Disparities in Health Care Are Driven by Where Minority Patients Seek Care

Examination of the Hospital Quality Alliance Measures

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Background: Racial/ethnic disparities in health care are well documented, but less is known about whether disparities occur within or between hospitals for specific inpatient processes of care. We assessed racial/ethnic disparities using the Hospital Quality Alliance Inpatient Quality of Care Indicators.

Methods: We performed an observational study using patient-level data for acute myocardial infarction (5 care measures), congestive heart failure (2 measures), community-acquired pneumonia (2 measures), and patient counseling (4 measures). Data were obtained from 123 hospitals reporting to the University HealthSystem Consortium from the third quarter of 2002 to the first quarter of 2005. A total of 320 970 patients 18 years or older were eligible for at least 1 of the 13 measures.

Results: There were consistent unadjusted differences between minority and nonminority patients in the quality of care across 8 of 13 quality measures (from 4.63 and 4.55 percentage points for angiotensin-converting enzyme inhibitors for acute myocardial infarction and congestive heart failure [$P<.01$] to 14.58 percentage points for smoking cessation counseling for pneumonia [$P=.02$]). Disparities were most pronounced for counseling measures. In multivariate models adjusted for individual patient characteristics and hospital effect, the magnitude of the disparities decreased substantially, yet remained significant for 3 of the 4 counseling measures; acute myocardial infarction (unadjusted, 9.00 [$P<.001$]; adjusted, 3.82 [$P<.01$]), congestive heart failure (unadjusted, 8.45 [$P=.02$]; adjusted, 3.54 [$P=.02$]), and community-acquired pneumonia (unadjusted, 14.58 [$P=.02$]; adjusted, 4.96 [$P=.01$]).

Conclusions: Disparities in clinical process of care measures are largely the result of differences in where minority and nonminority patients seek care. However, disparities in services requiring counseling exist within hospitals after controlling for site of care. Policies to reduce disparities should consider the underlying reasons for the disparities.

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Differences in the quality of health care for minority patients are well documented. Two reports from the Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the 21st Century*[1] and *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*,[2] concluded that minority patients experience a lower quality of care across a wide range of conditions even after adjusting for health insurance coverage and socioeconomic status. Some studies suggest that disparities in receipt of certain health care services are a result of bias or racism.[3,4] An alternative hypothesis is that disparities can be explained, in part, by where care is received. Thus, the relevant research and policy question might be restated as follows: Are racial disparities a result primarily of discrimination, bias, or lack of cultural understanding by providers and practitioners so that minority patients receive worse quality care than nonminority patients in the same institutions, or are they a result of patterns of care seeking and service delivery resulting in minority patients receiving care from lower quality providers? In other words, are racial disparities the result of who you are or where you seek care?

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Relatively few studies have addressed this question. Working with national data from the University HealthSystem Consortium (UHC), we used the Hospital Quality Alliance (HQA) 10 core indicators, which address recommended treatments for 3 clinical conditions: acute myocardial infarction (AMI), congestive heart failure

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Table 1. Description of HQA Measures

Condition and Measure	Measure Specification
AMI	
Aspirin at arrival at the hospital	Patients with AMI without aspirin contraindications who received aspirin therapy within 24 h before or after hospital arrival
Aspirin prescribed at hospital discharge	Patients with AMI without aspirin contraindications who were prescribed aspirin at hospital discharge
ACE inhibitor for LVSD	Patients with AMI with LVSD and without ACE inhibitor contraindications who were prescribed an ACE inhibitor at hospital discharge
β-Blocker at hospital discharge	Patients with AMI without β-blocker contraindications who were prescribed a β-blocker at hospital discharge
β-Blocker at arrival	Patients with AMI without β-blocker contraindications who received a β-blocker within 24 h after arrival at the hospital
CHF	
LV function assessment	Patients with CHF with documentation that LV function was assessed before arrival, during hospitalization, or is planned for after hospital discharge
ACE inhibitor for LVSD	Patients with CHF with LVSD and without ACE inhibitor contraindications who were prescribed an ACE inhibitor at hospital discharge
CAP	
Oxygenation assessment	Increased awareness of the importance of oxygenation assessment, which can improve outcomes in patients with CAP
Initial antibiotic therapy received within 8 h of hospital arrival	Time line of antibiotic administration for inpatients with pneumonia
Counseling measures	
AMI–adult smoking cessation advice or counseling	Patients with AMI with a history of smoking cigarettes who are given smoking cessation advice or counseling during hospital stay. (For the purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year before arrival at the hospital.)
CHF–adult smoking cessation advice or counseling	Patients with CHF with a history of smoking cigarettes who are given smoking cessation advice or counseling during hospital stay
CAP–adult smoking cessation advice or counseling	Ensure that adult patients with CAP are educated about behavioral risk factors that contribute to the disease
CGF–discharge instructions	Patients with CHF discharged to home with written instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen

Abbreviations: ACE, angiotensin-converting enzyme; AMI, acute myocardial infarction; CAP, community-acquired pneumonia; CHF, congestive heart failure; HQA, Hospital Quality Alliance; LV, left ventricular; LVSD, LV systolic dysfunction.

(CHF), and community-acquired pneumonia (CAP). Seven other measures were added to the core set, and these 17 indicators have been endorsed by the National Quality Forum, a national standard-setting entity.

We hypothesized that the greatest disparities occur in processes of care that require patient counseling compared with some of the other measures (eg, aspirin at arrival for AMI). We posited that documentation for counseling measures would not be better for people of one race/ethnicity over another within a hospital. Thus, we hypothesized that a documentation effect would occur between hospitals rather than within hospitals. We examined whether disparities in all HQA measures were within hospitals, between hospitals, or both.

Recent studies suggest that at least some of the disparities found in large national databases can be attributed to site of care and geographic factors. Schneider et al[5] found that clinical quality of care for Medicare beneficiaries in managed care plans was significantly lower for black patients than for white patients across a range of services. Both socioeconomic characteristics and differential enrollment of black patients in poor-performing health plans seemed to contribute to these disparities. Barnato et al[6] found that black and white patients tend to go to different hospitals; thus, quality differences across hospitals could have a role in observed racial disparities in care. Bach et al[7] noted that minority patients are treated by a group of physicians who may differ from physicians who treat primarily nonminority patients. Lucas et al[8] found that black patients have higher operative mortality risks across a range of surgical procedures because of higher mortality at the hospitals in which they seek care. Other studies with teaching and nonteaching hospitals suggest that geographic variations in health care are responsible for some of the observed disparity nationally because minorities live disproportionately in parts of the country that have lower quality hospitals and primary care physicians.[9,10]

These studies have provided important contributions to our understanding of disparities. However, several studies examined only a single condition or procedure and none examined quality measures that focus on direct patient counseling using a national data set.

The HQA data are likely to be the foundation of hospital quality assessments for the foreseeable future and provide a unique opportunity to better understand the quality of care patients receive nationwide. Through the HQA, more than 3700 hospitals report quality measures to the Centers for Medicare & Medicaid Services. We analyzed data for a subset of 123 teaching hospitals reporting to the UHC, providing important information about the quality of care and disparities within and between this subset of teaching hospitals

METHODS

SAMPLE AND DATA

This study used patient-level HQA quality measures obtained from the UHC, an alliance of academic medical centers and their affiliate hospitals in the United States. We present data, including patient characteristics, for 320 970 patients in 123 hospitals.

We examined hospital performance on 13 of the 17 measures from the third quarter of 2002 to the first quarter of 2005. Four measures (AMI–inpatient mortality; CAP–blood cultures before administration of first antibiotic therapy; CAP–

Table 2. Characteristics of Patients in the University HealthSystem Consortium Database Sampled for HQA Clinical Measures*

Characteristic	No. of Patients†	No. of Hospitals†	Age >60 y	Women	Minority Patient‡	Payer Medicaid§
All characteristics	320 970	123	53	41	40	21
AMI measures						
Aspirin at arrival at the hospital	20 828	72	62	39	31	15
Aspirin at hospital discharge	36 475	67	58	36	26	14
ACE inhibitor	6723	37	63	34	32	16
β-Blocker at arrival at the hospital	18 049	68	61	40	32	15
β-Blocker at hospital discharge	36 157	67	58	36	25	14
CHF measures						
LV function assessment	58 377	83	66	48	45	20
ACE inhibitor	26 082	71	57	36	50	24
CAP measures						
Oxygen assessment	37 431	80	48	48	44	28
Antibiotic therapy within 8 h of arrival at the hospital	1230	17	53	46	55	29
Counseling measures						
AMI–smoking cessation	11 439	48	32	29	27	24
CHF–smoking cessation	10 726	56	37	37	61	40
CAP–smoking cessation	7227	44	29	43	55	46
CHF–discharge instructions	50 226	80	62	46	48	23

Abbreviations: ACE, angiotensin-converting enzyme; AMI, acute myocardial infarction; ASA, acetylsalicylic acid (aspirin); CAP, community-acquired pneumonia; CHF, congestive heart failure; HQA, Hospital Quality Alliance; LVEF, left ventricular ejection fraction.

*Data are given as percentage unless otherwise indicated.

†The number of hospitals and number of patients differ for each measure because of eligibility criteria for denominator cases, differences in when individual hospitals began data collection for selected core measures, and criteria specified for this study (exclusion of hospitals with fewer than 50 total cases and 15 minority cases).

‡Identified as black or African American, Hispanic, or other.

§Medicaid/indigent included Medicaid, county medically indigent, and no charge.

antibiotic therapy started within 4 hours of arrival; and CAP–antibiotic selection) were excluded because there were not a sufficient number of cases at the individual hospital level to make meaningful comparisons. **Table 1** gives measure specifications. The first 3 groups correspond to clinical measures that refer to processes of care for AMI, CHF, and CAP; the last group contains 4 counseling measures for each of the conditions.

HOSPITAL CHARACTERISTICS

All 123 hospitals were teaching hospitals. Sixty-two percent had at least 300 beds. They were distributed by region, with 10.8% in the Northeast, 19.2% in the Mid-Atlantic, 18.3% in the Southeast, 35.9% in the Midwest, and 15.8% in the West. Of the approximately 1100 teaching hospitals in the United States, 245 are members of the UHC. To be eligible for UHC membership, organizations must be one of the following: a nonprofit hospital or health system having common ownership with a college of medicine; a nonprofit or government hospital or health system in which most medical school chairs and hospital chiefs of service are the same; or a specialty hospital or health system that satisfies either of the first 2 criteria.

The UHC consists of 96 academic medical center members and an additional 149 affiliate hospital members (ie, related community hospitals). The American Association of Medical Colleges defines 117 hospitals as academic medical centers; of these, 8 are ineligible for UHC as for-profit entities. The UHC represents 96 of the 109 not-for-profit academic medical centers. Approximately 123 member hospitals use the UHC clinical database.

STUDY POPULATION

We excluded patients who were younger than 18 years, classified as "unknown" for race/ethnicity, and from hospitals that reported fewer than 50 total cases or fewer than 15 minority cases for any of the 3 conditions, to conduct reasonable logistic regression analysis. Thus, the number of hospitals differs for each of the measures (**Table 2**) because of individual patient eligibility criteria for denominator cases in addition to the hospital-level exclusion criteria. After exclusions, the study sample consisted of 320 970 patients.

INDIVIDUAL PATIENT CHARACTERISTICS

The UHC merged the Centers for Medicare & Medicaid Services data with inpatient discharge data to obtain information about sociodemographic characteristics and comorbidities. We classified patients according to the following categories for analysis: age (>60 years), sex, race/ethnicity (minority or nonminority), and payer (Medicaid/indigent vs other). Medicaid/indigent payer included Medicaid, county medically indigent services, and no charge. Other payer included Medicare, Blue Cross/Blue Shield, managed care, self-pay, and third-party insurance. We defined minority patients as those identified as black or African American, Hispanic, Asian, and other. The number of minority patients in the specific racial/ethnic groups was too small to analyze separately at the individual hospital level. We examined a subset of the entire population for each of the measures to ensure that we had adequate numbers of patients at the individual hospital level to generate stable and reasonable estimates. Many of the hospitals had few patients in each of the subgroups. Preliminary analyses showed that the patients in each of these subgroups displayed similar trends. Therefore, we combined the minority subgroups into an overall minority category for analytical purposes.

The patient-level data were adjusted for severity of illness using the 3M APR-DRG (All Patient Refined–Diagnosis-Related Groups)[11] methods with 4 subclasses of severity of illness: minor, moderate, major, and extreme. Each patient was assigned a single all patient refined–diagnosis-related groups

Table 3. Crude Success Rates for HQA Quality Measures for Nonminority and Minority Patients*

HQA Measures	Nonminority Patient	Minority Patient	*P* Value†
AMI			
Aspirin at arrival at the hospital	96.5 (50.0-100)	96.6 (81.4-100)	.66
Aspirin at hospital discharge	97.1 (78.7-100)	96.5 (75.8-100)	.001
ACE inhibitor	81.4 (48.0-100)	86.0 (37.5-100)	<.001
β-Blocker at arrival at the hospital	92.9 (76.9-100)	91.9 (63.2-100)	.02
β-Blocker at hospital discharge	95.2 (79.3-100)	93.7 (74.3-100)	<.001
CHF			
Left ventricular function assessment	93.2 (7.5-100)	91.5 (9.1-100)	<.001
ACE inhibitor	79.3 (36.7-100)	83.8 (53.6-97.1)	<.001
CAP			
Oxygen assessment	98.9 (88.5-100)	98.2 (85.5-100)	<.001
Antibiotic therapy within 8 h of arrival at the hospital	85.6 (33.3-100)	76.2 (46.2-93.3)	<.001
Counseling			
AMI–smoking cessation	78.3 (16.7-98.9)	69.4 (16.5-100)	<.001
CHF–smoking cessation	56.4 (0.0-94.7)	48.0 (9.6-94.7)	<.001
CAP–smoking cessation	49.9 (0.0-98.8)	35.4 (2.4-98.0)	<.001
CHF–discharge instructions	37.6 (0.0-77.5)	28.1 (0.0-82.4)	<.001

Abbreviations: ACE, angiotensin-converting enzyme; AMI, acute myocardial infarction; CAP, community-acquired pneumonia; CHF, congestive heart failure; HQA, Hospital Quality Alliance;
*Data are given as percentage (range) of facility success rate.
†*t* Tests.

severity-of-illness subclass. In addition, the patient-level data were also adjusted for comorbid conditions.[12] The UHC adjusts patient-level data using both methods to account for inherent risk in chronic and comorbid conditions.

ANALYSIS

For each HQA measure, we tabulated the number of patients in the denominator affected (ie, those for whom the measure was relevant), then defined the performance rate as the percentage of eligible patients who received the indicated service. A disparity measure was derived as the nonminority rate minus the minority rate. Next, we divided the hospitals into the top quintile (top performers) and the bottom quintile (low performers) for each of the 13 measures, then determined the percentage of minorities in the top-performing and low-performing hospitals.

We used patient-level multivariate logistic regression models to estimate the likelihood of receiving the specified service. In all multivariate models, we adjusted standard errors for clustering of outcomes within hospitals. In the first model, we examined unadjusted bivariate relationships by including a dummy for race/ethnicity. In the second model, we controlled for the individual characteristics of age, sex, payer, severity of illness, and comorbid conditions. The 4 severity categories and the 30 comorbid conditions were entered into the model as dummies. In the third model, to address the possibility of confounding by site of care, we fit a set of models that included a dummy variable for each hospital.[13] Differences in the adjusted probability of receiving the specified service among minorities compared with nonminorities were computed using the coefficient associated with minority status, setting all other covariates at their mean value. Some of the measures in models 2 and 3 (CAP–oxygenation assessment and CAP–antibiotic therapy started within 8 hours of arrival; AMI–aspirin at arrival, AMI–aspirin at discharge, and AMI–β-blocker at discharge; and CHF–left ventricular function assessment) did not converge; thus, we showed results not adjusted for clustering for these measures.

RESULTS

Of the 320 970 patients included in these analyses, 40% were of racial/ethnic minorities. However, the proportion of minority patients varied across measures, ranging from 25% for AMI–β-blocker at hospital discharge to 61% for CHF–smoking cessation counseling (Table 2).

Table 3 gives crude success rates for HQA measures for nonminority and minority patients. Overall, HQA performance rates were greater than 90% for AMI measures, with statistically significant ($P<.05$) but small absolute differences, the exception being angiotensin-converting enzyme (ACE) inhibitor use. The CHF measures showed small but statistically significant ($P<.001$) differences between minority and nonminority patients. Minority patients were significantly more likely to receive ACE inhibitors. The CAP measures showed significant differences ($P<.001$) for oxygenation assessment and receipt of antibiotic therapy within 8 hours of arrival. The counseling measures had lower overall performance rates (well below 90%). Minority patients were significantly less likely to receive these services ($P<.001$), and the overall absolute differences were consistently large.

Table 4 gives unadjusted and adjusted racial/ethnic disparities in the HQA measures. Adjusting for individual patient characteristics had little effect on success rates for most measures. The exception was the receipt of ACE inhibitors in patients with CHF, where the difference (with minorities receiving the service more often) was reduced from 4.5% to 1.9%. The unadjusted differences ranged from 1.54% for AMI–β-blocker at discharge (95% CI, 0.5-2.68) to 14.58% for CAP–smoking cessation counseling (95% CI, 2.74-26.1). The magnitudes of the racial/ethnic disparities decreased substantially when adjusting for site of care (model 3). The 10 percentage point difference (unadjusted, 9.61; 95% CI, 4.44-14.74; $P<.001$) in the likelihood of receiving discharge instructions among patients with CHF was eliminated once we controlled for site of care (adjusted, 0.49; 95% CI, –0.92 to 1.89; $P=.50$). Adding the hospital effect to the counseling measures explained a large proportion of the disparities, and although disparities in smoking cessation counseling were decreased for all 3 conditions, they remained statistically significant ($P<.05$).

Hospitals that perform less well on the HQA measures tend to serve a higher percentage of minority patients (**Figure**). For example, only 20% of patients were minorities in top-performing hospitals compared with almost 70% of patients in lower performing hospitals for

Table 4. Racial Disparities (Difference in Success Rates Between Nonminority and Minority Patients) in HQA Quality Measures*

HQA Measure	Model 1: Unadjusted	Model 2: Age, Sex, Payer, Comorbidities, and Severity of Illness	Model 3†: Model 2 Plus Hospital Effect
AMI			
Aspirin at arrival at the hospital	−0.15 (−1.26 to 1.10) *P* = .80	−0.35 (−1.41 to 0.84) *P* = .55 [−1.72 to 1.53]	−0.76 (−1.37 to −0.11)‡ *P* = .02 [−7.02 to −4.25]
Aspirin at hospital discharge	0.65 (−0.06 to 1.45) *P* = .07	0.53 (−0.10 to 1.23) *P* = .10 [0.26 to 1.21]	−0.32 (−0.74 to 0.14)‡ *P* = .17 [−1.69 to 0.82]
ACE inhibitor	−4.63 (−7.76 to −1.33) *P*<.01	−5.20 (−8.16 to −2.07) *P* = .001 [−6.64 to −1.70]	−2.41 (−5.24 to 0.58) *P* = .11 [−5.37 to 1.01]
β-Blocker at arrival at the hospital	1.23 (−0.66 to 3.31) *P* = .21	1.37 (−0.54 to 3.46) *P* = .16 [−1.28 to 2.60]	−0.20 (−1.32 to 1.00) *P* = .74 [−7.05 to 4.23]
β-Blocker at hospital discharge	1.54 (0.50 to 2.68) *P*<.05	1.64 (0.61 to 2.77) *P* = .001 [0.50 to 3.10]	0.27 (−0.32 to 0.89)‡ *P* = .38 [−2.36 to 2.93]
CHF measures			
Left ventricular function assessment	1.70 (−0.33 to 3.81) *P* = .10	1.79 (−0.09 to 3.74) *P* = .06 [−.05 to 3.19]	−0.47 (−1.05 to 0.12)‡ *P* = .12 [−4.26 to 0.93]
ACE inhibitor	−4.55 (−7.05 to −2.05) *P*<.001	−1.91 (−4.39 to 0.58) *P* = .13 [−7.76 to 1.15]	−3.39 (−5.35 to −1.44) *P*<.001 [−8.80 to 0.002]
CAP			
Oxygen assessment	0.72 (−0.07 to 1.61) *P* = .07	0.38 (0.11 to 0.65)‡ *P* = .005 [0.20 to 1.00]	−0.28 (−.57 to 0.03)‡ *P* = .07 [−2.10 to 1.36]
Antibiotic therapy within 8 h of arrival at the hospital	9.78 (4.70 to 14.77) *P*<.001	8.30 (3.43 to 13.1)‡ *P* = .001 [5.11 to 12.46]	6.40 (0.78 to 11.9)‡ *P* = .03 [1.55 to 10.13]
Counseling			
AMI–smoking cessation	9.00 (4.19 to 14.05) *P*<.001	9.05 (4.06 to 14.27) *P*<.001 [4.36 to 17.62]	3.82 (1.17 to 6.55) *P*<.01 [−0.71 to 13.99]
CHF–smoking cessation	8.45 (1.10 to 15.68) *P* = .02	8.17 (1.14 to 15.11) *P* = .02 [2.62 to 10.80]	3.54 (0.46 to 6.62) *P* = .02 [−2.06 to 5.54]
CAP–smoking cessation	14.58 (2.74 to 26.10) *P* = .02	13.83 (3.33 to 24.09) *P*<.01 [8.28 to 17.32]	4.96 (1.17 to 8.74) *P* = .01 [0.28 to 8.53]
CHF–discharge instructions	9.61 (4.42 to 14.74) *P*<.001	9.11 (4.00 to 14.18) *P*<.001 [6.97 to 11.08]	0.49 (−0.92 to 1.89) *P* = .50 [−2.60 to 2.76]

Abbreviations: ACE, angiotensin-converting enzyme; AMI, acute myocardial infarction; CAP, community-acquired pneumonia; CHF, congestive heart failure; HQA, Hospital Quality Alliance; –, minorities more likely to receive the measure.

*Values are given as percentage (95% confidence interval) [range of predicted facility differences].

†Includes a dummy variable for each hospital.

‡Not adjusted for clustering with facilities.

AMI–smoking cessation. Still notable is the reversal of this trend for the 2 ACE inhibitor measures; the top-performing hospitals had a higher percentage of minority patients than did the lower performing hospitals, which mirrors the disparities analyses given in Table 3 and Table 4.

COMMENT

Our analysis confirms that quality of care for minority patients is often lower than for nonminority patients. Small but statistically significant disparities were noted in the bivariate analysis for 12 of the 13 HQA measures. In model 1, which adjusted for clustering of outcomes within hospitals, 8 measures showed significant racial/ethnic disparities. None of these disparities were accounted for by age, sex, payer, severity of illness, or comorbidities (with the exception of ACE inhibitor for CHF). After adjusting for site of care, the magnitudes of the 8 disparities were reduced and 3 disparities were entirely eliminated, suggesting that an underlying cause of disparities may be that minority patients are more likely to receive care

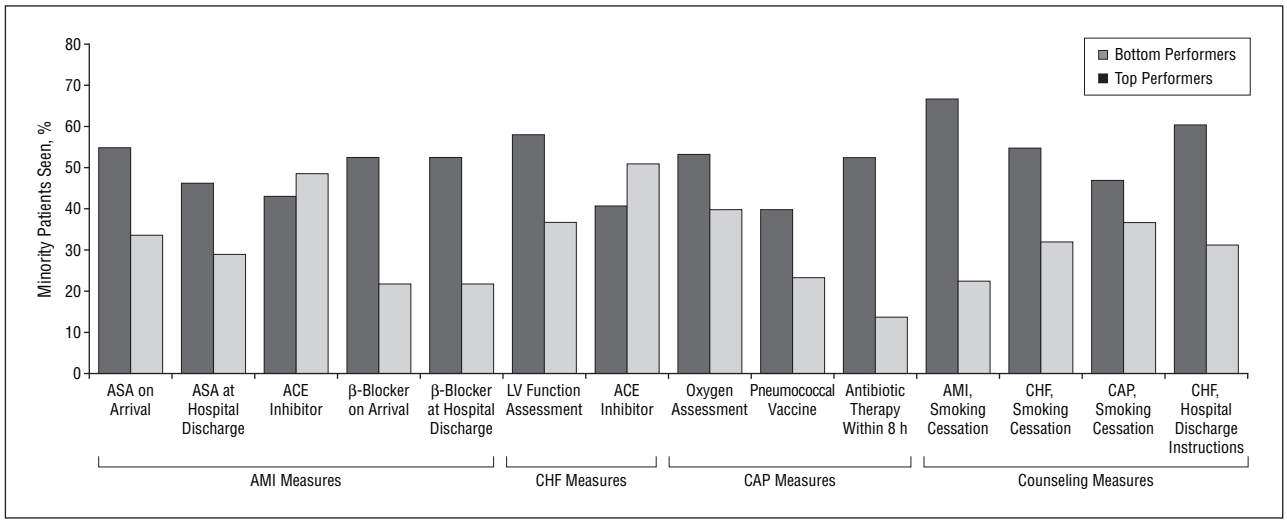

Figure. Percentage of minority patients cared for in top-performing and bottom-performing hospitals, by measure as described in Table 1. ACE indicates angiotensin-converting enzyme; AMA, acute myocardial infarction; ASA, acetylsalicylic acid (aspirin); CAP, community-acquired pneumonia; CHF, congestive heart failure; and LV, left ventricular ejection fraction.

in lower performing hospitals. We found that hospitals that were lower performers tended to serve a larger proportion of minority patients; another explanation may be that minority patients seek care in underresourced hospitals. A number of factors can characterize low-performing hospitals as underresourced including nurse staffing shortages, inadequate budgets, lack of technical support such as health information systems, and lack of capital.[14,15]

These data offer some clues as to the nature and potential causes of racial/ethnic disparities in quality of care. The reasons for disparities may vary with the services being provided. Some services may be of low quality because of where they are provided and others because of bias, racism, or difficulties with intercultural communication.

First, the magnitude of the racial/ethnic disparity varies among measures. Several of the HQA measures, such as aspirin and β-blocker use at arrival and on hospital discharge, show small disparities. These services are neither highly technical nor complex and require little interaction between the patient and the clinician. This may be why performance is greater than 90% for these measures.

Disparities are much greater for the counseling measures, which are communication sensitive. In contrast to aspirin and β-blocker use in AMI, the effectiveness of smoking cessation counseling might not be so straightforward. Counseling requires time, interaction with patients, and documentation. Previous research has suggested that the benefits of communication training for clinicians and patients can be enhanced by considering patient characteristics such as race/ethnicity and culture.[16] Communication training may improve the rates of the counseling measures for minority patients. Shrank et al[17] found that patient race/ethnicity was associated with modest quality differences in measures such as medication education and documentation. Further, Baker et al[18] found that patient-provider communication and education in a heart failure learning collaborative resulted in participants substantially more likely to have knowledge about managing their cardiovascular health.

Second, our results suggest that individual patient characteristics did not explain the observed disparities, however, disparities in some measures were eliminated after adjusting for hospital effects. The one exception was the relatively higher proportion of minority patients who received ACE inhibitors for CHF, which may reflect the higher prevalence of comorbid conditions, such as kidney disease, in which ACE inhibitors have a role.[19]

About half of the racial/ethnic disparities for ACE inhibitors for AMI, oxygenation assessment for CAP, and antibiotic therapy within 8 hours of arrival for CAP seemed to reflect between-hospital rather than within-hospital factors. These results were particularly striking for the counseling measures, where well more than half of the disparity could be accounted for by between-hospital effects. In the case of hospital discharge instructions for CHF, the initial disparity was strong but entirely disappeared when controlling for hospital effect. It is possible that documentation of this measure in most hospitals is done by a nurse as part of standard orders; thus, whether this performance measure is checked off may be related to nurse-patient ratios, size and funding of quality improvement activities, and availability and use of electronic medical records. This finding may indicate that minority patients may be more likely to go to hospitals that are underresourced. Yet, these same hospitals may have providers who are hardworking and efficient, providing care with fewer resources to more disadvantaged patients.

The policy question that motivated this study was whether we should target resources to facilities that serve a high percentage of minority patients or direct them toward reducing potentially biased treatment patterns within facilities. Our findings suggest that the issue of where care is administered has a role in the quality of care received. Further research should try to identify which factors contribute to low performance in hospitals and how performance may be related to disparities in care.

Our study has several strengths. To our knowledge, this is the first study to use the HQA patient-level measures to assess racial/ethnic disparities within and be-

tween hospitals and to examine racial/ethnic disparities in counseling measures, which are communication sensitive. We were able to control for potential confounding between race/ethnicity and other socioeconomic factors, and hospital effects. By including hospital effects in our multivariable models, we controlled for both measurable and implicit hospital characteristics.

Our study has limitations. We lacked detailed information about patient knowledge, beliefs, and attitudes toward health care, their physicians, and the hospitals they used. Also, minority patients in teaching hospitals may be more likely to be on the teaching service while nonminority patients may be on a nonteaching service, which may be related to whether, for example, patients with CHF receive detailed discharge instructions from a physician who knows them and will follow up. We did not have this level of detail for analysis. We cannot exclude the possibility that inadequacies in the clinical and administrative records for the populations that we studied may have biased our results. However, controlling for site of care should at least partially address this potential bias. Our analysis focused only on UHC hospitals, a subset of all teaching hospitals, which may limit the generalizability of our findings.

Future research should address the reasons for disparities. Pay-for-performance is a policy tool to drive quality improvement; however, it is important for providers serving disadvantaged communities to be given incentives to improve quality metrics. Policy recommendations may need to focus on pay-for-improvement metrics for those underresourced providers caring for the most disadvantaged populations. Identifying and targeting the underlying causes of lower performance in hospitals and how these relate to health care disparities should inform programs and policies to reduce and potentially eliminate disparities in health care.

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REFERENCES

1. Richardson W, Berwick D, Bisgard J, et al. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: Institute of Medicine; 2001.
2. Brian D, Smedley AY, Nelson AR, eds. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: Institute of Medicine; 2002.
3. Schulman KA, Berlin JA, Harless W, et al. The effect of race and sex on physicians' recommendations for cardiac catheterization [published correction appears in *N Engl J Med*. 1999;340:1130]. *N Engl J Med*. 1999;340:618-626.
4. van Ryn M, Fu SS. Paved with good intentions: do public health and human service providers contribute to racial/ethnic disparities in health? *Am J Public Health*. 2003;93:248-255.
5. Schneider EC, Zaslavsky AM, Epstein AM. Racial disparities in the quality of care for enrollees in Medicare managed care. *JAMA*. 2002;287:1288-1294.
6. Barnato AE, Lucas FL, Staiger D, Wennberg DE, Chandra A. Hospital-level racial disparities in acute myocardial infarction treatment and outcomes. *Med Care*. 2005;43:308-319.
7. Bach PB, Pham HH, Schrag D, Tate RC, Hargraves JL. Primary care physicians who treat blacks and whites. *N Engl J Med*. 2004;351:575-584.
8. Lucas FL, Stukel TA, Morris AM, Siewers AE, Birkmeyer JD. Race and surgical mortality in the United States. *Ann Surg*. 2006;243:281-286.
9. Baicker K, Chandra A, Skinner JS, Wennberg J. Who you are and where you live: how race and geography affect the treatment of Medicare beneficiaries. *Health Aff (Millwood)*. 2004;(suppl Web exclusive):VAR33-VAR44.
10. Baicker K, Chandra A, Skinner JS. Geographic variation in health care and the problem of measuring racial disparities. *Perspect Biol Med*. 2005;48(suppl):S42-S53.
11. Avrill RF, Goldfield N, Huges JS, et al. *All Patient Refined–Diagnosis-Related Groups (APR-DRGS) Version 20.0: Methodology Overview*.: Wallingford, Conn: 3M Health Information Systems; 2003.
12. Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. *Med Care*. 1998;36:8-27.
13. Localio AR, Belin JA, Ten Have TA, Kimmel SE. Adjustments for center in multicenter studies: an overview. *Ann Intern Med*. 2001;135:112-123.
14. Meyer JA, Silow-Carroll S, Kutyla T. *Hospital Quality: Ingredients for Success; Overview and Lessons Learned*. New York, NY: Commonwealth Fund; 2004.
15. Mannion R, Davies HT, Marshall MN. Cultural characteristics of "high" and "low" performing hospitals. *J Health Organ Manage*. 2005;19:431-439.
16. Post DM, Cegala DJ, Marinelli TM. Teaching patients to communicate with physicians: the impact of race. *J Natl Med Assoc*. 2001;93:6-12.
17. Shrank WH, Asch SM, Adams J, et al. The quality of pharmacologic care for adults in the United States. *Med Care*. 2006;44:936-945.
18. Baker DW, Asch SM, Keesey JW, et al. Differences in education, knowledge, self-management, activities, and health outcomes for patients with heart failure cared for under the chronic disease model: the improving chronic illness care evaluation. *J Card Fail*. 2005;11:405-413.
19. Karter AJ. Race and ethnicity: vital constructs of diabetes research. *Diabetes Care*. 2003;26:2189-2193.