

SPECIAL ARTICLE

## Primary Care Physicians Who Treat Blacks and Whites

Peter B. Bach, M.D., M.A.P.P., Hoangmai H. Pham, M.D., M.P.H.,  
Deborah Schrag, M.D., M.P.H., Ramsey C. Tate, B.S., and J. Lee Hargraves, Ph.D.

### ABSTRACT

#### BACKGROUND

In the United States, black patients generally receive lower-quality health care than white patients. Black patients may receive their care from a subgroup of physicians whose qualifications or resources are inferior to those of the physicians who treat white patients.

#### METHODS

We performed a cross-sectional analysis of 150,391 visits by black Medicare beneficiaries and white Medicare beneficiaries 65 years of age or older for medical “evaluation and management” who were seen by 4355 primary care physicians who participated in a biannual telephone survey, the 2000–2001 Community Tracking Study Physician Survey.

#### RESULTS

Most visits by black patients were with a small group of physicians (80 percent of visits were accounted for by 22 percent of physicians) who provided only a small percentage of care to white patients. In a comparison of visits by white patients and black patients, we found that the physicians whom the black patients visited were less likely to be board certified (77.4 percent) than were the physicians visited by the white patients (86.1 percent,  $P=0.02$ ) and also more likely to report that they were unable to provide high-quality care to all their patients (27.8 percent vs. 19.3 percent,  $P=0.005$ ). The physicians treating black patients also reported facing greater difficulties in obtaining access for their patients to high-quality subspecialists, high-quality diagnostic imaging, and nonemergency admission to the hospital.

#### CONCLUSIONS

Black patients and white patients are to a large extent treated by different physicians. The physicians treating black patients may be less well trained clinically and may have less access to important clinical resources than physicians treating white patients. Further research should be conducted to address the extent to which these differences may be responsible for disparities in health care.

From the Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York (P.B.B., D.S., R.C.T.); and the Center for Studying Health System Change, Washington, D.C. (H.H.P., J.L.H.). Address reprint requests to Dr. Bach at the Health Outcomes Research Group, Memorial Sloan-Kettering Cancer Center, 1275 York Ave., Box 221, New York, NY 10021.

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**T**HE ELIMINATION OF RACIAL AND ETHNIC disparities in health care is one of the two goals of the initiative Healthy People 2010 (the other being to increase the quality and years of healthy life), but the causes underlying these disparities have not been established.<sup>1</sup> Because patients who are members of minority groups and white patients to some extent reside in different locations and seek their care in different settings, it is possible that doctors who treat these patients may differ with regard to both their clinical qualifications and their clinical resources. We hypothesized that such discrepancies account for the pervasiveness of racial and ethnic disparities in health care.

Several studies support this hypothesis. In a study of primary care physicians in New York City comparing physicians who had patient panels in which less than 50 percent were members of minority groups with physicians whose patient panels included more than 50 percent minority-group patients, Gemson et al. found that those who treated a greater proportion of minority-group patients were less knowledgeable about preventive care practices and less likely to be board certified.<sup>2,3</sup> Schneider et al., in a study of managed-care plans, observed that physicians working for plans in which black patients were heavily enrolled provided primary care of a lower quality to all patients in the plan than did physicians working for plans in which fewer black patients were enrolled.<sup>4</sup> Differences in qualifications and competency between physicians treating black patients and those treating white patients have also been described with regard to cardiovascular surgery and the care of patients infected with the human immunodeficiency virus.<sup>5,6</sup>

We studied a nationally representative sample of primary care physicians who treated patients enrolled in Medicare, the nation's largest health insurance plan. We focused on primary care physicians, because they are largely responsible for the coordination of care, often counsel patients regarding the need for referrals to specialists and for diagnostic tests and therapies, and provide continuity of care for many patients with complex diseases. Studies have suggested that poor performance by physicians in these domains may lead to disparities in preventive care, evaluation of symptoms, treatment, and outcome.<sup>7-13</sup>

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## METHODS

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### DATA

We combined data from two main sources in order to investigate the relation of primary care physicians' training and resources to the race of patients to whom they provide "evaluation and management" services.

#### *Data on Physicians*

The Community Tracking Study Physician Survey is a biannual telephone survey conducted by the Center for Studying Health System Change of a nationally representative sample of physicians who are not federally employed. The survey is conducted in 60 randomly selected metropolitan statistical areas and is supplemented by a national sample. In 2000–2001 (round 3 of the survey), the response rate among physicians was 59 percent. Details of the survey are available at [www.hschange.org/index.cgi?data=04](http://www.hschange.org/index.cgi?data=04); many of the findings have been described previously.<sup>14-17</sup> The survey included only physicians who reported providing at least 20 hours per week of direct patient care in an office-based or hospital-based practice, including at sites of the Bureau of Primary Health Care of the Department of Health and Human Services. Residents and fellows were excluded. Our study included the participating physicians whose primary specialty was family practice or general practice, general internal medicine, or geriatrics (which we subsumed under the category of internal medicine).

#### *Data on Patient Visits*

The Medicare program provides health insurance for 97 percent of Americans who are 65 years of age or older. In 2001, the program covered 40 million persons, 86 percent of whom were enrolled under Part A and Part B indemnity insurance (fee for service), in which providers submit detailed claims to the Centers for Medicare and Medicaid Services for reimbursement for services rendered.<sup>18</sup> Data were obtained from the 2001 "5 percent carrier file," which contains claims histories of a representative sample of 5 percent of Medicare beneficiaries. We analyzed line items for "evaluation and management" that were identified according to the Berenson–Eggers Type of Service Codes used by Medicare: M1A (office visits — new patient), M1B

(office visits — established patient), and M6 (consultations), but we excluded items with the Healthcare Common Procedure Coding System codes 99381, 99411, 95115, 99391, 95117, 99236, 99262, 99251, 99255, 99261, 99254, G0175, 99253, and 99252. (Information about the codes is available at [www.cms.hhs.gov/data/betos](http://www.cms.hhs.gov/data/betos).<sup>19</sup>) We limited our analysis to data on black Medicare beneficiaries and white Medicare beneficiaries (as documented in Medicare files) 65 years of age or older. Other racial or ethnic categories included in the Medicare data — Hispanic, Asian, North American Native, other, and unknown — are less well studied and less reliable.<sup>20-23</sup>

#### *Linkage of Data*

Data on physicians and patient visits were linked with the use of the physicians' unique provider identification number, which is recorded on claims submitted to Medicare.<sup>24</sup> Of 5859 primary care physicians who were interviewed by telephone as part of the Community Tracking Study Physician Survey, 5627 (96.0 percent) had a unique provider identification number. Of these physicians, 729 (13.0 percent) were not associated with claims that appeared in the 2001 Medicare 5 percent carrier file, and 543 (9.6 percent) were associated only with claims that were ineligible for our study — for services other than evaluation and management, or for services rendered to patients who were not black or white and 65 years of age or older. A total of 4355 physicians (77.4 percent) and 43,032 patients were included in our study, and together they contributed 44,756 unique physician-patient pairs (a few patients saw more than one physician included in our study) and 150,391 visits to our analysis. The number of visits per physician ranged from 1 to 304 (median, 24; interquartile range, 10 to 48). These data were used to derive national estimates that reflected the characteristics of 87,803 primary care physicians and of the 58 million visits (by 54 million white patients and 4 million black patients) for evaluation and management that these physicians provided to black and white Medicare beneficiaries 65 years of age or older in the United States in 2001.

#### **CHARACTERISTICS OF PRIMARY CARE PHYSICIANS**

On the basis of their responses to the Community Tracking Study Physician Survey, physicians were characterized according to their demographic characteristics, setting of the practice and mix of payers, medical education, specialty, whether or not

they were board certified, and ability to provide access to necessary health care resources for their patients. The demographic characteristics included age, sex, and self-declared race or ethnic background. Information on payer mix and practice setting was based on the reported percentage of revenue the practice derived from Medicare, Medicaid, and managed-care plans, the number and specialties of the physicians in the practice, whether or not physicians provided care for which they received reduced compensation or no compensation ("charity" care), location in an urban area (00-03) or a rural area (04-09), according to metropolitan statistical area codes in the Area Resource File,<sup>25</sup> and the income level in the area where the practice was located, according to data from the Census Bureau for 2000 on the median income within the area of a ZIP Code. The site of the physicians' medical education was dichotomized as either the United States, including Puerto Rico, or elsewhere. Board certification was determined for the physicians' primary specialty. Data on each of these measures were missing for less than 1 percent of physicians.

To gain insight into the ability of physicians in the study to provide access to resources for their patients, we analyzed physicians' responses to five questions in the following form: "How often are you able to obtain access for your patients to [type of service] when you think it is necessary?" The five types of service were "subspecialists of high quality," "ancillary services of high quality," "nonemergency hospital admissions," "adequate number of inpatient days," and "high-quality diagnostic imaging." The physicians could respond "always," "almost always," "frequently," "sometimes," "rarely," and "never." On the basis of the distribution of the responses, and on our belief that providing high-quality care requires reliable access to such services, we dichotomized the responses into "always" (in which "always" and "almost always" were subsumed) or "not always" (in which the remaining responses were subsumed). Less than 0.25 percent of the responses were missing or in a category not listed, such as "don't know," and were not included in the analysis.

Physicians were asked to respond to two statements: "It is possible to provide high-quality care to all my patients," and "The level of communication I have with specialists about the patients I refer to them is sufficient to ensure the delivery of high-quality care." We dichotomized the responses into "agree" (in which "strongly agree" and

“somewhat agree” were subsumed) or “disagree” (in which “strongly disagree” and “somewhat disagree” were subsumed). Less than 3 percent of the responses were missing, “neither agree nor disagree,” or in a category not shown, such as “don’t know”; these responses were not included in the analysis.

#### STATISTICAL ANALYSIS

The unit of analysis was the patient visit. For statistical purposes, the visits were nested within unique physician–patient pairs. Some patients saw more than one physician and therefore contributed to more than one physician–patient pair. Many physicians were part of multiple physician–patient pairs, since they saw multiple patients (individual physicians who saw both black patients and white patients are represented in the counts of both visits by black patients and visits by white patients).

The distribution of visits by black patients and visits by white patients among physicians was estimated by means of logistic regression, with random effects for each physician, with the use of SAS software (version 8.12). The estimated random effects were used to calculate the proportion of black patients in each physician’s Medicare patient panel. This approach was used to correct for sampling error.

The responses to the questions in the Community Tracking Study Physician Survey were evaluated with the use of SUDAAN software (version 7.0), to accommodate the multilevel design of the survey.<sup>26</sup> Associations between the patient’s race and the physician’s characteristics were analyzed with the use of unadjusted logistic regression, with the patient’s race as the outcome. Associations between the patient’s race and the physician’s self-reports of access to resources were analyzed with the use of both unadjusted and adjusted logistic regression. In the primary analysis, the race of the patient was the outcome. In the secondary analysis, performed with the use of cumulative logistic regression, the race of the patient was the predictor and the physician’s response to the survey question was the ordered outcome.

In the adjusted analysis, we included measures of the payer mix, with binary variables for the categories of charity care and urban or rural location and continuous variables for the proportion of revenue the practice derived from Medicare, Medicaid, and managed-care plans; median income within the area of the ZIP Code of the practice; and the lev-

el of the availability of resources in the county in which the practice was located, according to the 2001 Area Resource File. For the analysis of the physicians’ ability to gain access to specialists, the measure of available resources was the number of patient care surgeons and medical subspecialists per capita. For the analysis of the physicians’ ability to gain access to nonemergency admission and hospital days, the measure of available resources was the number of short-term hospital beds per capita. For the analysis of the physicians’ ability to gain access to high-quality imaging, the measure of available resources was the number of patient care radiologists per capita. In a separate analysis (data not shown), adjusted for the median income within the ZIP Code of the patient’s residence rather than the ZIP Code of the physician’s practice, our findings were similar to those reported here.

To evaluate whether the characteristics of the population of primary care physicians in the geographic area where black patients and white patients received care were similar to those of the physicians who actually saw black patients and white patients in that area, we analyzed data on physicians’ characteristics with the use of two geographic categories used in the Dartmouth Atlas of Health Care project: the Hospital Service Area (a small geographic unit) and the Hospital Referral Region (a larger geographic unit) (information on these categories is available at [www.dartmouthatlas.org](http://www.dartmouthatlas.org)). We analyzed data on all physicians included in our study and generated weighted averages of these characteristics with respect to the geographic location of the visits with black patients and white patients.

Our findings are reported after weighting, which was performed to render them nationally representative. All P values are two-sided. The study was approved by the Center for Medicare and Medicaid Services under Data Use Agreement number 12993. The institutional review board officer at Mathematica Policy Research who oversees the conduct of the Community Tracking Study approved the confidentiality provisions of our study and determined that the Medicare data linkage did not violate the guidelines of the Community Tracking Study.

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## RESULTS

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#### DISTRIBUTION OF VISITS

The distribution of visits by Medicare patients who were white or black among primary care physicians

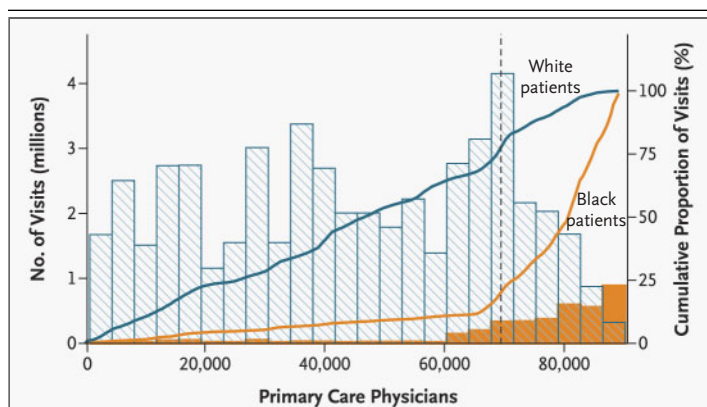
is shown in Figure 1, ordered according to the proportion of black patients in each physician's practice. The height of the bars reflects the number of visits by white patients and black patients. The cumulative-distribution Lorenz curves indicate that the bulk of visits by black patients are clustered among physicians whose patient panels include a higher percentage of blacks, whereas only a small percentage of visits by white patients are with these physicians. Visits by white patients are mostly with physicians who provide only a small amount of care to black patients. Of primary care physicians, 78 percent (68,311 physicians) with a relatively small proportion of black patients in their practice account for 78 percent of the visits by white patients but only 20 percent of all visits by black patients, whereas the remaining 22 percent of primary care physicians (19,492) account for 80 percent of all visits by black patients and 22 percent of visits by white patients. If visits by black patients and white patients were equally distributed among physicians, the Lorenz curves in Figure 1 would be superimposed on each other.

#### CHARACTERISTICS OF PHYSICIANS

Both primary care physicians treating black patients and those treating white patients were typically near 50 years of age, male, non-Hispanic, and working in solo or two-physician practices in an urban location (Table 1). Even though the majority of visits by both black patients (59.7 percent) and white patients (85.3 percent) were to white physicians, visits by black patients were markedly more likely than visits by white patients to be to black physicians (22.4 percent vs. 0.7 percent). Physicians treating black patients provided more charity care, derived a higher percentage of their practice revenue from Medicaid, more often practiced in low-income neighborhoods, and were less likely to have obtained board certification in their primary specialty (77.4 percent vs. 86.1 percent,  $P=0.02$ ) than physicians treating white patients.

#### ACCESS TO IMPORTANT HEALTH CARE SERVICES

The physicians' assessment of their ability to provide particular aspects of care to their patients also differed with respect to the race of the patient (Table 2). When physicians were asked if they were able to provide access to high-quality care for all of their patients, 27.8 percent of physicians treating black patients responded that they could not do so ("disagreed"), as compared with 19.3 percent of



**Figure 1. Estimated National Distribution of Visits to Primary Care Physicians by White Medicare Beneficiaries and Black Medicare Beneficiaries.**

The physicians are shown in order of the proportions of their Medicare patients who are black, as opposed to white. The estimated number of visits by white patients (white hatched bars) and black patients (orange hatched bars) is indicated for each group of physicians, with the width of each bar encompassing 3600 physicians. The cumulative proportion of visits by white patients and by black patients is shown by the cumulative-distribution Lorenz curves. To the right of the vertical dashed line are the 19,492 primary care physicians (22 percent of all primary care physicians) who account for 80 percent of the visits by black Medicare patients and 22 percent of visits by white Medicare patients. To the left of that line are the 68,311 primary care physicians (78 percent of all primary care physicians) who account for 78 percent of all visits by white Medicare patients but only 20 percent of all visits by black Medicare patients.

physicians treating white patients. They were also more likely than physicians treating white patients to report that they could "not always" provide access for their patients to subspecialists of high quality (24.0 percent vs. 17.9 percent), high-quality diagnostic imaging (24.4 percent vs. 16.6 percent), nonemergency hospital admissions (48.5 percent vs. 37.0 percent), and high-quality ancillary services (36.6 percent vs. 27.7 percent). These findings were significant in both unadjusted and adjusted analyses; the finding with regard to access to specialists was not significant in the cumulative logistic-regression analysis (data not shown).

#### GEOGRAPHIC DIFFERENCES AND PHYSICIANS' CHARACTERISTICS

We assessed whether the differences between physicians treating black patients and those treating white patients were associated with the characteristics of physicians practicing in the geographic areas where black patients and white patients received their care (Table 3). This type of geographic

**Table 1. Characteristics of Primary Care Physicians According to Visits by White and Black Medicare Beneficiaries.\***

Characteristic of Physicians	Visits by White Patients	Visits by Black Patients	Odds Ratio (95% CI) <sup>†</sup>	P Value
No. of physician–patient pairs	41,545	3211		
Mean age	48.3±0.27	49.1±0.66	1.01 (1.00–1.02)	0.18
Sex — % (no. of pairs)				
Male	85.6 (34,860)	82.3 (2491)	0.78 (0.60–1.02)	0.07
Female	14.4 (6685)	17.7 (720)	1.00	
Race — % (no. of pairs)				
White	85.3 (35,824)	59.7 (1947)	1.00	<0.001 <sup>‡</sup>
Black	0.7 (370)	22.4 (650)	39.9 (21.1–75.3)	
Asian	11.2 (3939)	15.7 (483)	1.69 (1.02–2.81)	
Other	2.7 (1067)	2.3 (98)	0.81 (0.44–1.52)	
Hispanic ethnic background — % (no. of pairs)				
Yes	3.6 (1458)	2.8 (97)	0.78 (0.51–1.20)	0.26
No	96.4 (39,925)	97.2 (3103)	1.00	
Type of practice — % (no. of pairs)				
Hospital or medical school	16.3 (7428)	16.5 (781)	1.00	0.29
Solo or two-physician	42.2 (15,331)	47.5 (1237)	1.11 (0.79–1.56)	
Group	34.8 (15,011)	29.7 (868)	0.84 (0.60–1.18)	
HMO	1.3 (659)	0.6 (45)	0.48 (0.24–0.95)	
Other	5.4 (3116)	5.7 (280)	1.04 (0.74–1.45)	
Location of practice — % (no. of pairs)				
Urban	73.0 (34,256)	72.9 (2744)	1.00 (0.45–2.32)	0.99
Rural	27.0 (7289)	27.1 (467)	1.00	
Income in area of practice				
Mean ±SE	\$52,963±777	\$44,045±1876	0.97 (0.95–0.99)	<0.001
No. of pairs	40,722	3039		
Provide some charity care each mo — % (no. of pairs)				
Yes	78.8 (31,317)	83.4 (2452)	1.35 (0.98–1.85)	0.06
No	21.2 (10,228)	16.6 (759)	1.00	
Source of practice revenue — % (no. of pairs)				
Medicare	42.0±0.69 (41,545)	40.8±1.46 (3211)	1.00 (0.99–1.00)	0.43
Managed care	37.0±1.10 (41,545)	35.0±1.82 (3211)	1.00 (0.99–1.00)	0.14
Medicaid	9.3±0.37 (41,545)	13.4±0.73 (3211)	1.03 (1.02–1.04)	<0.001
Primary care specialty — % (no. of pairs)				
Internal medicine	56.1 (20,898)	65.4 (1884)	1.00	0.26
Family practice	39.9 (18,881)	30.4 (1173)	0.65 (0.39–1.09)	
General practice	4.0 (1766)	4.2 (154)	0.90 (0.58–1.39)	
Medical education — % (no. of pairs)				
Graduate of U.S. medical school	81.9 (34,531)	79.2 (2528)	0.85 (0.60–1.18)	0.32
Graduate of foreign medical school	18.2 (7014)	20.8 (683)	1.00	
Board certification — % (no. of pairs)				
Board certified	86.1 (36,570)	77.4 (2644)	0.55 (0.33–0.92)	0.02
Not board certified	13.9 (4822)	22.6 (559)	1.00	

\* Plus–minus values are means ±SE. Number of pairs refers to the number of physician–patient pairs. Means and percentages for a given characteristic reflect weighted estimates and may not bear a numerical relation to the number of pairs. CI denotes confidence interval, and HMO health maintenance organization. A group practice was considered to include three or more physicians.

<sup>†</sup> For categorical variables, the odds ratio represents the likelihood that the patient in a given physician–patient pair, represented by a visit, is black as opposed to white. For continuous variables, the odds ratio represents the likelihood that the patient in a given physician–patient pair is black as opposed to white for each unit of increase (i.e., one year of age, \$1,000 of income in the location of the practice, or an increase of 1 percent in the revenue of the practice).

<sup>‡</sup> Hypothesis tests excluded 8 of the 60 sites in the Community Tracking Study Survey, because not all race or ethnic group combinations were present in these sites.

**Table 2. Primary Care Physicians' Perceptions of the Quality of Care Provided in Relation to the Race of Patient.\***

Index of Quality of Care — % (no. of pairs)	Visits by White Patients	Visits by Black Patients	Unadjusted Odds Ratio (95% CI)†	P Value	Adjusted Odds Ratio (95% CI)†	P Value
Access to high-quality specialists						
Always	82.1 (33,271)	76.0 (2437)	0.69 (0.47–1.01)	0.05	0.67 (0.46–0.99)	0.04
Not always	17.9 (8189)	24.0 (774)	1.00		1.00	
Access to high-quality diagnostic imaging						
Always	83.4 (34,443)	75.6 (2449)	0.62 (0.42–0.91)	0.01	0.60 (0.43–0.84)	0.003
Not always	16.6 (7082)	24.4 (762)	1.00		1.00	
Access to nonemergency hospital admission						
Always	63.0 (23,414)	51.5 (1613)	0.62 (0.48–0.81)	<0.001	0.69 (0.53–0.90)	<0.001
Not always	37.0 (13,946)	48.5 (1261)	1.00		1.00	
Access to an adequate number of inpatient days						
Always	63.4 (24,058)	55.1 (1549)	0.71 (0.50–1.00)	0.05	0.74 (0.52–1.05)	0.08
Not always	36.6 (13,761)	44.9 (1328)	1.00		1.00	
Access to high-quality ancillary services						
Always	72.3 (29,556)	63.4 (2039)	0.66 (0.47–0.95)	0.02	0.69 (0.49–0.97)	0.03
Not always	27.7 (11,875)	36.6 (1168)	1.00		1.00	
Able to deliver high-quality care to all patients						
Agree	80.7 (32,588)	72.2 (2398)	0.62 (0.44–0.87)	0.005	0.68 (0.48–0.95)	0.02
Disagree	19.3 (7960)	27.8 (688)	1.00		1.00	
Have good communication with subspecialists						
Agree	88.5 (34,773)	85.9 (2573)	0.79 (0.55–1.13)	0.19	0.77 (0.54–1.09)	0.14
Disagree	11.5 (5638)	14.1 (584)	1.00		1.00	

\* Number of pairs refers to the number of physician–patient pairs. Values are weighted and may not bear a numerical relation to the number of pairs. CI denotes confidence interval.

† For each variable, the odds ratio represents the likelihood that the patient in a given physician–patient pair, represented by a visit, is black as opposed to white. Adjusted odds ratios have been adjusted for payer mix, with binary variables for the categories of charity care and urban or rural location and continuous variables for the proportion of revenue the practice derived from Medicare, Medicaid, and managed-care plans; median income within the area of the ZIP Code of the practice; and the level of the availability of resources of the county in which the practice was located, according to the 2001 Area Resource File.

explanation of the quality of health care has been explored in other studies of racial differences in health care.<sup>27,28</sup>

The degree of racial concordance between patient and physician appeared greater than what would be expected if the local availability of physicians of different races were the only explanation of the matching of the patient's and physician's race (Table 3). Of visits by black patients in our study, 22.4 percent were to physicians who were black, whereas in the Hospital Service Areas and Hospital

Referral Regions, the percentage of black physicians was lower — 12.5 percent and 6.7 percent, respectively — a finding that supports the hypothesis that black patients preferentially seek care from primary care physicians of their own race.<sup>29,30</sup>

Other characteristics of the primary care physicians treating white patients and those treating black patients were similar to the overall population of primary care physicians in the geographic areas where the visits occurred. For example, 77.4 percent of visits by black patients were to physi-

**Table 3. Characteristics of Primary Care Physicians Who Treated White Patients and Those Who Treated Black Patients and of the Overall Population in the Areas Where Visits Occurred.\***

Variable	White Patients			Black Patients		
	Patient Visits	Average in Hospital Service Area	Average in Hospital Referral Region	Patient Visits	Average in Hospital Service Area	Average in Hospital Referral Region
<i>percentage of physicians</i>						
<b>Physician characteristic</b>						
Race						
White	85.3	81.5	80.1	59.7	69.7	75.2
Black	0.7	2.5	3.5	22.4	12.5	6.7
Asian	10.3	13.0	13.2	15.7	13.0	14.8
Other	2.5	3.0	3.2	2.3	4.8	3.3
Board certified	86.1	85.5	85.1	77.4	77.7	80.1
<b>Index of quality of care</b>						
Access to services						
High-quality specialists	82.1	79.7	79.2	76.0	76.6	78.8
Diagnostic imaging	83.4	81.1	80.7	75.6	76.7	79.6
Hospital admission	63.0	62.3	62.0	51.5	56.1	59.5
Days in hospital	63.4	61.8	61.4	55.1	55.7	58.6
Ancillary services	72.3	69.6	69.2	63.4	63.9	66.9
Able to provide high-quality care	80.7	79.8	79.7	72.2	75.3	77.9
Good communication with subspecialists	88.5	86.1	85.3	85.9	84.8	85.3

\* Location is defined according to categories used in the Dartmouth Atlas of Health Care Project as the Hospital Service Area (a small geographic unit) and the Hospital Referral Region (a larger geographic unit). Data show percentages of responses of primary care physicians participating in the Community Tracking Study Physician Survey in 2000 and 2001. Each patient visit is categorized according to whether the patient is white or black.

Physicians who were board certified; the average rates of board certification in the areas where the visits occurred were 77.7 percent according to the Hospital Service Area and 80.1 percent according to the Hospital Referral Region.

## DISCUSSION

We evaluated the hypothesis that differences between primary care physicians who treat black patients and those who treat white patients play a role in health care disparities. We found that visits by black patients were highly concentrated among a small subgroup of primary care physicians, were more often with physicians who were not board certified in their primary specialty, and were more often with physicians who reported facing obstacles in gaining access to high-quality services for their patients. Each of these observations potentially has implications for disparities in health care.

In our study, the great majority of the visits by

black patients (80 percent) were to a small group of primary care physicians (22 percent of the total), whereas the remaining physicians (78 percent) accounted for the majority of visits by white patients. This finding indicates that the care of black patients and white patients rests to a large extent in the hands of different physicians. Disparities in health care could emerge if these two groups of physicians differed in their ability to provide high-quality care, either because of differences in their clinical training or because of differences in their access to resources. In addition, our study shows that it would be possible to identify physicians who treat black patients or who treat white patients through claims databases.

The differences in the rates of board certification between the two groups of physicians support the notion that the poorer quality of care received by black patients may in part result from the fact that their physicians are less well trained than those who mostly treat white patients. For in-

stance, the rates of screening for most diseases are lower among black patients than among white patients, and black patients more often than white patients receive diagnoses when diseases are at a relatively advanced stage. Previous research has shown that physicians who scored poorly on their licensure examinations or who are not board certified in their specialty are less likely to follow screening recommendations and more likely to prescribe symptom-directed treatment, rather than diagnosis-directed treatment — tendencies that may result in delayed diagnoses.<sup>31-35</sup>

The differences in physicians' reported ease of access to services for their patients point to additional mechanisms underlying health care disparities. Differences in access to subspecialists, imaging studies, nonemergency hospital admission, and ancillary services might help explain why black patients see fewer subspecialists and receive less timely treatment for complex chronic illnesses than do white patients.<sup>36-39</sup>

Our findings should be interpreted within the context of the data that we analyzed. The responses of physicians regarding access to resources are necessarily subjective and reflect the physicians' experience with all their patients, not only with the Medicare patients included in our analysis. Moreover, we cannot be certain of the extent to which differences in physicians' responses signify differences in the care that their patients received, because we did not examine patients' outcomes. We could not consider the role of some other identified deficiencies in primary care of black patients. For example, predominantly black communities have fewer primary care doctors than predominantly white communities; black patients are more likely than white patients to receive care in inpatient and emergency-department settings, rather than outpatient settings; and a larger fraction of visits for primary care by black patients are to physicians with whom the patients do not have an established relationship.<sup>40-42</sup>

Because health care disparities are pervasive and because the disparities are not due solely to differences in the patients' insurance coverage, hypotheses regarding the role of physicians in their gene-

sis have emerged. One hypothesis is that most physicians, because they are not black, lack the necessary cultural competence needed to treat black patients effectively.<sup>43</sup> To redress this problem, many organizations have recommended that the physician workforce be enriched with more physicians who are members of minority groups and that training in cultural competence be mandated.<sup>44</sup> Our findings provide an indication of the extent to which black patients are currently receiving care from black physicians and of the extent to which these patients appear to make a special effort to do so.<sup>45-49</sup>

Without vitiating these hypotheses, our findings reveal other imbalances in the health care system that may underlie disparities in the delivery of health care. Black patients in the Medicare program, and presumably other black patients as well, are treated by a group of physicians who may differ in important ways from the physicians who treat white patients. That these differences reflect characteristics of the physicians who practice where black persons and white persons receive care suggests that our findings are the result of the distribution of physicians in the United States and not patients' choice. Further research is needed to evaluate the extent to which differences in training and resources between physicians who treat black patients and physicians who treat white patients affect patients' outcomes. Then, we could explore whether efforts to reduce disparities in the provision of health care should be focused on improving the care that physicians who treat black patients are able to deliver.

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## REFERENCES

1. Department of Health and Human Services. Healthy People 2010: understanding and improving health. 2nd ed. Washington, D.C.: Government Printing Office, November 2000.
2. Ashford A, Gemson D, Sheinfeld Gorin SN, et al. Cancer screening and prevention practices of inner-city physicians. *Am J Prev Med* 2000;19:59-62.
3. Gemson DH, Elinson J, Messeri P. Differences in physician prevention practice patterns for white and minority patients. *J Community Health* 1988;13:53-64.
4. Schneider EC, Zaslavsky AM, Epstein AM. Racial disparities in the quality of care

- for enrollees in Medicare managed care. *JAMA* 2002;287:1288-94.
5. Mukamel DB, Murthy AS, Weimer DL. Racial differences in access to high-quality cardiac surgeons. *Am J Public Health* 2000; 90:1774-7.
  6. Heslin K, Andersen RM, Ettner SL, Cunningham WE. Racial and ethnic differences in access to physicians with HIV-related expertise: findings from a nationally representative study. Presented at the Academy Health 20th Annual Research Meeting, Nashville, June 27-29, 2003. abstract.
  7. van Ryn M. Research on the provider contribution to race/ethnicity disparities in medical care. *Med Care* 2002;40:Suppl: I-140-I-51.
  8. Ayanian JZ, Landrum MB, Guadagnoli E, Gaccione P. Specialty of ambulatory care physicians and mortality among elderly patients after myocardial infarction. *N Engl J Med* 2002;347:1678-86.
  9. Lurie N, Buntin MB. Health disparities and the quality of ambulatory care. *N Engl J Med* 2002;347:1709-10.
  10. Shi L, Starfield B, Politzer R, Regan J. Primary care, self-rated health, and reductions in social disparities in health. *Health Serv Res* 2002;37:529-50.
  11. Blumenthal D, Mort E, Edwards J. The efficacy of primary care for vulnerable population groups. *Health Serv Res* 1995;30: 253-73.
  12. Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in quality: addressing socioeconomic, racial, and ethnic disparities in health care. *JAMA* 2000;283:2579-84.
  13. Shi L, Macinko J, Starfield B, Xu J, Politzer R. Primary care, income inequality, and stroke mortality in the United States: a longitudinal analysis, 1985-1995. *Stroke* 2003; 34:1958-64.
  14. Landon BE, Reschovsky J, Blumenthal D. Changes in career satisfaction among primary care and specialist physicians, 1997-2001. *JAMA* 2003;289:442-9.
  15. Landon BE, Reschovsky J, Reed M, Blumenthal D. Personal, organizational, and market level influences on physicians' practice patterns: results of a national survey of primary care physicians. *Med Care* 2001;39: 889-905.
  16. St Peter RF, Reed MC, Kemper P, Blumenthal D. Changes in the scope of care provided by primary care physicians. *N Engl J Med* 1999;341:1980-5.
  17. Kemper P, Blumenthal D, Corrigan JM, et al. The design of the community tracking study: a longitudinal study of health system change and its effects on people. *Inquiry* 1996;33:195-206.
  18. 2002 Data compendium. Baltimore: Centers for Medicare & Medicaid Services, 2002.
  19. Physicians' current procedural terminology: CPT 1999. Chicago: American Medical Association, 1999.
  20. Lauderdale DS, Goldberg J. The expanded racial and ethnic codes in the Medicare data files: their completeness of coverage and accuracy. *Am J Public Health* 1996; 86:712-6.
  21. Bach PB, Guadagnoli E, Schrag D, Schussler N, Warren JL. Patient demographic and socioeconomic characteristics in the SEER-Medicare database applications and limitations. *Med Care* 2002;40:Suppl:IV-19-IV-25.
  22. Arday SL, Arday DR, Monroe S, Zhang J. HCFA's racial and ethnic data: current accuracy and recent improvements. *Health Care Financ Rev* 2000;21(4):107-16.
  23. Aaron KF, Clancy CM. Improving quality and reducing disparities: toward a common pathway. *JAMA* 2003;289:1033-4.
  24. Baldwin L, Adamache W, Klabunde CN, Kenward K, Dahlman C, Warren JL. Linking physician characteristics and Medicare claims data: issues in data availability, quality, and measurement. *Med Care* 2002;40: Suppl:IV-82-IV-95.
  25. Best AE. Secondary data bases and their use in outcomes research: a review of the Area Resource File and the Healthcare Cost and Utilization Project. *J Med Syst* 1999;23: 175-81.
  26. Shah BV, Barnwell BG, Bieler GS. SUDAAN user's manual, release 7.0. Research Triangle Park, N.C.: Research Triangle Institute, 1996.
  27. Chandra A, Skinner J. Geography and racial health disparities. NBER working paper no. W9513. Cambridge, Mass.: National Bureau of Economic Research, February 2003.
  28. Skinner J, Weinstein JN, Sporer SM, Wennberg JE. Racial, ethnic, and geographic disparities in rates of knee arthroplasty among Medicare patients. *N Engl J Med* 2003;349:1350-9.
  29. Saha S, Taggart SH, Komaromy M, Bindman AB. Do patients choose physicians of their own race? *Health Aff (Millwood)* 2000; 19(4):76-83.
  30. Laveist TA, Nuru-Jeter A. Is doctor-patient race concordance associated with greater satisfaction with care? *J Health Soc Behav* 2002;43:296-306.
  31. Ramsey PG, Carline JD, Inui TS, Larson EB, LoGerfo JP, Wenrich MD. Predictive validity of certification by the American Board of Internal Medicine. *Ann Intern Med* 1989; 110:719-26.
  32. Tamblin R, Abrahamowicz M, Dauphinee WD, et al. Association between licensure examination scores and practice in primary care. *JAMA* 2002;288:3019-26.
  33. Norcini JJ, Lipner RS, Kimball HR. Certifying examination performance and patient outcomes following acute myocardial infarction. *Med Educ* 2002;36:853-9.
  34. Sharp LK, Bashook PG, Lipsky MS, Horowitz SD, Miller SH. Specialty board certification and clinical outcomes: the missing link. *Acad Med* 2002;77:534-42.
  35. Meyers DG, Steinkle BT. Awareness of consensus preventive medicine practice guidelines among primary care physicians. *Am J Prev Med* 1997;13:45-50.
  36. Canto JG, Allison JJ, Kiefe CI, et al. Relation of race and sex to the use of reperfusion therapy in Medicare beneficiaries with acute myocardial infarction. *N Engl J Med* 2000; 342:1094-100.
  37. Kinchen KS, Sadler J, Fink N, et al. The timing of specialist evaluation in chronic kidney disease and mortality. *Ann Intern Med* 2002;137:479-86.
  38. Blustein J, Weiss LJ. Visits to specialists under Medicare: socioeconomic advantage and access to care. *J Health Care Poor Underserved* 1998;9:153-69.
  39. Bach PB, Cramer LD, Warren JL, Begg CB. Racial differences in the treatment of early-stage lung cancer. *N Engl J Med* 1999; 341:1198-205.
  40. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med* 1996;334: 1305-10.
  41. Gornick ME, Eggers PW, Reilly TW, et al. Effects of race and income on mortality and use of services among Medicare beneficiaries. *N Engl J Med* 1996;335:791-9.
  42. Williams RL, Flocke SA, Stange KC. Race and preventive services delivery among black patients and white patients seen in primary care. *Med Care* 2001;39:1260-7.
  43. Smedley BD, Stith AY, Nelson AR, eds. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, D.C.: National Academy Press, 2003.
  44. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce. *Health Aff (Millwood)* 2002;21(5):90-102.
  45. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA* 1999; 282:583-9.
  46. Xu G, Fields SK, Laine C, Veloski JJ, Barzansky B, Martini CJ. The relationship between the race/ethnicity of generalist physicians and their care for underserved populations. *Am J Public Health* 1997;87: 817-22.
  47. Saha S, Komaromy M, Koepsell TD, Bindman AB. Patient-physician racial concordance and the perceived quality and use of health care. *Arch Intern Med* 1999;159: 997-1004.
  48. Moy E, Bartman BA. Physician race and care of minority and medically indigent patients. *JAMA* 1995;273:1515-20.
  49. LaVeist TA, Carroll T. Race of physician and satisfaction with care among African-American patients. *J Natl Med Assoc* 2002; 94:937-43.

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