



Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care (with CD)

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Racial and Ethnic Disparities in Diagnosis and Treatment: A Review of the Evidence and a Consideration of Causes

H. Jack Geiger, M.D.
City University of New York Medical School

INTRODUCTION

At no time in the history of the United States has the health status of minority populations—African Americans, Native Americans and, more recently, Hispanics, and several Asian subgroups—equaled or even approximated that of white Americans. The health of all American racial and ethnic groups has improved dramatically, particularly over the last six decades, but the paired burdens of excess morbidity and decreased life expectancy for people of color have been noted over several centuries and have proved, even recently, to be stubbornly resistant to substantial change (Byrd and Clayton, 2000; National Center for Health Statistics, 1998). Two observations, some four decades apart, illustrate this persistence of inequality. In his classic 1944 study of the role of race in American life, Gunnar Myrdal noted that “Area for area, class for class, Negroes cannot get the same advantages in the way of prevention and care of disease that whites can” (Myrdal, 1944). In 1985, the Report of the Secretary’s Task Force on Black and Minority Health concluded that “Despite the unprecedented explosion of scientific knowledge and the phenomenal capacity of medicine to diagnose, treat and cure disease, Blacks, Hispanics, Native Americans, and those of Asian/Pacific Islander heritage have not benefited fully or equitably from the fruits of science or from systems responsible for translating and using health sciences technology” (USDHHS, 1985). In 1995, the overall African-American mortality rate was 60 percent higher than that of whites—precisely what it had been in 1950 (Williams and Rucker, 2000; Williams, 1999).

Classic public health doctrine holds that the major determinants of population health status and the primary explanations of disparities among population groups lie in the social, physical, and economic environments, which in turn are determined by the larger society's norms, values, social stratification systems and political economy (King, 1996; Menefee, 1996). The causes of these minority/white disparities in health status have consistently been attributed to such variables as socioeconomic status (especially income, lack of education, and unemployment); lifestyle choices and behavioral risks; occupational and environmental hazards, inferior housing, poor nutrition, and different cultural beliefs about health and illness. There is evidence for all of these variables. Another explanation is lack of minority access to health care, particularly the lack of either public or private health insurance, which has persisted despite the introduction and expansion of such programs as Medicare and Medicaid (Blendon et al., 1989; Weinick, Zuvekas, and Cohen, 2000).

Two other variables frequently suggested as causative similarly reflect values and beliefs that are prevalent in the larger society and appear with considerable frequency in the medical literature on disparities. The first of these is the contention that there are biologically and genetically distinct human races, and that "racial" biologic differences in susceptibility to, manifestations of, or therapeutic responses to specific diseases are significant pathophysiologic contributors to health disparities. Such beliefs appeared frequently in 19th-century America as elaborate, pseudoscientific arguments for the inherent biological inferiority of African Americans (Cartwright, 1851). Today, however, despite the recognition that "race" is a social rather than a meaningful biologic concept (Marks, 1995; Cavalli-Sforza, Menozzi, and Piazza, 1994; Witzig, 1996), arguments about the medical importance of racial groupings continue to appear, without pejorative intent and in highly sophisticated form (Wood, 2001; Schwartz, 2001; Goodman, 2000).

The second suggestion is that racial and ethnic discrimination itself may be an important contributor to health disparities, not merely through the historic and persistent disadvantages it creates for minorities in the American social structure, but also specifically through health provider bias—conscious or unconscious, individual or institutional. A rich literature attests to the persistence and prevalence of racist beliefs and discriminatory behaviors in contemporary American society (Steinhorn and Diggs-Brown, 1999; Waller, 1998; Polednak, 1997; Massey and Denton, 1993; Hacker, 1992; Feagin, 1991; Farley and Allen, 1989). There was limited quantitative evidence, however, for the view that such racial/ethnic discrimination might occur frequently in medicine until the availability of large administrative databases from Medicare, the Health Care Financing Administration (HCFA), the Department of Veterans Affairs (VA) and

other sources initiated a growing stream of studies examining racial and ethnic disparities in diagnosis and treatment. These studies clearly established that whatever the causes, the experience of minorities *within* the health care system differed from that of comparable whites across a broad range of disease categories. The majority of these investigations focused on African-American patients; data on Hispanics, Native Americans, and Asian/Pacific Islanders were more limited.

In 1990, the American Medical Association (AMA) took formal note of black-white disparities in health care. While emphasizing the probable roles of socioeconomic status and sociocultural factors and noting the limitations of many studies, the AMA also acknowledged that “Disparities in treatment decisions may reflect the existence of subconscious bias. . . . The health care system, like all other elements of society, has not fully eradicated this [racial] prejudice” (Council on Ethical and Judicial Affairs, 1990). Intense discussions of the early evidence and its possible causes, however, were already underway. A search of the literature prepared for the AMA’s board of trustees covering only the articles, commentaries and letters that appeared in the *Journal of the American Medical Association* and the *New England Journal of Medicine* from 1984 to 1994, filled 66 single-spaced pages (Board of Trustees Report 50-1, 1995). The comments of many physicians were heavily weighted toward denial. As van Ryn has pointed out, such reluctance is understandable because the idea that racial/ethnic bias might be operative conflicts with most physicians’ conscious commitment to anti-discriminatory principles, their views of their own behaviors, that of their peers and the institutions within which they work, and the ethical commitments of medicine (van Ryn, 2001).

Studies of racial/ethnic disparities in diagnosis and treatment proliferated throughout the 1990s and were characterized by increasingly sophisticated control or adjustment for such confounding variables as health insurance status, income and education, severity or stage of disease, comorbidity, and hospital type and resources. They drew upon a wide variety of data sources, regional and multi-center collaborations, quality assurance investigations, and disease-specific investigations such as the Coronary Artery Surgery Study (CASS). Relatively few were based on detailed access to clinical records. The limitations of administrative databases and retrospective methodologies usually precluded any evidence-based identification of the causes of disparities. Explanations, which were necessarily speculative in most cases, were drawn from the same repetitive list of possibilities. They included patient choice or preference, unmeasured aspects of socioeconomic status, unmeasured clinical variables, biological differences in disease manifestation or response to treatment, minority cultural beliefs, lack of trust in the health care system, deficiencies in providers’ cultural competence, and difficulties in cross-racial/

ethnic physician-patient communication, in addition to the possibility of individual or institutional bias. In the late 1990s, concerns about racial/ethnic bias and stereotyping appeared with increasing frequency in the medical literature (Geiger, 1996, 1997; King, 1996; Smith, 1998; Williams and Rucker, 2000) and began to be presented as issues of social justice (McGary, 1999). Recently, local governments and public health departments have conducted studies of racial/ethnic disparities and discrimination in health care institutions in their own areas (Twin Cities Metro Minority Health Assessment, 2001; Seattle and King County Public Health Department, 2001). At the federal level, Congressional legislation has specifically addressed issues of discrimination in health care, and a new National Center on Minority Health and Health Disparities has been established at the National Institutes of Health. Clearly, the problem of racial/ethnic disparities in diagnosis and treatment is increasingly being viewed as an important subset of the issue of achieving equity in health status (Department of Health and Human Services, 2000) and as a particularly troubling component of the problems of race and ethnicity in the larger society.

It is in this context that systematic reviews of the relevant medical literature may help to illuminate three key questions. Does the cumulative weight of evidence establish that there are significant racial and ethnic differences in diagnostic investigation and therapeutic recommendations and actions, due at least in part to problems of bias and discrimination? If so, do such differences in health care in turn contribute to the excess burdens of morbidity, disability, impaired quality of life and premature mortality that are already so well documented in studies of the health status of minority populations? Finally, what can be determined about the multiple processes and causes of these differences? The answers may be helpful in addressing two additional questions: What are the needs for further research, and what steps might be taken now to reduce or eliminate such disparities?

The Present Review: Scope and Methods

This paper will present a sampling of findings from an ongoing review of the medical literature on racial and ethnic differences in diagnosis and treatment. Relevant studies were identified by searching Medline and many other databases, including those maintained by HCFA, the Agency for Healthcare Research and Quality (AHRQ), and the HHS Office of Minority Health (OMH). Additional studies were identified through references in published articles. A substantial number of dedicated web sites relevant to issues of minority health, cultural competence and health workforce diversity were examined, as were a wide variety of

reports from the Henry J. Kaiser Family Foundation, the Commonwealth Fund, the Association of American Medical Colleges (AAMC), the National Medical Association (NMA), the Hispanic Medical Association (HMA), and other organizations. Editorials, commentaries, and workshop and conference reports were also reviewed. In all, more than 600 bibliographic citations have been accumulated and organized primarily by disease category. Topics include general medical care, coronary artery and other cardiac disease, cancer, cerebrovascular disease, asthma, HIV/AIDS, renal disease and renal transplantation, diabetes, mental health, maternal and child health, ophthalmic disease, prevention, and a small sampling of other disease categories. An effort was made to identify all relevant studies comparing diagnosis and treatment by race or ethnicity, including any that did not report significant disparities. Additional topics include research methods and clinical trials, issues of trust and communication in the healthcare system, and medical education and cultural competence.

A hard copy of each article was obtained from the library and examined for relevance, study design, appropriateness of data sources, analytic methods and control of potentially confounding variables, and originality. Each selected article was then reviewed by at least two people—a physician with epidemiologic training and a master's or doctoral level epidemiologist or health services researcher. A detailed one- or two-page annotation was then prepared, including not only the material usually presented in the abstracts—purpose, data sources, study design, methods and results—but also important details from the text such as the discussions, the offered explanations, the acknowledged limitations, and any statements of implications for policy or research. Initial support for this work was provided by the Robert Wood Johnson Foundation, and support for what is now an ongoing effort has been provided by the Josiah Macy, Jr., Foundation, the Commonwealth Fund, the Ford Foundation, and the W.K. Kellogg Foundation.

This effort substantiates and extends the pioneering work of Mayberry and his associates, who published the first detailed and comprehensive review of the relevant medical literature (Mayberry, Mili, and Ofili, 2000). As indicated by the list of topics, the scope of the present effort was somewhat broader, as was the time frame. A few studies and commentaries, mostly in the psychiatric literature, were found in the 1960s (Gross and Herbert, 1969; Pasamanick 1963) and a small number of relevant publications appeared in the 1970s. The majority of articles selected for this review, however, were published between 1980 and the first half of 2001.

Our purpose in the following sections is not to present an exhaustive account or description of each annotation in every topic category, a task that would require a much longer paper. Instead, a modest number of

studies, selected as representative of the most important findings, will be described and discussed in the following section on general medical and surgical care. This will give some sense of the data sources, study designs and methods that are typical of the entire research effort. In subsequent sections, an attempt will be made to present representative studies in each of five disease categories. These examples from the literature review are intended to document the multiplicity of factors, including but by no means limited to individual and institutional bias, that contribute to racial and ethnic disparities in diagnosis and treatment.

General Medical and Surgical Care

Perhaps the most useful data come from large-scale studies that examine racial/ethnic differences in the adequacy, intensity and quality of diagnostic and therapeutic procedures for a wide range of clinical conditions, in different hospital types and health care systems. For example, Kahn and her colleagues examined the quality of care provided to a nationally representative sample of 9,932 elderly Medicare-insured beneficiaries. The sample included patients who were black or from poor communities and who had been hospitalized for congestive heart failure, pneumonia, acute myocardial infarction or stroke, in one of 297 acute care hospitals—urban teaching, urban nonteaching, or rural—in five states (Kahn et al., 1994). The study is noteworthy for its detailed examination of clinical records, and its use of explicit quality criteria to assess the most basic (not luxury) elements of care: history taking and physical examination, common diagnostic tests such as chemistries and chest X-rays, and standard therapies such as diuretics and antibiotics. Because the care of black and poor patients was found to be similar, the two groups were combined in the analysis. When the experience of these patients was compared with that of people who were white or more affluent, the quality of care as measured by these fundamental indicators was found to be significantly lower for the black and poor group. While quality of care was best in urban teaching hospitals, the magnitude of the quality gap was similar in all three hospital types. The authors noted that further research is necessary to clarify whether sociocultural and educational incongruity between providers and patients translates into misunderstandings about patients' preferences and expectations, and to evaluate the extent to which stereotyping, discrimination and bias exist in the hospital setting. They concluded that "racial characteristics and poverty status also influence the quality of care received by acutely ill, insured patients after they have gained access to the hospital."

A number of similar studies examined black-white differences in the use of selected specific procedures. Lee and colleagues reviewed the use

of both basic and sophisticated diagnostic tests and minor and major surgical procedures, using claims data for Medicare beneficiaries in 10 states and the District of Columbia who had both Part A and Part B coverage. A subset of this sample was created by matching beneficiaries on the basis of zipcode of residence to neutralize the effects of black-white differences in provider access and regional practice patterns. Despite the adequacy of health insurance coverage, black patients' utilization was substantially weighted toward lower-cost procedures. The authors concluded that "...providers appear to be giving less intensive care to otherwise similar black Medicare beneficiaries" (Lee et al., 1997). Similarly, McBean and Gornick studied the use of 17 major diagnostic and therapeutic procedures and found that black Medicare beneficiaries were much less likely than whites to receive "referral-sensitive surgeries" (McBean and Gornick, 1994).

One of the largest studies reviewed more than 1.7 million hospital discharge abstracts to examine use of major diagnostic and therapeutic procedures in 77 disease categories in some 500 acute care hospitals (Harris, Andrews, and Elixhauser, 1997). After controlling for patient age, severity of illness, health insurance and hospital type, blacks were significantly less likely than whites to receive a major therapeutic procedure in almost half of the 77 disease categories. Again, in a five percent sample of more than 1.2 million claims in a HCFA Medicare database, blacks were found less likely than whites to receive 23 of 32 services, and the disparities were found even when patients were insured by both Medicare and Medicaid, minimizing the confounding of race with financial barriers to care (Escarce and Epstein, 1993). In a study of racial variation in procedures characterized as low, moderate or high physician discretion (Mort, Weisman and Epstein, 1994), blacks were less likely to undergo even such low-discretion (i.e., clinically urgent) procedures as appendectomy and repair of an abdominal aortic aneurysm. Disparities are not limited to African Americans, however. After adjusting for socioeconomic status, a study comparing experiences of Hispanic with non-Hispanic patients in California, Florida, and New York found that Hispanics were less likely to undergo major procedures in 38 percent of 63 different disease categories (Andrews and Elixhauser, 2000). A similar pattern was found even when very basic in-hospital diagnostic and therapeutic procedures for such common conditions as congestive heart failure and pneumonia were examined (Ayanian et al., 1999a). Using explicit process criteria and after adjustment, black Medicare patients were significantly less likely than whites to receive adequate laboratory and other diagnostic tests or therapeutic drugs such as diuretics and antibiotics.

Most of the investigations described above are broad-brush studies. Despite the consistency of their findings, and the indications that dispari-

ties may occur at every level of disease severity and at every stage of the diagnostic and therapeutic process, they have the limitations described previously. Most are retrospective, and cannot report information gleaned directly from providers or patients. Most have limited access to detailed clinical records, and so estimates of variables such as stage and severity of disease are likely to be approximations. There are serious problems in controlling or adjusting adequately for socioeconomic status when data on individual patient income, education or occupation are limited or absent. Health insurance may fail to eliminate the financial barrier of out-of-pocket expenses, which may affect both patient and provider choices. And finally, these studies offer relatively little evidence on outcomes such as disability or subsequent mortality.

These limitations underlie both the wide range and tentative nature of the explanations that are offered for the findings of racial and ethnic differences in care. The list is extraordinarily varied, but strikingly similar across studies. As noted previously, researchers suggest patient choice or preference; unmeasured socioeconomic variables; unmeasured clinical variables; unspecified sociocultural factors and differences in health beliefs; and impaired physician-patient communication and interactions. Also frequently mentioned are financial barriers and procedure costs as disincentives to care; differences in provider type, practice patterns, referral patterns and hospital resources; and overuse of procedures for whites rather than underuse for blacks. Yet, almost all the investigators also raise the possibility of racial bias and discrimination by providers, sometimes referring explicitly to racial and ethnic stereotyping. And many call for further research specifically designed to resolve the unanswered questions of causation.

A number of general surgical and orthopedic studies present similar findings. Blacks hospitalized in Maryland from 1985 to 1987 had lower rates for discretionary orthopedic, vascular, and laryngeal surgeries; the more discretionary the procedure, the lower the incidence among blacks. The differences were particularly marked for vascular surgery and were attributed to lower rates of referral and access to specialty care (Gittelsohn, Halpern, and Sanchez, 1991). A large retrospective cohort study of amputation rates and leg-sparing surgery for peripheral vascular disease among African-American and white Medicare beneficiaries found that among both diabetics and nondiabetics, African Americans were significantly more likely than whites to undergo amputations and significantly less likely to receive lower-extremity arterial revascularization (Guadagnoli et al., 1995). A striking example of racially differential provision of advanced technology was reported in the free-care VA system, in which both providers' financial incentives and patients' financial barriers are irrelevant and the socioeconomic spectrum of patients is substantially narrowed.

Researchers examining a prospective clinical records file covering all VA hospitals with operating rooms studied the use of laparoscopic versus conventional open cholecystectomy (which has a much higher in-hospital death rate) in the first four years after the introduction of the newer method. After adjustment for age, coexisting disease, socioeconomic status, and potentially confounding clinical characteristics, African Americans were 32 percent less likely than whites to receive laparoscopic surgery (Arozullah et al., 1999). In several other studies, African Americans were significantly less likely to receive total hip or total knee replacements, although racial variation in disease incidence may account for some of the differences (Harris and Sledge, 1990; Wilson, May, and Kelly, 1994; Baron et al., 1996).

A few studies reported particularly troubling outcomes. Hispanic patients with long bone fractures in one teaching hospital emergency room were twice as likely as non-Hispanics to receive no medication for pain (Todd, Samaroo, and Hoffman, 1993). At least one study showed that minority outpatients with cancer were provided with inadequate analgesic medication (Cleeland et al., 1997). Elderly African-American, Hispanic, Native Americans and Asian nursing home residents with cancer were also less likely to receive pain medication (Bernabei et al., 1998). Finally, in a national sample of intensive care units (ICUs) in the United States, African-American patients were found to receive significantly less treatment, less technological monitoring, fewer laboratory tests and less life-supporting treatments than whites in the first 24 hours in the ICU, after adjusting for type and severity of illness, age, and hospital characteristics (Williams et al., 1995). However, the researchers noted no black-white difference in overall ICU and hospital death rates.

Finally, studies of hormone replacement therapy provide some insight into the contribution of physician-patient communication to differences in care. Post-menopausal African-American women were not only less likely than white women to receive such treatment, but also less likely to receive counseling from physicians or be offered the choice of replacement therapy (Marsh et al., 1999; McNagney and Jacobson, 1997; Ganeson and Norris, 2000).

Coronary Artery Disease

Coronary artery disease (CAD) and acute myocardial infarction (AMI) are the most intensively and elaborately studied topics among all studies of racial and ethnic differences in care. In the last 20 years close to 200 studies, reviews, editorials and commentaries have investigated or discussed disparities in cardiac catheterization, angioplasty, coronary artery bypass surgery (CABG) and medical therapies such as the use of

beta-blockers, thrombolytic drugs, and aspirin. The reasons for the abundance of CAD-related studies are apparent. Coronary artery disease is a leading cause of death in all population groups. Its natural history, pathophysiology, risk factors and complications are well understood. There are relatively clear and standardized criteria for the appropriateness of invasive interventions and medical treatments. Utilization of these procedures and treatments is recorded in numerous databases, across all hospital types, and in many multicenter studies of specific diagnostic, treatment, or outcomes questions. Over the last decade, studies have been characterized by increasingly sophisticated control or adjustment for confounders. With only a relative handful of exceptions (usually based on smaller samples), the pattern of results is clear: African Americans with CAD or AMI are significantly less likely to receive appropriate cardiac procedures or therapies (Maynard et al., 1986; Hannan et al., 1991; Udvarhelyi et al., 1992; Ayanian et al., 1993; Franks et al., 1993; Whittle et al., 1993; Peterson et al., 1994; Giles et al., 1995; Carlisle et al., 1995; Stone et al., 1996; Gornick et al., 1996; Sedlis et al., 1997; Weitzman et al., 1997; Peterson et al., 1997; Hannan et al., 1999; Canto et al., 2000). They are less likely to be catheterized. If they are catheterized, African Americans are frequently 20 percent to 50 percent less likely to undergo a revascularization procedure. They are less likely than whites to receive beta blockers, thrombolytic drugs, or aspirin. These findings occur in both teaching and nonteaching hospitals. Cumulatively, the studies have accounted for age, sex, disease severity, symptom expression, comorbidity, health insurance or payor, and physician specialty, though each of these has some effect on its own. Roughly similar but less consistent disparities have been found for Hispanic patients (Goff et al., 1995; Mickelson et al., 1997; Canto et al., 1998; Hannan et al., 1999) but the documentation is less extensive; one study found no significant differences (Ramsey et al., 1997). Little difference in either invasive or medical treatment has been found between whites and Asians or Native Americans, but the number of studies is far too small to justify firm conclusions (Canto et al., 1998).

It is worth noting again that most of this large body of evidence on disparities in the diagnosis and treatment of cardiac disease does not reflect problems of primary *access* to health care, but are based on studies of persons already *in* the health care system.

There is less certainty about the causes of these differences as the same varied explanations offered for differential treatment in general medical and surgical care tend to be presented in every disease category. Recent experimental and prospective studies, however, have clearly identified racial and ethnic bias or stereotyping in clinical decision making as a contributing factor (Schulman et al., 1999; van Ryn and Burke, 2000). One especially useful review of more than 25 major studies argues that while

the causes of these inequalities in care remain to be fully elucidated, the studies have clarified what does *not* explain them (East and Peterson, 2000). Thus, these authors conclude, the disparities are not due to differences in disease prevalence because the treatment differentials are found in studies comparing black and white people with documented lesions or infarctions, and among those who have had access to cardiologists. They are not due to differences in clinical presentation, electrocardiographic findings, or size and distribution of coronary artery lesions. They are not fully explained by comorbidity or other clinical characteristics. They are not due to health insurance or payor type alone, since these disparities occur among equally insured Medicare patients and in VA hospitals where care is free. (Public hospital patients, however, who are disproportionately minority, are less likely to receive revascularization procedures unless they have in-hospital access to a cardiologist. In other hospitals, such differences are not explained by physician specialty). Any patient whose primary admission is to a hospital with the requisite catheterization and operative facilities, however, is more likely to receive revascularization. The racial and ethnic disparities are not due to regional variations, since they have been found in all areas of the country. They are not due to patient choice or refusal of procedures by minority patients; although a few studies of heart disease have found such an effect, more recent prospective studies have indicated that it is far too small to account for the large differences in treatment rates. The disparities are not due to overuse of appropriate treatments for whites and underuse for minorities, as inappropriate use does not vary by race.

A uniquely detailed perspective on the complex sequence of events leading to decisions on revascularization—and the role of race at each stage in the process—is offered by a study of white, black and Hispanic patients, *not* on Medicare, who were discharged from California hospitals with a principal diagnosis of AMI during an eight-month period in 1991. The investigators divided the process into four phases: pre-hospital (admission to a hospital offering revascularization); intra-hospital (initial admission); inter-hospital (immediate transfer to a hospital offering revascularization), and post-hospital (re-admission for revascularization during ensuing months). At every stage, both race and payor status were powerful predictors of revascularization (angioplasty and CABG). For example, within hospitals offering revascularization, whites and privately insured patients were most likely to receive revascularization; minority patients and the uninsured were least likely. Whites were also more likely to undergo transfer and revascularization than were minority patients. In the subgroup of patients who received a diagnostic cardiac catheterization, whites were almost 50 percent more likely than minority patients to have the procedure “converted” to a revascularization procedure. After ac-

counting for the strong association between race and payor status, as well as gender, disease severity and age, the baseline racial differences were not diminished in any phase (Blustein et al., 1995).

In general, the pattern is similar for medical therapy of CAD. Poor, black, or female patients with AMI were less likely to receive beta-blockers, thrombolytic therapy, or aspirin (Rathore et al., 2000a). In a Corpus Christi study, Mexican Americans with myocardial infarction were more than 40 percent less likely than comparable whites to receive thrombolytic therapy (Goff et al., 1995), and in a VA study Hispanics were more than 70 percent less likely to do so (Mickelson et al., 1997).

Although a few studies have found no racial difference in revascularization rates, or have implicitly questioned the existence of physician bias in decision making as an explanation for differences, such studies also have significant limitations. For example, Leape et al. found similar revascularization rates for whites and racial/ethnic minorities, but the study used broad diagnostic categories (including “suspected atherosclerosis”) and the sample size was small (Leape et al., 1999).

A recent study raises more important and troubling questions than its data can answer. Chen et al. examined a large sample of more than 18,000 Medicare patients admitted to the hospital for AMI. After adjustment for a wide variety of potential confounders, the researchers reported a significant deficit in the rate at which black patients received cardiac catheterization as compared with white patients—a finding consistent with many other investigations. Uniquely, however, this study compared the experience of patients by the race of their attending physicians, and found that the black-white gap in catheterization for the patients of black attending physicians was almost identical to the black-white gap for the patients of white attending physicians. Since the authors found no significant interaction between the patient’s race and the physician’s race, they concluded that “racial discordance between the patient and the physician does not explain differences between black patients and white patients in the use of cardiac catheterization” (Chen et al., 2001). The implication, fully articulated in an accompanying editorial, is that “overt racial prejudice did not account for racial differences in the rates of cardiac catheterization among black patients,” presumably on the assumption that black physicians cannot be racially prejudiced (Epstein and Ayanian, 2001).

In almost every hospital with the requisite facilities, however, it is a cardiologist—not the attending physician—who must make the initial decision to recommend or deny catheterization. We do not know how many of the black and white attending physicians, respectively, referred their patients to cardiologists for a requested catheterization. And among the small numbers of white and black patients whose attending physicians were cardiologists, the published data do not specify what decisions those

black and white cardiologists made for patients of either race. In a comment on Chen et al., Barr pointed out that as many as 70 percent of all the patients were likely to have had a cardiac consultation, and given that there are only a few hundred black cardiologists and more than 18,000 white cardiologists, it is likely that most black patients were seen by white cardiologists (Barr, 2001). If this is so, the study by Chen et al. essentially compared the decisions of white cardiologists with those of other white cardiologists, regardless of the race of the attending physician. While it is possible for an attending physician to overrule a cardiologist's negative recommendation and demand a catheterization, the study did not provide data by either physician race or patient race as to how often (if ever) this happened.

There are other troubling possibilities. Bias, as frequently noted, can be covert and unconscious rather than overt. Institutional racism—customs and practices in a hospital that produce racial inequalities, regardless of an individual physician's intentions—may play a role. As noted by Jacobs, there may be something in the process of medical education, professional acculturation or practice experience that subtly biases both black and white physicians, so that "racial prejudice . . . does not depend on the color of the perpetrator's skin" (Jacobs, 2001). In sum, these uncertainties underscore the need for prospective studies, with access to detailed clinical records, information on the *processes* of clinical decision-making, and interviews with both patients and physicians.

Several studies also merit specific mention because of the importance of their findings. A large study at Duke Medical Center found the common pattern of significantly lower rates of CABG among African Americans. Those who did not receive such treatment included patients who were at highest risk, had two- or three-vessel disease, and would have been expected to gain the greatest benefit. The five-year mortality rate for blacks was significantly higher than for whites (Peterson et al., 1997), in contrast to other studies that had found little difference in mortality outcomes. A study of revascularization procedures at major medical centers in New York State examined the care of patients who had been classified, by widely accepted criteria, as "inappropriate," "appropriate," or "necessary" for revascularization. Among all African-American patients, including those in the "necessary" category for whom the procedure is regarded as almost obligatory in the absence of contraindications, the rates of angioplasty and CABG were lower than those of comparable whites. In the "necessary" category, African Americans underwent angioplasty and CABG 37 percent fewer times than whites; there was no difference between Hispanics and whites in this same category. Patient choice accounted for only a very small amount of the variation, and in 90 percent of the cases in which patients did not receive bypass surgery, it was the

physician who made the decision not to recommend the procedure (Hannan et al., 1999). In an elegant follow-up study designed to conceal the fact that race was an important focus of inquiry, researchers interviewed the decision-making clinicians about their treatment decisions. The physicians believed that their recommendations to deny invasive treatment to many African-American patients were based on sound clinical criteria. The data suggested, however, that the physicians projected classic negative racial stereotypes onto those patients, and that their negative perceptions of race and class were in fact predictive of their treatment decisions (van Ryn and Burke, 2000).

Perhaps the single most impressive demonstration of the role of race in clinical decision-making comes from the VA hospital system, which is well represented in studies finding significant racial/ethnic disparities in care. At the Cleveland VA hospital between 1993 and 1995, decisions about angioplasty and CABG on 938 consecutive patients who had undergone catheterization were made by a committee of cardiologists and cardiothoracic surgeons on the basis of a presentation by a cardiology fellow; they did not see the patient. The presentation of each case included all of the customary clinical data, including the extent and distribution of coronary artery lesions, cardiac function, comorbidity, etc., but *race was not specified*. When the decision-makers were effectively blinded to race, overall rates of revascularization were similar for blacks and whites, but on the basis of clinical factors identified in this series of patients, blacks were more likely to receive angioplasty and whites were more likely to undergo CABG (Okelo et al., 2001).

A recent independent review of 61 studies published from 1966 to May 2000, examining racial variation in receipt of invasive cardiovascular procedures, reached conclusions strikingly similar to those in our own evaluations of the evidence. Among studies using administrative data, odds ratios extracted from the data by the authors for African-American patients compared with white patients ranged from 0.41 to 0.94 for cardiac catheterization, from 0.32 to 0.80 for angioplasty, and from 0.23 to 0.68 for CABG, and procedure rates were also found to be lower for Hispanic and Asian patients. Among studies using detailed clinical data, odds ratios for African-American patients compared with white patients ranged from 0.03 to 0.85 for catheterization, from 0.20 to 0.87 for angioplasty, and from 0.22 to 0.68 for CABG. Studies using survey methods found conflicting results regarding patient refusals as a cause of racial variation in receipt of invasive cardiovascular procedures, and the authors noted that “physician bias was also associated with racial variation in recommendations for treatment” (Kressin and Petersen, 2001).

The evidence from these many investigations supports the hypothesis that providers’ perceptions of race and ethnicity is one of the factors

that affect their clinical decisions. This effect may be a direct consequence of conscious bias (Finucane and Carese, 1990) or, more often, unconscious negative stereotyping (van Ryn and Burke, 2000; van Ryn, 2001). Such stereotyping may be indirect in that it is mediated by distortions or omissions in cross-racial/ethnic physician-patient communication that are, in turn, a consequence of providers' race- or class-based stereotypic judgments of patients' intelligence, likelihood of compliance with recommended regimens, or preferences. Both processes may contribute to the repeatedly documented disparities in the care of patients with coronary artery disease.

There is some evidence, however, that such racial and ethnic differences in the diagnosis and treatment of coronary artery disease are neither intrinsic nor immutable characteristics of all health care systems in the United States. Taylor et al. examined the experiences of 1,441 patients with AMI within the free-care, equal-access Department of Defense health care system, which is open to all active-duty and retired military personnel and their dependents in what is, effectively, a national staff-model managed care system. After controlling for age, gender, clinical characteristics, and other variables, they found no racial differences in the rates of catheterization or revascularization (Taylor et al., 1997).

Cancer

Studies of racial and ethnic disparities in cancer incidence and prevalence, screening, stage at diagnosis, treatment and survival uniquely illustrate the complex and multifactorial nature of the causes of such differences. To explain them, investigators have invoked variation in tumor biology, genetic differences, cultural differences and folk beliefs, socioeconomic status, problems of access to and continuity of care, physician practice styles and communication with patients, and interactions among all of these factors. The possibility of racial bias is mentioned less frequently, although some studies have found a residual and unexplained effect of race after other variables are accounted for (Eley et al., 1994).

This complexity is illustrated by studies of breast cancer. While African-American and Hispanic women have a lower incidence, they are often first seen for treatment when they already have advanced disease and they have a worse prognosis and shorter survival times than comparable whites (Shinagawa, 2000; Institute of Medicine, 1999). Although early studies concluded that these differences were almost entirely attributable to racial/ethnic differences in socioeconomic status (Dayal, Power, and Chen, 1982; Bassett and Krieger, 1986), biological factors and cultural beliefs were also suggested as causative factors for both African Americans and Hispanics. Differences in income, education, and health insurance

were found to account for findings that elderly blacks had significantly lower experience of regular cancer preventive services such as mammograms, Pap tests, clinical breast examinations, rectal examination and fecal occult blood testing (Hegarty et al., 2000). In a North Carolina study, African-American women were three times more likely than whites to present with advanced stage disease, but when the analysis accounted for income, folk and religious beliefs about cancer, lack of a regular physician, and knowledge about breast cancer, the racial difference dropped to 20 percent (Lannin et al., 1998)

In data from National Health Interview Surveys, black and Hispanic women reported significantly lower rates than whites in having a screening mammogram in 1987, but by 1990 minority rates had improved so rapidly that all three groups were nearly equal (Breen and Kessler, 1994). When ethnic subgroups were considered, however, a different picture emerged. While overall, older black and Hispanic women have mammography and Pap smear rates similar to those of whites, the rates differed among Columbian, Dominican, Ecuadorian, Puerto Rican, Caribbean, Haitian, and U.S.-born black women (Mandelblatt et al., 1999; O'Malley et al., 1997). Similarly, a project focused on minority and underserved women found that rates of ever having had a mammogram were 93 percent for blacks and 90 percent for whites, but only 80 percent for Hispanics, 73 percent for Chinese and 46 percent for Vietnamese women (O'Malley et al., 1997).

Physician performance is an important factor in breast cancer diagnosis, and has been found to vary by patient race. Access to a regular provider is strongly associated with mammogram use (Bush and Langer, 1998) but cannot fully explain racial/ethnic variation. A study of 1990 HCFA billing files from 10 states accounting for patients' income levels and number of primary care visits found that older black women were consistently less likely than comparable white women to receive a mammogram, perhaps because physicians may be unwilling or unable to spend the additional time necessary to educate black women about the importance of the procedure (Burns et al., 1996). After an abnormal finding on a screening mammogram, African-American, Hispanic, and Asian women all had less timely follow-up than whites, and African-American women were much less likely than white women to undergo biopsy (Chang et al., 1996). Suggested explanations included patient preferences, insurance coverage, and discriminatory practices among providers.

Variation by race has also been found in patterns of treatment in some, but not all, studies. Black patients with breast cancer experienced "significantly different care" from whites on four of 10 treatment procedures, though they were not the most clinically important (Diehr et al., 1989). Later studies found similar rates and types of treatment among African-

American, Hispanic, and white women (Farrow, Hunt and Samet, 1992; Satariano, Swanson, and Moll, 1992). Among managed care organizations in which white and African-American women have equal access to health care, one study found equal survival rates after adjustment for stage of diagnosis and socioeconomic variables (Yood et al., 1999). Another study found that African-American women were less likely to receive breast conserving surgery, but the race effect disappeared after adjustment for stage at diagnosis, patients' educational level and rural or metropolitan residence. In a third such study, African Americans and whites received similar treatments (Velanovich et al., 1999). In contrast, two other studies have reported that even when universal access to medical care is assured, there are still racial disparities in breast cancer diagnosis and treatment (Katz and Hofer, 1994; Trock et al., 1993).

Similar patterns are found in treatment for men and women with colorectal cancer. In a study of discharge data from a nationally representative sample of more than 500 acute-care hospitals (Ball and Elixhauser, 1996), blacks were treated less aggressively than whites with similar disease, even after adjusting for insurance coverage, hospital type, and co-morbidities. Blacks were from 27 to 41 percent less likely (depending on tumor stage) to undergo major procedures such as colon resection and cholecystectomy. The authors could not determine whether these differences were social, cultural or economic. Similar treatment differences were found in a study of Medicare beneficiaries (Cooper et al., 1996; Cooper, Yuan, and Rimm, 1997). In marked contrast, there were no differences by race in surgical, radiation, chemotherapy treatments or five-year survival among patients treated in the free-care VA system (Dominitz et al., 1998) and no differences by race in treatment methods or survival rates in the equal-access Department of Defense health care system (Optenberg et al., 1995).

A striking difference in treatment has been found for early stage non-small-cell lung cancer, a condition treatable by surgery that can substantially increase the likelihood of surviving for five years or longer. Bach et al. examined the experience of nearly 11,000 black and white Medicare patients with this diagnosis. The two groups were similar in stage of disease, type of insurance, number of previous hospitalizations, and co-morbidity. After controlling for age, sex, stage of disease, co-morbidity, marital status, and income, blacks were only about half as likely as whites to undergo surgery. The authors estimated that 44 of the 77 excess black deaths were attributable to the difference in surgery rates, and suggested that either patient preference or physicians' decisions were responsible (Bach et al., 1999). In at least one other study, the absence of a physician's recommendation for surgery was more frequent for black than for white patients, and patients' refusal of surgery or contraindications for surgery were uncommon (Polednak, 2000).

Stroke

African Americans suffer strokes at a rate as much as 35 percent higher than whites, and the death rate among those suffering strokes is twice as high among blacks as whites (Gillum, 1986; Gorelick, 1998; Ness and Aranow, 1999). Yet almost every major study has found that blacks receive the major diagnostic and therapeutic interventions—cerebral angiography and carotid endarterectomy—far less frequently than do whites (Gross et al., 1984; Gorelick et al., 1984; Gillum, 1995; Oddone et al., 1993; Hsia, Mosoe, and Krushat, 1998; Oddone et al., 1999). The variety of explanations offered for these differences include (1) the suggestion that stenosis of cerebral arteries in blacks is much more frequent in intracranial vessels that cannot be treated by carotid endarterectomy; (2) black and white patients present with different symptomatic expressions of this disease or with higher black risks due to hypertension or diabetes; (3) clinicians' beliefs about this suggestion lead them to refer black patients less frequently for invasive diagnostic and therapeutic procedures; (4) black patients refuse such invasive procedures at much higher rates than do whites and are much less willing to accept surgical risks; (5) there is racial bias in the selection of patients for invasive rather than medical treatment; (6) physicians present treatment options less fully to black patients, who may have less information about the disease and physicians make less enthusiastic recommendations to black patients for invasive procedures, among other differences in physician-patient communication; and (7) the differences are due to financial barriers and racial differences in ability to pay. There is reasonably good evidence for some of these explanations, no definitive evidence for others, and still others have been refuted.

Economic barriers seem least likely. These racial differences have been found in both private hospitals and in VA hospitals where care is free. Studies have shown that both with and without adjustment for patient income, whites are still three times as likely as blacks to receive these procedures (Horner, Oddone, and Matchar, 1995) and these authors concluded that "there is no documented study indicating that differences in patient preference explain racial disparities in carotid endarterectomy or other invasive procedures." A subsequent study specifically examined the willingness of black and white patients who had undergone a previous transient ischemic attack (TIA) to consider the possibility of carotid endarterectomy at different assumed levels of risk from the procedure. In other words, they were asked how much of a gamble they were willing to take to achieve a benefit. African Americans showed a much greater desire to avoid the procedure (Oddone et al., 1998). However, this finding was based on the complicated presentation of hypothetical situations via telephone interviews, a situation that the authors noted may be very dif-

ferent from that of a patient facing a real-world choice, and the sample size was small. In a 1993 VA study, black patients were found to be only one-third as likely as whites to receive carotid angiography, the essential diagnostic precursor to a decision regarding endarterectomy, and Hispanics were less than half as likely as whites to do so (Oddone et al., 1993). The authors noted that evidence regarding racial differences in the distribution of lesions was inconsistent, and that, despite higher black rates of hypertension, hypertensive blacks and whites received endarterectomy at the same rate. Much more definitive findings came from a 1999 VA study of stroke or TIA patients whose appropriateness for endarterectomy, by lesion distribution, degree of stenosis, and degree of operative risk had been determined according to standard guidelines (Oddone et al., 1999). Blacks with TIA were less likely than whites to receive any type of angiography, even by low-risk, non-invasive Doppler imaging techniques; after adjustment for all confounders, white patients were approximately 50 percent more likely to receive diagnostic imaging than blacks. More whites than blacks were found to be appropriate for endarterectomy (18 percent versus 4 percent); among the blacks and whites deemed appropriate, whites were 34 percent more likely to receive endarterectomy. The difference was even greater (24 percent versus 3 percent) between white and black patients whose appropriateness was less certain—a situation in which physician discretion in the presentation of options to patients is likely to be greater. These results could not be explained by differences in symptoms or other clinical factors. Instead, the authors called for further research “with emphasis on the physician-patient interaction surrounding decision-making for the procedure, and the determinants of physician recommendations.”

Renal Disease and Kidney Transplantation

Among all minorities, African Americans and Native Americans suffer an excess risk of illness and death from end-stage renal disease (ESRD). Among Native Americans, for example, the rate of ESRD is four times that of whites. This is a consequence of the higher rates of hypertension, diabetes and sickle cell disease among blacks, diabetes among Native Americans, and less access to, or utilization of, early primary care intervention for both groups. The two life-saving or life-extending treatments for ESRD are dialysis and kidney transplantation. Although treatment of ESRD is specifically supported by a Medicare program, kidney transplantation is differentially distributed by race.

Compared with whites, blacks and Native Americans are less likely to receive transplants and are less likely to be put on a waiting list for transplants. If they are waitlisted, they wait longer before receiving a

transplant. If they do receive a cadaveric or donor kidney, they are more likely to suffer transplant failure. As long ago as 1981 to 1985, the most likely people (among those on dialysis) to receive a kidney transplant were white, male, young, non-diabetic and high-income (Held et al., 1988). A decade later, an HCFA study showed that time from renal failure to transplantation, time from renal failure to wait listing, and time from wait listing to transplantation were all longer for blacks than for whites, Asian Americans, or Native Americans (Eggers, 1995). A cohort study of more than 41,000 ESRD patients on the waiting lists of all the 238 renal transplant centers in the United Network for Organ Sharing from 1994 to 1996 used a measure of early wait listing and found that blacks, Hispanics and Asians, patients of any race or ethnicity who were less well educated, and those with fewer financial resources were much less likely to receive a transplant (Kasiske, London, and Ellison, 1998). In one dialysis center in which 67 percent of the patients were black, 64 percent of those who received a kidney transplant were white (Delano, Macey, and Friedman, 1997). In one of the relatively few studies of Native Americans with ESRD, rates of kidney transplantation in New Mexico and Arizona were sharply lower compared with whites, and waiting times were longer (Narva et al., 1996). A telephone survey of a representative national sample of ESRD patients showed that within the first year on dialysis, 30 percent of white respondents but only 13.5 percent of black respondents were placed on a waiting list, and three times as many whites as blacks received a kidney (Ozminkowski et al., 1997). The study also found that patients with annual incomes of more than \$40,000 a year were twice as likely to receive transplants as those with incomes under \$10,000.

Thus, the cumulative evidence for racial differences in access to and rate of transplantation is clear and powerful. As in other disease categories, however, the reasons for these disparities may involve many factors and are the subject of vigorous debate. Ozminkowski and his colleagues asserted that approximately 60 percent of the differences between black and white waiting list entry rates and roughly half of the differences in transplantation rates were due to race-related differences in socioeconomic status, biologic factors associated with the complicated immunologic problems of donor-recipient matching by human leukocyte antigens, disease severity and the presence of contraindications, and—of particular interest to our review—patient preferences or choices (Ozminkowski et al., 1997). In contrast, authors of a New York State study argued that differences in socioeconomic status were only minor contributors (Byrne, Nedelman, and Luke, 1994). Some researchers have argued that HLA-based allocation of kidneys has a disparate impact on minorities (Gaston, Dooley, and Diethelm, 1993; Butkus, Meydrich, and Raju, 1992), but others have asserted that these immunologic factors are less important (Chertow and Milford, 1997).

Many studies have provided evidence that African-American patient preferences, including refusal of or disinterest in the possibility of transplantation, is an important contributor. A number of recent investigations have cast light on the nuances and complexities of both patient and provider behavior. When a large sample of ESRD patients in four regions of the United States were interviewed about their preferences, black patients were less likely than whites to want a transplant (Ayanian, Cleary, Weissman, and Epstein, 1999). There were even larger racial differences, however, in the rates at which blacks and whites were fully informed of the options and referred for evaluation for a transplant, an essential step in offering a choice. These differences in referrals remained significant after adjustment for patients' preferences and expectations, sociodemographic characteristics, the presence or absence of co-existing illness, and other relevant variables. There is no evidence that the differences in referrals were motivated by providers' racial bias, conscious or unconscious, but the difference by race in provider behavior seems clear. An exploration of dialysis patients' behaviors in a prospective cohort study showed that black and poor patients were less likely to complete any of the steps involved in the process of seeking a transplant (Alexander and Schgal, 1998). In what is perhaps the most poignant finding, a recent study of dialysis patients in Maryland found that one of the factors associated with black disinterest in transplantation was what the authors described as fatalism based on lifelong experiences of perceived racial discrimination (Klassen, 2001). In an editorial comment on related studies, Sabatini urged physicians to "explain the procedure better or more clearly, allaying fears, anticipating questions, and providing a different kind of support than is currently offered. . . . We should examine our own attitudes and practices for the influence of social or cultural bias that could be affecting the delivery of health care" (Sabatini, 1997).

HIV/AIDS

Over the past two decades, infection with the human immunodeficiency virus and clinical progression to AIDS have disproportionately affected African Americans and Hispanics and are now among leading causes of death for these groups. Rates for Asian/Pacific Islanders are much lower but are increasing in urban areas (Kanuha, 2000). Yet, among the hundreds of scientific papers published each year that describe the progression of the epidemic among minority groups there are relatively few (compared with other disease categories) that bear directly on racial disparities in diagnosis and treatment. One commentator has complained of "scientific silence" about AIDS and African Americans (Mackenzie, 2000).

Studies that have addressed such disparities have focused far more on patient behaviors than on possible provider contributions to such differences. Considerable attention has been paid to potential explanatory variables such as patient preferences and attitudes, lack of knowledge or understanding, and mistrust of the health care system, in addition to such familiar issues as differences in socioeconomic status, lack of health insurance, problems of access to care, and apparent biologic differences in response to medication. The overall pattern, however, is clear. African Americans and Hispanics are less likely than whites to receive a variety of medications or to undergo some diagnostic procedures, although the findings vary by source of care. In the period from 1987 to 1990, for example, blacks (and to a lesser extent, Hispanics) were less likely to undergo bronchoscopy and tended to receive less timely administration of prophylaxis against an opportunistic infection in many hospitals, but there were no such disparities in the free-care VA hospital system (Bennett et al., 1995). Black patients were less frequent recipients of prophylactic drugs and of AZT medication on first appearing for treatment and during a follow-up period (Easterbrook et al., 1991). Among gay and bisexual men with HIV infection, whites were approximately 60 percent more likely than blacks to be taking antiretroviral drugs (Graham et al., 1994), after adjustment for access to care and insurance status. The study design did not permit any determination of causes, but possible explanatory factors were identified as patient choice, differing social and cultural norms, or discriminatory practices of providers. In patients appearing for treatment at a teaching hospital, blacks were 40 percent less likely than whites to have previously received antiretroviral drugs or prophylaxis against opportunistic infection, regardless of income and insurance status (Moore et al., 1994). These disparities disappeared during their subsequent treatment. Possible causes were described as misconceptions about HIV/AIDS among blacks, distrust of health authorities, or "prescribing habits" of providers. Investigators who examined the use of more recently developed antiretroviral drugs among a large sample of Medicaid-insured patients with HIV or AIDS found that blacks were significantly less likely than whites to receive nucleoside antagonists and protease inhibitors; and blacks were 20 percent more likely than whites to die each month (Anderson and Mitchell, 2000).

Difficulties in physician-patient communication in HIV/AIDS cases have been reported in a number of studies, particularly in discussing choices about end-of-life care and resuscitation (Haas et al., 1993) and when there was racial/ethnic discordance between provider and patient. A small study of physicians at one teaching hospital found that they felt more confident about giving an overview of clinical trials to white patients than to those of other races or ethnicities (Stone et al., 1998). Patient

mistrust is also described as a factor. Among 520 black adults in 10 randomly selected census tracts, 27 percent agreed with the statement that “HIV/AIDS is a man-made virus that the federal government made to kill and wipe out black people,” and an additional 23 percent were undecided (Klonoff and Landrine, 1999). Conspiracy beliefs were not related to age or income but tended to occur among culturally traditional, college-educated men who had experienced considerable racial discrimination.

The Overall Pattern of Evidence

The more than 150 studies reviewed above constitute only a modest—but representative—sample of the extensive literature in each of the six disease categories. The pattern of racial and ethnic disparities in diagnosis and treatment thus established is by no means limited to these diseases, but is similarly evident in all of the other major topics in our review. In psychiatric care, for example, African Americans are more likely than whites to be diagnosed as psychotic but are less likely to be given antipsychotic medications. They are also more likely to be hospitalized involuntarily, to be regarded as potentially violent, and to be placed in restraints or isolation—differences that are found at every age level and in both outpatient and inpatient services (Benson, 1983; Mukherjee, 1983; Rosenfield, 1984; Sleath, Svarstad, and Roter, 1998; Whaley, 1998; Kales et al., 2000a,b; DelBellow et al., 2001). Racial stereotyping or “labeling” is frequently invoked as a cause of these disparities (Strakowski et al., 1995; Abreu, 1999). In the case of asthma, a study of black and white Medicaid-insured children in Detroit found that African-American children were much more likely than their white counterparts to receive inadequate therapy—obsolete fixed-combination medications rather than the recommended single-entity prescriptions—and were less likely to receive steroids or an adrenergic inhaler (Bosco, Gerstman, and Tomita, 1993; Joseph et al., 1998), despite higher rates of health care visits and higher rates of hospitalization. In terms of prevention, Medicare-insured African Americans were less likely than whites to receive preventive services. The same study also found that African Americans were more likely to undergo bilateral orchiectomy (for prostate cancer) and more likely to undergo lower limb amputation (for diabetes and peripheral vascular disease), findings that are likely to reflect inadequate primary and preventive care (Gornick, Eggers, and Reilly, 1996). In these three disease categories, as in the six reviewed above, the suggested explanations include the full range of hypotheses listed previously, from minority mistrust to impaired communication to physician bias and stereotyping.

In summary, the preponderance of the evidence strongly suggests that among the multiple causes of racial and ethnic disparities in American

health care, provider and institutional bias are significant contributors—a possibility raised repeatedly, if reluctantly, by many researchers. This conclusion is explicitly supported by a number of studies in which providers' views have been assessed or in which decision-making physicians have been blinded to patient race or ethnicity. It is further supported by observations of physician-patient interactions and institutional cultures, and buttressed by experiments (described in both the medical and social psychology literatures) in which professional responses to white and non-white patients or subjects are found to differ significantly in diagnosis, prognosis and therapeutic recommendations, in the absence of change in any other variable.

Almost all studies have limitations of one sort or another. Limits on the ability to control for the effects of socioeconomic status are of particular concern, given the power of the associations between race and income, education and occupation in American society. But as Mayberry and his colleagues have observed, "The strength and weaknesses of each individual study vary. . . . The 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, may overcome the specific failing of a previous investigation" (Mayberry, Mili, and Ofili, 2000).

There is no scientifically sound way of quantifying the role of individual or institutional bias, as compared with other causes, in creating racial and ethnic disparities in care. However, non-clinical influences on decision making by clinicians—particularly the impact of race/ethnicity, social class, and culture—have been identified and discussed for many years in the medical and social science literature (Geiger, 1957; Bloom, 1965; Freidson, 1973; Eisenberg, 1979; Henderson, 1985). More recent contributions have explicitly linked the perceptions of providers at every level—from medical students to residents to experienced practitioners—to processes and decisions as varied as judgments of patients' quality of life (Rathore et al., 2000b), physician-patient communication during the medical encounter (Waitzkin, 1985; Levy, 1985; Cooper-Patrick et al., 1999), recommendations for cardiac catheterization (Schulman et al., 1999), and the management of pain (Weisse et al., 2001). It seems reasonable to conclude that neither the health care system as a whole nor individual providers are fully insulated from attitudes toward race, ethnicity, and social class that are prevalent (though often unacknowledged) in the larger society. Much less is known today about the processes by which these attitudes and perceptions are formed in the course of medical training and clinical experience and incorporated into clinical decision making. This might be called the natural history of social categorization in medicine and is an important subject for further research.

Racial and Ethnic Disparities in Care: A Global Problem?

It is useful to note that differential treatment of minorities, particularly people of color, is not a uniquely American phenomenon. In the United Kingdom, published reports alleging racism in the National Health Service appeared as early as 1981. A local community health council report quoted in an article on “Racism, the National Health Service, and the Health of Black People” strikes themes that are familiar:

“What is perhaps most interesting is the similarity between the stereotypes being generated within the health service and those in other parts of the state. In the NHS the mythology is that Afro-Caribbean women are feckless and irresponsible, while Asian women are compliant but stupid. West Indian women are dubbed as having no culture; the problem for Asians *is* their culture...The similarity between the two sets of stereotypes is not remarkable, but it reminds us just how much what goes on in the health service reflects, is reinforced by and *itself* reinforces values. . . .” (Kushnick, 1988). More recently, social class and language other than English (an indicator of minority status) was associated with impaired continuity of care (Hemingway, Saunders, and Parsons, 1997). A little-noticed finding in a British study of coronary revascularization procedures was that non-white patients are referred for revascularization less often than white patients with similar severity of disease (Hemingway et al., 2001).

A recent editorial in the *British Medical Journal* on racism in the National Health Service prompted a torrent of supportive letters and commentaries, though—like the editorial itself—they focused far more on perceived discrimination against Indian, Pakistani, Bangladeshi, African, and other minority physicians than on differential treatment of patients from these population groups (Bhopal, 2001). Racial/ethnic prejudice and discrimination against minority physicians in the National Health Service is examined at length in *Racism in Medicine: An Agenda for Change*, a book published in June 2001 by the King’s Fund, a distinguished British foundation. A joint United States-United Kingdom Collaborative Initiative on Racial and Ethnic Health has been underway since 1997, but its work has focused more on differences in health status than on disparities in health care (Office of Minority Health, 1997).

The health care of Aboriginal people in Australia has drawn substantial critical attention in that nation during the past two decades. Among numerous papers on cultural competence, and health status, and differentials in care, one—titled “These sorts of people don’t do very well” to capture the flavor of some clinical discussions—considers the impact of racial stereotypes on the allocation of health care resources (Lowe, Keridge, and Mitchell, 1995). Similarly, numerous studies have examined

problems of differential treatment of the Inuit people in Canada and emphasized the need for greater cultural competence on the part of physicians (Masi, 1989; Hamilton, 1996; Young et al., 2000). A scattering of articles in English-language journals has considered the care of such minority groups as African immigrants in France and Russian immigrants in Israel.

In the extreme case of South Africa, apartheid and profound inequality in the availability and content of medical and public health services had particularly devastating consequences for the health of the non-white majority populations (Nightingale et al., 1990). Even five years after the establishment of a democratic government and the beginnings of health sector reform, evidence of discriminatory treatment persists, particularly in the private sector, and attests to the difficulty of changing some professional behaviors (Personal communication, N.D. Zuma, Minister of Health, July 15, 1996).

Implications for Change

Earlier in this review it was noted that the major determinants of the deficits in health status of minority population groups in the United States were lack of access to care and differences in the social, physical and biological environments—incomes, education, occupation, housing and nutrition—which are themselves determined in part by persistent racism (Williams, 1998; Collins and Williams, 1999). Compared with those deeply entrenched causes, provider and institutional bias are far more directly (though not easily) remediable, and represent an opportunity for more rapid change.

To approach recommendations for change in provider behavior requires a recognition of the nature of racial and ethnic stereotyping. Numerous studies in social psychology have established that stereotyping is automatically triggered and operates below the level of conscious awareness. It is intensified by time pressure and complex cognitive tasks—the very hallmarks of much clinical practice—and functions as a convenient shortcut in the management of interpersonal relations, even when it conflicts with consciously held egalitarian views. It is resistant to disconfirmation—the recognition and acceptance of evidence that conflicts with the stereotype (Devine, 1989; Stangor and McMillan, 1992; Macrae, Milne, and Bodenhauser, 1994; Ryan et al., 1996; Hilton and von Hippel, 1996). Of particular consequence to physicians is the form of stereotyping called application error, in which epidemiologic information about a population group is inappropriately applied to any member of that group, without consideration of individual characteristics (van Ryn, 2001). Gamble has described the classic example of a middle-class and profes-

sional African-American woman who is assumed by an emergency room clinician to be an unemployed welfare recipient (Gamble, 1997). African-American males in painful sickle cell crisis are assumed to be drug addicts seeking opiates (Wailoo, 2001). Not all such bias is covert; openly pejorative racial comments on ward rounds have been described by many observers (Finucane and Carrese, 1990).

The first task, then, is to create increased recognition among providers of the existence and processes of stereotypical bias, and their role in the differential treatment of minority patients. Given the understandable difficulty of most physicians to recognize in themselves, their peers, and their health care workplaces that such disparities and biases exist and because such issues are in conflict with their consciously held egalitarian commitments, this will require a sustained long-term effort and a variety of strategies.

There are several mechanisms for attempting this. First, as suggested by Fiscella et al., the tracking of patterns of care by patient race and ethnicity can be added to the quality assurance systems of all organized settings of care (Fiscella et al., 2000). The ability to monitor systematically and regularly for disparities is a basic requirement for accountability. Of equal importance is that awareness that this aspect of clinical behavior is being monitored may facilitate change. Second, the problems and nature of stereotyping and bias need to be taught and discussed repeatedly at every level of the undergraduate and graduate medical curriculum, not merely as part of a cultural competency curriculum devoted to the beliefs and behaviors of different groups of patients, but also as efforts at self-awareness and recognition of the culture of medicine itself. It is important that faculty physicians, who are the preceptors of students and residents, be included in this process.

Recent suggestions have been made to change both the process and the meaning of racial and ethnic identification in everyday clinical practice. In a discussion of racism in the examination room, one clinician has pointed out that "labeling by race has been customary, expected, thought to clarify biologic risk for particular diseases, and considered critical for establishing an appropriate differential diagnosis" and as a proxy for socioeconomic status (South-Paul, 2001). Others have suggested that the place of race in the clinical presentation should be changed from its customary position in the initial description of the patient, whether or not such identification has any clinical relevance (Anderson and Moscou, 2001). Instead, they assert that if race or ethnicity are used at all they should be part of the social history, not the initial description. Such alterations may seem trivial, but small changes in the daily forms of practice, consistently adopted, can change the culture of medicine.

Finally, the limitations of much of the research on disparities in race and ethnicity underscore the need for prospective studies, with access to detailed clinical records. This may be particularly important in understanding the variations in verbal and nonverbal physician-patient communication in both race-concordant and race-discordant physician-patient dyads. Further research is essential, but implementation of corrective recommendations now should not be held in abeyance.

The raw discrimination and blatant racism described by Myrdal nearly six decades ago of relegating African Americans and other minority patients to all-black hospitals, charity wards, or the basement wards of white hospitals have disappeared, but the scars of those past experiences remain, and subtler forms of differential treatment have emerged (Myrdal, 1944). As in other sectors of American society, the elimination of race/ethnicity-based and class-based disadvantage in the health sector has always been an unsteady march, rather than a seamless record of uninterrupted progress. The documentation and further exploration of disparity is a step in an ongoing journey.

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