/dL | 0.85* | 0.70* | 0.81 | 0.81 | 0.87 | 0.80 |
| Creatinine ≥2.5 mg/dL | 0.43 | 0.37 | 0.48 | 0.52 | 0.70 | 0.72 |

Data missing if the models could not create a parameter estimate in a race-specific model. *CPR*, Cardiopulmonary resuscitation; *CHF*, congestive heart failure.
*Represents statistically significant differences at $P < .05$.

were also obtained for the use of angiotensin-converting enzyme inhibitors in the hospital (not reported in the tables). Here, the common-effects model for blacks yielded an adjusted rate of 0.39 (95% CI 0.37-0.40), and the race-specific model yielded an identical adjusted rate of 0.39 (95% CI 0.37-0.40).

Wald and likelihood ratio tests were performed to formally evaluate whether the interaction effects were jointly different from zero. Both tests rejected the null hypothesis that the coefficients on the interaction effects were jointly zero ($P < .001$), but these tests are influenced by the large samples available to us. Even though the 2 models produce estimates that are statistically different (Table II), these differences are small and not of clinical significance. For example, the predicted rate of PCI for blacks in the common-effects model is 14.0% versus 13.8% in the race-specific model.

When we examined the interaction terms, we found them to be inconsistent in size and statistical significance across different treatments. In Table III, we present the results of the interactions between race and patient characteristics for 3 common cardiac treatments. Of the interaction variables presented, only a previous history of diabetes had interactions that were significant ($P < .05$) for 2 of the 3 examined treatments, and 8 other covariates had 1 interaction that was statistically significant (Table III). The ORs for each of these covariates were relatively similar for blacks and whites across all 3 treatments (Table III). We found no covariates where there were important interactions across multiple treatments.

Finally, we examined graphically the relationship between the predicted rate of treatment using common-effect models on the x-axis and the predicted rate using race-specific models on the y-axis. We found that for both groups of patients, the common-effects rates closely predicted the race-specific rates of cardiac catheterization across the entire spectrum of patients, from those who had low predicted rates to those with high predicted rates of treatment (Figure 1, *A*). The results were very similar for β-blocker use (Figure 1, *B*) as well as for the other 4 treatments (data not shown). Because white patients constitute most of the patients, and therefore contribute heavily to the estimation of the common-effects model, it is unsurprising that predictions for these patients are insensitive to the choice of model. However, even for black patients who constitute a small fraction of the overall population, the common-effect models still closely predict the rates found using the race-specific model.

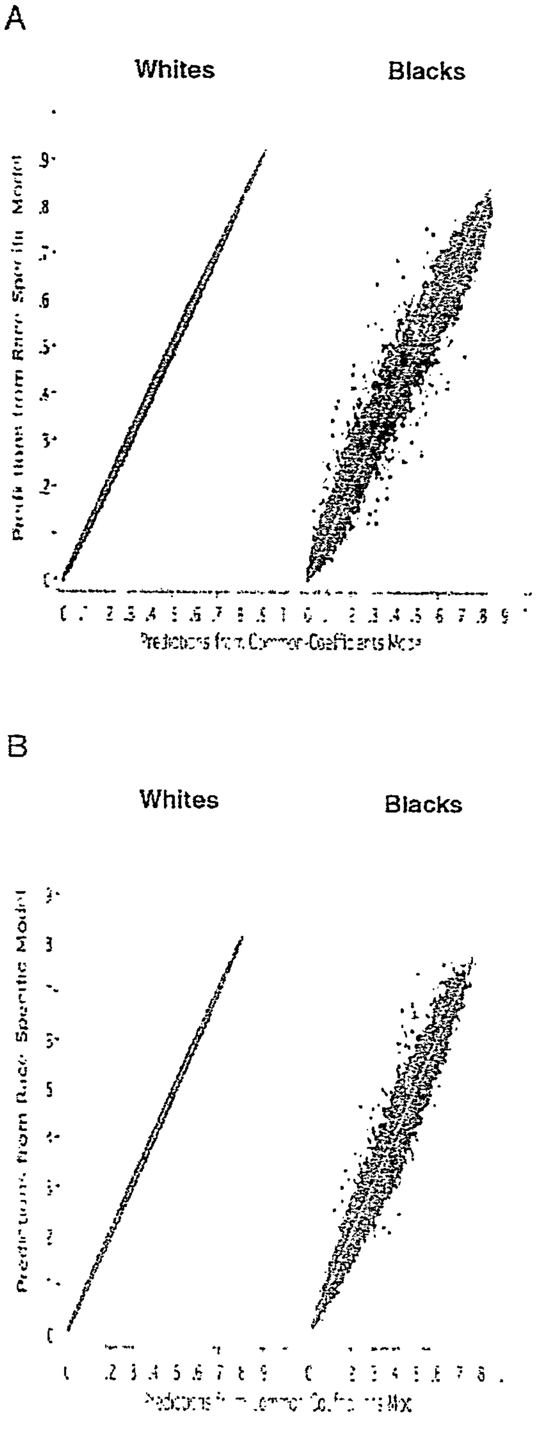
## Discussions

We examined whether race-specific coefficients in risk-adjustment models affect the degree of disparities observed for cardiac care and found nearly identical results as common-effects models. For 5 of the 6 outcomes examined, the common-effects models slightly overestimated the rates of treatment for blacks, but only to a small degree. There were no interactions that consistently modified the relationship between race and all of the 6 treatments.

While blacks and whites clearly have different levels of comorbid conditions (ie, diabetes) and important differences in socioeconomic factors, previous research on healthcare disparities has accounted for these differences based on the assumption that clinicians treat comorbidity in the same way for blacks and whites. It is heartening to know that this assumption, whether or not clinically appropriate, has only modest effects on the true relationship between race and treatment outcomes. Although clinicians clearly take these covariates into account in making clinical decisions, we could find no evidence that they weigh these factors differently for whites than they do for blacks. Therefore, our study suggests that an inappropriate common-effects assumption is unlikely to be responsible for treatment disparities seen in cardiac care.

Our results might provide some insight about one potential mechanism for racial differences in treatment: the role of clinician discrimination against minority patients, a factor emphasized by the Institute of Medicine Report as being of paramount importance in explaining racial disparities in healthcare. One might believe that if clinicians discriminated against black patients, they would do so "at the margins." That is, although they might treat white and black patients with clear indications for a treatment the same, among patients who might be marginal candidates for a therapy,

**Figure 1**



**A**, Predicted rates of cardiac catheterization using common-effects versus race-specific models for whites and blacks. **B**, Predicted rates of β-blocker use in the hospital from common-effects versus race-specific models for whites and blacks.

blacks may be less likely to be offered the treatment. Under this view, variables such as age and the presence of certain comorbidities (which measure the clinical appropriateness of patients) should affect the receipt of treatment differently in whites and blacks. If this mechanism of discrimination were responsible for disparities in treatment, our race-specific models and our interaction analyses would have likely identified this phenomenon. Our failure to find any consistent interaction effect makes this potential explanation for disparities much less likely. Either physicians discriminate against blacks regardless of clinical appropriateness, or the race effect is proxy for other explanations such as blacks being treated at lower quality facilities.

Our study has important limitations. First, we examined data from the CCP, which are now more than 10 years old, and it is likely that the rates of each of these treatments have risen. However, there is substantial evidence that treatment disparities for patients with AMI have not changed during this time.[15,16] Furthermore, changes in the prevalence of underlying comorbidities would not make our results any less relevant. The main threat to the generalizability of our finding is the unlikely scenario that, over time, the impact of these comorbidities on treatment decisions has changed. Second, our study does not account for contraindications, which is a limitation of the CCP data. We are not aware of any data that demonstrate racial differences in rates of contraindications to these treatments. Therefore, although the ideal rate for all of the therapies is likely less than 100%, it is likely that the ideal rates should not differ substantially by race. Third, we examined treatment differences only and not outcomes. Although the presence of certain comorbidities does not differentially affect the receipt of treatment for whites and blacks, the same may affect downstream survival differently by race. We did not explore this possibility in our analysis primarily because we were interested in clinician decision making and whether physicians weight these covariates differently. Also, given our ability to risk adjust for survival remains limited with data sets such as the CCP, we chose not to examine these outcomes. Finally, we only examined treatment decisions for patients with AMI, and our findings here cannot necessarily be generalized to patients with other conditions.

In conclusion, we examined whether using race-specific models affects the relationship between race and treatment outcomes using a large clinical data set and found minimal effects. The lack of any relationship between comorbidities and differential treatment between whites and blacks suggests that clinicians weigh patient characteristics the same for whites and blacks, at least in cardiovascular care. Therefore, using either race-specific or a more general model is reasonable, and this debate should not distract clinicians and policy makers from the difficult work of understanding and reducing racial disparities in healthcare

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## Appendix A. Technical appendix

To illustrate our technique with a stylized example that incorporates 2 covariates—age and diabetes—for ease of exposition, consider the following equations.

### A.1. Common-effects model

This is the conventionally estimated model where the effect of each covariate on the probability of receiving treatment is constrained to be the same by race:

$$Pr(Catheterization = 1) = F(\beta_0 + \beta_1 Black + \beta_2 Age + \beta_3 Diabetes) \qquad (1)$$

The function $F(\,)$ indicates the logistic distribution function $F(z) = \exp(z)/[1 + \exp(z)]$. After estimating this model, we calculate the predicted probability of receiving catheterization for each patient as if they were first white, then black. For each observation, we set the race indicator variable on and off to calculate:

$$Pr(Catheterization = 1|White) = F(\beta_0 + \beta_2 Age + \beta_3 Diabetes) \qquad (2)$$

$$Pr(Catheterization = 1|Black) = F(\beta_0 + \beta_1 + \beta_2 Age + \beta_3 Diabetes) \qquad (3)$$

The (adjusted) racial disparity in the probability of receiving catheterization is the difference between the average probability obtained from Eqs. (2) and (3). This is an adjusted disparity because we used identical distributions of the covariates (age and diabetes) to obtain the predictions for patients as if they were white or black.

### A.2. Race-specific model

In this model, age and diabetes can have different effects for whites and blacks on the probability of treatment. Therefore, we estimate the following:

$$Pr(Catheterization = 1) = F(\delta_0 + \delta_1 Black + \delta_2 Age + \delta_3 Diabetes + \delta_4 Black{*}Age + \delta_5 Black{*}Diabetes) \qquad (4)$$

The variables $\delta_4$ and $\delta_5$ represent the differential effect of age and diabetes on the receipt of treatment for blacks. Statistically, the race-specific model is distinguished from the common-effects model by simultaneously testing $\delta_4 = \delta_5 = 0$ using a Wald or likelihood ratio test. For this reason, the race-specific model is the more general model and nests the common-effects model. To assess whether the different models yield estimates that differ from a clinical perspective, we compare the predictions from each. Predictions from the race-specific model, assuming that all patients are first white and then black, will be given by the following:

$$Pr(Catheterization = 1|White) = F(\delta_0 + \delta_2 Age + \delta_3 Diabetes) \qquad (5)$$

$$Pr(Catheterization = 1|Black) = F(\delta_0 + \delta_1 + \delta_2 Age + \delta_3 Diabetes + \delta_4 Age + \delta_5 Diabetes) \qquad (6)$$

These predictions will be different than those obtained from the common-effects model as long as $\delta_4$ and $\delta_5$ are different from zero. In contrasting these predictions to ones obtained from the common-effects model, if the treatment $\delta_4$ and $\delta_5$ are positive, using a common-effects approach would overstate racial disparities, and if $\delta_4$ and $\delta_5$ are negative, the common-effects approach would understate disparities. In our tables, we contrast the racial disparity as measured by the difference in the average predictions from Eq. (2) to those in Eq. (5), and those from Eq. (3) to those in Eq. (6). The first comparison provides insights about the degree to which common-effects models produce biased estimates for whites, whereas the second set of comparisons elucidates the degree to which common-effects models produced biased estimates for blacks.

In theory, it is possible that the 2 models yield similar estimates when pooling across all patients, but produce very different estimates for nonstandard patients. For example, it may be the case that the common-effects model produces estimates of receiving catheterization that are considerably different than those from the race-specific model for extremely young or old patients. To examine this possibility, we used each patient's actual values for each covariate and obtained the probability of receiving the treatment from the common-effects and race-specific models. If the 2 models yield similar predictions (not only on average, but throughout the distribution of covariates), then a plot of predictions of one model on those from the other should, on average, align along a 45° line. This provides yet another test of the robustness of the common-effects model vis-à-vis the more general race-specific model by exploiting the full range of covariate values and interactions available in the data.

In other work not reported, we calculated racial disparities from the common-effects and race-specific effects models by predicting the probability of receiving treatment for a patient with the clinical characteristics of the average patient (pooling across whites and blacks), as well as the average black patient and the average white patient. For example, after estimating the common-effects model, we calculated the following:

$$Pr(Catheterization = 1|White) = F(\beta_0 + \beta_2 \overline{Age} + \beta_3 \overline{Diabetes})$$

$$Pr(Catheterization = 1|Black) = F(\beta_0 + \beta_1 + \beta_2 \overline{Age} + \beta_3 \overline{Diabetes})$$

The bar above each variable denotes explicitly that we evaluated the prediction at the full-sample (combining white and black patients) average value of these covariates. The (adjusted) racial disparity in the probability of receiving catheterization is the difference between the probability obtained from Eqs. (2) and (3). These predictions yielded estimates of the racial disparity that were identical to those reported in this analysis, but produced estimates of the probability of receiving treatment that were substantially different than the observed rates by race It is only in linear models that the average of the dependent variable is equal to the predicted average at the point of sample means.

# PANEL 2

## Understanding and Closing the Gaps within the Cardiovascular/Hypertension Context

The New York Times
nytimes.com

February 7, 2006
A Conversation With Herman Taylor

# Mississippi's 'Heart Man' Examines Links Between Race and Disease

By CLAUDIA DREIFUS

JACKSON, Miss. — When Dr. Herman A. Taylor Jr. goes for breakfast in this city of 180,000, he orders carefully: granola, fresh fruit. "People look at what I put on my tray," he said on a recent morning at the Broad Street Bakery, a local cafe. "They wonder if I practice what I preach."

Around Jackson, where a common breakfast can be eggs fried in lard, Dr. Taylor, a University of Mississippi cardiologist, is known as "heart man." He is the director of the Jackson Heart Study, the largest epidemiological investigation ever undertaken to discover the links between cardiovascular disease and race.

From now until 2014, Dr. Taylor and his team will be following 5,302 black residents of three Mississippi counties — Hinds, Rankin and Madison — observing their lives and how their heart health is related to their environment.

For the study's participants, there will be periodic medical examinations and referrals for care when problems are detected. The ultimate aim of the $54 million investigation, Dr. Taylor said, "is to gain the information we need to stop an epidemic of cardiovascular diseases within the African-American community."

Q. The Framingham Heart Study, which tracked cardiovascular disease in three generations of New Englanders, is thought to be the most productive investigation in public health history. With Framingham's research continuing, why do something similar here in Jackson?

A. Framingham can't tell us everything. You can probably count the number of blacks in the original study on one hand. Well, maybe two. It's no one's fault. When that study was first begun in 1948, the town of Framingham was mostly populated by second-generation immigrants and Yankees. That's just what it was.

But if there are unique risks and environmental agents triggering cardiovascular disease in African-Americans, Framingham's data can't be that helpful.

Q. Is there a special problem with heart disease in African-Americans?

A. For the nation as a whole, death from cardiovascular disease has declined since 1963. Yet, if you look at African-Americans in regions like Mississippi, mortality from heart disease is flat, or trending upward. This is particularly true for women. A middle-aged black woman in Mississippi will have four times the risk of death from cardiovascular disease than a white woman elsewhere in the country.

We have reasonable guesses why this is so. We think obesity is hugely important. We also think that smoking, inactivity, high blood pressure and access to health care figure into the problem, too. But we have to pin it down. We need more information on things like social support, anger, hostility, optimism. There may also be some unique buffers against stress within our community — like religion and extended family.

When you do a study like this, you want to figure out what's killing people. You enroll a large number and follow them. Over the years, some people will get sick; others won't. So the job is to try to determine the difference between those who got sick and those who didn't.

That's how Framingham worked.

Q. Why do a health study in Jackson?

A. What did the bank robber Willie Sutton answer when asked why he robbed banks? "Because that's where the money is!" Mississippi is where the heart disease is. We have the highest rates of it in the country.

Q. You've just finished collecting your base line data. Have you found anything interesting? A. Very high levels of obesity, higher than the national average. African- American women lead the way in obesity nationally, and our numbers here are significantly higher than that. The rates of diabetes and hypertension are quite high.

Interestingly, alcohol consumption among the women is much lower than average. There are some other findings, but we'll have to hold off on announcing them until they are published in professional journals.

Q. Are you looking at the unique stresses that African-Americans experience — racial discrimination, for instance?

A. We have questionnaires that zero in on discrimination. But we also look at the response, how you cope with it.

Also, a lot of the areas where blacks live are economically depressed. One of the things we're looking at is, What kind of access do you have to a healthy lifestyle?

Can you get out of there to walk, do exercise — or is the level of violence in your immediate surroundings so high that this would be a risky proposition? We look at how many grocery stores are in a certain area. Do you have to rely on the corner market with its jars of pickled eggs and pigs' feet on the counter?

**Q.** Is the traditional diet of Mississippi a problem related to heart disease?

**A.** Yes. In the traditional diet, the fat and calories are astronomical. They add up to our being the fattest state in the union. The soul food diet needs a lot of tweaking if it's ever to be remotely healthy.

There was a study of blacks and whites in a Georgia county in the 1960's. It showed that even given the traditional diet, blacks had a surprisingly low rate of coronary heart disease. The big difference: they were sharecroppers, people who did physical work. They didn't have nearly the access to bad things all day long that people have now.

The problem today for people living under stressful conditions is that harmful stuff is sometimes a cheap way to take a load off their lives and feel less stressed. I think that drives a lot of eating and smoking.

**Q.** Do you think that some people are going to hate your message of heart health?

**A.** Some will think we're further stigmatizing a group with a lot of problems already. But if you have conversations with African-Americans from the South, they already suspect that a lot of things they love are no good for them.

**Q.** Do you try to intervene in the lives of the people you're studying?

**A.** We're an observational study. But we have to be careful. If you don't share helpful information because you don't want to interfere with the natural history of their disease, then you're on a slippery slope. That was the rationale behind keeping information from the sick in the Tuskegee study.

People around here remember that. So, of course, we take an active role in spreading the word about prevention.

Also, when one of our medical exams shows something of clinical importance in a participant, we contact their physician. If they don't have one, we have a group of local doctors who've volunteered to take them on.

**Q.** Did you grow up in the South?

**A.** Near Birmingham. My mother was a teacher; my father a steelworker, active in his union.

During my childhood, I think there were two big influences, beyond my family: the incredibly heroic acts you saw from individuals like Martin Luther King, and the space program. I wanted to grow up and help my people. I also dreamed about science. For me personally, the wonderful thing about working on this study is that it's a way for me to do both.

# Eliminating Racial and Ethnic Disparities in Cardiac Care

Eric Peterson, M.D., M.P.H., and Clyde W. Yancy, M.D.

Related article, p. 1179

> Of all the forms of inequality, injustice in health care is the most shocking and inhumane.
>
> — Martin Luther King, Jr.

The Institute of Medicine (IOM) includes "equity" as one of six key domains of health care quality, yet equal treatment for Americans of all races and ethnic groups remains an incompletely realized goal. It has been 25 years since significant unexplained racial variation in the use of coronary-artery bypass grafting (CABG) was noted in a single institution.[1] Although this finding raised an alert, the medical community was skeptical, assuming that the data were anomalous or confounded. Since then, however, multiple studies have identified similar unexplained racial and ethnic differences in cardiac care, leaving us today with three pivotal questions: Do racial and ethnic disparities persist in contemporary practice? If so, what are their health consequences? And how can these disparities be overcome?

Racial or ethnic differences in the prevalence of cardiac risk factors and the natural history of cardiovascular disease are well documented. The incidence of hypertension is several times as high among blacks as among whites, and diabetes, obesity, and the metabolic syndrome are significantly more common among blacks and Hispanics than among whites.[2] Yet such health differences do not necessarily signify true racial disparities. The IOM noted that there may indeed be differences in care or outcome that are attributable to differences in underlying pathophysiology, patients' expressed preferences regarding care, or the appropriateness of care for different patients. Health care disparities are those "unexplained" differences that persist after these factors have been accounted for; such disparities are most likely attributable to socioeconomic barriers, language differences, cultural insensitivity, bias, or frank racism.[3]

The magnitude and extent of racial or ethnic disparities in health care have been summarized in several reports.[3,4] In cardiac care, disparities have been most frequently reported with regard to costly, invasive procedures such as cardiac catheterization, percutaneous coronary intervention, CABG, cardiac transplantation, and the implantation of defibrillators or cardiac resynchronization devices. Disparities are also evident in the rapidity with which different groups gain access to new cardiac technologies, as exemplified by the delayed adoption of device therapy for heart failure and drug-eluting stents for black patients as compared with white patients. Though less studied, Hispanic and American Indian populations typically receive care at an intermediate level between blacks and whites, whereas care for Asian Americans parallels that given to whites.

Disparities also extend to both primary and secondary prevention. After hospitalization for acute myocardial infarction, heart failure, or stroke, black patients are less likely than white patients to receive certain evidence-based medical treatments. Similarly, blacks and Hispanics are generally less likely than whites to be screened, receive treatment, or reach target therapeutic goals for hypertension, dyslipidemia, and obesity.[2-4]

Documenting racial or ethnic disparities is a start, but it's more important to determine whether such unequal care is associated with adverse patient outcomes. To date, studies linking such differences in care to health outcomes have been limited in size and duration of follow-up and have failed to examine the full spectrum of important patient outcomes. Nevertheless, worrisome data are slowly accumulating. Although black patients with coronary disease, acute myocardial infarction, or heart failure have short-term outcomes that are at least as good as those among white patients, their long-term survival, readmission rates, and functional outcomes tend to be worse. Similarly, less aggressive risk-factor management in minority populations has been associated with more downstream complications. Hispanic and black patients are three to five times as likely as white patients to require hospital admission for uncontrolled diabetes, and black patients with hypertension are several times as likely as whites to have a stroke or end-stage renal disease.

In this issue of the *Journal*,

Bibbins-Domingo et al. extend this linkage, reporting striking race-based differences in the natural history of heart failure (pages 1179–1190). Among persons younger than 30 years of age, the likelihood of heart failure developing over the ensuing 20 years was 20 times as high among blacks as among whites. Heart failure in blacks was more often preceded by hypertension, obesity, and kidney disease. At baseline, hypertension was untreated or poorly controlled in 84% of black patients with this condition; after 10 years, the proportion with poorly controlled hypertension remained a striking 76%. Thus, there is growing and disturbing evidence that disparities in care result in preventable excess morbidity and possibly increased mortality.

***There is growing and disturbing evidence that disparities in care result in preventable excess morbidity and possibly increased mortality.***

How can such disparities be overcome? First, the question of race and genetics must be put in proper perspective. Race is neither a genetic trait nor a physiological designation. However, groups with similar heritage and cultural experiences can have similar genotypes (and phenotypes) that may be associated with differential risks for disease or responses to therapies. Although some studies have noted race as a factor in differential responses to treatments (such as angiotensin-converting–enzyme inhibitors, beta-blockers, and isosorbide dinitrate–hydralazine), future genomic work will most likely yield a more complete characterization of risk-conferring genetic polymorphisms, which, in combination with social, environmental, and epidemiologic factors, will permit more informed personalized treatment selection.

A second set of issues to be addressed are socioeconomic. More complete coverage and improved access to care should greatly promote equitable health care. Greater access should also facilitate the implementation of early "primordial prevention" strategies designed to prevent the development of risk factors as well as further support adequate control of risk factors and disease once they are present. The study by Bibbins-Domingo et al. raises the possibility that a proactive approach to diet, lifestyle, and weight management might avert the development of hypertension; and more complete control of hypertension, once it is present, might reduce the downstream disparity in the incidence of heart failure. Such an opportunity should not be missed.

Recommendations that patients and providers become more fully engaged in health and disease management raise a third set of issues. Even where access to care is similar for people of different races and ethnic groups, target levels of risk-factor control appear less likely to be reached in blacks than in whites. Overcoming this gap will require better patient education, better tools for patient engagement, and increased provider awareness of population-specific barriers to care. Providers will also need to improve the skills required to care for patients from dissimilar backgrounds — that is, the relevant language skills and cultural competence. Admittedly, the effectiveness of cultural-competence training remains untested, but its potential benefits should not remain unexplored.

Focusing performance-measurement and quality-improvement efforts on care for at-risk populations may be a particularly effective approach to reducing gaps in health care. It has been well documented that caregivers respond to constructive feedback regarding quality of care. Providers' performance may be further modified in response to influences from public reporting and pay-for-performance initiatives. Perhaps the most hopeful approach would be to integrate such data measurement into systems for quality improvement. For instance, centers participating in the Get with the Guidelines program of the American Heart Association (AHA) routinely achieve greater than 90% adherence to core measures for coronary artery disease, stroke, and heart failure in all patients regardless of race or ethnic background. Similarly, the Expecting Success program of the Robert Wood Johnson Foundation showed that an initiative focused on the quality of care for patients with heart failure and those who had myocardial infarction dramatically improved care for all patients, with the most striking improvements seen among high-risk populations.[5]

Both programs demonstrate that even within the current health care environment, real change is possible.

Both the Healthy People 2010 initiative sponsored by the Department of Health and Human Services and the recent statement on health care reform from the AHA embrace the elimination of health disparities as one of several prominent goals. Regrettably, the study by Bibbins-Domingo et al. shows that much work remains. As we enter an era of anticipated sociopolitical transformation, we must make the elimination of disparities in health care one of our highest priorities. Our society should no longer accept treatment driven by economics, convenience, and familiarity; we should insist instead on care guided by science and focused on quality.

Drs. Peterson and Yancy report serving on the steering committee for Get with the Guidelines program from the American Heart Association. Dr. Yancy reports receiving consulting fees from Arca Discovery and grant support from Medtronic. No other potential conflict of interest relevant to this article was reported.

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Dr. Peterson is a professor of medicine in the Division of Cardiology and associate vice-chair for quality at Duke University Medical Center and director of cardiovascular research at the Duke Clinical Research Institute — both in Durham, NC. Dr. Yancy is medical director of the Baylor Heart and Vascular Institute and chief of cardiothoracic transplantation at Baylor University Medical Center in Dallas.

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# Denial

Ranjana Srivastava, F.R.A.C.P.

The medical student is watching closely. In an overfilled clinic, time is scarce and the teaching staccato. I point out a malignant lymph node here, an enlarged liver there. She witnesses the abbreviated version of my breaking bad news and I hope finds some parallel with what she has been taught. I try to offer her a window into my thinking, as I talk patients into and out of having chemotherapy. Then I pick up an unfamiliar file. In response to an urgent request from her primary care doctor, the patient has been sandwiched into a virtual slot. Ushering her in, I introduce her to the medical student, who has respectfully tucked herself behind the bed.

"How are you today?" I ask, leafing through the patient's record.

"Okay."

She is a plain-looking, overweight woman in her 50s, well protected from the winter chill in a thick green parka atop several layers of clothing. A knitted scarf cocoons her neck.

"So, when were you last here?"

"A while ago."

"I think part of your stuff is missing. The last notes are from 7 months ago."

She looks at me without comment.

"I can see that you were diagnosed with breast cancer and had chemotherapy. I can't find your operation report or any other notes." I stop jabbing at the computer keyboard. "Can you fill me in on what happened next?"

"Not much."

I sigh, realizing that I will have to slowly reconstruct her history while the queue outside lengthens. The notes reveal that she presented to the clinic with a locally advanced breast cancer. A multidisciplinary team assessed her as requiring preoperative chemotherapy followed by a mastectomy, radiation therapy, and hormonal therapy. The file neatly charts her progress through chemotherapy before stopping abruptly.

"How was the chemo?"

"I wasn't as sick as they reckoned." I detect a note of pride in her voice.

"Good! And then the operation?"

"I didn't have an operation."

"Oh? Did the surgeon change his mind?"

She looks uncertain. "I figure so."

"What did he say?"

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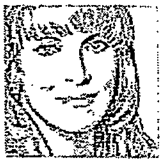
THE INFORMED PATIENT | APRIL 15, 2009

# Guidelines for Heart Care Show Promise

By LAURA LANDRO



A push to get hospitals to follow prescribed treatment guidelines is showing promising results in improving care for stroke and heart-attack patients and preventing repeat hospitalizations for those with heart failure.

Guidelines for treating such patients have been around for years. But surveys have shown that they often aren't followed, especially for women and minorities, and that adherence to the guidelines varies widely around the country.

A program called Get With the Guidelines, launched in 2000 by the American Heart Association, aims to improve outcomes and eliminate disparities in care of heart and stroke patients. About 1,600 U.S. hospitals, or about a third of the total, have so far signed up with the program. Following the release of recent studies showing improved outcomes at hospitals enrolled in the program, institutions are joining at an accelerated pace, program officials say.

One patient is Beverly Henry Smith, who underwent quadruple bypass surgery 14 years ago and has long struggled with heart failure, a condition that keeps his heart from pumping blood efficiently. The 58-year-old is on his third implantable defibrillator, a device that helps regulate his heart's rhythm.

For the past four years, however, Mr. Smith, a retired town planner in Elizabethtown, N.C., has avoided being admitted to hospital, thanks to careful monitoring of his condition at Duke University Medical Center in Durham, N.C., which is participating in the guidelines program. Doctors there make sure Mr. Smith carefully monitors his weight, adheres to a special diet and exercise program and uses a telephone monitoring service at home that takes readings from his defibrillator.

The Duke program "is helping me live with this condition and have a better quality of life," Mr. Smith says.

Deaths from heart disease have sharply declined in recent years, thanks to advances such as angioplasty to open blocked arteries and beta-blocker drugs that reduce the workload on the heart. But heart disease still remains the leading killer of Americans, accounting for 36% of all deaths. The heart association estimates that total costs of cardiovascular disease in the U.S. exceed $475 billion a year, with more than 80 million Americans suffering from one or more types of heart disease.

Guidelines for treating heart and stroke patients were developed over the years by the American College of Cardiology and other medical groups. They range from simple interventions like making sure heart-failure patients are counseled to stop smoking, watch their weight and exercise, to complex measures that should be taken in emergency situations. Certain stroke patients, for instance, should be given clot-busting drugs within the first one-to-three hours of arrival in the emergency room.

## *Fall Through the Cracks*

Medical experts say that hospitals often don't have a systematic method for evaluating each patient using the guidelines. In a chaotic hospital environment, such things can fall through the cracks. Heart-attack patients, for example, may end up back in the hospital because doctors neglected to discharge them with medications known to prevent a recurrent attack.

"Rather than rely on their memory, doctors need to have the guidelines and evidence right there at the bedside," says Gregg C. Fonarow, associate chief of cardiology at the University of California Los Angeles Medical Center, and chairman of the Get With the Guidelines steering committee.

Patients can learn more about the guidelines and see a list of participating hospitals at americanheart.org/getwiththeguidelines. The heart association also sponsors a patient Web site, heart360.com, which includes interactive tools to help reduce the risk of cardiovascular disease.

The heart association is pushing use of guidelines for three conditions: stroke, heart failure and coronary-artery disease. Hospitals, which can sign up for one or more of these efforts, have access to guideline checklists for doctors and nurses and educational materials for patients. For an annual fee of about $1,800, hospitals can enter their own data in a registry, which they can use to compare their performance to other hospitals, and participate in online seminars to help improve their performance. Hospitals that consistently follow treatment guidelines can achieve recognition such as bronze, silver and gold status, which they can use in negotiating with payers and recruiting new patients. The Get With the Guidelines program is sponsored in part by unrestricted grants from pharmaceutical companies and medical-device makers.

Heart failure is the most frequent cause of hospitalization and re-hospitalization for Medicare beneficiaries, according to a study of 11.3 million Medicare patients published this month in the New England Journal of Medicine. The study found that 26.9% of the heart-failure patients in the study were rehospitalized within 30 days after discharge.

The American Heart Association says that 259 hospitals who used the guidelines program for heart failure from March 2003 to December 2004 reduced the risk that patients would have to be re-hospitalized or die by 20% in the first 60 days after discharge, which is the period of highest risk. There are currently 460 hospitals treating more than 275,000 heart-failure patients enrolled in this program.

Of course, hospitals are paid to treat heart attacks, strokes and other cardiac diseases, so "right now there are not strong incentives to keep people out of the hospital," says Adrian Hernandez, Mr. Smith's cardiologist at Duke and a researcher who analyzes data for the guidelines program. "Reimbursement for primary care and preventive care lag far behind the reimbursement for procedures."

Meanwhile, some doctors object to the idea of strict guidelines and have labeled the practice "cookbook medicine." Healing is an art, and treatment needs to be worked out between the doctor and patient on an individual basis, these physicians say.

Still, treatment guidelines are getting a big push from Medicare, which is aiming to reduce preventable illness and hospital admissions. Starting next year, the federal insurance program for older and disabled people hospitals will have to report their rate of heart-failure re-admissions in order to get the full increase in Medicare payment rates for the year. Eventually, hospitals with higher re-admission rates may eventually have their payments reduced. Medicare is evaluating whether to adopt similar policies for stroke care.

## *Getting Certified*

In another move, the heart association is teaming up with the Joint Commission, a nonprofit group that accredits hospitals, to offer an advanced heart-failure certification program for Get With the Guidelines participants. The idea is that insurers will be able to use the certifications to steer health-plan members to hospitals that meet the highest standards of care. The heart association is also developing an outpatient guidelines program that can be used by primary-care physicians and cardiologists to better treat patients with heart disease and prevent new cases from developing.

At St. Joseph's Regional Medical Center in Paterson, N.J., staffers were able to improve their compliance with guidelines for treating heart-failure patients to 98% in 2008 from 57% in 2004, says Robert Faillace, chief of the cardiology department. Nurse practitioners teach patients before being discharged what they need to know to manage their disease, and help with other issues such as care at home and finding generic drugs or low-cost medication programs if they can't afford their prescription drugs.

## *Saving Money Over Time*

Dr. Faillace says that while staffing the program added costs, it paid for itself by reducing the length of time that patients spend in the hospital. This in turn enabled St. Joseph's to get better terms in contracts from private insurers, he says. And because Medicare pays a set fee for hospitalizations, shorter hospital stays also help the hospital's bottom line, he says.

The heart association's Get With the Guidelines program for stroke patients has been used by more than 1,400 hospitals to treat some 800,000 such patients.

Lee Schwamm, vice chairman of neurology at Massachusetts General Hospital and a member of the guideline program's steering committee, led a study of data from 790 hospitals participating in the stroke-guidelines program from 2003 to 2007. The research found that the percentage of eligible patients treated with clot-busting drugs within.two hours of à stroke increased to 72.8% from 42%. Also, the percentage of patients started on recommended cholesterol-lowering drugs increased to 88.3% from 73.3%. The number of patients who were counseled to quit smoking -- a guideline that is often not followed -- rose to 93.6% from 65.2%.

"There is no excuse for not following evidence-based care," Dr. Schwamm says.

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# The Cardiovascular State of the Union: Confronting Healthcare Disparities

Robert O. Bonow, Augustus O. Grant and Alice K. Jacobs

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**Editorial**

# The Cardiovascular State of the Union

## Confronting Healthcare Disparities

Robert O. Bonow, MD; Augustus O. Grant, MD, PhD; Alice K. Jacobs, MD

As we reach the midpoint of the first decade of the twenty-first century, we are also at the midpoint in the timeline of the American Heart Association (AHA) strategic plan to reduce coronary heart disease, stroke, and risk by 25% by the year 2010.[1,2] Encouraging evidence demonstrates important gains toward that goal, with decreases in coronary heart disease and stroke mortality, as well as reductions in certain risk factors such as cigarette consumption and untreated hypercholesterolemia. Still, troubling evidence indicates that other ominous risk factors—physical inactivity, overweight and obesity, diabetes, and hypertension—are on the rise,[3] especially among adolescents and young adults, and these may contribute to the next wave of the cardiovascular epidemic. And there is undeniable evidence that not all Americans have shared equally in the improved cardiovascular outcomes. Individuals in specific subgroups defined by race, ethnicity, socioeconomic status, and geography have a disproportionate burden of myocardial infarction, heart failure, stroke, and other cardiovascular events. These individuals also have a worse outcome after these events, including higher mortality rates, and a higher prevalence of unrecognized and untreated risk factors places them at greater likelihood of experiencing these events. Differences such as these arise not only from disparities in access to care and quality of care but also from disparities in awareness and access to knowledge.

Disparities in cardiovascular prevention, diagnosis, treatment, and outcomes have been documented in a number of publications from the US Department of Health and Human Services (DHHS),[4–6] the Institute of Medicine,[7] and the Kaiser Family Foundation,[8] and reports of continuing racial and ethnic disparities appear regularly in cardiovascular scientific journals.[9,10] If this unacceptable situation fails to be rectified, it is unlikely that the AHA's 2010 goals or the DHHS *Healthy People 2010* goals can be achieved.

In the autumn of 2003, the AHA convened a 3-day meeting to discuss the current understanding of the scientific basis of cardiovascular healthcare disparities and to assist the Association in formulating the next phase of its scientific, programmatic, and advocacy agendas to address these issues. In addition to attendees representing the basic, clinical, population, and social sciences, stakeholder organizations attending the meeting included the National Institutes of Health, the Centers for Disease Control and Prevention, the Association of Black Cardiologists, the National Medical Association, the International Society on Hypertension in Blacks, the National Council of La Raza, the National Association for the Advancement of Colored People, and The Robert Wood Johnson Foundation. The Executive Summary of the meeting in this issue of *Circulation*[11] provides a number of key research, advocacy, and educational recommendations to aid in the long-term goal of eradicating healthcare disparities. Another objective of the meeting planners was the publication of this issue of *Circulation*, which is dedicated to research and clinical studies in cardiovascular disparities, with the goals of raising further awareness of the importance of this topic within the scientific community and demonstrating the high priority the AHA assigns to the elimination of healthcare disparities.

Several of the reports in the present issue of *Circulation* add to the growing mass of data confirming that cardiovascular healthcare disparities are deeply rooted and pervasive in our society. Sonel and the CRUSADE (Can Rapid Risk Stratification of Unstable Angina Patients Suppress Adverse Outcomes With Early Implementation of the ACC/AHA Guidelines?) investigators[12] substantiate the findings of earlier studies of myocardial infarction (MI) by reporting that African American patients with acute MI, although younger than white patients, have a greater risk factor burden and are less likely to receive many evidence-based treatments, particularly treatments that are newer or more costly. Similarly, Sabatine and the TIMI investigators[13] report that nonwhite patients with non–ST-elevation acute coronary syndromes (ACS) are at greater risk of death, MI, or rehospitalization for ACS and are less likely to undergo angiography or percutaneous coronary intervention as compared with white patients. These studies add to voluminous data on the underutilization of evidence-based treatments in minority patients with ACS.[7,8] It is hoped that ongoing hospital-based national quality improvement programs, such as *Get With the Guidelines*,[14] will help to level the playing field for all patients hospitalized with ACS and acute MI. This will remain a challenge, however, in patients with more chronic forms or coronary artery disease, inasmuch as data continue to show disparities in medical management and secondary prevention. Kaul et al[15] report a lower utilization of revascularization procedures in black than in white patients, which translates into higher rates of angina and lower mental health and emotional health scores. Moreover, Konety et al[16] provide

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From the Northwestern University Feinberg School of Medicine (R.O.B.), Chicago, Ill; Duke University School of Medicine (A.O.G.), Durham, NC; Boston University School of Medicine (A.K.J.), Mass; and the American Heart Association.

Correspondence to Robert O. Bonow, MD, Division of Cardiology, Northwestern University Feinberg School of Medicine, 201 E Huron St, Suite 10-240, Chicago, IL 60611. E-mail r-bonow@northwestern.edu

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evidence of less effective secondary prevention strategies after coronary artery bypass surgery in African American patients. After adjusting for differences in outcomes of hospitals used by African American versus white patients, 30-day and 90-day postoperative mortality rates were the same in both groups, but African American patients had a 17% higher mortality rate at 1 year. It is noteworthy in this latter study that before adjustment for hospital outcomes it was clear that African American patients did have higher short-term mortality, which was related to treatment at hospitals in the highest mortality category and in the lowest volume category.

Studies of providers also are revealing. Lurie et al[17] report that only 34% of cardiologists agree that disparities of care exist in the United States, but even fewer (5%) believe that these disparities exist in their own practices. Werner et al[18] demonstrate evidence of physician bias based on perceived higher risk of minority patients undergoing bypass surgery, resulting in fewer minority patients undergoing surgery shortly after the introduction of physician report cards in New York. Thus, a system change designed to improve healthcare quality actually aggravated racial and ethnic disparities in health care.

A study in the present issue provides new evidence of major disparities in cardiovascular disease mortality among Native Americans[19] that have increased dramatically in the past decade, and another provides additional evidence of increased stroke risk among African Americans and Hispanic Americans compared with white individuals.[20] Unfortunately, the increased stroke risk among minority populations is coupled to a lower level of awareness of stroke and stroke warning signs among minority women compared with white women.[21]

Current data from the Centers for Disease Control and Prevention reported in this issue[22] substantiate the persistent, significantly higher prevalence of risk factors in minority populations, most notable for striking rates of hypertension (41%) in African Americans independent of gender or educational status and obesity (47%) in African American women. High rates of obesity are also reported among Mexican American men and women (33% and 38%, respectively) and among white women with lower levels of education (37%). These risk factor profiles translate into significantly higher rates of stroke in African Americans and heart failure in African Americans, Hispanics, and Native Americans compared with whites. Overall, ischemic heart disease and stroke incidence are inversely related to education and income levels.

Thus, the studies reported in this issue of *Circulation* provide a unique, compelling, and sobering series of snapshots of the cardiovascular state of the union in 2005. They provide different perspectives on the various components that together define the disparity problem. The overall picture is the immense and pervasive nature of healthcare disparities, from lack of provider and population awareness, to disproportionate risk factors and disease prevalence, to higher cardiovascular disease event rates and adverse outcomes among the highest-risk segments of our population. One can only conclude that the current situation is not acceptable.

The current situation calls for constant surveillance; for renewed efforts to increase awareness of health disparities among medical professionals, the public, and legislators; and for the design and implementation of effective interventions to reverse these troubling trends. One example is the community-based multiple risk factor intervention program discussed by Becker et al.[23] Another is the faith-based *Search Your Heart* program of the AHA,[24] which is targeted to African American and Hispanic communities and which has been implemented nationwide.

Another component of the solution, but one that is also difficult to deliver, is the development of a more diverse and more culturally competent cardiovascular workforce. Currently, the supply of minority healthcare professionals, especially cardiovascular specialists, is inadequate to meet the demand, and the pipeline of future minority doctors and nurses is nearly empty. Greater efforts to stimulate the brightest young people to pursue careers in biomedical science are required.

Recommendations for a strategic framework to eliminate cardiovascular disparities are articulated by Dr George Mensah.[25] His proposed strategic imperatives to eliminate disparities in cardiovascular health call on strong partnerships at the community and state level based on sound clinical, population, and public health science. We support this call to action. As pointed out in the Guiding Principle for Improving Minority Health from the Centers for Disease Control and Prevention, "The future health of the nation will be determined to a large part by how effectively we work with communities to reduce and eliminate health disparities between non-minority and minority populations experiencing disproportionate burdens of disease, disability, and premature death."[26] The AHA guide for improving cardiovascular health at the community level[27] could serve as a template to begin implementing changes in at-risk communities. Important steps include exercise facilities that are safe and secure, supermarkets that provide fresh fruits and vegetables of comparable quality to those in more affluent communities, elimination of cigarette advertising in minority neighborhoods, and schools that provide physical education and healthy lunches, to name a few.

The underlying causes for healthcare disparities are deeply rooted in our society and are not merely medical issues. Thus, healthcare professionals and scientists alone cannot solve them. But the community of medicine and science, when challenged and mobilized, can be a powerful force that can help to implement change through education, research, and advocacy.

We commend the editors of *Circulation* for publishing this special issue dedicated to such an important area of cardiovascular health and disease, and Dr Emelia Benjamin in particular for her editorial efforts in selecting the articles that cover the full spectrum of the disparity landscape. We hope the information contained in these excellent articles will generate considerable thought, discussion, and fruitful debate.

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Key Words: Editorials ■ cardiovascular diseases ■ ethnic groups ■ public health

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# Racial Misclassification and Disparities in Cardiovascular Disease Among American Indians and Alaska Natives

Dorothy A. Rhoades

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# Racial Misclassification and Disparities in Cardiovascular Disease Among American Indians and Alaska Natives

Dorothy A. Rhoades, MD, MPH

*Background*—National vital event data suggest that cardiovascular disease (CVD) mortality rates are lower for American Indians and Alaska Natives (AIAN) than for the general US population, but these data are disproportionately flawed for AIAN because of racial misclassification.

*Methods and Results*—Vital event data adjusted for racial misclassification and published by the Indian Health Service were used to compare trends in CVD mortality from 1989 to 1991 to 1996 to 1998 between AIAN, US all-races, and US white populations. Without misclassification accounted for, AIAN initially had the lowest mortality rates from major CVD, but by the end of the study, their rates were the highest. Adjustment for misclassification revealed an early and rapidly growing disparity between CVD mortality rates among AIAN compared with rates in the US all-races and white populations. By 1996 to 1998, the age- and misclassification-adjusted number of CVD deaths per 100 000 among AIAN was 195.9 compared with age-adjusted rates of 166.1 and 159.1 for US all races and whites, respectively. The annual percent change in CVD mortality for AIAN was 0.5 compared with −1.8 in the other groups. Regardless of racial misclassification, the most striking and widening disparities were found for middle-aged AIAN, but CVD mortality among AIAN ≥65 years of age was lower than in the other populations.

*Conclusions*—A previously underrecognized disparity in CVD mortality exists for AIAN, particularly among middle-aged adults. Moreover, these disparities are increasing. Efforts to reduce CVD mortality in AIAN must begin before the onset of middle age. (***Circulation*. 2005;111:1250-1256.**)

**Key Words:** cardiovascular disease ■ epidemiology ■ Indians, North American ■ Inuits

Several racial disparities in cardiovascular disease (CVD) mortality and health care have been documented in the United States.[1,2] The Institute of Medicine reports that racial and ethnic disparities in health care are widespread, are associated with worse health outcomes, and occur independently of socioeconomic status.[1]

Nevertheless, national vital event data suggest that CVD mortality for American Indians and Alaska Natives (AIAN) is lower than in the general US population and has been for decades.[2,3] Similar findings have been reported in other AIAN population-based studies using vital event data.[4,5] These findings are somewhat puzzling because American Indians have for years had some of the nation's highest prevalence rates of major CVD risk factors[6] such as smoking,[7,8] diabetes,[9,10] and obesity.[11,12] CVD is also the leading cause of death among AIAN and has been for decades. Furthermore, AIAN are among the most disadvantaged populations in the United States. Despite improvements in life expectancy and total mortality over the past century, disparities in these health status indicators remain for this population compared with the general population. Also, AIAN death rates for several major diseases, including cerebrovascular disease, increased during the 1990s, unlike rates in other racial and ethnic groups.[3]

Data from the nation's only longitudinal epidemiological study of CVD and its risk factors among a diverse group of American Indians, the Strong Heart Study (SHS),[13] suggest that CVD incidence and mortality rates are as bad as or worse than those in comparable general populations.[14,15]

The seemingly disparate findings between national data and the SHS may be explained by errors in national data resulting from racial misclassification and population estimates. These errors disproportionately affect AIAN[16] and likely contribute to falsely low estimates of CVD. The Indian Health Service (IHS), the nation's leading source of health care for AIAN, has compiled data since the 1950s on mortality rates for ≈60% of the US AIAN population. These rates are derived from the vital event and census data and are reported in the IHS *Trends in Indian Health* (*Trends*) series of publications. The IHS began to adjust for racial misclassification beginning with data from the early 1990s.

The present article uses data from the IHS to report trends in CVD mortality and to assess the impact of racial misclassification on an underrecognized CVD disparity among AIAN.

## Methods

Data were obtained from the IHS as published in the *Trends* series for the periods of 1989 to 1991,[17] 1991 to 1993,[18] 1992 to 1994,[19] 1994 to 1996,[20] and 1996 to 1998.[21]

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From the Division of American Indian and Alaska Native Programs, University of Colorado Health Sciences Center, Denver

Correspondence to Dorothy A. Rhoades, MD, 4034 30th Ave W, Seattle, WA 98199 (e-mail drhoades@myuw.net). Reprint requests to Teresa Lapp, Nighthorse Campbell Native Health Building, Mail Stop F800, PO Box 6508, Aurora, CO 80045-0508.

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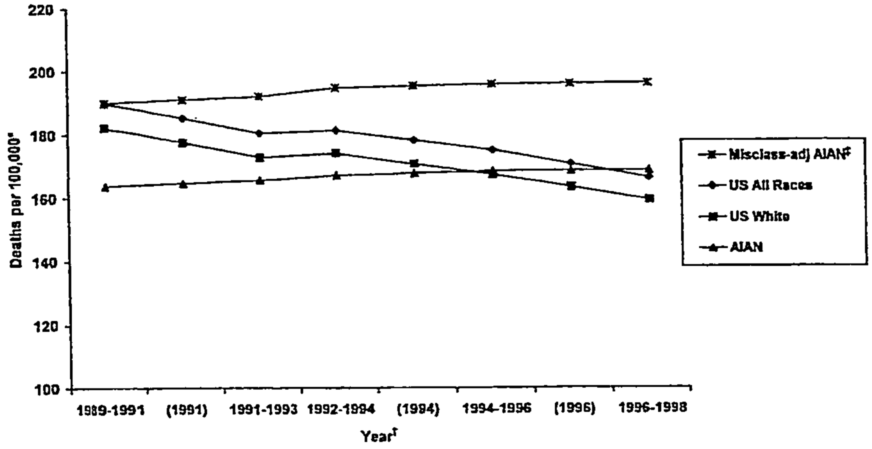

Mortality rates for major CVD by population, 1989 to 1991 to 1996 to 1998. *Age-adjusted to 1940 US standard population. †Rates for years in parentheses were averaged between time periods. ‡Misclassification-adjusted (Missclass-adj) rates for the periods 1989 to 1991 and 1991 to 1993 were estimated by the author, not Indian Health Service.

## Population Estimates

IHS obtains population estimates from the US Bureau of the Census and defines its service population as those persons who identified themselves as American Indian, Eskimo, or Aleut on the 1990 census and who resided in geographic areas "on or near" reservations or trust lands. Estimates of the IHS service population are census based, not "user" or clinic based. This population is also characterized by marked geographic and cultural diversity. The IHS service population from the 1990 census consisted of ≈1.21 million AIAN, ≈60% of the total AIAN population. CVD mortality rates for the IHS service population from 1989 to 1991 on have been corrected by the IHS for revisions in the census counts made by the US Bureau of the Census. Rates before 1989 to 1991 were not adjusted for changes in census estimates and therefore are not included in the present study. Population estimates for subsequent periods used consistent assumptions and projections obtained with linear regression techniques.[21] By 1998, the IHS service population was estimated at 1.46 million.[21]

## Vital Event Data

Vital event statistics as reported in *Trends* were derived by the IHS from the National Center for Health Statistics (NCHS) publications and from unpublished data supplied by the NCHS.[20] The NCHS compiles vital event data for all US residents on the basis of information reported on official birth and death certificates from state departments of health.

Causes of death were identified by the NCHS from death certificates and coded with the *International Classification of Diseases*, ninth revision, definitions. The codes for categories of CVD were consistent throughout the study period and included the following: 390 to 448 for major CVD; 390 to 398, 402, and 404 to 429 for diseases of the heart; and 430 to 438 for cerebrovascular diseases.

The IHS uses 3-year averages to minimize the random fluctuations that may result from uncommon events. Rates for the US all-races and US white populations represent single years corresponding to the "center" year for the IHS period. For example, the US all-races and white rates corresponding to the AIAN rates for 1989 to 1991 were obtained from 1990 data.

Age group data for those 45 to 54 and 55 to 64 years of age are reported in *Trends* from 1991 to 1993 on. Age-adjusted total CVD, heart disease, and cerebrovascular disease mortality rates were not available by sex in the *Trends* publications. Although data were stratified by sex within age groups, they were available for <5 years and were subject to wide fluctuations resulting from the small number of events.

## Adjustment for Racial Misclassification and Age

In the 1990s, the IHS conducted a study to determine the frequency of racial misclassification and to develop methodology for adjustment for underreporting of AIAN deaths.[22] Briefly, records of the IHS user population were matched with data from the National Death Index (NDI) for the years 1986 to 1988. Adjustment factors were determined from the ratio of the actual number of AIAN deaths in the matched IHS NDI database to the number of AIAN deaths reported on state death certificates. Adjustment factors were developed for each of the 12 IHS regional administrative "areas" and the IHS overall and selected age groups; however, data were insufficient to reliably determine adjustment factors by subgroups within IHS area.[22] Because misclassification rates varied more widely across the IHS areas, only the area-specific factors were chosen for use in the *Trends* publications (personal communication, Debra A. Heller, PhD, consulting statistician, IHS, December 2004).

Misclassification- and age-adjusted mortality rates in *Trends* were obtained as follows (personal communication, Debra A. Heller). First, the unadjusted number of total deaths from CVD, diseases of the heart, and cerebrovascular disease was adjusted by the IHS area-specific factor within age groups. These rates were subsequently applied to the 1940 standard US population for age adjustment using the direct method used by NCHS.[20] The 2000 standard US population was not available at the time these data were prepared. Because the IHS service population was much smaller than the US white and all-races populations, misclassification of AIAN as another race on death certificate data has a negligible effect on mortality rates for these populations.

The IHS first reported misclassification-adjusted CVD mortality rates for data from 1992 to 1994.[19] To estimate adjusted rates for earlier periods, the average percent differences between the unadjusted and adjusted rates for the periods 1992 to 1994, 1994 to 1996, and 1996 to 1998 were calculated. The average of these differences over the 3 periods was then applied to the rates from previous years.

The annual percent change in rates was also calculated by use of the midpoint years of the first and last time periods. Because these are census-level data and because denominator data were not available, statistical testing for significant differences in the annual percent change by race was not done.

# Results

The Figure shows that, without adjustment for misclassification, a favorable gap in major CVD mortality rates at baseline existed for AIAN compared with the other groups, although this gap narrowed as a result of increasing rates in AIAN and decreasing rates in the other groups. In contrast, adjustment for racial misclassification, which resulted in a 16% increase in major CVD mortality rates, revealed a baseline and rapidly growing disparity in CVD mortality rates among AIAN compared with whites and, after the initial study period, US all races. The average annual percent change in major CVD mortality was 0.4 for AIAN rates compared with −1.8 for both the US all-races and white populations.

**TABLE 1. Trends and Annual Percent Change in Age-Adjusted* Mortality Rates Per 100 000 for Diseases of the Heart and Cerebrovascular Disease by Population, 1989–1991 to 1996–1998†**

| Race | 1989–1991[17] | 1991–1993[18] | 1992–1994[19] | 1994–1996[20] | 1996–1998[21] | Annual Change, % |
|---|---|---|---|---|---|---|
| Diseases of the heart | | | | | | |
| AIAN | 132.1 | 132.4 | 133.4 | 132.4 | 132.9 | 0.1 |
| Misclassification-adjusted AIAN | (155.9) | (156.2) | 157.6 | 156.0 | 157.1 | 0.1 |
| US all races | 152.0 | 144.3 | 145.3 | 138.3 | 130.5 | −2.0 |
| US white | 146.9 | 139.2 | 139.9 | 133.1 | 125.9 | −2.0 |
| Cerebrovascular disease | | | | | | |
| AIAN | 25.2 | 25.3 | 25.1 | 27.2 | 26.7 | 0.9 |
| Misclassification-adjusted AIAN | (28.0) | (28.1) | 27.8 | 30.5 | 29.5 | 0.8 |
| US all races | 27.7 | 26.2 | 26.5 | 26.7 | 25.9 | −0.9 |
| US white | 25.5 | 24.2 | 24.5 | 24.7 | 24.0 | −0.8 |

*All rates are age-adjusted to the 1940 standard US population.

†Intervals between time periods are not to scale. Numbers in parentheses and the annual percent changes were provided by the author, not by the IHS.

Table 1 presents mortality data for diseases of the heart and cerebrovascular disease for the total populations. Rates for diseases of the heart and cerebrovascular disease increased 18% and 11%, respectively, after adjustment for misclassification. Mortality rates from diseases of the heart were highest among AIAN after adjustment for misclassification, and the differences increased over time as a result of declines in the US all-races and white rates. The AIAN mortality rates from diseases of the heart changed minimally over the periods of study. Cerebrovascular disease mortality among AIAN rose during the study period but declined in the US all-races and white populations.

Diseases of the heart were the leading cause of death among AIAN beginning at 45 years of age for all periods reported in this study (data not shown). In contrast, diseases of the heart were not the leading cause of death for the US all-races or white populations until 65 years of age. Mortality rates from diseases of the heart and cerebrovascular disease stratified by age group are shown in Tables 2 and 3, respectively. Mortality rates among the 45- to 54-year-old AIAN group were dramatically higher than for the US all-races or white populations, regardless of adjustment for misclassification for both diseases of the heart and cerebrovascular disease, and these disparities increased over time. Death rates for diseases of the heart and cerebrovascular disease for AIAN 55 to 64 years of age were also substantially higher than for their non-AIAN counterparts, again regardless of adjustment for misclassification. Although decreases in the AIAN rates were found over time for diseases of the heart in this age group, the rate of decline was less than

**TABLE 2. Diseases of the Heart Mortality Rates per 100 000 and Annual Percent Change by Age Group and Population, 1991–1993 to 1996–1998***

| Age/Race | 1991–1993[18] | 1992–1994[19] | 1994–1996[20] | 1996–1998[21] | Annual Change, % |
|---|---|---|---|---|---|
| Age 45–54 y | | | | | |
| AIAN | 127.0 | 146.2 | 154.9 | 153.2 | 4.1 |
| Misclassification-adjusted AIAN | (151.1) | 174.7 | 182.6 | 181.8 | 4.1 |
| US all races | 114.6 | 114.0 | 111.3 | 104.9 | −1.7 |
| US white | 103.6 | 102.9 | 100.4 | 94.6 | −1.7 |
| Age 55–64 y | | | | | |
| AIAN | 380.8 | 373.1 | 369.5 | 361.4 | −1.0 |
| Misclassification-adjusted AIAN | (453.2) | 444.7 | 439.2 | 436.3 | −0.7 |
| US all races | 346.5 | 344.3 | 324.1 | 302.4 | −2.5 |
| US white | 325.6 | 311.7 | 303.9 | 282.3 | −2.7 |
| Age ≥65 y | | | | | |
| AIAN | 1353.2 | 1327.3 | 1293.2 | 1324.9 | −0.4 |
| Misclassification-adjusted AIAN | (1569.7) | 1538.5 | 1502.3 | 1534.3 | −0.5 |
| US all races | 1844.5 | 1891.0 | 1837.4 | 1781.1 | −0.7 |
| US white | 1849.7 | 1895.6 | 1843.7 | 1795.1 | −0.6 |

*Intervals between time periods are not to scale. Numbers in parentheses and the annual percent changes were provided by the author, not by the IHS.

**TABLE 3. Cerebrovascular Disease Mortality Rates per 100 000 and Annual Percent Change by Age Group and Population, 1991–1993 to 1996–1998***

| Age/Race | 1991–1993[18] | 1992–1994[19] | 1994–1996[20] | 1996–1998[21] | Annual Change, % |
|---|---|---|---|---|---|
| Age 45–54 y | | | | | |
| AIAN | 16.6 | 14.9 | 27.1 | 24.1 | 9.0 |
| Misclassification-adjusted AIAN | (18.5) | 16.2 | 30.7 | 26.2 | 9.0 |
| US all races | 17.5 | 17.6 | 17.7 | 16.9 | −0.7 |
| US white | 13.8 | 13.7 | 13.8 | 13.1 | −1.0 |
| Age 55–64 y | | | | | |
| AIAN | 58.8 | 59.3 | 47.4 | 56.1 | −0.9 |
| Misclassification-adjusted AIAN | (64.3) | 64.9 | 52.3 | 60.8 | −1.0 |
| US all races | 46.4 | 46.0 | 46.2 | 44.4 | −0.9 |
| US white | 39.1 | 38.8 | 39.0 | 36.9 | −1.1 |
| Age ≥65 y | | | | | |
| AIAN | 298.1 | 294.4 | 319.5 | 315.8 | 1.2 |
| Misclassification-adjusted AIAN | (326.5) | 325.2 | 353.1 | 346.4 | 1.1 |
| US all races | 388.5 | 401.4 | 414.2 | 411.9 | 1.2 |
| US white | 384.3 | 397.4 | 410.0 | 411.3 | 1.4 |

*Intervals between time periods are not to scale. Numbers in parentheses and the annual percent changes were provided by the author, not by the IHS.

half that of the non-AIAN groups. In contrast, rates of decline were similar between populations in this age group for cerebrovascular disease.

Among persons ≥65 years of age, AIAN had lower mortality rates from heart disease and cerebrovascular disease, regardless of adjustment for racial misclassification. Overall, heart disease mortality rates decreased and cerebrovascular disease mortality rates increased in this age group for each population, with roughly similar annual percent changes.

## Discussion

This report assesses recent trends in CVD mortality for the >1 million AIAN residing on or near reservations and trust lands. Findings suggest that total CVD mortality for AIAN is higher, not lower, than in the rest of the nation and may have been higher for more than a decade. Furthermore, CVD mortality is increasing in this population but decreasing in the general population, widening a previously unrecognized disparity. National vital event data had consistently suggested that CVD mortality rates among AIAN compared favorably to the general population, even to the present[2,4,5,23–25]; however, prior studies did not account for the effect of racial misclassification.

This study also reveals differences in CVD mortality among adults by age groups. The marked disparity in CVD mortality between middle-aged AIAN and the US all-races and white populations is striking and is increasing. Other studies have also recently demonstrated a higher burden of premature heart disease mortality for AIAN.[26,27] In contrast, lower rates of heart disease and cerebrovascular disease mortality occurred among AIAN compared with US all-races and white populations ≥65 years of age, even after adjustment for racial misclassification. This finding is also consistent with some other studies[27,28] but not all.[14,15] In addition, heart disease mortality rates for AIAN ≥65 years of age decreased and cerebrovascular mortality rates increased. Although it is tempting to speculate that the lower mortality from diseases of the heart, coupled with a rising prevalence of hypertension,[29] increased the number of AIAN elders at risk for dying of stroke, reasons for this pattern are not clear. Similarly, the increasing trend in mortality from diseases of the heart among middle-aged AIAN compared with the decreasing trend in older AIAN cannot be explained by this study. This may reflect the birth cohort effects of diabetes and smoking, which have increased markedly in prevalence among younger AIAN in recent decades. Additional evidence that the burden of CVD among AIAN was not as low as suggested by national vital event data can be found in previous studies. The 1987 Survey of American Indians and Alaska Natives found that the self-reported percent prevalence of CVD was nearly equal to that reported for the general US population.[28] Among AIAN in Washington State, heart disease and cerebrovascular mortality did not differ significantly between urban AIAN and urban whites, but rural AIAN had significantly higher mortality than either of these 2 groups.[10] Other smaller, tribally based studies in the late 1980s also suggested that AIAN heart disease rates rivaled or exceeded rates in the general population or were rising rapidly.[6]

Findings from the largest study of CVD among American Indians provide even stronger support for a growing burden of CVD. The SHS is an epidemiological study of CVD among a well-defined but culturally diverse population of American Indians 45 to 74 years of age residing in Arizona, Oklahoma, and North and South Dakota.[13] The SHS included a population-based survey to estimate CVD mortality rates in these communities for 1984 to 1988.[14] Major CVD mortality rates were determined from death certificate data and confirmed by independent review of medical records. In contrast to studies using national event data, the SHS found that CVD mortality rates were close to the US averages in Arizona and Oklahoma and >2 times higher in North and South Dakota for persons between 45 and 64 years of age. Furthermore, American Indian CVD mortality rates were often higher than the respective state rates for most age and sex groups.

The SHS also longitudinally ascertained CVD morbidity and mortality from medical record review, clinical history, and physical examinations in a cohort of 4549 American Indians 45 to 74 years of age in the 3 regions described above. Lists of tribal rolls were used to identify eligible persons, thus eliminating racial misclassification.[13] Medical records and death certificates were independently reviewed by 2 physicians to determine whether the deaths were due to CVD. After 7 years of follow-up, combined coronary heart disease incidence rates were nearly twice as high as those reported in the national Atherosclerosis Risk in Communities study cohort.[15] This finding suggests that rates of coronary disease in this cohort exceed those of other US populations.

## Racial Miscoding and CVD

Several studies support the use of adjustment for racial miscoding in reporting AIAN mortality rates. The National Center for Health Statistics evaluated the quality of the national death rates and found a markedly disproportionate underestimation of AIAN total mortality rates compared with other races.[16] Specifically, the study found that death rates for AIAN were underestimated by nearly 21% compared with 11% for Asians and 2% for Hispanics. In contrast, death rates for black and white populations were overestimated by 5% and 1%, respectively. In the misclassification study of death certificate data for the IHS user population, AIAN race was misidentified an average of 10.9%, with rates varying widely from 1.2% to 30.4% across the different service units and age groups.[22] Also, in Washington State, nearly 15% of AIAN were misclassified as a different race.[30]

Racial misclassification among AIAN has resulted in substantial underestimation of cancer mortality,[31] injury rates,[32] and prevalence of end-stage renal disease.[33] Furthermore, mortality from "signs, symptoms, and ill-defined conditions" was a disproportionately leading cause of death among American Indians in New Mexico,[34] likely leading to underestimation in rates of death from CVD.

## Study Limitations

The adjustment factors developed by IHS were based on racial misclassification of deaths from all causes in the IHS user population from 1986 to 1988. Although overlap exists between the IHS user-defined population and the census-defined IHS service population, misclassification may be greater in the wider service population. Because adjustment factors by both age group and IHS area could not be determined,[22] only the area-specific adjustment factors were applied, forcing the assumption that rates of misclassification across age groups were uniform. Also, rates of misclassification of AIAN race may be increasing.[30] Finally, disease-specific misclassification rates have not been determined for the IHS populations. Still, misclassification might vary by cause of death, with racial misclassification occurring less often for conditions well known to affect AIAN such as alcoholism than for conditions such as cancer.[35] Because CVD has not been widely recognized as disproportionately affecting AIAN, it may be subject to greater rates of misclassification. Mortality from ill-defined causes is also markedly disproportionate for some American Indians,[34] leading to undercounting of CVD as a cause of death. The combined effect of these biases may result in conservative estimates of CVD mortality among AIAN; therefore, the disparities in the present study may be greater than demonstrated.

Data were not available for a sensitivity analysis of CVD-specific adjustment factors. The adjustment for misclassification led to a 16% increase in total CVD mortality rates, which, as discussed above, may be conservative. If the overall correction of the misclassification of CVD deaths had resulted in only a 10% increase in mortality rates, the disparity would be apparent only 2 years later.

Another limitation in the IHS data is the use of the standard 1940 population rather than a more recent standard population for age adjustment. It is unlikely, though, that the observed disparities would be substantially affected by use of a different standard population.

The lack of sex-specific age-adjusted CVD mortality rates is another limitation of the IHS data. Such information would contribute to a better understanding of the disparities demonstrated in this study, especially if the disparities affect men and women differentially.

Despite these limitations, the data clearly show an enlarging disparity in CVD mortality among AIAN compared with the US white and all-races populations. These disparities are particularly marked among middle-aged AIAN even without adjustment for racial misclassification.

Reasons for the widening disparities in CVD mortality cannot be determined from the present study. One factor may be the severe epidemic of diabetes mellitus, which is markedly disproportionate among AIAN[9,36,37] and may be exacting its toll. Diabetes mellitus is the most common modifiable CVD risk factor for many AIAN populations[38,39] and is one of the strongest risk factors for incident CVD among participants in the SHS.[15] Indeed, diabetes is a stronger risk factor among the SHS cohort than among the Framingham cohort.[40] The role of socioeconomic status and access to specialty care cannot be assessed with these data but could also account for some of the disparities found here. For instance, in the 1990 census, 31.6% of the AIAN living in states with reservations lived below the poverty level compared with 13.1% of the US all-races population.[20] Also, in 2000, the IHS annual per capita healthcare spending was $1430, less than one half that for the general US population ($3766),[41] raising the specter that some of the observed disparities could be due to underfunding of the IHS.

Although >1.2 million AIAN were included in this study, the extent to which these data can be generalized to other AIAN populations is unknown. Many AIAN may have different access to health care or different risk profiles compared with the IHS service population. Furthermore, marked heterogeneity in CVD risk factors,[29] mortality,[42] and racial misclassification exists among AIAN.[42] The present report cannot provide region- or tribe-specific information.

## Conclusions and Future Directions

Unfavorable and widening disparities in CVD mortality for AIAN have been largely unrecognized because of errors in national vital event data that disproportionately affect AIAN. Even without misclassification accounted for, disparities in CVD are most marked among middle-aged AIAN, which in turn suggests an even higher burden of chronic disease among younger AIAN. Rigorous data collection efforts to ensure accurate and adequate representation of AIAN in national data sets are required. Reassessments of national rates of racial misclassification should be conducted periodically to help ensure the accuracy of CVD mortality data. IHS should be commended because it is the only federal healthcare agency to routinely account for misclassification of AIAN in its health status reports. Researchers using national event data to assess trends in the health of AIAN should follow its lead.

This study shows an alarming increase in CVD mortality among middle-aged AIAN and a growing disparity in CVD mortality for AIAN compared with the general population. Further research is needed to discover the root causes of these disparities and to identify persons at high risk. Although the premature CVD deaths may be attributable in part to the disproportionate and rising scourge of diabetes among younger AIAN, this hypothesis has not been tested. How AIAN men and women are affected differently by CVD mortality needs further elucidation. Also, manifestations of CVD among AIAN may differ from the general population or may be less recognized. To best address these questions, future research should include longitudinal comparative epidemiological studies of AIAN and non-AIAN men and women before the onset of middle age. Finally, AIAN communities should be alerted to the increased risk of early CVD mortality so that they can develop programs targeted at decreasing this risk.

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### Clinical Investigation and Reports

# Rising Tide of Cardiovascular Disease in American Indians

## The Strong Heart Study

Barbara V. Howard, PhD; Elisa T. Lee, PhD;
Linda D. Cowan, PhD; Richard B. Devereux, MD;
James M. Galloway, MD; Oscar T. Go, PhD;
William James Howard, MD; Everett R. Rhoades, MD;
David C. Robbins, MD; Maurice L. Sievers, MD;
Thomas K. Welty, MD

From Medlantic Research Institute and Washington Hospital Center, Washington, DC (B.V.H., W.J.H., D.C.R., M.L.S.); Center for American Indian Health Research, University of Oklahoma Health Sciences Center, Oklahoma City (E.T.L., O.T.G.); the Department of Biostatistics and Epidemiology, University of Oklahoma, Oklahoma City (L.D.C.); Cornell University, College of Medicine, Ithaca, NY (R.B.D.); Center for Native American Health, Tucson, Ariz (J.M.G.); College of Medicine, University of Oklahoma, Oklahoma City (E.R.R); and Aberdeen Area Tribal Chairmen's Health Board, Rapid City, SD (T.K.W.).

Correspondence to Barbara V. Howard, PhD, Medlantic Research Institute, 108 Irving St, NW, Washington, DC 20010. E-mail bvh1@mhg.edu

*Background*—Although cardiovascular disease (CVD) used to be rare among American Indians, Indian Health Service data suggest that CVD mortality rates vary greatly among American Indian communities and appear to be increasing. The Strong Heart Study

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was initiated to investigate CVD and its risk factors in American Indians in 13 communities in Arizona, Oklahoma, and South/North Dakota.

*Methods and Results*—A total of 4549 participants (1846 men and 2703 women 45 to 74 years old) who were seen at the baseline (1989 to 1991) examination were subjected to surveillance (average 4.2 years, 1991 to 1995), and 88% of those remaining alive underwent a second examination (1993 to 1995). The medical records of all participants were exhaustively reviewed to ascertain nonfatal cardiovascular events that occurred since the baseline examination or to definitively determine cause of death. CVD morbidity and mortality rates were higher in men than in women and were similar in the 3 geographic areas. Coronary heart disease (CHD) incidence rates among American Indian men and women were almost 2-fold higher than those in the Atherosclerosis Risk in Communities Study. Significant independent predictors of CVD in women were diabetes, age, obesity (inverse), LDL cholesterol, albuminuria, triglycerides, and hypertension. In men, diabetes, age, LDL cholesterol, albuminuria, and hypertension were independent predictors of CVD.

*Conclusions*—At present, CHD rates in American Indians exceed rates in other US populations and may more often be fatal. Unlike other ethnic groups, American Indians appear to have an increasing incidence of CHD, possibly related to the high prevalence of diabetes. In the general US population, the rising prevalence of obesity and diabetes may reverse the decline in CVD death rates. Therefore, aggressive programs to control diabetes and its risk factors are needed.

**Key Words:** cardiovascular diseases • heart disease • mortality • Indians, North American • risk factors

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Robert Wood Johnson Foundation

# Racial Disparity in Hypertension Control

## Tallying the Death Toll

More than 7,600 African Americans die from strokes and heart disease each year because their blood pressure is not as well controlled as that of White Americans, according to this study which analyzed racial disparity in hypertension control.

Previous studies have shown hypertension, a precursor to cardiovascular disease, is more prevalent and not as well controlled in African Americans, versus Whites. But this is the first study to attempt to quantify annual heart disease and stroke deaths that would be avoided or postponed if the hypertension of African Americans was controlled as well as that of White Americans. The findings are based on national survey data of 1,545 African-American adults and 1,335 White adults.

Key Findings:

- African-American men and women with hypertension have higher mean systolic blood pressure than their White counterparts, 6.5 mm Hg higher for African-American men and 8.2 mm Hg higher for African-American women.
- Eliminating this racial disparity would reduce annual African-American deaths from heart disease and stroke by an estimated 5,480 and 2,190, respectively.
- Racial parity in hypertension control also would reduce annual mortality rates from heart disease and stroke among African-American men by 17 percent and 16 percent, respectively, and among African-American women by 9 percent and 14 percent, respectively

Previous studies reveal little evidence of difference in diagnosis and treatment between the two racial groups; African Americans do not have more severe hypertension than Whites and do not respond less favorably to drug treatment. But there is evidence of racial disparity in adherence to medication treatment plans. This difference has been reduced in programs designed to address the reasons why people do not take their medication as prescribed, such as medication costs, personal beliefs, anticipated adverse effects and health literacy

The authors conclude better hypertension control among African Americans is likely an attainable goal, if sufficient resources are available to discover and address barriers to treatment adherence. Noting limitations of their data, they call for more research, especially regarding gender differences and the underlying reasons for the disparities that lead to so many more African-American deaths.

The Robert Wood Johnson Foundation, based in Princeton, N.J., is the nation's largest philanthropy devoted exclusively to health and health care.

# Racial Disparity in Hypertension Control: Tallying the Death Toll

*Kevin Fiscella, MD, MPH*[1,2]
*Kathleen Holt, PhD*[1]

[1]Department of Family Medicine, University of Rochester School of Medicine and Dentistry, Rochester, New York

[2]Department of Community and Preventive Medicine, University of Rochester School of Medicine and Dentistry, Rochester, New York

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## ABSTRACT

**PURPOSE** Black Americans with hypertension have poorer blood pressure control than their white counterparts, but the impact of this disparity on mortality among black adults is not known. We assessed differences in systolic blood pressure (SBP) control among white and black adults with a diagnosis of hypertension, and measured the impact of that difference on cardiovascular and cerebrovascular mortality among blacks.

**METHODS** Using SBP measurements from white and black adults participating in the National Health and Nutrition Examination Survey, 1999-2002, we modeled changes in mortality rates resulting from a reduction of mean SBP among blacks to that of whites. Our data source for mortality estimates of blacks with hypertension was a meta-analysis of observational studies of SBP; our data source for reduction in mortality rates was a meta-analysis of SBP treatment trials.

**RESULTS** The final sample of participants for whom SBP measurements were available included 1,545 black adults and 1,335 white adults. The mean SBP among blacks with hypertension was approximately 6 mm Hg higher than that for the total adult black population and 7 mm Hg higher than that for whites with hypertension. Within the hypertensive population, a reduction in mean SBP among blacks to that of whites would reduce the annual number of deaths among blacks from heart disease by 5,480 and from stroke by 2,190.

**CONCLUSIONS** Eliminating racial disparity in blood pressure control among adults with hypertension would substantially reduce the number of deaths among blacks from both heart disease and stroke. Primary care clinicians should be particularly diligent when managing hypertension in black patients.

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## INTRODUCTION

Cardiovascular disease, the leading cause of death in the United States, occurs at the highest rate among black Americans.[1] As a precursor to cardiovascular disease, hypertension is one of the most important contributors to racial disparities in mortality rate.[2] The age-adjusted prevalence of hypertension is significantly higher among blacks (39%) than among whites (29%).[3] Uncontrolled hypertension has an enormous impact on the health of minorities,[1,4] accounting for up to one-quarter of all deaths among black adults, primarily from cardiovascular and cerebrovascular causes.[5]

Recent data suggest that among persons under treatment for hypertension, blacks have poorer blood pressure control.[3] Only a few studies have quantified the effects of racial disparities in health care interventions on the number of deaths among.[6,7] To our knowledge, none have quantified the impact of disparity in hypertension control on black mortality.

To model the impact of this disparity in hypertension control, we used national data on systolic blood pressure (SBP), mortality data, and published estimates of the relative risk associated with decreases in SBP. Specifically, we calculated the annual numbers of heart and stroke deaths

*Conflicts of interest: none reported*

**CORRESPONDING AUTHOR**

Kevin Fiscella, MD, MPH
Departments of Family Medicine,
and Community and Preventive Medicine
University of Rochester School
of Medicine and Dentistry
1381 South Ave
Rochester, NY 14620
Kevin_Fiscella@urmc.rochester.edu

that would be avoided or postponed assuming blacks with hypertension had their blood pressure controlled to the same level as whites.

## METHODS

### Data Sources

We used SBP data from the National Health and Nutrition Examination Survey (NHANES) for the years 1999-2002. NHANES is a periodic national survey of the health status of the United States and is designed to yield nationally representative estimates. It includes data from questionnaires, physical examinations, and medical tests. Eligibility criteria for our sample included (1) self-identification as white or black, (2) age of 25 years or older, and (3) diagnosis of hypertension (regardless if treated or not). We also used 2002 US black mortality data for heart disease and stroke, stratified by sex and age.[8]

We estimated the additional risk associated with an elevated SBP based on a meta-analysis of epidemiologic studies of SBP and mortality. This meta-analysis, based on approximately 1 million individuals, estimated the risks, stratified by age and sex, of heart disease and stroke associated with elevated blood pressure.[9] We estimated the effect of reductions in SBP based on relative risks for heart disease and stroke mortality from a meta-analysis of randomized treatment trials of hypertension.[10]

### Estimating Black Mortality Risk From Hypertension

National mortality rates are known for all black adults (ie, those with and without hypertension), but not for black adults with hypertension. To estimate sex- and age- specific mortality rates for this group, we used NHANES data to derive the mean difference in SBP between blacks with hypertension and all blacks by sex and age. Next, we calculated the relative risk associated with a given difference in SBP between blacks with hypertension and all blacks using the following sex- and age-specific exponential function, derived from a meta-analysis of observational studies of blood pressure and mortality[9]:

$$RR = RR_s^{(\Delta SBP/20)}$$

where ΔSBP equals the difference in mean SBP between blacks with a hypertension diagnosis and all blacks aged 25 years or older, and RRs equals the relative risk for heart disease or stroke by age and sex for a standardized ΔSBP of 20 mm Hg. The relative risk was then applied to each sex and age category for heart disease and stroke mortality to produce mortality rates adjusted for hypertension. For example, the difference in mean SBP among black men aged 55 to 64 years with hypertension relative to all black men in this age category was 5 mm Hg (142 vs 137 mm Hg). This difference represents a relative risk for heart disease mortality of 1.17 ($1/0.53^{(5/20)}$). The overall mortality rate for black men in this age-group is 605 deaths per 100,000. Among black men of this age with hypertension, the overall mortality is thus estimated at 708 per 100,000 (605 × 1.17). This estimate is conservative because it does not adjust for comorbidity (such as diabetes, hyperlipidemia, or obesity) associated with hypertension.[11]

### Estimating Relative Risk From Disparity in SBP

We estimated the relative risk associated with racial disparity in SBP based on a reduction in the mean SBP for blacks to that of whites in the same sex and age group. We calculated the mean difference in SBP between blacks and whites for each group using NHANES data and used a relative risk for reduction in SBP from a meta-analysis of randomized trials of hypertension treatment.[10] In that meta-analysis, an 8.3-mm Hg reduction in SBP was associated with a relative risk of 0.80 (95% confidence interval [CI], 0.77-0.84) for heart disease mortality and a relative risk of 0.67 (95% CI, 0.61-0.74) for stroke mortality. We then estimated the relative risk in heart disease mortality for various reductions in SBP using the following formula:

$$RR = RR_s^{(\Delta SBP/8.3)}$$

where ΔSBP equals the difference in SBP between blacks and whites matched for sex and age based on NHANES data, and $RR_s$ is the relative risk for heart disease or stroke standardized to an 8.3-mm Hg decrease in SBP. We then converted relative risks to relative risk reductions (RRR = 1 − RR).

### Estimating Deaths From Disparity in SBP

To estimate the number of deaths among blacks that would be postponed or avoided if parity in SBP control were achieved, we multiplied the relative risk reduction by the sex- and age-specific mortality rates (AMR) for blacks adjusted for SBP to obtain the absolute risk reduction. We then multiplied this by the estimated number of blacks (N) in each sex and age group, derived from NHANES data. Our estimate for deaths was thus equal to RRR × AMR × N.

### Statistical Analyses

The number of persons in each sex and age group and mean SBPs for blacks and whites were derived from NHANES data, weighted to yield national estimates using SAS (SAS Institute Inc, Cary, North Carolina). All other calculations were performed using Microsoft Excel (Microsoft Corp, Redmond, Washington).

### Sensitivity Analyses

We conducted a series of sensitivity analyses around key estimates in the model. First, we assessed the effect of assuming a ±30% black-white difference in SBP. We also assumed a constant difference in SBP across all age-groups using the mean SBP by sex to assess the effect of age distributions on our findings. Next, we used the 95% CIs surrounding the estimated relatives risks associated with decreases in SBP.[10] Last, we assumed comparable risk per change in SBP regardless of the source of the estimate, for example, observational data vs treatment data.[10]

## RESULTS

There were 661 black adults and 1,335 white adults with hypertension in the sample and an additional 884 blacks without hypertension. Table 1 shows the number of black men and women in the sample with hypertension in each age-group along with their mean SBP and corresponding 95% CIs. For men, the mean SBP was 22 mm Hg higher in the oldest as compared with the youngest cohort. For women, that difference was 26 mm Hg.

The differences in mean SBP by age and sex among blacks with hypertension, the entire black adult population, and non-Hispanic whites with hypertension are shown in Table 2. The mean SBP among black men with hypertension was 6 mm Hg higher than that for all black men and 6.5 mm Hg higher than that for white men with hypertension. For women, the differences were 6.5 and 8.2 mm Hg, respectively.

Table 3 shows the annual mortality rates by age and sex for heart disease and stroke for the entire black population, estimates of annual mortality rates for those with hypertension, and estimates for blacks with hypertension assuming racial parity in blood pressure control. Parity in SBP control would reduce annual mortality rates from heart disease and stroke among men by 17% and 16%, respectively. For women, the reductions would be smaller, 9% and 14%, respectively.

Racial parity in hypertension control would reduce the annual number of deaths from heart disease and stroke by an estimated 5,480 and 2,190 (Table 4). Sensitivity analyses are shown in the Supplemental Appendix (available online at http://www.annfammed.org/cgi/content/full/6/6/497/DC1). Use of 30% lower or higher estimates for racial differences in SBP yielded a 23% to 28% variation in death estimates. Use of a constant (mean SBP difference by race) across age-groups yielded slightly lower estimates for men, but substantially higher estimates for women relative to the base case. In general, use of a constant difference

**Table 1. Mean Systolic Blood Pressures of Blacks With Hypertension by Age and Sex, United States, NHANES 1999-2002**

| Age-Group, Years | US Population 2002 | Mean Systolic Blood Pressure (95% CI), mm Hg |
|---|---|---|
| Men | | |
| 25-34 | 2,537,000 | 128 (121-135) |
| 35-44 | 2,681,000 | 135 (130-141) |
| 45-54 | 2,116,000 | 138 (133-143) |
| 55-64 | 1,116,000 | 142 (136-148) |
| 65-74 | 693,000 | 139 (138-144) |
| ≥75 | 436,000 | 150 (141-159) |
| Women | | |
| 25-34 | 2,792,000 | 126 (121-130) |
| 35-44 | 3,024,000 | 135 (130-141) |
| 45-54 | 2,460,000 | 142 (136-147) |
| 55-64 | 1,438,000 | 141 (136-146) |
| 65-74 | 977,000 | 148 (142-153) |
| ≥75 | 849,000 | 152 (145-159) |

NHANES = National Health and Nutrition Examination Survey; CI = confidence interval.

**Table 2. Differences in Mean Systolic Blood Pressures by Age and Sex Between Blacks With Hypertension vs the Black Population and vs Non-Hispanic Whites With Hypertension**

| | Difference in Systolic Blood Pressure, mm Hg | |
|---|---|---|
| Group | Blacks With Hypertension vs Entire Black Population | Blacks With Hypertension vs Whites With Hypertension |
| Men | | |
| Age-group, years | | |
| 25-34 | 8 | 1 |
| 35-44 | 9 | 7 |
| 45-54 | 7 | 9 |
| 55-64 | 5 | 10 |
| 65-74 | 1 | 3 |
| ≥75 | 6 | 9 |
| Unweighted mean Δ | 6.0 | 6.5 |
| Women | | |
| Age-group, years | | |
| 25-34 | 12 | 14 |
| 35-44 | 13 | 13 |
| 45-54 | 12 | 10 |
| 55-64 | 3 | 4 |
| 65-74 | 1 | 4 |
| ≥75 | 2 | 1 |
| Unweighted mean Δ | 6.5 | 8.2 |

in SBP increased the number of deaths from heart disease by 43% and that from stroke by 49%. Use of the 95% upper and lower CIs yielded roughly 8% to 15% variations in estimates for heart disease deaths and 18% to 22% variations in those for stroke deaths. Last, substitution of age- and sex-specific relative risk values from observational studies for those from treatment studies yielded a 9% higher estimate of deaths from heart disease and a 21% lower estimate of deaths from stroke relative to the base case, but very similar estimates of death from heart disease and stroke combined (7,670 vs 7,720).

## DISCUSSION

Our findings show that racial disparity in SBP control contributes to nearly 8,000 excess deaths annually from heart disease and stroke among blacks. These findings are fairly robust to changes in key model assumptions. Previous analyses have shown that hypertension is the single largest contributor, of any medical condition, to racial disparity in adult mortality.[7] This excess mortality results from a combination of a higher age-adjusted prevalence of hypertension and poorer control of blood pressure among those under treatment.[3] Our analysis estimated the contribution of just the latter factor to deaths among blacks, but nonetheless, found a substantial impact on the number of deaths in this racial group.

To our knowledge, this study represents the first effort to quantify the toll of racial disparities in blood pressure control. Given the high prevalence of hypertension in blacks, appreciable benefits of blood pressure reduction, and significant disparity in control, it is not surprising that disparity in blood pressure control results in appreciably more deaths than those estimated from other health care disparities, including influenza vaccination, mammography screening, use of β-blockers after myocardial infarction, treatment of childhood asthma, and diabetes.[6,7]

The causes of racial disparity in blood pressure control are not known.[12] There are several potential explanations—differences in access to care, clinician management, hypertension severity, and patient adherence. Surprisingly, NHANES data show no racial difference in treatment among all patients with hypertension, suggesting that rates of diagnosis and treatment among blacks in this sample are the same

### Table 3. Black Mortality Rates by Age, Sex, and Blood Pressure

| Group | Entire Black Population[a] |  | Black Adults With Hypertension[b] |  | With Racial Parity in Blood Pressure Control[b] |  |
|---|---|---|---|---|---|---|
|  | Heart Disease | Stroke | Heart Disease | Stroke | Heart Disease | Stroke |
| **Men** |  |  |  |  |  |  |
| Age-group, years |  |  |  |  |  |  |
| 25-34 | 65 | 12 | 85 | 19 | 83 | 19 |
| 35-44 | 107 | 20 | 146 | 33 | 121 | 24 |
| 45-54 | 246 | 47 | 314 | 69 | 246 | 44 |
| 55-64 | 605 | 110 | 709 | 141 | 542 | 87 |
| 65-74 | 1,192 | 262 | 1,225 | 273 | 1,130 | 236 |
| ≥75 | 3,556 | 864 | 4,047 | 1,017 | 3,177 | 659 |
| Age adjusted | 419 | 90 | 733 | 167 | 603 | 140 |
| **Women** |  |  |  |  |  |  |
| Age-group, years |  |  |  |  |  |  |
| 25-34 | 24 | 7 | 39 | 11 | 7 | 6 |
| 35-44 | 58 | 17 | 98 | 28 | 69 | 15 |
| 45-54 | 125 | 36 | 186 | 54 | 142 | 33 |
| 55-64 | 312 | 70 | 334 | 75 | 277 | 54 |
| 65-74 | 734 | 181 | 758 | 187 | 680 | 154 |
| ≥75 | 3,438 | 975 | 3,527 | 1,000 | 3,433 | 953 |
| Age adjusted | 400 | 109 | 589 | 159 | 538 | 136 |

Note: mortality rates are expressed as number of deaths per 100,000

[a] Data from Kochanek and Smith.[8]

[b] Derived estimates. See Methods for calculation details.

### Table 4. Annual Deaths From Heart Disease and Stroke Avoided or Postponed Among Blacks Through Parity in Blood Pressure Control Between Black and White Adults With Hypertension, by Age and Sex

| Group | Annual No. of Deaths[a] |  |
|---|---|---|
|  | Heart Disease | Stroke |
| **Men** |  |  |
| Age-group, years |  |  |
| 25-34 | 10 | 0 |
| 35-44 | 120 | 50 |
| 45-54 | 480 | 170 |
| 55-64 | 940 | 300 |
| 65-74 | 420 | 160 |
| ≥75 | 1,450 | 600 |
| Overall | 3,420 | 1,280 |
| **Women** |  |  |
| Age-group, years |  |  |
| 25-34 | 50 | 20 |
| 35-44 | 230 | 110 |
| 45-54 | 420 | 200 |
| 55-64 | 560 | 210 |
| 65-74 | 440 | 190 |
| ≥75 | 360 | 180 |
| Overall | 2,060 | 910 |
| Men and women | 5,480 | 2,190 |

[a] Derived estimates. See Methods for calculation details.

as among whites.[3] Although there is considerable evidence for racial disparity in management of cardiovascular disease,[11] there is little evidence of racial disparity in treatment of hypertension. Specifically, among those with hypertension, there is no significant difference in rates of drug treatment of hypertension by race.[12] In addition, some data suggest no difference in clinician adherence to national hypertension treatment guidelines or intensification of antihypertensive treatment by race.[14]

It is possible that blacks have more severe hypertension or respond less favorably to antihypertensive drugs. There is no clear evidence, however, for racial differences in severity, and meta-analyses of treatment trials show a similar response to antihypertensive medication by race, with whites having a slightly greater response to β-blockers and blacks having a slightly greater response to diuretics.[15]

There is evidence for racial disparity in patient adherence to antihypertensive medication, including studies conducted within the Veterans Administration Health System, where fewer differences in access appear to exist.[16-18] Differences in adherence by race may be due to affordability of medicines, personal beliefs, anticipated adverse effects, and health literacy that disproportionately affect blacks.[19,20]

Although multiple causes may contribute to racial disparity in blood pressure control, this disparity is not inevitable. Disparity in hypertension control is significantly smaller in the Veterans Administration Health System, where access barriers are fewer.[21] Little or no disparity in blood pressure control was noted in the treatment arms of 2 large community-based hypertension treatment trials, the Hypertension Detection and Follow-up Program and the Multiple Risk Factor Intervention Trial.[22,23] It is thus probable that elimination of racial disparity in SBP is an attainable goal, provided sufficient resources are available to discover and address adherence barriers.

The strengths of this study include use of a nationally representative sample to estimate blood pressures among persons with hypertension; use of race-, sex-, and age-specific national mortality rates for heart disease and stroke; and estimates of relative risk associated with SBP derived from meta-analyses.

The limitations of our study merit comment. The sample of hypertensive blacks, although derived from a nationally representative sample, was relatively small. CIs surrounding estimates of blood pressure for specific groups were therefore relatively wide. Because the number of deaths rises exponentially with age, even small variation in estimates of racial disparity in blood pressure among the elderly blacks can yield appreciable changes in estimates. This phenomenon is best illustrated by the results for women. Despite a higher black-white disparity in SBP, our findings showed that elimination of this disparity would reduce deaths more among black men than among black women because the disparity for women is skewed toward younger ages. It is for this reason that use of a constant SBP yielded much higher estimates for women than men. In addition, because of small subgroup sizes, we used an upper age category of 75 years or older. Mean life expectancy at birth in 2004 was 69.5 years for black men and 75.3 years for black women.[1] Use of this cutoff underestimates the impact of these disparities on deaths among elderly black women. For these reasons, findings that racial disparity in SBP disproportionately affects male mortality should be viewed with caution pending more precise estimates of racial disparity in blood pressure control among men and women of advanced age.

These caveats notwithstanding, our findings suggest that racial disparity in hypertension control contributes appreciably to deaths among blacks from heart disease and stroke. Our analyses highlight the need to more fully understand the causes of these disparities and develop viable strategies to eliminate them, particularly clinician attention to adherence barriers among patients.

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**Key words:** Race/ethnicity; blacks; mortality; heart disease; stroke; hypertension; blood pressure; control

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# Minority Healthcare Quality

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## Structured Abstract

Context: The healthcare system in the United States does not provide the same quality of care for ethnic minority populations that it does for the majority white population. Despite awareness of inequities in healthcare quality, little is known about strategies with the potential to improve the quality of healthcare for minority populations.

Objectives: We performed a systematic review of evidence concerning the effectiveness of interventions designed to improve the quality of healthcare in racial or ethnic minorities. Our report focused on evaluations of interventions targeted at healthcare providers or organizations, as provider and organizational factors contribute substantially to disparities and inequities in access to and quality of healthcare.

Data Sources: Electronic searches of MEDLINE®, the Cochrane Collaboration's CENTRAL Register of Controlled Trials, EMBASE, and three specialty databases were performed. Hand searching of key journals and references lists was also performed. Electronic searching was completed in February 2003 and hand searching was completed to June 15, 2003.

Study Selection: Articles included in this evidence synthesis were English-language reports of evaluations of interventions that addressed one of the specific research questions.

Data Extraction: Pairs of reviewers assessed the study quality and abstracted data for each eligible article. Data were entered into a relational database.

Data Synthesis: Ninety-one articles were identified. Twenty-seven articles evaluated strategies targeted at healthcare providers or organizations to improve minority healthcare quality. The majority of these studies targeted physicians and most addressed aspects of prevention.

Main Results: There is excellent evidence that tracking/reminder systems can improve quality of care, and fair evidence that multifaceted interventions, provider education interventions, and interventions that bypass the physician to offer screening services to racial/ethnic minority patients can improve quality of care. Sixty-four articles evaluated cultural competence training as a strategy to improve the quality of healthcare in minority populations. Curricula addressed specific or general concepts of culture and were primarily group discussions and lectures. The lack of consistency in intervention methods and measured outcomes limited the evidence synthesis. There is, however, excellent evidence for improvement in provider knowledge, good evidence for improvement in provider attitudes and skills, and good evidence for improvement in patient satisfaction.

Conclusions: There is some evidence that interventions to improve quality of healthcare for minorities, including cultural competence training, are effective. More research is needed on quality improvement interventions specifically designed to reduce disparities. For example, interventions should target conditions and healthcare processes for which disparities have been documented. Also needed is more research on cultural competence training that uses rigorous study designs, well-described interventions and measurable objectives that are linked to process and outcome variables. Valid, reliable, and objective measurement of cultural competence is needed. As the literature grows, this information needs continued systematic review, updated on a regular basis and disseminated to clinicians, other healthcare decision-makers, educators, and the medical and health services research community.

Agency for Healthcare Research and Quality

Evidence Report/Technology Assessment

Number 90

# Strategies for Improving Minority Healthcare Quality

Summary

## Introduction

In recent years, it has become clear that the healthcare system in the United States is not providing the same quality of care for ethnic minority populations that it does for the majority white population. Racial and ethnic disparities in access to and quality of healthcare have been extensively documented.[1] The Institute of Medicine report "Unequal Treatment" confirmed that racial and ethnic disparities in healthcare are not entirely explained by differences in access, clinical appropriateness, or patient preferences.[2] There is also increasing evidence that provider behaviors and practice patterns contribute to disparities in care.[3]

Despite extensive documentation of inequities in healthcare quality, little is known about strategies with the potential to improve the quality of healthcare for ethnic minority populations. For those interested in quality improvement, there is a need for an evaluation and synthesis of the strategies that have been shown to be effective in bettering the quality of healthcare for ethnic minorities.

The purpose of this report is to systematically review the evidence to determine the effectiveness of interventions designed to improve the quality of healthcare and/or to reduce disparities for ethnic minorities. It focuses on evaluations of interventions aimed at healthcare providers or organizations, as recent work suggests these factors contribute substantially to the inequities. We examined broadly any type of strategy aimed at improving the quality of care in an ethnic minority population of patients, and then looked more specifically at strategies designed to improve the cultural competence of healthcare providers or organizations.

## Methods

The project consisted of engaging technical experts, formulating and refining the specific questions, performing a comprehensive literature search, reviewing the content and quality of the literature, constructing the evidence tables, synthesizing the evidence, and submitting the report for peer review.

The original questions were refined through team discussions, input from internal experts, and review and feedback from the external technical experts to arrive at the questions addressed in this report.

1. What strategies targeted at healthcare providers or organizations have been shown to improve minority healthcare quality?
    a. Which of these strategies have been shown to be effective in reducing disparities in health or in healthcare between minority and white populations?
    b. What are the costs of these strategies?
2. What strategies have been shown to improve the cultural competence of healthcare providers or organizations?
    a. What are the costs of these strategies?

We performed electronic searches of MEDLINE®, the Cochrane Collaboration's CENTRAL Register of Controlled Trials, EMBASE, and the following three specialty databases: the specialized register of Effective Practice and Organization of Care Cochrane Review Group (EPOC), the Research and Development Resource Base in Continuing

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are mixed, with most studies showing improvements in one or two (but not all) outcomes measured. Overall, there is fair evidence supporting the use of multifaceted interventions aimed at providers of racial/ethnic minority patients (Evidence Grade C).

*Bypass the physician.* Two studies (both in adult cancer screening) bypassed the physician and had either a nurse or a nurse practitioner offer screening directly to patients,[22,23] and both studies demonstrated improvements in the provision of preventive services to patients. Overall, there is fair evidence supporting the use of bypassing the providers of racial/ethnic minority patients to offer standardized services directly to patients (Evidence Grade C).

*Provider education.* Two studies used provider education as the main intervention strategy, one in the area of adult general prevention[24] and one in prevention of injuries in children.[25] Both studies demonstrated improvements in provider counseling behaviors,[24,25] but one measured and did not find any effect of the intervention on parent knowledge of injury prevention (the only outcome categorized as efficacy of treatment) or parent adherence to provider advice.[25] Overall, there is fair evidence supporting the use of provider education aimed at providers of racial/ethnic minority patients (Evidence Grade C).

*Use of Safe Times Questionnaire (STQ).* One study (in the area of prevention in children) used a structured questionnaire to assess adolescent health behaviors and demonstrated a positive impact on providers' counseling behaviors.[26] Overall, there is poor evidence supporting the use of structured questionnaires for racial/ethnic minority patients (Evidence Grade D).

*Use of Remote Simultaneous Translation (RST).* One study compared the accuracy of translation and quality of patient-physician communication by using remote simultaneous and proximate consecutive interpretation and found fewer translation errors and greater patient and physician satisfaction.[27] Overall, there is poor evidence supporting the use of RST for racial/ethnic minority patients (Evidence Grade D).

*Use of specialty consult.* One study evaluated the use of nephrology consults for patients with chronic kidney disease and found no effect on health care process or patient outcomes.[28] Overall, there is poor evidence supporting the use of specialty consults aimed at providers of racial/ethnic minority patients (Evidence Grade D).

*Use of defibrillators on emergency medical services.* One study evaluated the use of defibrillators on emergency medical services and found no effect on patient outcomes.[29] Overall, there is poor evidence supporting the use of defibrillators on emergency medical services (Evidence Grade D).

### Results for Question 1a: Strategies to Reduce Disparities

Only one study specifically addressed the question of whether an intervention could reduce disparities in healthcare quality between minorities and white persons.[18] The study, in which two different culturally tailored interventions to improve the quality of depression care were evaluated and compared to a control group that received no intervention, had mixed results. There was no differential effect of the interventions on healthcare process for white versus minority patients; all patients (African American, Latino, and white) in the intervention groups were more likely than patients in the control group to receive appropriate therapy. However, there was a mixed effect on health outcomes: there were improvements for African-American and Latino patients in the rate of depression compared with controls (with no improvement for white patients), whereas there were no improvements for African-American and Latino patients in the intervention groups in employment rates compared with controls (with improvement for white patients). Overall, there is poor evidence to determine which interventions might reduce disparities between racial/ethnic minority patients and majority patients (Evidence Grade D).

### Results for Question 1b: Costs of Quality Improvement for Racial/Ethnic Minorities

Only one study reported on the costs of an intervention aimed at improving the quality of healthcare for racial/ethnic minority persons.[28] This study, which provided case management and nephrology consultation for patients with chronic renal insufficiency, estimated a minimum yearly cost of $89,355 in 1998 (or $484 per intervention patient) and it was unable to demonstrate any health benefits in its participants. Overall, there is poor evidence to determine the cost of strategies to improve the quality of care for racial/ethnic minorities (Evidence Grade D).

## Question 2: Effectiveness of cultural competence training

### Overview of Reviewed Studies

Of the 64 articles that qualified for our review, only two described randomized controlled trials, eight studies were concurrent controlled trials, and four had an external (non-concurrent) control group. Most studies were designed without a comparison group; these had either a postintervention evaluation only (n=25), a pre- and a postintervention evaluation (n=20), or a qualitative evaluation (n=5). Most of the interventions targeted nurses (n=32) or physicians (n=19).

The content of the curricular interventions varied. Using a previously developed framework to categorize cultural competence curricular content,[30] we found that most interventions focused on specific cultural content (n=45), general concepts of culture (n=43), language (n=15), and patient-provider interaction (n=13). In terms of the specific ethnic minority groups that were the focus of the interventions, 20 studies mentioned Hispanic persons; 19, African Americans; 16, Asians/Pacific Islanders; and 5, American Indians.

Most interventions used more than one training method, and no two studies used exactly the same methods. The most common training methods were group discussion (n=29) and lectures (n=29). Most studies used more than one method for evaluation; the most common method was provider self-assessment forms (used in 33 studies). Only four articles attempted to measure patient outcomes. Most included some measure of provider outcome; attitude (n=44), knowledge (n=30), or skills/behaviors (n=22).

### Quality of Reviewed Studies

Notably, less than half (n=27) of the studies had an objective outcome assessment; only one third (n=21) included enough detail about the intervention to ensure replication; only 17 of the interventions were developed with a theoretical model; only 21 studies clearly described the targeted healthcare providers, setting, and dates of study; only 15 had a complete statistical analysis; only 14 included the numbers and reasons for non-inclusion in the study analysis; only eight had an adequate comparison group (concurrent and similar); only two had masking of outcome assessors; and only one had adequate randomization.

### Results of Reviewed Studies

In our results below, we focus on the 34 studies with the strongest study design (studies that either had a comparison group and/or did a pre- and postintervention evaluation). We do not focus on articles that described interventions evaluated qualitatively or with only a post-test.

*Knowledge.* Of the 19 studies that evaluated the effect of cultural competence training on the knowledge of healthcare providers, 17 demonstrated a positive effect, one study showed no effect, and one study demonstrated a partial/mixed effect. Eleven of these studies tested the provider's knowledge about general cultural concepts, seven evaluated culture-specific knowledge, and one did not provide details to allow determination of content. There was no obvious pattern regarding which type of knowledge was enhanced by cultural competence training. Overall, there is excellent evidence to suggest that cultural competence training increases the knowledge of healthcare providers (Evidence Grade A).

*Attitudes.* Of the 25 studies that evaluated the effect of cultural competence training on the attitudes of healthcare providers, 21 demonstrated a positive effect, one showed no effect, and three showed a partial/mixed effect. The most common attitude outcome measured was cultural self-efficacy (measured in three studies), but other types of attitudes were greater understanding of the impact of sociocultural issues on the patient-physician relationship, more positive attitudes toward community health issues, and an increased interest in learning about patient and family backgrounds. Overall, there is good evidence to suggest that cultural competence training favorably affects the attitudes of healthcare providers (Evidence Grade B).

*Skills.* Of the 14 studies that evaluated the effect of cultural competence training on the skills of healthcare providers, all demonstrated a positive effect. For example, in one study, participants were given 16 one-hour sessions in which they practiced communication skills with the community volunteers. They were subsequently shown to be significantly more competent in interviewing a non-English-speaking person as rated by a masked psychologist who viewed videotapes of interviews. Other types of skills/behaviors improvements were an increase in nurses' involvement in community-based cancer education programs, an increase in self-reported social interactions with peers of different races/ethnicities, and an improved ability of participants to conduct a behavioral analysis and treatment plan. Overall, there is good evidence to suggest that cultural competence training favorably affects the skills/behaviors of healthcare providers (Evidence Grade B).

*Patient outcomes.* Only three articles evaluated patient outcomes: one targeted physicians,[31] one targeted mental health counselors,[32] and one targeted a mixed group of providers.[33] All three reported favorable patient satisfaction measures,[31-33] and one demonstrated improved adherence to follow-up among patients assigned to the intervention group providers.[32]

In terms of the methods used to bring about such improvements in patient satisfaction and (in one case) adherence, one study trained four mental health counselors about the attitudes that low-income, African-American women bring to counseling (4 hours total),[32] another trained nine physicians to speak Spanish (20 hours total),[31] and a third implemented a state-mandated, 3-day training program focused on team training, recipient recovery principles, clinical issues, and cultural competence for all staff who have contact with recipients of inpatient mental healthcare.[33] Overall, there is good evidence that cultural competence training improves patient satisfaction (Evidence Grade B) and poor evidence that it affects patient adherence or health outcomes (Evidence Grade D).

### Results for Question 2a: Costs of Cultural Competence Training

Of the 55 articles eligible for review, only five addressed the costs of cultural competence training.[31,34-37] Four of the five[34-37] described the costs of interventions that involved international travel. In all cases students paid for some portion of the trip, while the school or program paid $0 to $2,000. There are limited data on the costs of classroom or other types of instruction. One study estimated the cost of 20 total hours of Spanish-language instruction for nine physicians to be

$2,000 in 2000, not including the opportunity costs for physician time (approximately 20 hours total for each physician).[31] In another program, 60 hours of classroom instruction (20 hours of Spanish-language instruction and 40 hours of cultural competence training focused on Hispanic populations) provided for 19 students had an estimated local cost of $3,000 in 1994, of which each student contributed $80.[36] Finally, one program matched involved matching 26 students to 26 local ethnically diverse families, asked the students to visit the family six times, and paid each family $400 in 1996-2000.[35] Overall, there is poor evidence to determine the costs of cultural competence training (Evidence Grade D).

## Discussion

### Question 1. Effectiveness of healthcare quality improvement interventions for racial/ethnic minorities

There is excellent evidence that provider tracking/reminder systems are effective in improving the quality of care for racial/ethnic minority patients (Evidence Grade A), fair evidence that multifaceted interventions, provider education interventions, and interventions which bypass the physician to offer screening services to racial/ethnic minority patients can improve quality of care (Evidence Grade C), and insufficient evidence for the use of any of the studied interventions (Evidence Grade D). Notably, however, two types of interventions had favorable results (employed in one study each, thus receiving an evidence grade of D) that may be worthy of further study: use of remote simultaneous translation for patients with limited English proficiency and the use of the Safe Times Questionnaire for health behavior risk assessment in adolescents.

There is poor evidence to determine which strategies are most effective in reducing disparities between ethnic minority and white populations (Evidence Grade D). The only study specifically designed to do this had mixed results with improvements in only one of the two outcomes assessed.[18] There is poor evidence to determine the costs of strategies to improve care and reduce disparities for ethnic minority populations (Evidence Grade D).

### Question 2. Effectiveness of cultural competence training

There is excellent evidence to suggest that cultural competence training can increase the knowledge of healthcare providers (Evidence Grade A), and good evidence that cultural competence training can improve the attitudes and skills of healthcare providers (Evidence Grade B). However, the studies are heterogeneous (no two studies used exactly the same intervention methods), and it is difficult to conclude which specific types of training interventions are effective in improving particular outcomes. Even within an outcome category, there is no uniformity in outcome measurement, thus making it difficult to determine which specific types of knowledge, attitudes, or skills are affected by cultural competence training.

There is good evidence from three studies to suggest that cultural competence training can favorably affects patient satisfaction (Evidence Grade B) and poor evidence that cultural competence training can affect patient adherence (Evidence Grade D), although the one study that examined patient adherence demonstrated a positive impact. There are no studies that have evaluated patient health outcomes.

There is poor evidence to determine the cost of cultural competence training (Evidence Grade D). One of the studies demonstrated an improvement in patient satisfaction also included information about cost, and so perhaps the best evidence is found in that study, which estimated a cost of $2,000 to train nine emergency department physicians in the Spanish language.[31]

## Limitations of Report and Literature

### General Limitations

This review was limited to reports published in English (after 1980), as our resources did not permit extensive searching of the non-English-language and "gray" literature. Consequently, publication bias is possible. However, recent work has suggested that results of reviews with these limits do not differ substantially from reviews with no such limits.[38] Only studies that specifically presented data on racial/ethnic minorities were included.

### Limitations of Report and Literature for Question 1

There were limited numbers of studies in each clinical category (except prevention), and few studies focused on priority conditions for which there are documented healthcare disparities (such as HIV/AIDS, cardiovascular disease, diabetes mellitus, and infant mortality). The majority of interventions (all but two) were generic improvement interventions targeted at providers of racial/ethnic minority patients; they did not necessarily target those aspects of care for which there are demonstrated disparities between minority and nonminority populations.

Some of the targeted processes of care were not evidence-based practices for any patient population (such as oral cavity exams or breast self-examinations for cancer screening) and thus would be unlikely to improve the quality of care or reduce disparities for racial/ethnic minority patients. Most studies measured health processes, rather than patient outcomes. This characteristic poses a significant limitation for studies that targeted processes of care not already linked to patient outcomes (that is, not evidence-based).

Evaluating the effectiveness of specific interventions was challenging for several reasons. Each study used slightly different intervention methods, thereby making generalizations across studies difficult. The studies used multicomponent interventions and did not examine separate components.

Very few studies involved Hispanic populations, and none included American Indians/Alaska Natives or Asians/Pacific Islanders. Most studies had no data on costs.

Only interventions targeting providers/organizations were included in this review. Although targeting patients directly may be a promising strategy to improve quality of care and reduce racial/ethnic disparities, such interventions are not reflected here. Only randomized controlled trials and concurrent controlled trials were included; there may be other worthwhile interventions that have been evaluated with other study designs.

Eligibility for our review was limited to studies in the United States, even though there may have been other promising studies conducted in other countries. Finally, we made no assessment of the generalizability of the population of providers targeted in these studies to the broader population of providers caring for racial/ethnic minorities.

### Limitations of Report and Literature for Question 2

There are no standardized instruments for measuring cultural competence, and very few outcome assessments were objectively measured. Often there were no data concerning the psychometric properties of the instruments used for evaluation, and most studies were designed without a comparison group for evaluation.

Many articles did not describe the curricular interventions well enough to ensure replication. Furthermore, each curricular intervention was different, making generalizability across studies difficult.

Few studies measured patient outcomes, and none measured healthcare process quality indicators. Some studies used curriculum evaluation as the only outcome. Finally, most studies did not include data on costs.

We made no attempt to assess the psychometric properties of the instruments used to measure cultural competence. Our review focused on interventions aimed at the education of healthcare providers, rather than on an evaluation of all possible organizational strategies to provide culturally and linguistically appropriate services.

## Future Research

### Research on Improving the Quality of Care and Reducing Disparities for Racial/Ethnic Minorities

More research designed specifically to reduce demonstrated racial/ethnic disparities in healthcare quality is needed. It is necessary to distinguish between interventions aimed at improving the quality of care for all persons and those aimed specifically at improving quality of care for racial/ethnic minorities (such as reducing provider bias). More quality improvement interventions are needed that focus on priority conditions for which there are documented health disparities (e.g., infant mortality, cardiovascular disease, diabetes mellitus, and HIV/AIDS). For generic quality improvement interventions done in mixed populations, there should be subgroup analyses to gauge the effect of the interventions on equality of treatment for racial/ethnic minorities.

Several gaps in the current literature need to be filled. More studies are needed in acute care and specialty settings and also among Asian/Pacific Islander, American Indian/Alaska Native, and Hispanic populations. More information is needed about the costs of various strategies to improve healthcare quality and reduce racial/ethnic disparities. In general, studies ought to include patient outcomes, have longer follow-up, and link processes of care to health outcomes. There is a need to replicate promising intervention strategies in different healthcare settings and organizations.

The literature is evolving rapidly, and updated evidence assessments will be necessary soon. Funding for that research is needed.

### Research on Cultural Competence

Curricular objectives need to be measurable and linked to outcomes that can be measured objectively. There is a dire need for standardized, reliable, and valid instruments to measure aspects of cultural competence. Studies should also measure the effect of the curricular interventions on healthcare process and patient outcomes. For the results to be meaningful, studies need to have a pre- and postintervention evaluation and/or a comparison group; there is certainly a need for more randomized controlled trials in this area.

Researchers should comprehensively describe the curricular interventions, such that they can be replicated in different settings. Studies also ought to include more comprehensive information about resources needed and the cost of cultural competence training.

Knowledge on this topic is evolving rapidly, and updated evidence assessments will be needed in the near future.

## Availability of the Full Report

The full evidence report from which this summary was taken was prepared for the Agency for Healthcare Research and Quality (AHRQ) by the Johns Hopkins University Evidence-based Practice Center, Baltimore, MD, under Contract No. 290-02-0018. The full report is expected to be available in January 2004. At that time, printed copies may be obtained free of charge from the AHRQ Publications Clearinghouse by calling 800-358-9295. Requesters should ask for Evidence Report/Technology Assessment No. 90, *Strategies for Improving Minority Healthcare Quality*. In addition, Internet users will be able to access the report and this summary online through AHRQ's Web site at www.ahrq.gov

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# HEALTHY PEOPLE 2010

## Volume I

- Understanding and Improving Health
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**U.S. Department of Health and Human Services**
**November 2000**

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HEALTHY
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# 1

# Access to Quality Health Services

Co-Lead Agencies: Agency for Healthcare Research and Quality
Health Resources and Services Administration

*[Note: The Healthy People 2010 Information Access Project provides dynamic, pre-formulated PubMed searches for selected objectives in this focus area so that current information and evidence-based strategies related to these objectives are easier to find. The National Library of Medicine has also provided PubMed links to available references that appear at the end of this focus area document.]*

## Contents

## Goal

### Improve access to comprehensive, high-quality health care services.

## Overview

Access to quality care is important to eliminate health disparities and increase the quality and years of healthy life for all persons in the United States. This chapter focuses on four components of the health care system: clinical preventive care, primary care, emergency services, and long-term and rehabilitative care. Together with health care delivered by specialists and care received in hospital settings, these elements represent major components of the continuum of care. The public health system is important in each of these areas because it educates people about prevention and addresses the need to eliminate disparities by easing access to preventive services for people less able to use existing health services. It ensures the availability of primary care through direct funding of clinics and providers or by providing public insurance. It coordinates emergency services systems and oversees long-term and rehabilitative care. Tertiary services (for example, hospital and specialty care) currently are not included among the Healthy People 2010 objectives. The Agency for Healthcare Research and Quality (AHRQ), formerly the Agency for Health Care Policy and Research, is working in conjunction with the Centers for Disease Control and Prevention (CDC) and other agencies of the U.S. Department of Health and Human Services to develop a *National Report on Healthcare Quality*, which will report annually on a broader array of quality measures that will complement Healthy People 2010.

### Issues

Access to high-quality health care across each of the components in the continuum of care must be improved to realize the full potential of prevention. For example, success in reducing the burden of heart disease and narrowing the gap in heart disease outcomes between different racial groups will depend on several factors. These factors include ensuring access to clinical preventive services, such as blood pressure and cholesterol screening; effective primary care to educate people about modifiable risk factors, such as smoking, and to manage effectively chronic conditions like hypertension; high-quality emergency services to improve outcomes of acute cardiac events; and access to rehabilitative and long-term care for heart disease patients.

Major changes in the structure of the U.S. health care system, including the increasing influence of market forces, changes in payment and delivery systems, and welfare reform, have significant implications for vulnerable and at-risk populations. In light of these systems changes, Federal, State, and local public health agencies must redouble their efforts to address access barriers and reduce disparities for these populations. It is increasingly important that health care communication and services be provided in a culturally and linguistically sensitive manner. Adequate access to health care and related services can increase appropriate patient use of the health care system and, ultimately, improve health outcomes. Consequently, measures of access across a continuum of care are an important way to evaluate the quality of the Nation's health care system.

**Clinical preventive care.** Clinical preventive services have a substantial impact on many of the leading causes of disease and death. People must have access to clinical preventive services that are effective in preventing disease (primary prevention) or in detecting asymptomatic disease or risk factors at early, treatable stages (secondary prevention). As in Healthy People 2000, the recommendations of the U.S. Preventive Services Task Force[1] serve as a guide to quality preventive health care. The task force was reconvened in 1998 and, in conjunction with AHRQ's Evidence-Based Practice Centers (EPCs), will provide additional information regarding the effectiveness and cost-effectiveness of individual clinical preventive services.

Improving access to appropriate preventive care requires addressing many barriers, including those that involve the patient, provider, and system of care.[2], [3] Patient barriers include lack of knowledge, skepticism about the effectiveness of prevention, lack of a usual source of primary care, and lack of money to pay for preventive care. Although patient awareness and acceptance of some interventions are high (such as screening for breast cancer) other interventions (for example, colorectal cancer screening and sexually transmitted disease [STD] screening) are less uniformly accepted. A small but significant number of patients remain skeptical of even widely accepted preventive measures, such as immunizations. Having health insurance, a high income, and a primary care provider are strong predictors that a person will receive appropriate preventive care. Although reimbursement for common screening tests, such as mammograms and Pap tests, is provided by most health insurance plans (and is required by law in some States), reimbursement for effective counseling interventions, such as smoking cessation, is less common.[4]

Health provider barriers include limited time, lack of training in prevention, lack of perceived effectiveness of selected preventive services, and practice environments that fail to facilitate prevention. Although consensus is growing regarding the value of a range of preventive services, providers identify lack of time and reimbursement as specific barriers to more consistent delivery of counseling about behavioral risk factors such as diet and exercise.[5] Computerized or manual tracking systems, patient and clinician reminders, guidelines, and patient information materials can help providers improve delivery of necessary preventive care.[6]

System barriers can include lack of resources or attention devoted to prevention, lack of coverage or inadequate reimbursement for services, and lack of systems to track the quality of care.[3] Systems interventions that can increase delivery of health care include offering clinical preventive services among standard covered benefits, providing feedback on performance to providers and practices, offering incentives for improved performance, and developing and implementing systems to identify and provide outreach to patients in need of services.[2]

Measuring and reporting how well preventive care is provided under different systems are essential first steps in motivating those systems that are not performing well to develop the information, tools, and incentives to improve care.[7] Significant progress in the delivery of clinical preventive services (CPS) is unlikely without appropriate data systems to allow providers and administrators to identify those services and populations most in need of better delivery. To be effective, preventive care also must be linked to systems to ensure appropriate followup services or counseling for patients identified through risk assessment or screening. Comprehensive national data to track what systems of care are doing to monitor and improve the delivery of CPS will not be available in the first half of the decade. Thus, this issue is not addressed in this focus area's objectives but represents an important agenda for research and data collection for the coming decade.

**Primary care.** Improving primary care across the Nation depends in part on ensuring that people have a usual source of care. Having a primary care provider as the usual source of care is especially important because of the beneficial attributes of primary care. These benefits include the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.[8] Increasing the number and proportion of members of underrepresented racial and ethnic groups who are primary care providers also is important because they are more likely to practice in areas where health services are in short supply and in areas with high percentages of underrepresented racial and ethnic populations.

**Emergency services.** Prehospital emergency medical services (EMS), poison control centers (PCCs), and hospital-based emergency departments (EDs) are the most commonly sought sources of emergency care. Each year, they provide prompt first-contact care for millions of people regardless of their socioeconomic status, age, or special need. For many severely ill and injured persons, these settings are a crucial link in the chain of survival between the onset of symptoms and treatment in a hospital. For persons whose health problems are less pressing but who believe they need urgent medical attention, emergency services are a gateway to additional health care.

In addition to their central role in secondary and tertiary prevention, emergency services are increasingly contributing to primary prevention by providing immunizations and other preventive care in association with treatment for acute health problems.

Within the current health care delivery system, EDs are the only institutional providers required by Federal law to evaluate anyone seeking care.[9] They are expected at least to stabilize the most severely ill and injured patients, and they provide walk-in care for vast numbers of persons who face financial or other barriers to receiving care elsewhere.

**Long-term care and rehabilitative services.** People with physical or mental conditions that limit their capacity for self-care need long-term care and rehabilitative services. This population covers persons of all ages, from those who were born with physical or mental limitations or who developed such limitations later on in life, including those injured at any age, to those with diminishing functioning at older ages.[10] About 40 percent of the people in this population are under age 65 years.[11] The long-term care population includes individuals who need help or supervision to perform activities of daily living or instrumental activities of daily living.

The goals of long-term care services are to improve functioning, maintain existing functioning, or slow deterioration in functioning while delivering care in the least restrictive environment. Rehabilitative services, a critical component of long-term care, strive to return individuals to their optimal level of functioning. People in the long-term care population need access to a range of services, including nursing home care, home health care, adult day care, assisted living, and hospice care.

## Trends

A significant measure of the access problem is the proportion of people who have health insurance. Following declines in the proportion of people with health insurance during the 1980s, the proportion has remained essentially level, at about 85 percent from 1989 to 1997 for persons under age 65 years.[12] Approximately 44.3 million persons lacked health insurance in 1998,[13] continuing an increase in the number of uninsured persons. At the same time, the proportion of adults with a usual source of care—an important predictor of access to needed services—fell from 83 percent to 78 percent between 1987 and 1992 before rising to 85 percent in 1998.[14] Although the lack of health insurance is clearly a major factor impeding access to care, having health insurance does not guarantee that health care will be accessible or affordable. Significant numbers of privately insured persons lack a usual source of care or report delays or difficulties in accessing needed care due to affordability or insurance problems.[15]

As a result of growing scientific evidence on the effectiveness of certain preventive services, 82 percent of employer-sponsored insurance plans include childhood immunizations, and 90 percent include Pap tests and mammograms. Nonetheless, gaps persist in coverage for effective preventive services, especially counseling.[4]

Concerns increasingly are focused on access to quality emergency services, long-term care, and rehabilitative services. Although emergency services are widely available in the United States, the range of services varies in accessibility and quality from region to region and, often, from neighborhood to neighborhood, raising additional concerns about care for vulnerable underserved populations. As the proportion of older people in the total U.S. population increases, the demand for quality long-term care services and facilities also will increase. Quality rehabilitative care needs are evident across all populations, and access to rehabilitative care is a significant problem for people who lack health insurance or who are underinsured and are unable to pay for the type and quality of health care they need.

During the 1990s and into the 21st century, increased attention has been paid at all levels of government as well as by the private sector to improving health care quality. The National Committee for Quality Assurance (NCQA), a managed care accreditation group, led a collaborative effort to develop the Health Plan Employer Data and Information Set (HEDIS), a widely used tool for evaluating health plan performance.[16] The Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) also has developed performance measures. AHRQ has developed the Consumer Assessment of Health Plans Survey (CAHPS), an instrument to assess consumer experiences with health plans. AHRQ also has developed the Healthcare Cost and Utilization Project (HCUP), which makes available State and nationwide estimates of hospital use. These data can be used with the HCUP Quality Indicators to provide measures of ambulatory-care sensitive conditions, which can uncover potential problems in access to primary care services. Quality monitoring systems tend to emphasize measures that focus on delivery rates for clinical preventive services because access to and use of these services are an important indicator of the quality of health care providers and of delivery systems. The complementary *National Report on Healthcare Quality* will explore methods for integrating the data from these quality-monitoring systems with population-based data collected by the public sector.

The Federal Advisory Commission on Consumer Protection and Quality in the Health Care Industry was established in 1997 to study changes occurring in the health care system and recommend ways to ensure consumer protection and quality health care. The Commission's report[17] provides a foundation for the emerging issues of the next decade in monitoring and reporting on quality of health care. It also includes a "Consumer Bill of Rights and Responsibilities,"[18] which is designed to strengthen consumer confidence in the health care system while holding participants in the system accountable for improving quality.

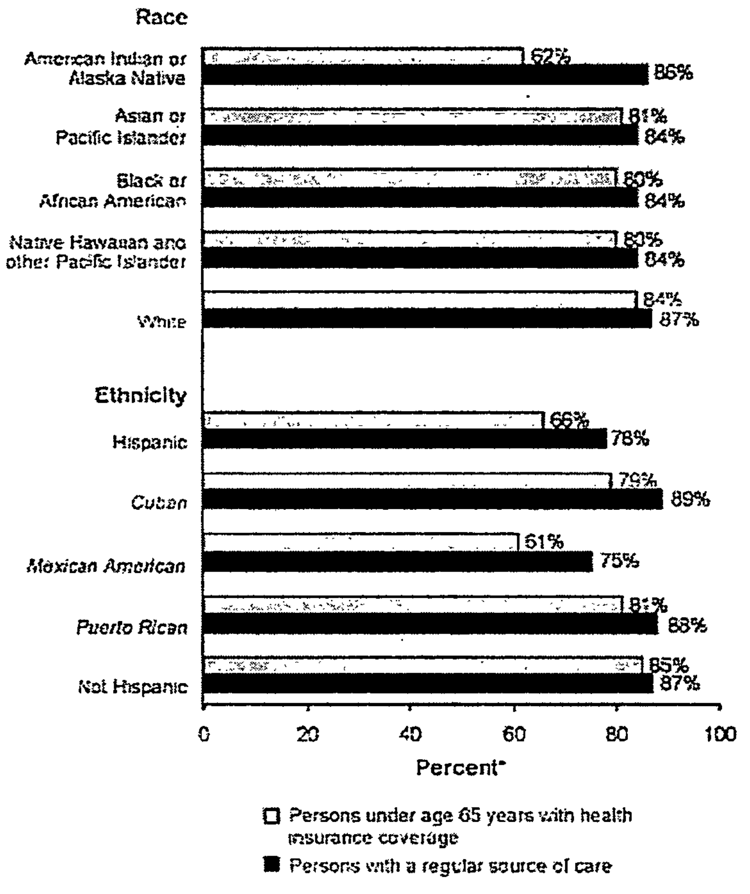
One essential step to improving quality is to reduce errors. The Institute of Medicine issued a report in

December 1999 documenting the magnitude of medical errors in U.S. hospitals. The report recommended strategies to reduce such errors, including better reporting of errors.[19]

## Disparities

Limitations in access to care extend beyond basic causes, such as a shortage of health care providers or a lack of facilities. Individuals also may lack a usual source of care or may face other barriers to receiving services, such as financial barriers (having no health insurance or being underinsured), structural barriers (no facilities or health care professionals nearby), and personal barriers (sexual orientation, cultural differences, language differences, not knowing what to do, or environmental challenges for people with disabilities). Patients with disabilities may face additional barriers arising from facilities that are not physically accessible or from the attitudes of clinicians. Hispanics, young adults, and uninsured persons are least likely to have a usual source of care.[12] Hispanic persons and those with less than 12 years of education are least likely to have a usual primary care provider.[20] Certain people, such as those who are disabled, elderly, chronically ill, or HIV-infected, require access to health care providers who have the knowledge and skills to address their special needs.[21]

**Access to Quality Health Services**
(By race and ethnicity, United States, 1997)



*Age adjusted to the year 2000 standard population.

Source: CDC NCHS National Health Interview Survey (NHIS), 1997

Substantial disparities remain in health insurance coverage for certain populations. Among the nonelderly population, approximately 33 percent of Hispanic persons lacked coverage in 1998, a rate that is more than double the national average. Mexican Americans had one of the highest uninsured rates at 40 percent. For adults under age 65 years, 34 percent of those below the poverty level were uninsured. Similar disparities exist in access to a specific source of ongoing care. An average of 85 percent of adults identified a specific source of ongoing care in 1998, but the proportions dropped to 76 percent for Hispanics and 77 percent for those below the poverty level.[12]

## Opportunities

Increasing recognition of the critical role of preventive services across the continuum of care and the need for providers to incorporate preventive services into patient visits has led to the development of tools and projects designed to help providers and patients shift to a prevention-oriented health care system. HEDIS reports on the delivery of many clinical preventive services provided by participating health maintenance organizations (HMOs). The 1999 reporting set for HEDIS contained several measures of clinical preventive services, including childhood immunizations, adolescent immunizations, smoking cessation advice, influenza vaccinations for older adults, breast cancer screening, cervical cancer screening, and prenatal care in the first trimester. A CDC grant to the State of Massachusetts for a health assessment partnership has resulted in a collaborative effort in New England to increase HMO participation in HEDIS. The specific tools developed include the increased use of electronic birth certificates, which have assisted outreach programs to teach new mothers the value of periodic checkups for their infants.

One of the earliest and most recognized tool kits is the *Clinician's Handbook of Preventive Services,*[6] developed as part of the *Put Prevention Into Practice* initiative by the Office of Disease Prevention and Health Promotion and now the responsibility of AHRQ. It was produced as a companion to *Healthy People 2000* and the U.S. Preventive Services Task Force *Guide to Clinical Preventive Services*.[1] Under development is the CDC *Guide to Community Preventive Services*, due to be released in 2001.[22] The guide will assess the effectiveness of preventive services and interventions in community settings and at the clinical systems level. It will cover 15 topics in three areas: changing risk behaviors, such as eliminating tobacco use and increasing physical activity; reducing specific diseases and injuries, such as cancer and injuries from motor vehicle crashes; and addressing environmental challenges, such as changing the sociocultural environment.

Continued progress in the delivery of clinical preventive services will require better collection and reporting of data on the delivery of recommended services by providers and health plans. This information will allow providers and administrators to identify the services and groups of people where the biggest gaps exist in receiving needed health care services. The best information systems allow both cross-sectional comparisons of performance by providers, plans, systems, and localities as well as long-term analyses of the health and health care of individuals. These systems can facilitate interventions such as reminders for patients and providers, audit, and feedback, which have been shown to improve rates of immunization and screening.[23], [24]

In centralized health systems with stable populations (people who stay with one provider or health plan, for example), tracking of individuals has been used effectively for a limited number of services, primarily immunizations and cancer screenings. Expanding effective data collection efforts to cover additional services and to include more providers and health care systems is the current challenge. Measuring how well preventive care is provided under different systems is an essential first step in motivating those systems that are not performing well to develop the information, tools, and incentives to improve care.

Into the next decade, Healthy People and its partners will continue to promote communitywide efforts to provide clinical preventive services, using local leadership and insights to tailor and increase the accessibility of these services. Efforts will continue to promote the development of local prevention coalitions that include health departments, businesses, community institutions, and individuals from each community. Healthy People also will work to strengthen the capacity of States and localities to collect health data and conduct community health assessments for small geographic areas.

Advances in the use of genetic information may improve both clinical and preventive care by helping to identify high-risk individuals and populations who will benefit most from preventive services and other clinical interventions. It will be essential to develop policies that will ensure appropriate evaluation of new genetic services, quality assurance of available genetic technology, and access to genetic services of proven benefit.

Overcoming technological, financial, or organizational barriers that can slow or block access to emergency services and improving emergency care accessibility and quality will require the combined effort of health care providers, health plans, and health care consumers as well as government agencies at the Federal. Tribal, State, and local levels.

## Interim Progress Toward Year 2000 Objectives

The proportion of adults under age 65 years without health care coverage has remained essentially the same, while the total number of uninsured persons has continued to increase. The proportion of the adult population with a specific source of primary care has increased, although Hispanic and African American adults and other subgroups continue to be less likely to have a specific source of primary care. Compared to 1991 and 1992 baseline data, the proportion of adults in 1995 who received selected recommended clinical preventive services (including tetanus boosters and routine mammograms) has increased. Progress also has been made in improving racial and ethnic representation in the health professions.

Note: Unless otherwise noted, data are from the Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2000 Review, 1998–99.*

## Healthy People 2010—Summary of Objectives

### Access to Quality Health Services

**Goal:** Improve access to comprehensive, high-quality health care services.

| Number | Objective Short Title |
|---|---|
| **Clinical Preventive Care** | |
| 1-1 | Persons with health insurance |
| 1-2 | Health insurance coverage for clinical preventive services |
| 1-3 | Counseling about health behaviors |
| **Primary Care** | |
| 1-4 | Source of ongoing care |
| 1-5 | Usual primary care provider |
| 1-6 | Difficulties or delays in obtaining needed health care |
| 1-7 | Core competencies in health provider training |
| 1-8 | Racial and ethnic representation in health professions |
| 1-9 | Hospitalization for ambulatory-care-sensitive conditions |

**Emergency Services**

| | |
|---|---|
| 1-10 | Delay or difficulty in getting emergency care |
| 1-11 | Rapid prehospital emergency care |
| 1-12 | Single toll-free number for poison control centers |
| 1-13 | Trauma care systems |
| 1-14 | Special needs of children |
| **Long-Term Care and Rehabilitative Services** | |
| 1-15 | Long-term care services |
| 1-16 | Pressure ulcers among nursing home residents |

## Healthy People 2010 Objectives

### Clinical Preventive Care

### 1-1. Increase the proportion of persons with health insurance.

**Target:** 100 percent.

**Baseline:** 83 percent of persons under age 65 years were covered by health insurance in 1997 (age adjusted to the year 2000 standard population).

**Target setting method:** Total coverage.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

| Persons Under Age 65 Years, 1997 | Health Insurance |
|---|---|
| | Percent |
| TOTAL | 83 |
| **Race and ethnicity** | |
| American Indian or Alaska Native | 62 |
| Asian or Pacific Islander | 81 |
| Asian | 81 |
| Native Hawaiian and other Pacific Islander | 80 |
| Black or African American | 80 |
| White | 84 |
| | |
| Hispanic or Latino | 66 |
| Cuban | 79 |
| Mexican American | 61 |
| Puerto Rican | 81 |
| Not Hispanic or Latino | 85 |
| Black or African American | 80 |
| White | 86 |
| **Gender** | |
| Female | 84 |
| | |

| | |
|---|---|
| Male | 81 |
| **Family income level** | |
| Poor | 66 |
| Near Poor | 69 |
| Middle/high income | 91 |
| **Geographic location** | |
| Within MSA | 83 |
| Outside MSA | 80 |
| **Disability status** | |
| Persons with disabilities | 83 |
| Persons without disabilities | 83 |
| **Sexual orientation** | DNC |
| **Select populations** | |
| Age groups | |
| 10 to 24 years | DNA |
| 10 to 14 years | DNA |
| 15 to 19 years | DNA |
| 20 to 24 years | DNA |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.
MSA = Metropolitan statistical area.
Note: Age adjusted to the year 2000 standard population.

Access to health services—including preventive care, primary care, and tertiary care—often depends on whether a person has health insurance.[25], [26], [27] Uninsured people are less than half as likely as people with health insurance to have a primary care provider; to have received appropriate preventive care, such as recent mammograms or Pap tests; or to have had any recent medical visits. Lack of insurance also affects access to care for relatively serious medical conditions. Evidence suggests that lack of insurance over an extended period significantly increases the risk of premature death and that death rates among hospitalized patients without health insurance are significantly higher than among patients with insurance.[28] As demonstrated by a study of data from the National Health Interview Survey (NHIS), Medicaid expansions that increase the proportion of a State's population eligible for Medicaid lead to increases in enrollment, enhanced utilization of medical services, and lower child death rates.[29] Another study showed that, among those without insurance, chronically ill persons are even less likely than those with acute conditions to get health care services they need.[30]

### 1-2. (Developmental) Increase the proportion of insured persons with coverage for clinical preventive services.

**Potential data source:** Medical Expenditure Panel Survey (MEPS), AHRQ.

Insurance coverage for clinical preventive services improved substantially during the 1990s, but significant variations remain in the services covered, depending on the plan and type of insurance. In 1988, among employers who offer health insurance, only 26 percent of their employees were covered for adult physical examinations, 35 percent for well-child care (including immunizations), and 43 percent for preventive screening tests.[31] In contrast, a 1997 national survey of over 3,000 employers found that 88 percent of employer-sponsored plans covered well-baby care, 89 percent covered adult physical examinations, 92 percent covered gynecologic examinations, and 89 and 91 percent covered Pap tests and mammograms, respectively. Coverage was highest in HMO plans and lowest in indemnity insurance plans.[4]

Including effective clinical preventive services among the services routinely covered by insurance is an effective way to emphasize the importance of clinical preventive services as an integral part of health care.[32] The Balanced Budget Act of 1997 (Public Law 105-33) added colorectal cancer screening among other new preventive benefits under the Medicare program and expanded Medicare coverage of mammography and cervical cancer screening. Although health insurance coverage by itself is not sufficient to eliminate existing gaps in the delivery of preventive services, it is an important factor influencing who gets recommended services.[33], [34]

Selected clinical preventive services have a positive influence on personal health, and many are cost-effective in comparison with the treatment of disease.[1], [35] Insurance coverage is especially problematic for counseling services, in part, because of the difficulty in proving the benefits of some counseling interventions. For example, only 22 percent of employer-sponsored plans cover medications or counseling for smoking cessation.[4] The effectiveness of smoking cessation counseling, however, is supported by strong evidence, with more intensive interventions having the greatest impact and most favorable cost-effectiveness ratios.[36]

## 1-3. Increase the proportion of persons appropriately counseled about health behaviors.

**Target and baseline:**

| Objective | Increase in Counseling on Health Behaviors Among Persons at Risk With a Physician Visit in the Past Year | 1995 Baseline | 2010 Target |
|---|---|---|---|
| | | *Percent* | |
| **1-3a.** | Physical activity or exercise (adults aged 18 years and older) | Developmental | |
| **1-3b.** | Diet and nutrition (adults aged 18 years and older) | Developmental | |
| **1-3c.** | Smoking cessation (adult smokers aged 18 years and older) | Developmental | |
| **1-3d.** | Reduced alcohol consumption (adults aged 18 years and older with excessive alcohol consumption) | Developmental | |
| **1-3e.** | Childhood injury prevention: vehicle restraints and bicycle helmets (children aged 17 years and under) | Developmental | |
| **1-3f.** | Unintended pregnancy (females aged 15 to 44 years) | 19 | 50 |
| **1-3g.** | Prevention of sexually transmitted diseases (males aged 15 to 49 years; females aged 15 to 44 years) | Developmental | |
| **1-3h.** | Management of menopause (females aged 46 to 56 years) | Developmental | |

**Target setting method:** Better than the best.

**Data sources:** National Survey on Family Growth (NSFG), CDC, NCHS; National Health Interview Survey (NHIS), CDC, NCHS.

| | **1-3f.** |
|---|---|

| Females Aged 15 to 44 Years With a Physician Visit in the Past Year, 1995 | Counseled About Unintended Pregnancy |
|---|---|
| | Percent |
| **TOTAL** | 19 |
| **Race and ethnicity** | |
| American Indian or Alaska Native | DSU |
| Asian or Pacific Islander | DSU |
| Asian | DNC |
| Native Hawaiian and other Pacific Islander | DNC |
| Black or African American | 24 |
| White | 19 |
| | |
| Hispanic or Latino | 20 |
| Not Hispanic or Latino | DNA |
| Black or African American | 24 |
| White | 19 |
| **Education level** (females aged 22 to 44 years) | |
| Less than high school | 15 |
| High school graduate | 20 |
| At least some college | 19 |
| **Sexual orientation** | DNC |
| **Select populations** | |
| Age groups | |
| 15 to 24 years | 22 |
| 25 to 34 years | 23 |
| 35 to 44 years | 10 |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Substantial gaps remain in the delivery of appropriate screening and counseling services related to health behaviors. Unhealthy diets, smoking, physical inactivity, and alcohol use account for a majority of preventable deaths in the United States.[37] Data indicate that risk assessment and counseling interventions are delivered less frequently than other preventive interventions (for example, cancer screenings).[12] In addition, the attention physicians give to specific health-risk behaviors appears to be influenced by the socioeconomic status of their patients.[38] Although time is an important constraint in the primary care setting, evidence demonstrates that brief clinician counseling is effective in getting patients to stop smoking and reduce problem drinking.[1, 39] In addition, more intensive dietary counseling can lead to reduced dietary fat and cholesterol intake and increased fruit and vegetable consumption.[1] Effective primary care-based interventions to increase physical activity among patients have been more difficult to identify.[1, 40]

Some evidence shows that provider counseling can increase the use of seat belts, child safety seats,and bicyclehelmets, especially when directed to parents of infants and young children.[1] Brief counseling interventions aimed at high-risk individuals can increase condom use and prevent the spread of sexually transmitted diseases.[41]

Clinician counseling should be tailored to the individual risk factors, needs, preferences, and abilities of each patient.[1] For some preventive interventions, such as hormone therapy in postmenopausal women, the optimal strategy depends on how individual women value potential benefits and risks. Counseling of perimenopausal and postmenopausal women should encourage shared decisionmaking based on individual risk factors and patient preferences.[1]

## Primary Care

### 1-4. Increase the proportion of persons who have a specific source of ongoing care.

**Target and baseline:**

| Objective | Increase in Persons With Specific Source of Ongoing Care | 1998 Baseline* | 2010 Target |
|---|---|---|---|
| | | *Percent* | |
| **1-4a.** | All ages | 87 | 96 |
| **1-4b.** | Children and youth aged 17 years and under | 93 | 97 |
| **1-4c.** | Adults aged 18 years and older | 85 | 96 |

*Age adjusted to the year 2000 standard population.

**Target setting method:** Better than the best.

**Data source**: National Health Interview Survey (NHIS), CDC, NCHS.

| **Population by Age Group, 1998 (unless noted)** | **Specific Source of Ongoing Care** | | |
|---|---|---|---|
| | **1-4a. All Ages** | **1-4b. Aged 17 Years and Under** | **1-4c. Aged 18 Years and Older** |
| | Percent | | |
| **TOTAL** | 87 | 93 | 85 |
| **Race and ethnicity** | | | |
| American Indian or Alaska Native | 82 | 89 | 79 |
| Asian or Pacific Islander | 84 | 89 | 81 |
| Asian | 84 | 89 | 82 |
| Native Hawaiian and other Pacific Islander | 83 | 90 | 82 |
| Black or African American | 86 | 91 | 84 |
| White | 88 | 95 | 86 |
| | | | |
| Hispanic or Latino | 79 | 86 | 76 |
| Cuban | 86 | 95 | 82 |
| Mexican American | 75 | 83 | 72 |
| Puerto Rican | 86 | 90 | 85 |
| Not Hispanic or Latino | 89 | 95 | 87 |
| Black or African American | 86 | 91 | 85 |
| | | | |

| | | | |
|---|---|---|---|
| White | 89 | 96 | 87 |
| **Gender** | | | |
| Female | 91 | 93 | 90 |
| Male | 84 | 94 | 81 |
| **Family income level** | | | |
| Poor | 80 | 88 | 77 |
| Near Poor | 82 | 90 | 79 |
| Middle/high income | 91 | 97 | 88 |
| **Geographic location** | | | |
| Urban | 87 | 93 | 85 |
| Rural | 89 | 95 | 87 |
| **Disability status** | | | |
| Persons with disabilities | 89 (1997) | 95 (1997) | 86 (1997) |
| Persons without disabilities | 86 (1997) | 93 (1997) | 84(1997) |
| **Sexual orientation** | DNC | DNC | DNC |
| **Select populations** | | | |
| Age groups | | | |
| 10 to 24 years | DNA | NA | NA |
| 10 to 17 years | 91 (1997) | NA | NA |
| 18 to 24 years | 72 (1997) | NA | NA |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. NA = Not applicable.
Note: Age adjusted to the year 2000 standard population.

Access to care depends in part on access to an ongoing source of care. People with a usual source of health care are more likely than those without a usual source of care to receive a variety of preventive health care services.[42], [43] An estimated 15 percent of adults in the United States lack a usual source of care. Thus, more than 40 million persons have no particular doctor's office, clinic, health center, or other place where they go for health care advice. The National Health Interview Survey (NHIS) does not count emergency departments as a usual source of care.[12]

An estimated 93 percent of children aged 17 years and under have a specific source of ongoing care. The implementation of the Children's Health Insurance Program in 1999 provides a mechanism for increasing the proportion of children with an ongoing source of care.[12]

The usual source of care can vary among groups according to their age, race and ethnicity, and health insurance coverage. Young children and elderly adults aged 65 years and older are most likely to have a usual source of care, and adults aged 18 to 64 years are least likely. Young adults aged 18 to 24 years are the least likely of any age group to have a usual source of care. Among racial and ethnic groups, Hispanic persons are the least likely to have a usual source of care. Some 24 percent of the adult Hispanic population (and 28 percent of the Mexican American population) lack a usual source of care, compared to 15 percent of African Americans and 15 percent of the total adult population.[12]

Some 88 percent of persons with a usual source use an office-based provider, and 11 percent use a hospital outpatient department or clinic. African Americans and Hispanics are more likely to use hospital-based providers (including hospital clinics and outpatient departments) as their usual source of care.[15]

Uninsured persons under age 65 years are more likely to lack a usual source of care (38 percent) than those who have either public or private insurance. When compared with their counterparts who have private health insurance, uninsured people under age 65 years are 2.6 times more likely to lack a usual source of care.[15]

### 1-5. Increase the proportion of persons with a usual primary care provider.

**Target:** 85 percent.

**Baseline:** 77 percent of the population had a usual primary care provider in 1996.

**Target setting method:** Better than the best.

**Data source:** Medical Expenditure Panel Survey (MEPS), AHRQ.

| Total Population, 1996 | 1-5. Have a Usual Primary Care Provider | Provider Has Office Hours at Night or on Weekends* | Provider Usually Asks About Prescription Medications and Treatments by Other Doctors* |
|---|---|---|---|
| | Percent | | |
| **TOTAL** | 77 | 37 | 59 |
| **Race and ethnicity** | | | |
| American Indian or Alaska Native | 79 | 37 | 64 |
| Asian or Pacific Islander | 72 | 36 | 57 |
| Asian | DNC | DNC | DNC |
| Native Hawaiian and other Pacific Islander | DNC | DNC | DNC |
| Black or African American | 74 | 34 | 60 |
| White | 77 | 37 | 59 |
| | | | |
| Hispanic or Latino | 64 | 32 | 52 |
| Not Hispanic or Latino | 78 | 37 | 60 |
| Black or African American | 74 | 34 | 60 |
| White | 79 | 38 | 60 |
| **Gender** | | | |
| Female | 80 | 37 | 61 |
| Male | 73 | 36 | 57 |
| **Education level** (aged 18 years and older) | | | |
| Less than high school | 69 | 24 | 53 |
| High school graduate | 74 | 32 | 58 |
| At least some college | 74 | 34 | 59 |
| **Geographic location** | | | |
| Within MSA | 76 | 39 | 59 |
| Outside MSA | 78 | 29 | 60 |

| | | | |
|---|---|---|---|
| **Disability status** | | | |
| Persons with activity limitations | DNA | DNA | DNA |
| Persons without activity limitations | DNA | DNA | DNA |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. MSA = Metropolitan statistical area.

*Data for office hours, prescription medications, and treatments are displayed to further characterize the practices of primary care providers.

A usual source of primary care helps people clarify the nature of their health problems and can direct them to appropriate health services, including specialty care.[44] Primary care also emphasizes continuity, which implies that individuals use their primary source of care over time for most of their health care needs. More after-hours care, shorter travel time to a practice site, and shorter office waits have been associated with patients' beginning an acute episode of care with primary care physicians. Greater continuity has been observed for individuals with shorter appointment waits, insurance, and access to more after-hours care.[45] Other advantages of primary care are that a primary care provider deals with all common health needs (comprehensiveness) and coordinates health care services, such as referrals to specialists. Evidence suggests that first contact care provided by an individual's primary care provider leads to less costly medical care.[46]

### 1-6. Reduce the proportion of families that experience difficulties or delays in obtaining health care or do not receive needed care for one or more family members.

**Target:** 7 percent.

**Baseline:** 12 percent of families experienced difficulties or delays in obtaining health care or did not receive needed care in 1996.

**Target setting method:** Better than the best.

**Data source:** Medical Expenditure Panel Survey (MEPS), AHRQ.

| **Families, 1996** | **Experienced Difficulty or Delay in Receiving Health Care or Received No Health Care** |
|---|---|
| | Percent |
| TOTAL | 12 |
| **Race and ethnicity** (head of household) | |
| American Indian or Alaska Native | 15 |
| Asian or Pacific Islander | 14 |
| Asian | DNC |
| Native Hawaiian and other Pacific Islander | DNC |
| Black or African American | 10 |
| White | 12 |
| | |

| | |
|---|---|
| Hispanic or Latino | 15 |
| Not Hispanic or Latino | 11 |
| Black or African American | 10 |
| White | 11 |
| **Gender** (head of household) | |
| Female | DNA |
| Male | DNA |
| **Family income level** | |
| Below poverty | 17 |
| Near poverty | 17 |
| Middle/high income | 9 |
| **Geographic location** | |
| Within MSA | 12 |
| Outside MSA | 12 |
| **Health insurance status of family** | |
| All members private insurance | 7 |
| All members public insurance | 12 |
| All members uninsured | 27 |
| **Disability status** | |
| Persons with activity limitations | DNA |
| Persons without activity limitations | DNA |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. MSA = Metropolitan statistical area.

In 1996, according to the Medical Expenditure Panel Survey (MEPS), 12.8 million families (11.6 percent) for a variety of reasons experienced difficulty or delay in obtaining care or did not receive health care services they thought they needed. In addition to a lack of insurance or underinsurance, barriers include a lack of appropriate referrals, travel distance to the provider, lack of transportation, and unavailability of specialists. Families experience barriers to care for a variety of reasons: inability to afford health care (60 percent); insurance-related causes (20 percent), including (1) the insurance company not approving, covering, or paying for care, (2) preexisting conditions for which insurance coverage often is restricted, (3) lack of access to required referrals, and (4) clinicians refusing to accept the family's insurance plan; and other problems (21 percent), such as transportation, physical barriers, communication problems, child care limitations, lack of time or information, or refusal of services.[15]

An additional source of information on obtaining services is the Robert Wood Johnson National Access to Care Survey. Results of the 1994 National Access to Care Survey suggest that some studies have missed substantial components of unmet needs by failing to include specific questions about supplementary health care services, such as prescription drugs, eyeglasses, dental care, and mental health care or counseling.[47] When specific questions were added about these services, the findings showed that 16.1 percent of respondents (approximately 41 million) were unable to obtain at least one service they believed they needed. The highest reported unmet need was for dental care. This problem can be attributed partly to insufficient provider reimbursement, which discourages participation in plans even when the service is covered.

### 1-7. (Developmental) Increase the proportion of schools of medicine, schools of nursing, and other health professional training schools whose basic

**curriculum for health care providers includes the core competencies in health promotion and disease prevention.**

**Potential data source:** Adaptation of the Prevention Self-Assessment Analysis, Association of Teachers of Preventive Medicine (ATPM).

Significant changes in the health care system and in the expectations of consumers are influencing the education of health care providers in the United States. For example, many medical schools are assessing the content of their predoctoral and postgraduate curricula.[48] Medical educators and medical schools are recognizing that physicians will need to be prepared to provide population-based preventive health care as well as high-quality medical care to their patients.[49] This challenge exists for other health professionals, including nurses, nurse practitioners, physician assistants, and allied health personnel. This link between medicine and public health is essential to provide the highest quality health care possible to the U.S. population.

A core set of competencies for medical students in health promotion and disease prevention was developed by a task force established by the Association of Teachers of Preventive Medicine (ATPM) and the U.S. Department of Health and Human Services' Health Resources and Services Administration. The competencies, derived from the ATPM *Inventory of Knowledge and Skills Relating to Health Promotion and Disease Prevention,*[50] cover four categories: clinical prevention, quantitative skills, health services organization and delivery, and community dimensions of medical practice. Together, they address a wide spectrum of topics, including environmental health hazards and asthma management. This set of competencies will provide medical educators with measurable education outcomes in prevention education. The core competencies will be evaluated for potential adaptability to health provider education curricula in schools of nursing and health professional schools.The core competencies also will be reviewed for potential expansion to cover emerging issues and competencies in evaluating and responding to environmental health concerns and natural and man-made disasters. Because health care providers will have to address new health issues, policies, technologies, and practice guidelines over their careers, continuing education programs also need to be updated periodically.

### 1-8. In the health professions, allied and associated health profession fields, and the nursing field, increase the proportion of all degrees awarded to members of underrepresented racial and ethnic groups.

**Target and baseline:**

| Objective | Increase in Degrees Awarded to Underrepresented Populations | 1996-97 Baseline (unless noted) | 2010 Target |
|---|---|---|---|
| | | Percent | |
| | **Health professions, allied and associated health professions fields** (For the baselines, health professions include medicine, dentistry, pharmacy, and public health.) | | |
| **1-8a.** | American Indian or Alaska Native | 0.6 | 1.0 |
| **1-8b.** | Asian or Pacific Islander | 16.2 | 4.0* |

| | | | |
|---|---|---|---|
| **1-8c.** | Black or African American | 6.7 | 13.0 |
| **1-8d.** | Hispanic or Latino | 4.0 | 12.0 |
| | **Nursing** | | |
| **1-8e.** | American Indian or Alaska Native | 0.7 (1995–96) | 1.0 |
| **1-8f.** | Asian or Pacific Islander | 3.2 (1995–96) | 4.0 |
| **1-8g.** | Black or African American | 6.9 (1995–96) | 13.0 |
| **1-8h.** | Hispanic or Latino | 3.4 (1995–96) | 12.0 |
| | **Medicine** | | |
| **1-8i.** | American Indian or Alaska Native | 0.6 | 1.0 |
| **1-8j.** | Asian or Pacific Islander | 15.9 | 4.0* |
| **1-8k.** | Black or African American | 7.3 | 13.0 |
| **1-8l.** | Hispanic or Latino | 4.6 | 12.0 |
| | **Dentistry** | | |
| **1-8m.** | American Indian or Alaska Native | 0.5 | 1.0 |
| **1-8n.** | Asian or Pacific Islander | 19.5 | 4.0* |
| **1-8o.** | Black or African American | 5.1 | 13.0 |
| **1-8p.** | Hispanic or Latino | 4.7 | 12.0 |
| | **Pharmacy** | | |
| **1-8q.** | American Indian or Alaska Native | 0.4 | 1.0 |
| **1-8r.** | Asian or Pacific Islander | 17.5 | 4.0* |
| **1-8s.** | Black or African American | 5.7 | 13.0 |
| **1-8t.** | Hispanic or Latino | 2.8 | 12.0 |

*The Asian or Pacific Islander population group has exceeded its target, which represents the minimum target based on this group's estimated proportion of the population.

**Target setting method:** Targets based on U.S. Bureau of the Census projections of the proportions of racial and ethnic groups in the population for the year 2000.

**Data sources:** Survey of Predoctoral Dental Educational Institutions, American Dental Association; Profile of Pharmacy Students, American Association of Colleges of Pharmacy; AAMC Data Book: Statistical Information Related to Medical Schools and Teaching Hospitals, Association of American Medical Colleges; Annual Data Report, American Association of Schools of Public Health; Annual Survey of RN (registered nurse) programs, National League for Nursing, Center for Research in Nursing Education and Community Health.

Certain racial and ethnic groups and low-income communities lag behind the overall U.S. population on virtually all health status indicators, including life expectancy and infant death. Furthermore, access to health care is a problem, and these groups often lack a specific source of care. Increasing the number of health professionals from certainracial and ethnic groups is viewed as an integral part of the solution to improving access to care.

Members of underrepresented racial or ethnic groups make up about 25 percent of the U.S. population. Their representation among health professionals, however, is in the range of 10 percent. Several studies have shown that minority health professionals are more likely to serve areas with high proportions of underrepresented racial and ethnic groups and to practice in or near designated health care shortage areas. [51], [52]

Despite considerable efforts to increase the number of representatives of racial or ethnic groups in health profession schools (medicine, dentistry, nursing, pharmacy, and allied and associated health professions), the percentage of such entrants, enrollees, and graduates has not advanced significantly and in some cases has not advanced at all since 1990. The targets set for Healthy People 2000 for such enrollment and graduation were not achieved, and achieving the revised targets by 2010 presents a significant challenge. Additional attention will need to be given to such efforts as providing financial assistance for underrepresented racial and ethnic group students to pursue health care degrees, encouraging mentor relationships, promoting the early recruiting of students from racial and ethnic groups before they graduate from high school, and increasing the number of racial and ethnic group faculty and administrative staff members in schools that train health care professionals. Other suggested approaches to improving culturally appropriate care for ethnic and minority populations include increasing cultural competency among all health workers and increasing the number of lay health workers from underrepresented racial and ethnic groups.

## 1-9. Reduce hospitalization rates for three ambulatory-care-sensitive conditions—pediatric asthma, uncontrolled diabetes, and immunization-preventable pneumonia and influenza.

**Target and baseline:**

| Objective | Reduction in Hospitalizations for Ambulatory-Care-Sensitive Conditions | 1996 Baseline | 2010 Target |
|---|---|---|---|
| | | *Admissions per 10,000 Population* | |
| **1-9a.** | Pediatric asthma—persons under age 18 years | 23.0 | 17.3 |
| **1-9b.** | Uncontrolled diabetes—persons aged 18 to 64 years | 7.2 | 5.4 |
| **1-9c.** | Immunization-preventable pneumonia or influenza—persons aged 65 years and older | 10.6 | 8.0 |

**Target setting method:** 25 percent improvement.

**Data source:** Healthcare Cost and Utilization Project (HCUP), AHRQ.

| **Persons With Ambulatory-Care-Sensitive Conditions by Age Group, 1996** | **Hospitalizations** | | |
|---|---|---|---|
| | **1-9a. Persons Under Age 18 Years With Asthma** | **1-9b. Persons Aged 18 to 64 Years With Diabetes** | **1-9c. Persons Aged 65 Years and Older With Preventable Pneumonia or Influenza** |
| | Admissions per 10,000 | | |
| **TOTAL** | 23.0 | 7.2 | 10.6 |
| **Race and ethnicity** | | | |
| American Indian or Alaska Native | DNC | DNC | DNC |
| Asian or Pacific Islander | DNC | DNC | DNC |
| Asian | DNC | DNC | DNC |
| Native Hawaiian and | | | |

| | | | |
|---|---|---|---|
| other Pacific Islander | DNC | DNC | DNC |
| Black or African American | DNC | DNC | DNC |
| White | DNC | DNC | DNC |
| | | | |
| Hispanic or Latino | DNC | DNC | DNC |
| Not Hispanic or Latino | DNC | DNC | DNC |
| Black or African American | DNC | DNC | DNC |
| White | DNC | DNC | DNC |
| **Gender** | | | |
| Female | 18.2 | 7.0 | 9.1 |
| Male | 27.6 | 7.4 | 12.6 |
| **ZIP Code income level *** | | | |
| $25,000 or less | 52.0 | 18.8 | 21.1 |
| $25,001 to $35,000 | 22.3 | 6.7 | 9.2 |
| More than $35,000 | 10.6 | 2.9 | 6.0 |
| **Health insurance status** | | | |
| Private | 15.7 | 3.7 | DNA |
| Medicaid | 45.9 | 23.5 | DNA |
| Uninsured | 8.3 | 6.3 | NA |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. NA = Not applicable.
*Income of patient is the median income for the postal ZIP Code of residence.

Comprehensive primary care services can reduce the severity of certain illnesses. Hospital admission rates for “ambulatory-care-sensitive conditions” serve as an indicator for both limited access to primary care and evidence of low-quality primary care. Disparities in hospital admission rates for racial and ethnic groups and low-income populations have been well documented.[53], [54]

The three indicators selected here represent common problems encountered in primary care and allow monitoring of hospitalization rates for children (asthma), working-age adults (diabetes), and elderly persons (pneumonia and influenza). For each of these conditions, interventions can reduce hospitalization rates. Advances in the management of asthma have reduced its adverse health effects. Primary care can prevent both acute problems and long-term consequences of diabetes. Illness and death from preventable pneumonia and influenza among elderly persons can be avoided through the use of pneumococcal and influenza vaccines. These three conditions have been chosen because coordination of community preventive services, public health interventions, clinical preventive services, and primary care can reduce levels of these illnesses. To be effective, these services must be culturally competent and linguistically appropriate.[55]

This objective can be achieved by targeting high-risk populations. Because multiple factors besides access and quality contribute to the admission rates for ambulatory-care-sensitive conditions, each State will need to examine its rates and interpret them in the context of its population, health system, and community characteristics and will need to implement corresponding strategies. The objective is to improve primary care and preventive services and thereby reduce the need for hospital admission and the extended illness and costs associated with hospitalization.[56], [57], [58], [59]

It should be noted that persons who are privately insured have admission rates that are half those of the national average, indicating what is potentially achievable. Because of data limitations and potential access barriers to hospital admission among the uninsured, the Medicaid rate is artificially high and the uninsured rate is artificially low. (See *Tracking Healthy People 2010* for more information.) Data by race are not included because these data are reported at the State level. State-level hospital discharge databases can provide accurate estimates of racial and ethnic disparities in hospital admission rates at the State level. There are substantial disparities in hospital admission rates for pediatric asthma and uncontrolled diabetes by race and ethnicity. The magnitude of this disparity also fluctuates by State, suggesting that access to care and quality may play a role. Specifically, among seven States for which rates were determined, the age- and gender-adjusted relative risk of hospitalization for pediatric asthma ranged from 2.3 to 5.8 for African Americans and 1.3 to 2.6 for Hispanics compared to non-Hispanic whites. For uncontrolled diabetes, the relative risk of hospitalization ranged from 3.0 to 4.4 for African Americans and 1.2 to 2.0 for Latinos compared to non-Hispanic whites.[60] AHRQ is developing a "minority national inpatient sample" as part of HCUP that will provide national estimates of disparities in avoidable hospitalization rates by race and ethnicity.

## Emergency Services

### 1-10. (Developmental) Reduce the proportion of persons who delay or have difficulty in getting emergency medical care.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

Emergency services are a vital part of access to health care in the United States. All population groups, regardless of their socioeconomic, health, or insurance status, want to know that emergency services will be available and will function quickly and effectively when needed.[61] This broadly shared social expectation was reinforced by landmark Federal legislation, the Emergency Medical Treatment and Active Labor Act (EMTALA) of 1986. EMTALA stipulates that anyone seeking care at a hospital emergency department (ED) must receive a medical screening examination for an emergency medical condition and appropriate stabilizing measures.[62]

For many people, however, a variety of barriers continue to block access to emergency departments when the need for emergency medical care arises.[9] Among these barriers are psychological and cultural factors that may keep some people, even if insured, from seeking care promptly; financial constraints that may inhibit some people, even if insured, from seeking care promptly; and shortcomings in the number, location, or capability of EDs in a specified geographic area.

A significant component of this objective is to reduce the proportion of people whose access to emergency services is blocked by their health insurance coverage or payment policies. These policies affect access to hospital emergency departments and, in some instances, use of prehospital emergency services.[63] Typically, these policies stipulate that unless an enrollee's condition is life threatening, the enrollee or the ED must obtain authorization before an ED visit or risk that a claim for services will be denied.In some cases, claims for ED visits can be denied retroactively if they are deemed medically unnecessary. The rationale for these coverage and payment policies is clear: to manage care and contain costs. These policies, however, discourage some enrollees from receiving emergency treatment when and where it is warranted.[64]

Concerns about access barriers have prompted Federal, State, and organizational groups to seek assurances that health coverage or payment policies will provide payment when people go to an ED with acute symptoms of sufficient severity—including severe pain—such that a prudent layperson could reasonably expect that the lack of medical attention could result in serious jeopardy, serious impairment to bodily functions, or serious dysfunction of any bodily organ or part.

### 1-11. (Developmental) Increase the proportion of persons who have access to rapidly responding prehospital emergency medical services.

**Potential data source:** Annual Survey of EMS Operations, International Association of Fire Fighters.

The outcome of many medical emergencies depends on the prompt availability of appropriately trained and properly equipped prehospital emergency medical care providers. In urban areas, this capability is defined by an interval of less than 5 minutes from the time an emergency call is placed to arrival on the scene for at least 90 percent of first-responder emergency medical services and less than 8 minutes for at least 90 percent of transporting EMS. In rural areas, this capability is defined as an interval of less than 10 minutes from the time an emergency call is placed to arrival on the scene for at least 80 percent of EMS responses.

Assuring a prompt response requires a well-coordinated system of care involving a variety of organizations and agencies, some of which are outside the traditional health care arena. The components include public awareness of how and whom to call for emergency assistance and public education concerning initial lifesaving emergency care procedures to be followed until the arrival of EMS providers. They also include access via a 911 or enhanced 911 system or, in rural areas, a uniform addressing system that allows emergency responders to locate the person requesting emergency assistance quickly; the availability of well-trained and appropriately certified response personnel, who are frequently from law enforcement or fire services; transportation (ground, air, or water ambulance); medical direction and oversight; and destination hospitals that are well-equipped and appropriately staffed.

### 1-12. Establish a single toll-free telephone number for access to poison control centers on a 24-hour basis throughout the united states.

**Target:** 100 percent.

**Baseline:** 15 percent of poison control centers shared a single toll-free number in 1999.

**Target setting method:** Total coverage.

**Data source:** American Association of Poison Control Centers Survey, U.S. poison control centers.

Poison control centers (PCCs) are staffed on a 24-hour basis by toxicologists and specialists in poison information who respond to requests from the general public and health care professionals for immediate information and treatment advice about poisonings and toxic exposures. Local or toll-free telephone calls to PCC hotline numbers provide primary access to these services. Each year more than 2 million callers seek telephone assistance from PCCs throughout the United States.[65] When a caller reports a poisoning or toxic exposure, a PCC toxicologist or specialist in poison information assesses the severity of the incident, advises the caller about treatment, and makes referrals for further medical attention when necessary. PCCs respond to inquiries in languages other than English by using language-translation services, interpreters, or bilingual staff members. PCCs manage most incidents by providing telephone advice to a caregiver at home, avoiding the need for more costly care at a hospital emergency department or another health care facility.

Linking all PCCs in the United States through a single toll-free telephone number and consolidating several key PCC functions can make contacting PCCs easier and more cost-effective.[66], [67] When PCCs are linked through a common telephone number, callers can be routed automatically to the nearest PCC based on their area code, telephone exchange number, and ZIP Code. Educational efforts could focus on a single easy-to-remember emergency number that permits callers to access PCCs quickly. Incorporating all PCCs under the umbrella of a toll-free nationwide telephone number will help ensure access to poison control services when and where they are needed.

### 1-13. Increase the number of Tribes, States, and the District of Columbia with trauma care systems that maximize survival and functional outcomes of trauma patients and help prevent injuries from occurring.

**Target:** All Tribes, States, and the District of Columbia.

**Baseline:** 5 States had trauma care systems in 1998.

**Target setting method:** Total coverage. (Tribal trauma systems are measured differently because they frequently are regional and often are linked to a State EMS.)

**Data sources:** State EMS Directors Survey, National Association of State EMS Directors; IHS (Tribal data are developmental).

A trauma care system is an organized and coordinated effort in a defined geographic area to deliver the full spectrum of care to injured patients. The main goals of the system are to match the available trauma care resources in a community, region, or State with the needs of individual patients and to ensure that patients have rapid access to the acute care facility and rehabilitation services they need. In a trauma care system, prehospital, acute care, and rehabilitation services are integrated and administered by a public agency that provides leadership, coordinates service delivery, establishes minimum standards of care, designates trauma centers (which offer 24-hour specialized treatment for the most severely injured patients), and fosters ongoing system evaluation and quality improvement.

Trauma care systems traditionally have focused on preventing adverse outcomes in the event of injury. Many trauma care professionals and people in the public health field believe that trauma care systems also should contribute to the prevention of injuries.[68] Trauma care professionals are in a good position to provide leadership in injury surveillance, clinical preventive services, and communitywide injury prevention programs. Recent Federal initiatives in trauma care have resulted in the design of a model system that incorporates public information, education, and prevention of injuries as key features.[69]

Results of a national survey conducted in 1993 indicated that only 5 States had complete trauma systems, but 19 other States and the District of Columbia had at least some trauma system components in place.[70] A survey of all 50 States and the District of Columbia in 1998 again indicated that only 5 States satisfied all trauma care system criteria.[71] However, results from this survey also showed that 37 other States and the District of Columbia had at least some trauma system components in place.

### 1-14. Increase the number of States and the District of Columbia that have implemented guidelines for prehospital and hospital pediatric care.

**1-14a.** Increase the number of States and the District of Columbia that have implemented statewide pediatric protocols for online medical direction.

**Target:** All States and the District of Columbia.

**Baseline:** 18 States had implemented statewide pediatric protocols for online medical direction in 1997.

**Target setting method:** Total coverage.

**Data source:** Emergency Medical Services for Children Annual Grantees Survey, HRSA.

Emergency medical service systems try to bring essential prehospital medical treatment to patients as quickly as possible. Emergency care of children presents a particular challenge because prehospital providers often treat fewer children and have limited pediatric experience and assessment skills. It can be more difficult to assess the severity of illness or injury because characteristic changes in vital signs that signal deterioration in adults may not occur in children. Important anatomic, physiologic, and developmental differences exist between children and adults that affect their responses to medical care and their risk of injury and illness.[72] Most EMS systems operate independently of hospitals or other facilities and typically have few physicians to ensure appropriateness of care.

Experienced providers can offer medical direction in two ways, either online or offline. Online direction involves direct communication (for example, voice) between EMS medical directors (for example, at hospitals) and emergency medical technicians (EMTs) and paramedics to authorize and guide the care of patients at the scene and during transport. Offline medical direction includes the development of guidelines, protocols, procedures, and policies, as well as planning for, training in, and evaluation of their use.

**1-14b.** Increase the number of States and the District of Columbia that have adopted and disseminated pediatric guidelines that categorize acute care facilities with the equipment, drugs, trained personnel, and other resources necessary to provide varying levels of pediatric emergency and critical care.

**Target:** All States and the District of Columbia.

**Baseline:** 11 States had adopted and disseminated pediatric guidelines that categorize acute care facilities with the equipment, drugs, trained personnel, and other resources necessary to provide varying levels of pediatric emergency and critical care in 1997.

**Target setting method:** Total coverage.

**Data source:** Emergency Medical Services for Children Annual Grantees Survey, HRSA.

Emergency care for life-threatening pediatric illness and injury requires specialized resources, medical direction, equipment, drugs, trained personnel, and properly staffed and equipped hospitals.[72] Children, however, receive emergency care in a variety of settings—from rural community hospitals to large urban medical centers. Hospitals vary in terms of their readiness to treat children's emergencies. If the hospitals are properly equipped and staffed, children frequently can receive the care that they need at local hospitals, but some children require the advanced care available only at regional specialty centers. Categorization is essentially an effort to identify the readiness and capability of a hospital and its staff to provide optimal emergency care.[73] Compliance can be voluntary or assigned by official agencies.

## Long-Term Care and Rehabilitative Services

### 1-15. (Developmental) Increase the proportion of persons with long-term care needs who have access to the continuum of long-term care services.

**Potential data sources:** National Long-Term Care Survey, Medicare Current Beneficiary Survey, HCFA; National Health Interview Survey (NHIS), CDC, NCHS; Medical Expenditure Panel Survey (MEPS), AHRQ.

The long-term care population needs access to a range of services, including nursing home care, home health care, adult day care, assisted living, and hospice care.[74] Persons with long-term care needs require the help of other persons to perform activities of daily living (personal care activities) and instrumental activities of daily living (routine needs). Access problems are viewed as a need for specified long-term care services that were not received in the past 12 months.

Long-term care crosses the boundaries of different types of care—from health to social—and intensity of services—from periodic home health and homemaker visits to round-the-clock subacute care. Access to the full range of long-term care services continues to be a problem because of financial barriers and the limited availability of specific services.[11, 75] Although people in the long-term care population and their caregivers prefer long-term care to be delivered in the least restrictive environment, limited access and limited knowledge about care options can result in a long-term care population that is more dependent than necessary. The long-term care services selected cover key services in institutions, in the home, and in the community. Access to this range of services in rural areas is often difficult.

### 1-16. Reduce the proportion of nursing home residents with a current diagnosis of pressure ulcers.

**Target:** 8 diagnoses per 1,000 residents.

**Baseline:** 16 diagnoses of pressure ulcers per 1,000 nursing home residents were made in 1997.

**Target setting method:** Better than the best.

**Data source:** National Nursing Home Survey (NNHS), CDC, NCHS.

| Nursing Home Residents, 1997 | Pressure Ulcers |
|---|---|
| | Diagnoses per 1,000 |
| **TOTAL** | 16 |
| **Race and ethnicity** | |
| American Indian or Alaska Native | DSU |
| Asian or Pacific Islander | DSU |
| Asian | DSU |
| Native Hawaiian and other Pacific Islander | DSU |
| Black or African American | DSU |
| White | 14 |
| | |
| Hispanic or Latino | DSU |
| Not Hispanic or Latino | 15 |
| Black or African American | DSU |
| White | 13 |

| | |
|---|---|
| **Gender** | |
| Female | 14 |
| Male | 20 |
| **Education level** | |
| Less than high school | DNC |
| High school graduate | DNC |
| At least some college | DNC |
| **Geographic location** | |
| Within MSA | 17 |
| Outside MSA | 12 |
| **Disability status** | |
| Persons with disabilities | 16 |
| Persons without disabilities | DSU |

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. MSA = Metropolitan statistical area.

Pressure ulcers in all settings are sufficiently common to warrant concern, particularly as a quality-of-care issue. A significant number of people are at risk for pressure ulcers in nursing homes. Older adults are particularly prone to pressure ulcers as a result of decreased mobility, multiple contributing diagnoses, loss of muscle mass, and poor nutrition. About 24 percent of the Nation's 1.4 million nursing home residents require the assistance of another person to transfer from bed to chair.

According to studies of the treatment of pressure ulcers, it is difficult to determine the exact extent of the problem, including the number of new cases and the number of people who have pressure ulcers. Pressure ulcers have long been recognized as a serious quality-of-care problem in both acute care facilities and nursing homes.[76], [77] The prevention of pressure ulcers depends on close observation, appropriate nutrition, and effective nursing care. The number of new cases of pressure ulcers could indicate the overall quality of care provided to nursing home residents. Evidence-based guidelines have been issued on the prevention and treatment of pressure ulcers.[78]

## Related Objectives From Other Focus Areas

**2. Arthritis, Osteoporosis, and Chronic Back Conditions**
- 2-2. Activity limitations due to arthritis
- 2-3. Personal care limitations
- 2-6. Racial differences in total knee replacement
- 2-7. Seeing a health care provider
- 2-11. Activity limitations due to chronic back conditions

**3. Cancer**
- 3-10. Provider counseling about cancer prevention
- 3-11. Pap tests
- 3-12. Colorectal cancer screening
- 3-13. Mammograms

**5. Diabetes**
- 5-1. Diabetes education
- 5-4. Diagnosis of diabetes
- 5-11. Annual urinary microalbumin measurement
- 5-12. Annual glycosylated hemoglobin measurement
- 5-13. Annual dilated eye examinations
- 5-14. Annual foot examinations

- 5-16. Aspirin therapy

6. **Disability and Secondary Conditions**
   - 6-7. Congregate care of children and adults with disabilities
   - 6-10. Accessibility of health and wellness programs
7. **Educational and Community-Based Programs**
   - 7-2. School health education
   - 7-3. Health-risk behavior information for college and university students
   - 7-5. Worksite health promotion programs
   - 7-7. Patient and family education
   - 7-8. Satisfaction with patient education
   - 7-12. Older adult participation in community health promotion activities
9. **Family Planning**
   - 9-1. Intended pregnancy
   - 9-2. Birth spacing
   - 9-3. Contraceptive use
   - 9-5. Emergency contraception
   - 9-6. Male involvement in pregnancy prevention
   - 9-10. Pregnancy prevention and sexually transmitted disease (STD) protection
   - 9-11. Pregnancy prevention education
   - 9-13. Insurance coverage for contraceptive supplies and services
11. **Health Communication**
   - 11-2. Health literacy
   - 11-6. Satisfaction with health care providers' communication skills
12. **Heart Disease and Stroke**
   - 12-1. Coronary heart disease (CHD) deaths
   - 12-15. Blood cholesterol screening
13. **HIV**
   - 13-6. Condom use
   - 13-8. HIV counseling and education for persons in substance abuse treatment
   - 13-9. HIV/AIDS, STD, and TB education in State prisons
   - 13-10. HIV counseling and testing in State prisons
14. **Immunization and Infectious Diseases**
   - 14-5. Invasive pneumococcal infections
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## Terminology

(A listing of abbreviations and acronyms used in this publication appears in Appendix H.)

**Access:** According to the Institute of Medicine, "The timely use of personal health services to achieve the best possible health outcomes."[79] This definition includes both the use and effectiveness of health services. The concept of access also encompasses physical accessibility of facilities.

**Activities of daily living (ADL):** Personal care activities, such as bathing, dressing, eating, and getting around (with special equipment, if needed) inside the home.

**Acute care facility:** A health facility that provides care on a short-term basis. Included are community hospitals with an average length of stay of less than 30 days for all patients.

**Ambulatory care:** Health care that does not require the patient to stay in a hospital or other facility, such as care provided on an outpatient basis.

**Ambulatory-care-sensitive conditions:** Conditions resulting in hospitalization that could potentially have been prevented if the person had improved access to high-quality primary care services outside the hospital setting.

**Asymptomatic:** Without symptoms. This term may apply either to healthy persons or to persons with preclinical (prior to clinical diagnosis) disease in whom symptoms are not yet apparent.

**Clinical care:** The provision of health care services to individual patients by trained health care professionals.

**Clinical preventive services (CPS):** Common screening tests, immunizations, risk assessment, counseling about health risk behaviors, and other preventive services routinely delivered in the clinical setting for the primary prevention of disease or for the early detection of disease in persons with no symptoms of illness.

**Continuum of care:** The array of health services and care settings that address health promotion, disease prevention, and the diagnosis, treatment, management, and rehabilitation of disease, injury, and disability. Included are primary care and specialized clinical services provided in community and primary care settings, hospitals, trauma centers, and rehabilitation and long-term care facilities.

**Core competencies:** A defined set of skills and knowledge considered necessary in the educational curricula for training health care providers. Examples of core competencies include skills in prevention education; skills in using sources of health data to identify what clinical preventive services should be delivered to the individual patient based on that person's age, gender, and risk factor status; an understanding of the U.S. public health system (local and State health departments) and its role in monitoring and maintaining the health of the community; and skills to evaluate and translate medical and scientific research reports into clinical practice.

**Emergency services:** Health care services that are or appear to be needed immediately because of injury or sudden illness that threatens serious impairment of any bodily function or serious dysfunction of any bodily part or organ.18

**Functional assessment:** A health care provider's review of a patient for the ability to perform activities of daily living (personal care activities) and instrumental activities (routine needs) of daily living. (See also *Persons with long-term care needs.*)

**Health insurance:** Any type of third party payment, reimbursement, or financial coverage for an agreed-upon set of health care services. Includes private insurance obtained through employment or purchased directly by the consumer, or health insurance provided through publicly funded programs, including Medicare, Medicaid, CHAMPUS/CHAMPVA, or other public hospital or physician programs.

**Health intervention:** Any measure taken to improve or promote health or to prevent, diagnose, treat, or manage disease, injury, or disability.

**Health outcomes:** The results or consequences of a process of care. Health outcomes may include satisfaction with care as well as the use of health care resources. Included are clinical outcomes, such as changes in health status and changes in the length and quality of life as a result of detecting or treating disease.

**Instrumental activities for daily living:** Routine activities, such as everyday household chores, shopping, or getting around for other purposes, that enable a person to live independently in the community.

**Long-term care (LTC):** A broad range of health and social services delivered in institutions, in the community, and at home. Long-term care services include institutional services, such as those delivered in nursing homes, rehabilitation hospitals, subacute care facilities, hospice facilities, and assisted living facilities; services delivered in the home, such as home health and personal care, hospice, homemaker, and meals; and community-based services, such as adult day care, social services, congregate meals, transportation and escort services, legal protective services, and counseling for clients as well as their caregivers.10

**Managed care:** According to the Institute of Medicine, "a set of techniques used by or on behalf of purchasers of health care benefits to manage health care costs by influencing patient care decisionmaking through case-by-case assessments of the appropriateness of care prior to its provision."[80]

**Patient barriers:** Any mental, physical, or psychosocial condition that prevents an individual from accessing needed health care. Examples include attitudes or biases, mental disorders or illnesses, behavioral disorders, physical limitations, cultural or linguistic factors, sexual orientation, and financial constraints.

**Persons with long-term care needs:** Persons who need the help of other persons to perform activities of daily living (personal care activities) and instrumental activities of daily living (routine needs).

**Primary care:** According to the Institute of Medicine, "The provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community."[8]

**Primary care provider:** A physician who specializes in general and family practice, general internal medicine, or general pediatrics, or a nonphysician health care provider, such as a nurse practitioner, physician assistant, or certified nurse midwife.

**Primary prevention:** Health care services, medical tests, counseling, and health education and other actions designed to prevent the onset of a targeted condition. Routine immunization of healthy individuals is an example of primary prevention.1

**Provider barriers:** Any mental, physical, psychosocial, or environmental condition that prevents or discourages health care providers from offering preventive services. Examples of provider barriers include a poor practice environment, lack of knowledge, and lack of efficacy studies.

**Quality:** According to the Institute of Medicine, "The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[79] Simply stated, it is doing the right thing, for the right patient, at the right time, with the right outcome.

**Rehabilitative services:** Services to restore specific skills, including overall physical mobility and functional abilities.

**Secondary prevention:** Measures such as health care services designed to identify or treat individuals who have a disease or risk factors for a disease but who are not yet experiencing symptoms of the disease. Pap tests and high blood pressure screening are examples of secondary prevention.[1]

**System barriers:** Conditions within a health care system that prevent people from accessing needed services or prevent health care providers from delivering those services. System barriers include physical, cultural, linguistic, and financial barriers as well as the availability of health care facilities or providers with special skills, such as eye, ear, nose, and throat specialists.

**Tertiary prevention:** Preventive health care measures or services that are part of the treatment and management of persons with clinical illnesses. Examples of tertiary prevention include cholesterol reduction in patients with coronary heart disease and insulin therapy to prevent complications of diabetes.[1]

**Usual source of care:** A particular doctor's office, clinic, health center, or other health care facility to which an individual usually would go to obtain health care services. Having a usual source of care is associated with improved access to preventive services and followup care.

**Vulnerable and at-risk populations:** High-risk groups of people who have multiple health and social needs. Examples include pregnant women, people with human immunodeficiency virus infection, substance abusers, migrant farm workers, homeless people, poor people, infants and children, elderly people, people with disabilities, people with mental illness or mental health problems or disorders, and people from certain ethnic or racial groups who do not have the same access to quality health care services as other populations.

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# NEW INITIATIVE AIMS TO CURTAIL HEALTH DISPARITIES BY ADDRESSING ROOT CAUSES OF HEALTH PROBLEMS

**By Dr. Gail Christopher**

The Joint Center Health Policy Institute (HPI) has launched a new Initiative, *Place Matters: Addressing the Root Causes of Health Disparities,* a targeted benchmarking and accountability system that will document progress and accelerate efforts to eliminate health disparities in places where it is needed most.

For too long, Native Americans, Hispanics and African Americans have died needlessly because of poor nutrition, lack of health services and other social conditions and habits that have contributed to minorities suffering disproportionately from a number of diseases ranging from cancer to high blood pressure, diabetes and heart disease.

Our initiative will reduce health disparities by addressing the complex underlying causes of health disparities and disseminating strategies to help ameliorate these root causes. Researchers have determined that altering social determinants impacting individual wellbeing can modify health patterns, illness and health disparities. But any systematic and researched-based translation of this knowledge into policy and practice has been limited, particularly at the local level.

Until now.

The Place Matters initiative changes that trend. Simply put, we believe that by addressing the underlying causes of health disparities, we can make people healthier.

Already, the initiative has reached out to partner with the National Association of Counties, International City/County Management Association, and National Association of County and City Health Officials. Working with state and local public officials, administrators and community leaders, we use data from the 100 counties across the country with the highest concentration of minorities to prompt new policies and programs aimed at reducing disparities. More importantly, we will benchmark our progress, keeping records of what projects have the best results so we can repeat their success in other communities.

Clearly, our initiative has been launched at a time when America needs it. Our nation has just witnessed the type of human suffering, and race and class divisions that Americans had long forgotten, or thought only existed today on some other shores. In the aftermath of Hurricanes Katrina and Rita, we saw what it is like to be poor and forgotten in America. Thousands of Black men, women and children were herded into the New Orleans Superdome, a chaotic shelter without enough food and water. Elderly patients were deserted and left to die in a nursing home. The travesties went on and on.

These same people have been preyed up for years in less explicit ways. After the killer hurricanes, their pain and suffering was transparent. But for decades their families, neighbors and colleagues have been the victims in the statistics that show:

- African American men have the highest overall rate for cancer deaths. They are one and a half times more likely to get the disease – and twice as likely to die from it as Whites.

- The rate of high blood pressure among African Americans in the United States is the highest in the world. Studies by the Center for Disease Control and Prevention have found that 36.4% of Black men ages 20 and older have high blood pressure, compared to 25.6% of White men.

- An estimated 2.3 million African Americans have diabetes, with Black men twice as likely to have diabetes as Whites of the same age. Mortality rates for African Americans with diabetes are 27% higher than Whites with the disease.

- The mortality rate for African American men ages 35 to 44 with coronary heart disease is 82.6%, compared to 38.8% for Whites of the same age.

Our goal is for the PLACE MATTERS initiative to turn the tide. We want this project to symbolize that the public and private sectors can work together and save lives. When we launched the initiative in September, Sen. John Kerry (D-Ma.) attended the announcement and talked frankly about America's healthcare services for the poor. "The truth,'' he said, "is that, as a result of Katrina, many children went to shelters where they got vaccinations for the first time. Thousands of adults are seeing a doctor for the first time in years. Illnesses lingering long before Katrina will be treated by a health care system that just weeks ago was indifferent. We have to act now to be sure it won't soon be indifferent again. We must demand something simple and humane: health care for every American – not just when a disaster strikes, but every day of the year."

What's clear is that barriers, such as concentrated poverty, unemployment and inadequate educational, housing and transportation resources contribute to health disparities for minorities and low-income residents across the country. These conditions must be addressed, if real progress on health disparities is to be made.

Place Matters is a new beginning. It can demonstrate to the world that America can overcome race and class divisions, and that the victims of Katrina did not die in vain – they sparked a new commitment to saving lives and building healthy communities.

(Dr. Gail Christopher is Vice President for Health, Women and Families at the Joint Center for Political and Economic Studies, and director of the Joint Center Health Policy Institute.)

# Expecting Success: Excellence in Cardiac Care

## Results from Robert Wood Johnson Foundation Quality Improvement Collaborative

November 2008

Robert Wood Johnson Foundation

# Hospitals Show That Quality of Heart Care Can Be Improved – And Disparities Reduced – In Relatively Short Timeframe

**Percentage of patients receiving all recommended care for heart failure improves 37 percent over two years**

The United States spends twice as much money per person on health care than anywhere on earth, but the U.S. ranks 18th worldwide in average life expectancy – behind Australia, Canada, France, Japan and others. Given that America spends so much more money on health care, one would hope that Americans have better health outcomes than anyone else, so why the gap?

Most experts say that the answer lies in the quality of care Americans receive. Unfortunately, **more** care doesn't always mean **better** care or the **right** care. Americans receive a lot of health care treatments, but far too often, they are not the treatments that are proven to be most effective for the most people when applied at the right time, without mistakes.

Although the quality of health care is poor for many Americans, certain racial and ethnic groups continually experience worse quality care than white patients. While quality sometimes differs depending on the patient's geographic location, education level or health insurance status, repeated research has shown that African Americans and Hispanics consistently receive a lower quality of care than their white counterparts, even when all demographic and socioeconomic factors are equal.

It's also proven that disparities in care don't stop once patients leave the hospital. Data suggest that gaps in health status emerge after patients of different racial and ethnic groups are discharged. Clearly, there is much to be done to improve the quality of care that minorities receive in and out of the hospital.

| PARTICIPATING HOSPITAL | ACCOMPLISHMENTS |
|---|---|
| **Del Sol Medical Center, El Paso, Texas**<br>• 336-bed community hospital<br>• Member of the HCA Hospital Corporation<br>• Patient population is 75 percent Hispanic | • Heart attack patients who received all the indicated care they were eligible to receive (Measure of Ideal Care) increased from 17 percent to 89 percent over two years<br>• HF patients who received all indicated care they were eligible to receive (Measure of Ideal Care) increased from 15 percent to 94 percent over two years |
| **Delta Regional Medical Center, Greenville, Mississippi**<br>• 398-bed, county-owned hospital serving five counties within the Mississippi Delta<br>• Population served has a high prevalence of heart disease<br>• Over two-thirds of the area's residents are African American | • Maintained 100 percent compliance throughout the project for providing patients with the appropriate medicines used to treat HF<br>• Established a health ministry network among local minority churches to provide cardiac education and support for chronically ill patients through trained local parishioners |
| **Duke University Hospital, Durham, North Carolina**<br>• 811-bed, not-for-profit hospital and the flagship hospital for the Duke University Health System an academic medical center<br>• Serves Durham County, where almost half of the residents are either African American (40 percent) or Latino (8 percent) | • Maintained AMI and HF core measures at or above state and national averages throughout the project<br>• Created a HF consultative clinic to improve access to outpatient specialty care for disadvantaged patients through a partnership with a community federally qualified health center |
| **Memorial Healthcare System, Hollywood, Florida**<br>• Memorial Regional Hospital is the flagship, 690-bed hospital of a public, not-for-profit, healthcare system and home to the system's Cardiac and Vascular Institute<br>• Serves south Broward County where half of the area's population of 618,000 is either black or Hispanic | • Increased the HF Measure of Ideal Care from 72 percent to 97 percent between the fourth quarter of 2005 and December of 2007<br>• Increased time to Percutaneous Coronary Intervention from 67 percent to 95 percent between the fourth quarter of 2005 and December of 2007<br>• Designed and implemented a cardiac care disease management transition program for the medical management of uninsured/underinsured patients with AMI and HF |
| **Montefiore Medical Center, Bronx, New York**<br>• Not-for-profit, academic medical center and a fully integrated healthcare delivery system with 1,491 beds<br>• Located in the Bronx, where 80 percent of residents are Hispanic (48 percent) or black (31 percent) | • Smoking cessation counseling rates for HF patients increased from 71 percent to 100 percent in the first year and were maintained at 100 percent compliance throughout the second year of the project<br>• AMI and HF rates remained steady at 100 percent from the first quarter of 2007 through the second quarter of 2008<br>• Heart attack patients receiving an angioplasty balloon within 90 minutes increased from 17 percent to 100 percent by the end of the program |
| **Mount Sinai Hospital Medical Center, Chicago, Illinois**<br>• 291-bed, not-for-profit, teaching hospital<br>• Almost all hospital visits are by African-American (56 percent) or Hispanic patients (38 percent) | • Increased the AMI Measure of Ideal Care by 27 percentage points over the course of the program<br>• Achieved a 46 percentage point increase in the HF Measure of Ideal Care from the beginning of the program to the end |
| **Sinai-Grace Hospital, Detroit, Michigan**<br>• 454-bed, not-for-profit community-based teaching hospital<br>• Patient population is 90 percent African American | • Consistently provided evidence-based care to greater than 92 percent of heart attack patients during the last three quarters of 2007<br>• Created a post-hospital discharge HF education program focused on providing patients with a basic understanding of HF and key aspects of lifestyle self-management techniques |
| **University Health System, San Antonio, Texas**<br>• 498-bed, publicly owned academic medical center<br>• More than half of patients are Hispanic (61 percent) | • Achieved targets of 85 percent compliance with the Measures of Ideal Care for AMI and HF by December 2007<br>• AMI and HF patients receiving smoking cessation counseling increased from 20 percent (2005 baseline) to 100 percent for both the third and fourth quarters of 2007 |
| **University of Mississi[illegible] Health Care, Jackson, Mississippi**<br>• 598-bed, teaching hos[illegible] serves as Mississippi's principal diagnostic and [illegible]<br>• Two-thirds of the Me[illegible] patients are African American | • Implemented a protocol-driven, nurse practitioner-led HF disease management program for uninsured/underinsured patients<br>• Improved overall evidence-based care to heart attack patients from 74 percent to 82 percent over two years |
| **Washington H[illegible] Washington, DC**<br>• 226-bed, [illegible] hospital [illegible] largest care [illegible]<br>[illegible]<br>• [illegible] | • Achieved a 43 percentage-point increase in providing HF patients with complete written discharge instructions (from 29 percent to 72 percent)<br>• Cr[illegible] a Heart Failure Case Manager position to assist patients with disease management activitie[illegible]-discharge |

The participating hospitals' multidisciplinary teams worked together via a collaborative "Learning Network" managed by a National Program Office that operated from The George Washington University Medical Center's School of Public Health and Health Services. Each hospital's efforts were led by a core team representing a wide variety of backgrounds – from chiefs of cardiology to frontline nurses to directors of quality improvement.

The hospitals received modest grants for their participation and ongoing technical assistance. Over time, while simultaneously working to improve the quality of care for **all** of their heart patients, the hospitals were able to identify if there were racial and ethnic disparities in the care they were providing.

## Hospitals Tracked Care Quality with Performance Measures

Throughout the *Expecting Success* project, the hospital teams provided monthly reports on 23 different care performance measures – all stratified by patient race, ethnicity and primary language. These included the eight core measures of care for heart attacks or acute myocardial infarction (AMI), and four core measures for heart failure (HF) that the U.S. Centers for Medicare and Medicaid Services collects and publicly reports.

In addition, the hospitals reported on key composite measures – known as Measures of Ideal Care – showing whether a given patient receives all of the core components of care they are eligible to receive as prescribed by the American College of Cardiology and the American Heart Association as evidence-based guidelines for the treatment of heart failure or heart attack.

Most of the measures reflected the quality of inpatient care, but because *Expecting Success* was simultaneously focused on improving outpatient cardiac care, participating hospitals also reported their 30-day readmission rates as an additional performance measure.

## Core AMI and HF Measures

| Condition | Measures |
|---|---|
| Acute Myocardial Infarction (AMI)/Heart Attack | • Aspirin at arrival<br>• Aspirin at discharge<br>• Angiotensin Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) for Left Ventricular Systolic Dysfunction*<br>• Beta Blocker at arrival<br>• Beta Blocker at discharge<br>• Fibrinolytic agent received within 30 minutes of hospital arrival<br>• Percutaneous Coronary Intervention (PCI) received within 90 minutes of hospital arrival (previously PCI received within 120 minutes of hospital arrival, as well as, Percutaneous Transluminal Coronary Angioplasty (PTCA) received within 90 minutes of hospital arrival)<br>• Smoking cessation advice/counseling |
| Heart Failure | • Evaluation of Left Ventricular Systolic (LVS) Function**<br>• ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction*<br>• Discharge instructions<br>• Smoking cessation advice/counseling |

**Modified, effective 1Q2005 discharges. For more information, see The Hospital Quality Alliance (HQA) Ten Measure Starter Set.*

***Modified, effective 1Q2006 discharges.*

*U.S. Department of Health & Human Services, Medicare Hospital Compare Database. Glossary of Definitions. Available at: http://www.hospitalcompare.hhs.gov/Hospital/static/SupportingInformation_tabset.asp?activeTab=2&language=English*

## Hospitals Measured Care by Patient Race, Ethnicity and Language

All hospital leaders like to believe that their institutions provide equal care regardless of a patient's race, ethnicity or primary language, but few know for certain. Without uniform standards for collecting this information (most registration staff simply "eyeball" patients and make a determination) and without tracking patient race and ethnicity data against quality measurements, there is no way of knowing if all patients receive the same level of care.

The *Expecting Success* hospitals each utilized the Health Research and Educational Trust toolkit to establish standardized collection of race, ethnicity and language patient data. Some of the hospitals made select modifications to tailor the tools for their staff. The cornerstone of each involved directly asking patients to self-report their race, ethnicity and language so that all of the patient's care could ultimately be compared with these demographics. At first, staff registration management and even senior hospital leadership expressed anxiety about whether collecting such data was legal, whether their computer registration systems would need to be completely overhauled and how patients would react to such questions about their race and ethnicity.

The process went considerably more smoothly than anticipated. The hospitals soon found that such data collection is legal; information technology departments were engaged early; and people are relatively accustomed to being asked demographic questions in many aspects of their everyday lives.

### Tracking Data by Patient Race and Ethnicity Can Lead to Questions about Quality

For hospitals participating in *Expecting Success*, tracking care by every patient's race, ethnicity and primary language produced data that raised critical questions for the hospitals, including:

- Why are some Black patients not getting aspirin when they arrive at the hospital with symptoms of a heart attack?
- Why are some Hispanic patients consistently not receiving all discharge instructions?
- Why are readmission rates so much higher for minority patients?

By reviewing the data, the hospitals were able to design specific interventions to help improve the overall quality of care provided by the hospitals and, in time, reduce disparities in care.

For the first time ever, the hospitals analyzed 23 cardiac care quality indicators by patient race, ethnicity and language. They faced the tough reality that **disparities in care might exist in their institutions,** but armed with this information, have made tremendous progress toward reducing these gaps in care.

## Hospitals Designed Interventions to Improve Quality of Care

For the first year of the program – while a significant amount of data on race, ethnicity and language preferences of patients was being generated – the hospitals focused on developing interventions and putting systems in place to ensure that their heart patients would consistently receive all of the recommended care for their condition.

Comparing data on the core measures before and after interventions were applied helped hospitals gauge how effective their interventions were and gave them the momentum to continue their work as planned, or adapt the intervention to be more effective.

## Transitions in Care

Transitions in care for minority patients were closely tied to many of the disparities encountered during *Expecting Success.* As part of the program, hospitals realized the great benefits of inpatient and outpatient centers coming together to learn form each other. Moving between the hospital and ambulatory care settings, minority patients were more likely to experience serious lapses in their path to recovery. *Expecting Success* promoted a disintegration of silos between the care settings and challenged them to work together.

### Toolkit Helps Hospitals Tackle Data Collection

The Health Research & Educational Trust, a division of the American Hospital Association, developed a toolkit to guide hospitals through the process of collecting data on patients' race, ethnicity and primary la[illegible]

The kit [illegible] the nuts a[illegible] the data [illegible] resou[illegible] or trainin[illegible] sample sc[illegible]

Access the toolkit at [illegible]

## Sample Interventions Identified and Implemented by *Expecting Success* Hospitals

| INTERVENTION | GOAL/KEY MEASURE | INNOVATION | RESULTS |
|---|---|---|---|
| Reducing Door-to-Balloon Time | • Reduce time from heart attack patient's arrival at the emergency department (ED) to receiving percutaneous coronary intervention to 90 minutes or less | "Code Heart" program, a process that immediately and simultaneously alerts the ED staff and cardiac team when a heart attack patient arrives at the hospital | • Door-to-balloon time improved by 60 percent in the first year<br>• Hospital routinely hits the 90-minute target for 100 percent of heart attack patients |
| Universal Patient Discharge Instructions | • Ensure adult cardiac patients receive all necessary discharge instructions to meet core cardiac-specific measures mandated by the Joint Commission and Centers for Medicare & Medicaid Services (CMS) | System-wide universal discharge instruction form developed by physicians, nurse practitioners, hospital and community pharmacists, merging general discharge instructions with cardiac-specific discharge instructions for patients with acute myocardial infarction (AMI) or heart failure (HF) | • Adherence to AMI- and HF-specific discharge instructions increased by 21 percent and 29 percent, respectively in the first nine months of use<br>• More than 91 percent of the time, hospital consistently meeting discharge guidelines for adult cardiac patients |
| Establishing a Nurse Practitioner-Run Clinic for Heart Failure Patients | • Reduce readmissions and return visits to hospital EDs among HF patients | Off-site, nurse-led HF clinic that helps HF patients better control and self-manage their disease post-hospitalization | • Approximately 50 percent of its HF patients had not had a repeat ED visit one year after the clinic opened its doors<br>• Prior to the clinic, many patients visited the ED regularly |
| Improving Success of Smoking Cessation Counseling for Heart Patients | • Increase the effectiveness of smoking cessation counseling for patients with HF and AMI while also demonstrating measured success in CMS performance metrics | Modified inpatient smoking cessation counseling programs to identify patients willing to change behavior and provided them with targeted resources to quit | • Hospital quality performance for smoking cessation counseling improved dramatically, from 44 percent in Q4 2005 to 100 percent in Q3 2007 for AMI patients, and from 32 percent to 100 percent during the same period for HF patients |

*Information and videos on* Expecting Success *innovations that work can be found at www.rwjf.org/goto/expectingsuccesstoolkit.*

Since many factors inhibit patients from following and managing their care once discharged, leaders at *Expecting Success* hospitals are now taking more time to talk with cardiac patients about their transition care plan long before discharge, so potential problems are identified prior to discharge and to prevent readmission. Hospitals often found that their ambulatory care centers had very successful programs in place that could be leveraged and used with patients in the hospital prior to discharge. Successful improvements to transitions in care include:

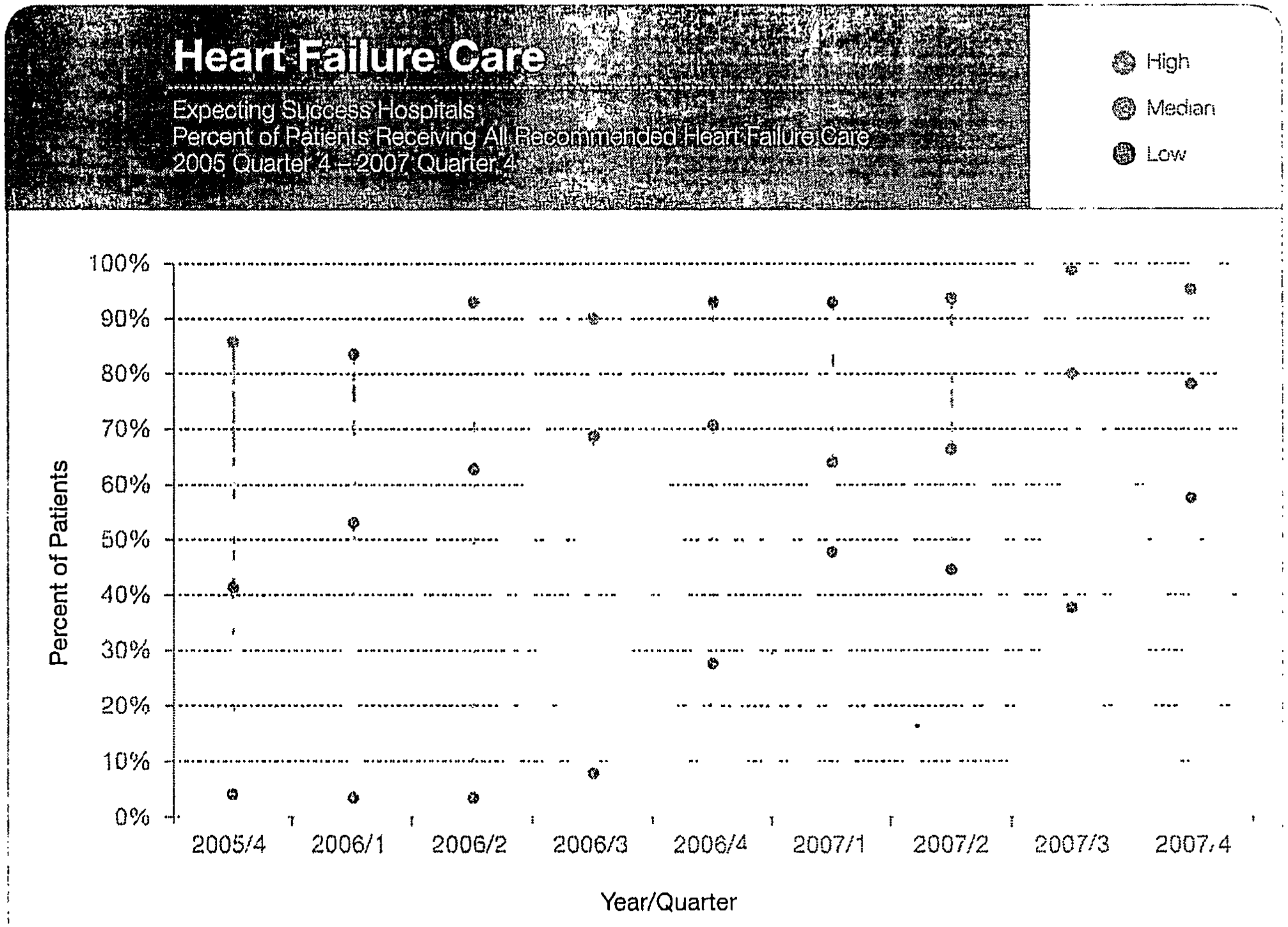
- Assess the transition points in the hospital.
- Ensure that existing transition procedures are being consistently followed.
- Assess if other procedures or resources exist to improve transitions.
- Coordinate the transition with all relevant inpatient staff.
- Discuss the transition and care plan with patients **before** discharge.
- Develop patient-centered, take-home resources to provide support during transitions.
- Proactively check on the status of patients after discharge and during transition.

## Interpreting the Results

Final data from *Expecting Success* awaits peer-reviewed publication, but preliminary results show that the program had a remarkable effect in a short period of time.

Key results show:

- The all-hospital median heart failure Measure of Ideal Care, an indicator that a patient received all the recommended standards of heart failure care eligible to receive in the hospital, had a **significant increase from 41 percent to 78 percent** over two years.



*The median heart failure Measure of Ideal Care, an indicator that a patient received all the recommended standards of heart failure care in the hospital, had a significant increase from 41 percent to 78 percent between the fourth quarter of 2005 and the fourth quarter of 2007.*

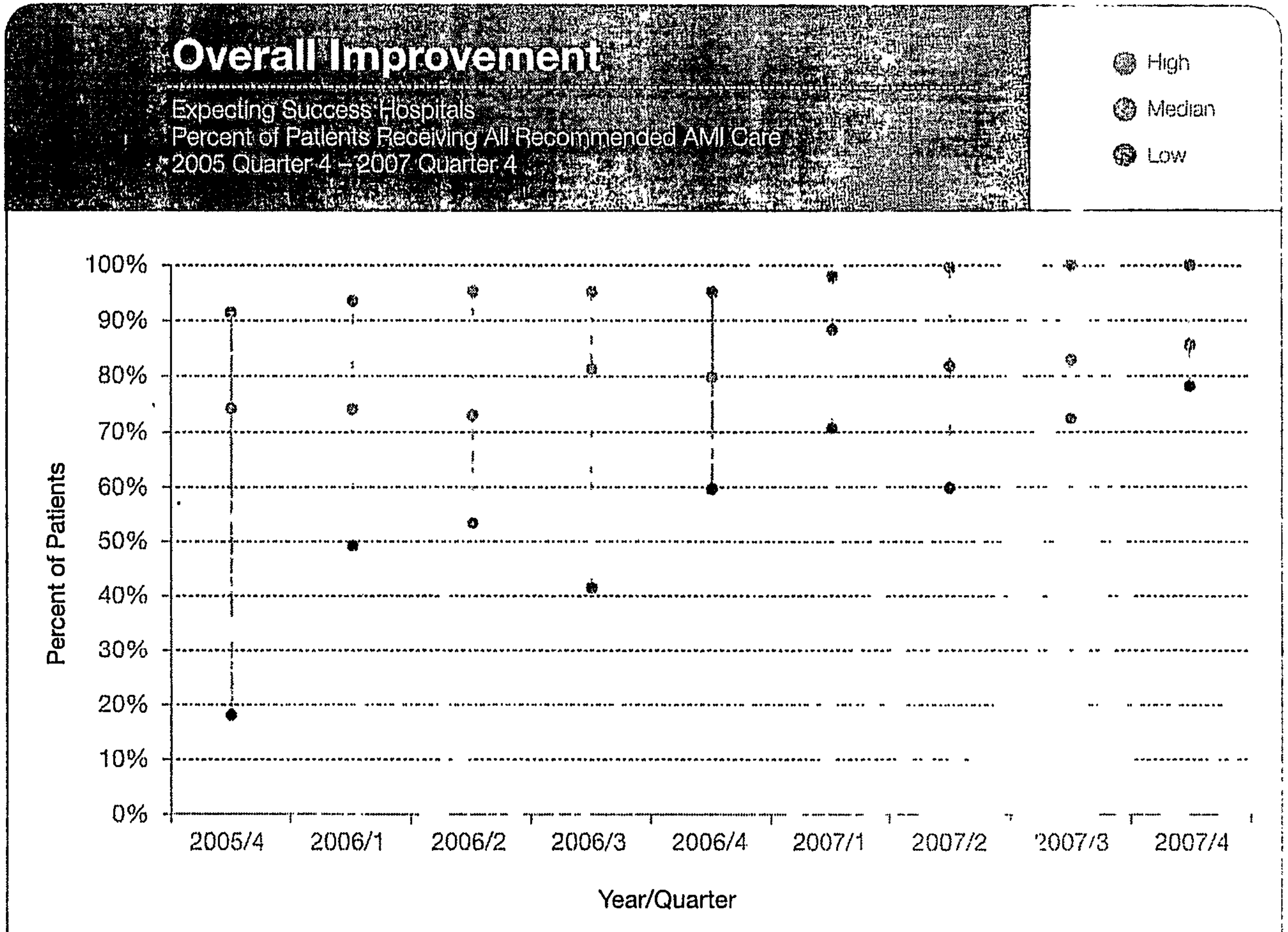
- The all-hospital median Measure of Ideal Care score for heart attack patients, an indicator that a patient received all the recommended standards of heart attack care eligible to receive in the hospital, **increased from 74 percent to 86 percent** over two years.

The hospitals participating in the pilot phase of *Expecting Success* achieved core goals of the program, and many are actively applying the program's principles to areas of care for other conditions. Among their accomplishments:

- Recognized disparity in disease treatment
  Through the *Expecting Success* program, hospital management and clinicians became increasingly aware that the potential for racial and ethnic disparities existed at their institution and became more firmly committed to identifying whether disparities existed and addressing them promptly. Recognizing that black and Hispanic patients appear to face a greater burden in consistently receiving high-quality care in their institutions was a huge eye opener for some participants.

- Improved quality; reduced disparities
  Within one year, every hospital that participated in the program was increasing its percentage of patients receiving all core measures of care recommended for heart attacks and heart failure. The successes continued throughout the program.

- Hardwired uniform collection of patient race, ethnicity and language data
  For the first time, participating hospitals tracked data on core measures of care for patients with heart failure or who had a heart attack by race, ethnicity and primary language. While simultaneously working to improve the quality of care for all their heart patients, the hospitals were able to identify if there were racial and ethnic disparities in their care.



*The median Measure of Ideal Care score for heart attack patients, an indicator that a patient received all the recommended standards of heart attack care in the hospital, increased from 74 percent to 86 percent between the fourth quarter of 2005 and the fourth quarter of 2007.*

- Implemented targeted quality improvements based on data
  The hospitals identified and implemented ways to ensure that patients consistently received the right care – developing standard order sets, creating documentation systems, etc. At each hospital, this required a team approach to identify where proven quality standards were being missed, and to redesign systems accordingly.

- Became more engaged in discharge and outpatient care to reduce readmissions

Quality of care after hospital discharge proved to be dramatically different for patients of different races/ethnicities. *Expecting Success* hospitals all recognized that they have considerable work to do with providers and clinics in their communities to better manage their cardiac patients after they leave the hospital, in order to prevent unnecessary readmissions and emergency department visits.

### Spreading the Success to Other Institutions

Working together, the *Expecting Success* collaborative helped participating hospitals improve the overall quality of their cardiac care, explore whether disparities in their care exist and summon the courage and tools to address the findings. Success was contingent upon the hospitals knowing exactly who their patients were and identifying whether these patients received the same care regardless of race, ethnicity or language.

> Quality of care after hospital discharge proved to be dramatically different for patients of different races/ethnicities.

Hospitals that participated in the pilot program, along with staff from the National Program Office, believe key factors to implementing the program include:

- Recognize the importance of talking about disparities.
  No one wants to consider that their institution may have disparities, but acknowledgement that inequities may exist is the first step to gathering and following the data.
- Garner executive buy-in for improving quality
  Develop a compelling case for management's support by showing that the hospital does not always meet evidence-based care metrics.
- Engage all stakeholders.
  Include senior leadership, information technology, quality improvement staff, all levels of clinical staff, frontline registration staff and others in planning the program.
- Build community awareness.
  Tell the community what you're undertaking to showcase efforts and increase support.
- Data collection is essential
  A consistent process for collecting patient data by race, ethnicity and primary language with everyone is instrumental to the success of the effort.
- Creativity counts when improving quality
  All hospitals tried out a wide range of interventions in their effort to improve their progress on meeting core measures.

## NEW Online Resource Offers Insights to Hospitals on Improving Quality

A comprehensive online *Expecting Success* toolkit helps hospitals improve the quality of care in their own community. The toolkit provides tips for hospitals on improving the quality of care and reducing disparities including:

- Advice from hospital CEOs and frontline staff on why and how to get started
- Expansive library of interventions tested and applied at hospitals of all sizes
- Videos showing successful tools from participating hospitals in practice
- Additional resources to help hospitals collect data and create tools to increase quality of heart care while reducing disparities

Visit http://www.rwjf.org/goto/expectingsuccesstoolkit

# Expecting Success: National Program Office Staff

The Center for Health Care Quality in the Department of Health Policy of The George Washington University School of Public Health and Health Services served as the National Program Office for Expecting Success.

Bruce Siegel, MD, MPH
*Director*

Jennifer Bretsch, MS
*Senior Research Associate*

Karen Jones, MS
*Senior Research Scientist*

Vickie Sears, RN, MS, CCRN
*Quality Improvement Leader*

Lissette Vaquerano
*Senior Research Assistant*

Marcia J. Wilson, PhD, MBA
*Deputy Director*