

# Update on the Health Disparities Literature

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**H**ealth and health care are distributed unevenly in the United States, and under-represented minorities are likely to get less of both. In 2002, the Institute of Medicine published an authoritative research and policy document on this matter. Since release of that report, hundreds of publications have addressed racial or ethnic disparities in health and health care. This Update focuses on the literature from 2002 and 2003 addressing the lack of equity in adult health and health care in the United States.

We read the title of every article published in leading medical, health services research, and health sociology journals in 2002 and 2003, including *Annals of Internal Medicine*, *Journal of the American Medical Association*, *The New England Journal of Medicine*, *American Journal of Public Health*, *Health Services Research*, *Medical Care*, *Journal of Health and Social Behavior*, *Social Science and Medicine*, and *Sociology of Health and Illness*. We selected this approach as a way to focus the review on articles with potentially high impact factors. On the basis of title, we reviewed the abstracts of 95 articles and then selected 20 for full independent evaluation by at least 2 authors. We excluded abstracts for the following reasons: The subject matter was thought to add only incrementally to the existing literature ( $n = 27$ ), the scope of the subject matter was narrow ( $n = 24$ ), the research did not focus on racial or ethnic disparities ( $n = 12$ ), the focus of the article was theory or methodology ( $n = 10$ ), the research was purely qualitative ( $n = 1$ ), or the article was a review ( $n = 1$ ).

Each reviewer rated the 20 articles reviewed in full on a scale of 1 to 10 on the following qualities: innovation, methodologic rigor, exposition, attention to new areas, and interest to readers of *Annals of Internal Medicine*. We combined the scores from both reviewers. The maximum score was 100, with a range of 57 to 83 (scores for included articles are in parentheses after the article title).

Articles are grouped in terms of the evolution of research on health equity, including studies documenting disparities, studies explaining disparities, and studies of strategies to reduce disparities. Although individual studies often combine elements that cross these categories, together, this framework conveys the structure of this emerging field.

## Studies Documenting Disparities

We included the following 2 articles because they establish that racial disparities in the delivery of care exist even in settings where health care access is good.

### Black Patients in Medicare Managed Care Plans Receive Worse Care than White Patients

Schneider EC, Zaslavsky AM, Epstein AM. Racial disparities in the quality of care for enrollees in Medicare managed care. *JAMA*. 2002;287:1288-94. [PMID: 11886320] (Rating score: 81)

Although it is well-established that black people receive fewer health services than white people (1), few studies have evaluated disparities within managed care plans. Considering that managed care plans are often organized around delivering high-quality primary care, Schneider and colleagues sought to determine how black patients, compared with white patients, fared in Medicare managed care with respect to standard quality measures. They drew the outcomes of interest from the Medicare-specific Health Plan Employer Data and Information Set (HEDIS) from 1997, which Medicare + Choice programs are required to report.

These outcomes included the following 4 measures: mammography for women 65 to 70 years of age in the past year, retinal examinations for diabetic patients within the past year,  $\beta$ -blockers dispensed at the time of discharge from the hospital after an acute myocardial infarction (MI), and follow-up with a mental health professional within 30 days after discharge from a hospitalization for mental illness. The data came from 294 plans with 415 040 beneficiaries. Excluding persons younger than 65 years of age, those who died during 1997, and those who could not be matched to the Medicare demographic file, the authors produced an analytic sample of 305 574 beneficiaries.

Black patients were less likely than white patients to receive all 4 measures in unadjusted analyses: mammography, 62.9% versus 70.9% ( $P < 0.001$ ); diabetic retinal examination, 43.6% versus 50.4% ( $P < 0.02$ ); post-acute MI  $\beta$ -blockers, 64.1% versus 73.8% ( $P < 0.001$ ); and posthospitalization follow-up for mental illness, 33.2% versus 54.0% ( $P < 0.001$ ). After adjustment for clustering within health plans, the differences observed between black and white patients for mammography were no longer statistically significant; however, black patients remained statistically less likely to receive diabetic retinal examinations,  $\beta$ -blockers after acute MI, and posthospitalization follow-up for mental illness.

This large study using Medicare data from more than 294 plans is consistent with previous literature showing that black patients receive fewer appropriate medical services than white patients. This study extends that work

*Ann Intern Med*. 2004;141:805-812.

For author affiliations, see end of text.

See editorial comment on pp 815-817.

with the observation that black patients receive fewer appropriate services even within managed care plans that are systematically rated for performance quality. Thus, it provides further evidence that access is not the only driver of racial and ethnic health care disparities. The study also highlights the fact that quality improvement initiatives, such as rating managed care plans on HEDIS measures, are unlikely to eliminate disparities in care.

### Black Patients Receive Fewer Interventional Cardiac Procedures than White Patients in an Equal-Access Health Care Plan

Petersen LA, Wright SM, Peterson ED, et al. Impact of race on cardiac care and outcomes in veterans with acute myocardial infarction. *Med Care*. 2002;40:186-96. [PMID: 11789635] (Rating score: 77)

Previous studies indicate that black patients receive fewer indicated invasive cardiac procedures than white patients (2–5). Less is known about noninvasive cardiac care, especially in the Veterans Health Administration (VHA), which is considered to be an equal-access care system. As with the Medicare-managed care plans evaluated by Schneider and colleagues, equal-access care systems may be expected to eliminate racial disparities in care. The authors evaluated racial differences in the use of medication and invasive procedures for acute MI in the VHA.

The retrospective cohort study was based on chart review for patients admitted to the VHA with acute MI and discharged between January 1994 and September 1995. The authors identified 13 310 admissions, from which they reviewed a stratified sample of charts from 81 of 139 VHA facilities. They based stratification on hospital cardiac service capability and hospital volume. The researchers randomly selected 5503 charts and located 94% of those charts. After excluding patients discharged to non-VHA facilities, those without acute MI, those with incomplete charts, and those whose race was neither black nor white, the authors reviewed the remaining 4611 charts. By using recommendations from the American College of Cardiology, the authors identified ideal candidates for thrombolytic therapy,  $\beta$ -blockers, angiotensin-converting enzyme inhibitors, and aspirin. The authors used published criteria to characterize patients who had received catheterization as having or not having severe coronary artery disease and having or not having left main or 3-vessel disease. The authors tracked the use of angiography, angioplasty, or bypass surgery in the 90 days after discharge in both VHA and Medicare databases.

Black patients were less likely than white patients to receive thrombolytic therapy on arrival (32.4% vs. 48.2% for ideal candidates,  $P < 0.01$ ; 15.8% vs. 22.8% for all patients with acute MI,  $P < 0.001$ ). Black and white patients were equally likely to receive  $\beta$ -blockers or angiotensin-converting enzyme inhibitors at discharge (56.9% vs. 55.9% for  $\beta$ -blockers,  $P > 0.2$ ; 43.3% vs. 40.8% for

angiotensin-converting enzyme inhibitors,  $P > 0.2$ ). Black patients were more likely to receive aspirin at discharge (86.8% vs. 82.0%;  $P < 0.05$ ). The use of or decision not to undergo angiography and angioplasty among black and white patients did not differ. However, black patients were less likely to get bypass surgery in both the index admission and 90 days after acute MI (3.6% vs. 7.0% for the index admission,  $P < 0.001$ ; 6.9% vs. 12.5% for the 90 days after acute MI,  $P < 0.01$ ). In subset analyses, black patients who had severe coronary artery disease or left main or 3-vessel disease were more likely to decline bypass surgery (11.6% vs. 4.3% for severe coronary artery disease,  $P < 0.005$ ; 12.2% vs. 4.6% for left main or 3-vessel disease,  $P < 0.005$ ). However, adjustments for these differences in patients' decisions not to undergo these procedures did not eliminate observed disparities in the receipt of bypass surgery. Mortality rates at 30 days, 1 year, or 3 years did not differ.

Although racial disparities in the use of medications, angiography, and angioplasty among veterans with acute MI were not observed, black patients in this equal-access system received less thrombolytic therapy and bypass surgery than white patients, even in the subset of patients who would be considered ideal candidates. Although the mortality rates were similar among the patient groups, this work suggests, as did Schneider and colleagues' article, that some racial disparities persist in systems where the confounding effects of access to medical care are minimized.

### Regional Variation May Partly Explain Racial and Ethnic Disparities in Rates of Knee Arthroplasty, Especially for Female and Hispanic Medicare Patients

Skinner J, Weinstein JN, Sporer SM, et al. Racial, ethnic, and geographic disparities in rates of knee arthroplasty among Medicare patients. *N Engl J Med*. 2003;349:1350-9. [PMID: 14523144] (Rating score: 82)

Skinner and colleagues focus on an understudied concept in health equity research—that regional variation may partly explain the racial and ethnic disparities in health and health care. Previous research indicates that black and Hispanic patients have lower rates of knee arthroplasty, especially among men (6, 7). In addition, rates of knee arthroplasty and other discretionary procedures vary greatly by region (8). The authors wanted to determine whether racial variation in the receipt of knee arthroplasty among black people, Hispanic people, and non-Hispanic white people could be explained by variation in region of residence.

To determine rates of knee arthroplasty, Skinner and colleagues used Medicare data from beneficiaries enrolled in fee-for-service programs or non-risk-bearing health maintenance organizations from 1998 through 2000. They used denominator files to determine the number of beneficiaries in the region. The authors determined the rates of

arthroplasty according to sex, race, and ethnic groups for 306 unique hospital referral regions. They credited procedures to a region on the basis of the ZIP code of patient residence. By using the index of dissimilarity for the metropolitan area and the mean income level for the region, the authors determined whether black–white racial residential segregation and household income in the hospital referral regions modified any associations between rates of knee arthroplasty and race or ethnicity.

As expected, the authors found racial and ethnic disparities in the receipt of knee arthroplasty. White, Hispanic, and black women had 5.97, 5.37, and 4.84 procedures per 1000 women, respectively ( $P < 0.001$ ). White, Hispanic, and black men had 4.82, 3.46, and 1.84 procedures per 1000 men, respectively ( $P < 0.001$ ). Within regions, black men almost always had lower rates of arthroplasty than white men; however, there were regions where Hispanic men and women and black women received fewer, the same, or more procedures compared with their white counterparts. After adjustment for hospital referral region, white patients received more procedures than Hispanic or black patients. The difference in rates were 0.03 per 1000 patients between white and Hispanic women; 1.13 per 1000 patients between white and black women; 0.89 per 1000 patients between white and Hispanic men; and 2.50 per 1000 patients between white and black men. Living in regions with higher income and lower levels of residential segregation seemed to reduce the observed differences in the rates of arthroplasty, although not equally by sex or race or ethnicity.

Although this study is limited by its ecologic design and does not adjust for individual factors, such as clinical comorbidity, need, appropriateness, or preference, regional variation did partly explain knee arthroplasty racial and ethnic disparities. Understanding the source of such regional variations may provide insight into the pathways that lead to disparities, as well as potential avenues for intervention.

### Decreases in Physical Activity during Adolescence Occur More for Black Girls than White Girls

Kimm SY, Glynn NW, Kriska AM, et al. Decline in physical activity in black girls and white girls during adolescence. *N Engl J Med*. 2002;347:709-15. [PMID: 12213941] (Rating score: 84)

Obesity is a growing epidemic in the United States that starts in childhood and is more prevalent in black women than white women (9, 10). We included this study for this Update because of the dramatic racial disparities observed among adolescent girls in an important determinant in the pathway toward obesity—physical activity. Cross-sectional studies indicate that the physical activity of girls decreases substantially during adolescence (11, 12). Kimm and colleagues used a longitudinal cohort of 2400 adolescent girls to examine racial differences in decreases in physical activ-

ity and factors that are potentially associated with this decline.

The authors assessed physical activity with the Habitual Activity Questionnaire (HAQ) at regular intervals over 10 years. The HAQ scores are the average metabolic equivalents (MET) for the sum of each recorded activity by the weekly frequency and the fraction of the year during which it was performed and is expressed as MET-times per week. Low scores indicate less physical activity. Included among other data collected were parental education level, body mass index (BMI), information on pregnancy and smoking, and school dropout rates.

Throughout the study, black girls had statistically significantly higher BMI values. For both black and white girls, HAQ scores at baseline were low and became lower over time; however, at all points in time black girls had lower median HAQ scores than white girls. The median HAQ score decreased 64% for white girls and 100% for black girls (that is, for black girls the median decreased to 0 MET-times per week) over the 10 years of the study ( $P < 0.001$ ). In years 5 to 8, BMI and lower parental education were associated with decreases in HAQ scores for both white and black girls ( $P < 0.05$  for all comparisons). Pregnancy was associated with a decrease in HAQ scores for black girls. Smoking and living in a single-parent household were associated with a decrease in HAQ scores for white girls ( $P < 0.05$  for all comparisons).

These findings document a statistically significant decrease in physical activity among adolescent girls and a decrease in activity for black girls twice that of white girls. These findings also suggest potentially modifiable risk factors for decrease in physical activity, such as pregnancy and smoking. Finally, since baseline BMI was a strong predictor of activity decrease and black girls had higher BMIs than white girls throughout the study, these results indicate that to address the obesity epidemic, which disproportionately affects black women, we must start addressing the issue before girls reach even 10 years of age.

### Studies Explaining Disparities: Patient-Level Factors

Patient beliefs and preferences are often cited in discussion sections as a potential reason for observed racial and ethnic disparities in care. The following 3 studies are some of the first to help us understand how beliefs and preferences differ by race. They underscore the need for better education about invasive medical interventions.

### Trust and Spirituality May Help Explain Disparities in Willingness To Donate Blood and Cadaveric Organs

Boulware LE, Ratner LE, Cooper LA, et al. Understanding disparities in donor behavior: race and gender differences in willingness to

donate blood and cadaveric organs. *Med Care.* 2002;40:85-95. [PMID: 11802081] (Rating score: 80)

Black people donate blood and cadaveric organs less frequently than white people (13–15). Efforts to understand the reasons for these disparities may help focus donor recruitment efforts and increase the availability of blood and cadaveric organs to minority populations. Boulware and colleagues evaluated race- and sex-specific reasons for willingness to donate blood and cadaveric organs.

The study sample consisted of residents living in 14 ZIP codes in the Baltimore, Maryland, metropolitan area chosen through random digit dialing of telephone numbers. The authors considered participants to be willing to donate blood if they reported having done so previously and to be willing to be a cadaveric organ donor if they reported that they were identified as an organ donor on their driver's license. The authors collected additional information on spirituality, medical mistrust, perceived discrimination, and sociodemographic characteristics. Of 1066 homes contacted, 460 individuals agreed to participate, of which 385 were eligible and completed the survey. For the analyses, the authors focused on 339 non-Hispanic black and white participants (114 black women, 46 black men, 110 white women, and 69 white men).

In unadjusted analyses, black women were least likely to report donating blood previously (41%) compared with white women (59%), black men (66%), and white men (86%) ( $P < 0.01$ ). Black men were least willing to donate organs (19%) compared with black women (38%), white women (60%), and white men (65%) ( $P < 0.01$ ). In adjusted analyses, sociodemographic and clinical factors did little to explain racial differences in willingness to donate. However, adjustment for medical mistrust and perceived discrimination explained most of the differences in willingness to donate blood for black men compared with white men but not for black or white women compared with white men. For cadaveric organ donation, adjustment for the importance of spirituality and religion explained most of the differences in willingness to be an organ donor among all groups as compared with white men, and medical mistrust and perceived discrimination explained the remaining difference in willingness to be an organ donor for black women but not for black men.

Although this was a small study that focused on 1 region of the country, it is among the first to start untangling the reasons for racial differences in rates of blood and organ donation. As the authors point out, medical mistrust, perceived discrimination, and spirituality explained much of the differences in willingness to donate between the sex-specific race groups. Therefore, these factors provide potential targets for intervention to improve national donation recruitment efforts.

### Black People Are Less Likely than White People To Know about Joint Replacement and More Likely To Be Concerned about Postsurgical Adverse Outcomes

Ibrahim SA, Siminoff LA, Burant CJ, et al. Understanding ethnic differences in the utilization of joint replacement for osteoarthritis: the role of patient-level factors. *Med Care.* 2002;40:144-51. [PMID: 11789631] (Rating score: 79)

To understand why black men are less likely than white men to undergo knee or hip replacement for end-stage osteoarthritis (6, 7), Ibrahim and colleagues studied male veterans 50 years of age or older with moderate to severe knee or hip osteoarthritis (potential candidates for joint replacement) who had not undergone a knee or hip replacement. They approached 1351 veterans in primary care waiting rooms between May 1997 and March 2000. They based analyses on the first 600 patients who were eligible and willing to participate. They asked patients about their familiarity with joint replacement procedures and expectations of postsurgical outcomes. Chart abstraction provided information on medications, comorbid conditions, and health care utilization.

Black patients were less likely than white patients to have heard of joint replacement (81% vs. 87%;  $P = 0.065$ ), to have a family member or friend who had a joint replacement (52% vs. 78%;  $P < 0.001$ ), and to report a good understanding of joint replacement (44% vs. 61%;  $P < 0.001$ ). Black patients were more likely than white patients to believe the hospital course after surgery could last for more than 2 weeks (45% vs. 18%;  $P < 0.001$ ), to believe the recovery period would require more than 6 months (47% vs. 40%;  $P = 0.086$ ), to expect moderate or extreme pain after the procedure (62% vs. 42%;  $P < 0.001$ ); and to expect moderate to extreme difficulty walking after the procedure (64% vs. 39%;  $P < 0.001$ ). Variables, significant at a  $P$  value less than 0.05 in the unadjusted analyses, remained significant when adjusted for sociodemographic characteristics, functional status, depression score, and Charlson comorbidity index.

This study would have been more informative if women had been included in the sample and findings had been linked to actual procedure use. Nevertheless, the authors identify differences in patients' beliefs and understanding that might contribute to observed racial disparities in the receipt of joint replacement.

### Black People Are More Likely than White People To Believe That Lung Cancer Spread Is Accelerated By Surgery

Margolis ML, Christie JD, Silvestri GA, et al. Racial differences pertaining to a belief about lung cancer surgery: results of a multicenter survey. *Ann Intern Med.* 2003;139:558-63. [PMID: 14530226] (Rating score: 83)

Previous studies have reported that black patients receive less aggressive treatment for lung cancer compared with

white patients (16, 17). Noting anecdotal evidence that black patients often express concerns about lung cancer spreading with air exposure during surgery, Margolis and colleagues sought to determine the prevalence and distribution of this belief and its association with preferences for lung cancer treatment.

The authors recruited patients from VHA and university clinics that served patients with either general pulmonary disease or lung tumors in Philadelphia, Pennsylvania; Los Angeles, California; and Charleston, South Carolina. Between July 1999 and December 2000, patients completed an anonymous, self-administered instrument asking about individual beliefs about surgery for lung cancer, sociodemographic characteristics, and religious affiliation. The analysis was confined to black and white patients.

Of the 652 distributed questionnaires, 626 were completed. More black than white patients thought that lung cancer spread was accelerated by exposure to the air during surgery (61% vs. 29%;  $P < 0.001$ ), would oppose surgery on the basis of this belief (19% vs. 5%;  $P = 0.001$ ), and would not believe their physician on this issue (14% vs. 5%;  $P = 0.001$ ). These differences remained statistically significant after adjustment for VHA versus university clinic, surgical clinic versus general pulmonary clinic, urban versus rural setting, and region of the country.

Like Ibrahim and colleagues' study, this study indicates that medical beliefs that may play key roles in decision making can differ among black and white patients. Although these studies show association rather than causation, they suggest opportunities for patient-centered intervention. However, since 14% of black patients and 5% of white patients reported that they would not believe their physician on this issue, education provided by nonmedical sources, as well as interventions aimed at improving physician-patient trust and communication, may also be beneficial.

### Studies Explaining Disparities: Physician-Level Factors

The patient-physician interaction is another often discussed yet little studied potential explanation for racial and ethnic disparities in care. The following studies are among the first to address this relationship, particularly as it relates to patient-physician race concordance.

#### Patient-Physician Race Concordance Is Associated with Longer Visits and More Positive Patient Affect but Not Patient-Centered Communication

Cooper LA, Roter DL, Johnson RL, et al. Patient-centered communication, ratings of care, and concordance of patient and physician race. *Ann Intern Med.* 2003;139:907-15. [PMID: 14644893] (Rating score: 80)

Black patients are more likely to report distrust of the health care system, to report being treated with disrespect

during health care visits, and to report feeling that they might be better served by a nonwhite physician (18-21). However, few studies have examined patient-physician interactions to determine how patient-physician race concordance affects patients' perceptions.

Cooper and colleagues surveyed patients before and after physician visits and analyzed audiotaped interactions between patients and physicians in 16 urban primary care practices in the Baltimore, Maryland, and Washington, DC, metropolitan areas. Between July 1998 and July 1999, the researchers recruited consecutive patients from waiting rooms with the goal of enrolling 10 patients per physician. Before the visit, patients answered questions about their health status and sociodemographic characteristics. After the appointment, they answered questions about the physician's decision-making style and their satisfaction with the visit. Physicians completed a background survey and a postvisit survey about how well they knew the patient. The authors assessed audiotapes of the actual exchanges for data gathering, education and counseling, relationship building, and partnership building. Data gathered included duration of visit, speech speed, physicians' verbal dominance, and patient-centered interviewing (the ratio of codes relating to socioemotional and psychosocial elements divided by codes reflecting a biomedical agenda). In addition, the authors generated a global composite affect score of the dialogue for both patients and physicians (1 = low; 6 = high). The analyses were based on the data from 252 black and white patients seeing 31 different physicians.

Compared with race-discordant visits, race-concordant visits were 2.2 minutes longer, contained slower speech, and had higher positive patient affect scores. Patients in race-concordant visits rated their physicians as more participatory and were more likely to be satisfied with the visit. Adjustment for communication behaviors did little to explain patients' perceptions of how participatory their physician was or their satisfaction with their physician.

This study indicates that patient-physician communication is affected by race concordance; however, this did little to explain patient ratings of their physicians. This study highlights some of the complexities of understanding the patient-physician relationship and shows that patients are more satisfied with race-concordant providers. While further research is necessary to understand these findings, increasing the supply of minority physicians in the United States may help increase patient satisfaction.

#### Race Concordance and Quality of Patient-Physician Interactions Help Explain Racial and Ethnic Disparities in Patient Satisfaction with Care but not Use of Health Services

Saha S, Arbelaez JJ, Cooper LA. Patient-physician relationships and racial disparities in the quality of health care. *Am J Public Health.* 2003;93:1713-9. [PMID: 14534227] (Rating score: 74)

Analyzing data from a large nationally representative random digit dial survey performed during April and November of 2001, Saha and colleagues examined whether patient–physician interactions, physician cultural sensitivity, and physician race or ethnicity help explain differences in patient satisfaction with care and the use of recommended health services. Analyses focused on black patients ( $n = 1037$ ), Hispanic patients ( $n = 1153$ ), Asian patients ( $n = 621$ ), and white patients ( $n = 3488$ ). The outcomes of interest were global satisfaction with care and the total number of age-appropriate screening tests. The main predictor variables of interest were a composite score of the patient’s assessment of the quality of the physician–patient interaction, the patient’s assessment of the physician’s cultural sensitivity, and the race or ethnicity of the patient’s physician.

Hispanic and Asian patients were less satisfied with their care than black and white patients, but adjustment for several sociodemographic and other patient characteristics eliminated these differences. Adjustment for patient age, sex, and health status eliminated differences in satisfaction between Hispanic and white patients. Adjustment for the quality of the patient–physician interaction eliminated differences in satisfaction between Asian and white patients and rendered Hispanic patients statistically significantly more likely than white patients to be satisfied with their physician. Listening, participatory decision making, and respect were important physician behaviors for patient satisfaction reported by black patients; time spent was important for Hispanic patients; time spent and respect were important for Asian patients; and listening, time spent, respect, and patient–physician race concordance were important for white patients. Compared with white patients, black patients received more preventive services, and Hispanic and Asian patients received fewer. Adjustment for the source of care eliminated differences between Hispanic and white patients. Adjustment for the quality of the physician–patient interaction, physician’s cultural sensitivity, and the race or ethnicity of physician did little to explain any of the observed racial or ethnic disparities in the receipt of preventive services.

As in the study by Cooper and colleagues, Saha and colleagues attempt to decompose the patient–physician relationship to understand race-associated differences in patient satisfaction. Cooper and colleagues rated the quality of the patient–physician encounter; however, in the study by Saha and colleagues, patients themselves rated the quality of discrete encounters. The 2 studies provide partially inconsistent results. Saha and colleagues’ study provides some evidence for the importance of race concordance for white patients but not for black, Hispanic, or Asian patients. Together, these studies suggest how tangled the individual elements of race, professional style, and interaction may be, as well as the potential importance of sorting them all out.

## Studies Explaining Disparities: System-Level Factors

### Mortality for Black Patients Is Only Modestly Increased Compared with White Patients Who Were Treated Similarly for Similar-Stage Cancer

Bach PB, Schrag D, Brawley OW, et al. Survival of blacks and whites after a cancer diagnosis. *JAMA*. 2002;287:2106-13. [PMID: 11966385] (Rating score: 78)

Black patients have worse 5-year survival rates after diagnosis of cancer than white patients (17). Studies have argued that this disparity occurs because black patients get fundamentally more aggressive types of cancer than white patients (22). This study is important because it addresses this argument by estimating the magnitude of overall and cancer-specific survival differences between black and white patients who received similar treatment for similar-stage types of cancer.

First, Bach and colleagues systematically reviewed studies that reported survival for black and white patients. They converted survival rates to hazard ratios and determined cancer-specific hazards by using life tables to parse out the hazard of death due to other causes. They identified studies through MEDLINE and included studies that contained data on at least 10 black patients and 10 white patients, summarized survival of both black and white patients, presented outcomes within stage, and specified that black and white patients received similar treatment. Bach and colleagues analyzed 54 articles made up of 89 unique analyzable cohorts, 32 004 black patients, 189 877 white patients, and 14 different types of cancer.

The overall hazard of death for black patients compared with white patients was 1.16 (95% CI, 1.12 to 1.20). The cancer-specific mortality hazard for black patients compared with white patients was 1.07 (CI, 1.02 to 1.13). Stratified by cancer type, and after adjustment for death due to causes other than cancer, black patients had excess cancer-specific mortality compared with white patients for only 3 types of cancer: breast, uterine corpus, and bladder. The pooled cancer-specific hazard ratio for other types of cancer (excluding breast, uterine corpus, and bladder cancer) was 1.02 (CI, 0.97 to 1.06).

For most types of cancer, black and white patients who are treated similarly for similar-stage cancer seem to have similar cancer-specific mortality rates. Although all-cause mortality for black patients was substantially higher than that for white patients, cancer-specific mortality was only marginally increased for black patients and seems to be driven by only 3 different types of cancer. This meta-analysis suggests caution in attributing observed racial differences in cancer survival to racial differences in tumor aggressiveness. Instead, substantial differences in cancer outcomes are more plausibly related to unequal treatment.

## Few Diseases Explain Most of the Racial Disparities in Mortality between Black and White Patients

Wong MD, Shapiro MF, Boscardin WJ, et al. Contribution of major diseases to disparities in mortality. *N Engl J Med*. 2002;347:1585-92. [PMID: 12432046] (Rating score: 82)

Black people have higher mortality rates than white people (23–25). Wong and colleagues evaluated whether specific diseases have greater influence on overall disparities in potential life-years lost and potential gains in life expectancy. This unique study focuses on the major causes of disparities in mortality rates between black and white people and can be used to help guide policy and resources aimed at reducing mortality disparities.

By using a simulation model, Wong and colleagues determined cause-specific potential life-years lost (years a person would have lived had they not died of a specific cause) and potential life-years gained (increase in life expectancy if a specific cause of death was eliminated). They matched data from the National Health Interview Survey conducted from 1986 through 1994 with the National Death Index to determine cause-specific death rates. They used weighted Kaplan–Meier product limit methods to estimate the 1-year risk for cause-specific death for each subgroup on the basis of age, race, sex, and education and used these estimates in a state-transition Monte Carlo simulation to model deaths among U.S. adults. They determined the potential life-years lost as the difference between the simulated age at death and the maximum number of years a person could have lived, which was set at 75 years. They determined the potential gain in life expectancy as the change in life expectancy when the mortality rate for a specific cause of death was set at 0%.

After adjustment for age, sex, and education, potential life-years lost from all causes of death were 35% greater for black patients than white patients, for a difference of 1.8 years (99% CI, 1.4 to 2.8 years). Hypertension, HIV infection, diabetes, and homicide contributed most to racial disparities in potential life-years lost. Cancer contributed only 3.4% to racial disparities in potential life-years lost. Similar results were obtained from the analysis of potential gains in life expectancy. The elimination of hypertension, HIV infection, diabetes, and homicide would contribute the greatest to eliminating racial disparities in mortality.

Like Bach and colleagues' study, Wong and colleagues' study helps us interpret population-based differences in survival and suggests targets for social and health care intervention. Whereas Bach and colleagues' study helps us look beyond tumor aggressiveness as an explanation for racial disparities in cancer mortality, Wong and colleagues' study helps us identify disease-specific targets to improve overall population health equity.

## Conclusion

The urge to identify, understand, and eliminate disparities in health and health care is strong, but the science is young and the field is currently most distinguished by its promise. Although this Update does not encompass all the health equity and disparities literature published in 2002 and 2003, it does reflect what we considered to be the best and most relevant articles from 10 leading health journals. The articles in this Update reveal some maturation from the initial documentation of disparities toward the beginning of an understanding of their origins. The articles also reveal a daunting challenge: The potential dependent and independent variables to be measured are often ill-defined, socially determined, and politically charged. These articles tell us more about the various methods needed to understand these issues than about the answers themselves. Indeed, we found no high-quality, reportable studies of strategies to reduce disparities. While studies documenting disparities continue to have value, the field will advance more through analytic work that understands those disparities, and studies that implement and test interventions are desperately needed. Although some may argue that intervention studies are premature, well-designed interventions that either fail or succeed will teach us more about the pathways that lead to racial disparities and will lead us closer to improving health and health care for all Americans, which is ultimately how the field of health equity research will be judged.

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**Note:** Drs. Chang and Ibrahim contributed equally to this article.

**Acknowledgment:** The authors thank Hannah Shacter for her time and assistance with this manuscript.

**Grant Support:** Drs. Long and Ibrahim are supported by Veterans Administration Health Services Research & Development Career Development Awards. Dr. Ibrahim is also a recipient of the Harold Amos Fellowship Award from Robert Wood Johnson Foundation. Dr. Chang is supported by a Career Development Award (5-K12-HD-0435901) from the National Institutes of Health/National Institute of Child Health and Human Development.

**Potential Financial Conflicts of Interest:** None disclosed.

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