SPECIAL ARTICLE

THE ROLE OF BLACK AND HISPANIC PHYSICIANS IN PROVIDING HEALTH CARE FOR UNDERSERVED POPULATIONS

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Abstract *Background.* Patients who are members of minority groups may be more likely than others to consult physicians of the same race or ethnic group, but little is known about the relation between patients' race or ethnic group and the supply of physicians or the likelihood that minority-group physicians will care for poor or black and Hispanic patients.

Methods. We analyzed data on physicians' practice locations and the racial and ethnic makeup and socioeconomic status of communities in California in 1990. We also surveyed 718 primary care physicians from 51 California communities in 1993 to examine the relation between the physicians' race or ethnic group and the characteristics of the patients they served.

Results. Communities with high proportions of black and Hispanic residents were four times as likely as others to have a shortage of physicians, regardless of community income. Black physicians practiced in areas where the percentage of black residents was nearly five times as high, on average, as in areas where other physicians practiced. Hispanic physicians practiced in areas where the percentage of Hispanic residents was twice as high as in areas where other physicians practiced. After we controlled for the racial and ethnic makeup of the community, black physicians cared for significantly more black patients (absolute difference, 25 percentage points; $P<0.001$) and Hispanic physicians for significantly more Hispanic patients (absolute difference, 21 percentage points; $P<0.001$) than did other physicians. Black physicians cared for more patients covered by Medicaid ($P=0.001$) and Hispanic physicians for more uninsured patients ($P=0.03$) than did other physicians.

Conclusions. Black and Hispanic physicians have a unique and important role in caring for poor, black, and Hispanic patients in California. Dismantling affirmative-action programs, as is currently proposed, may threaten health care for both poor people and members of minority groups. (N Engl J Med 1996;334:1305-10.)

MANY studies have documented racial and ethnic disparities in the U.S. health care system. Blacks and Hispanics have less access to health care, and the quality and outcomes of the care they receive are worse than those of non-Hispanic whites.[1-4] Little is known, however, about the physicians who provide care to these underserved groups. Poor urban communities have fewer physicians per capita than do more affluent areas,[5] but there have been no systematic studies of the relation between the racial and ethnic characteristics of a community and the distribution of physicians. A limited body of research suggests that physicians who are members of minority groups may have an important role in serving minority populations. Among graduates of U.S. medical schools in 1975, black and Hispanic physicians were more likely than non-Hispanic whites to practice in areas with a shortage of physicians and to care for black and Hispanic patients.[6] A more recent survey of a large population found that black and Hispanic patients are more likely than others to report that they have a black or Hispanic physician.[7]

Because knowledge is limited about the supply of physicians in largely minority communities and about the types of physicians who serve minority populations, we investigated the relations among the racial or ethnic characteristics of physicians, the supply of physicians, and physicians' likelihood of caring for poor and minority-group patients in California. These issues are particularly timely because affirmative-action programs were recently abolished in the California state university system and affirmative-action policies have become a prominent political issue.[8] Our study had three aims: to examine the distribution of physicians and how it relates to the demographic characteristics of California communities; to examine the relation between the race or ethnic background of physicians and the characteristics of the communities where they practice; and to assess the relation between a physician's race or ethnic group and the racial or ethnic distribution and insurance status of his or her patients.

METHODS

To address the first aim of our study, we used the Physician Masterfile of the American Medical Association (AMA) and U.S. Census data to examine the distribution of physicians throughout California and the association of that distribution with demographic features of the communities where physicians practiced. Because routinely collected data on the supply of physicians do not include physicians' race

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or ethnic group, we next surveyed a sample of California physicians to obtain such information. This survey allowed us to address the second study aim, of linking information on physicians' race or ethnic background with census data on the racial and ethnic characteristics of the communities where these physicians practice. We also used data from our cross-sectional survey of California physicians to address the third aim of the study — to identify the characteristics of patients who are actually cared for by physicians from various racial or ethnic groups.

For purposes of categorizing both community residents and physicians, we used the following mutually exclusive categories for race and ethnic groups: black, Hispanic, non-Hispanic white, and Asian.

Sources of Data

We used the 1990 AMA Physician Masterfile to determine the numbers of physicians practicing in California communities. This file contains information on all allopathic physicians and many osteopathic physicians in the United States, including physicians who are not AMA members.[9] We included only office-based primary care physicians, defined as those who designated themselves as in the fields of family practice, general practice, general internal medicine, general pediatrics, or obstetrics and gynecology.[10] Areas with shortages of primary care physicians were defined as those with fewer than 30 office-based primary care physicians per 100,000 population.[10]

Using state work-force–planning guidelines, we grouped all California ZIP Codes into 394 community areas, 250 of which were urban and 144 rural.[11] A physician was counted in the area containing the ZIP Code of his or her business mailing address, as obtained from the Masterfile.

We used data from the 1990 U.S. Census to determine the demographic characteristics of each area. We designated areas above the 85th percentile among all California community areas in the proportion of black and Hispanic residents as "high black" or "high Hispanic." These were areas where more than 10 percent of the people were black or more than 46 percent were Hispanic; the areas included 62 percent of all black state residents and 32 percent of all Hispanic residents. We defined areas of poverty as those in which more than 25 percent of the residents had yearly household incomes of less than $15,000.

For the survey of physicians, we used the 1993 AMA Masterfile to obtain a random sample of general internists, family physicians, and general practitioners in office-based or hospital-based practice in 51 areas randomly selected from the 394 California community areas. Because this survey was conducted as part of a larger study examining the access of adults to primary care for chronic medical conditions, the sample did not include pediatricians or obstetrician–gynecologists.[12] Respondents were asked to specify their race or ethnic group and were asked to characterize the racial and ethnic makeup of the patients in their practices and the distribution of types of insurance coverage (private, Medicaid, Medicare, or uninsured).

Finally, because the potential practice locations of minority-group physicians may be limited because of discrimination, rather than reflecting choice on the part of these physicians, we examined the practice locations chosen by graduates of the University of California, San Francisco (UCSF), School of Medicine, whose graduates (from whatever racial or ethnic group) were likely to have had a wide variety of practice locations from which to choose. UCSF has the highest proportion of graduates from underrepresented minorities of any medical school in the United States other than traditionally black schools.[13] We used data from the UCSF School of Medicine to determine the race or ethnic group and practice location of each of 1713 physicians who entered the medical school between 1969 and 1984 and who currently practice in California (about 65 percent of all graduates in these years). This sample included both primary care physicians and specialists.

Statistical Analysis

Using data from the 1990 AMA Masterfile and the U.S. Census, we calculated the total number of physicians and the number of primary care physicians per 100,000 population for each of the 394 community areas. We then classified these communities as urban or rural and as areas of poverty or non-poverty areas; we then examined how the supply of physicians related to the racial and ethnic makeup of the communities within each stratum. We performed multiple linear regression analyses to examine the independent association between the demographic characteristics of an area (the percentage of low-income residents, the percentage of black residents, the percentage of Hispanic residents, the mean age of the population, and the percentage of males) and the supply of physicians.

We explored the relation between the racial and ethnic characteristics of physicians and the demographic characteristics of the areas where they practiced by combining data from the cross-sectional survey of California physicians with census data. We used analysis of variance and t-tests to compare crude means. We examined differences among physicians of differing racial and ethnic groups in terms of the demographic features of their practice locations and the supply of primary care physicians in those communities. We then examined the relation between a physician's race or ethnic group and the racial and ethnic characteristics and insurance status of his or her patients. We used least-squares regression analysis to identify the characteristics of physicians that were associated with caring for greater numbers of black patients or Hispanic patients. We included graduation from a medical school in the top quartile in terms of federal grant funding as a characteristic of physicians in this analysis.[13]

Table 1. The Supply of Physicians and Demographic Characteristics of California Communities in 1990.

Characteristic*	No. of Communities	Primary Care Physicians/ 100,000†	Physicians/ 100,000†	Physician-Shortage Areas (%)‡
All communities	394	58.4	134.3	29
All urban communities	250	67.7	169.3	21
All rural communities	144	42.4	73.5	42
Urban communities				
Areas of poverty				
High black and high Hispanic	7	23.9	53.8	57
High black, not high Hispanic	23	42.8	104.8	44
High Hispanic, not high black	13	44.2	100.5	46
Neither high black nor high Hispanic	24	69.1	171.0	13
Non-poverty areas				
High black	24	54.4	126.0	42
High Hispanic, not high black	14	40.5	82.0	29
Neither high Hispanic nor high black	145	80.4	206.5	10
Rural communities				
Areas of poverty				
High black§	3	9.4	18.4	100
High Hispanic, not high black	17	17.8	24.4	82
Neither high Hispanic nor high black	55	46.0	76.6	40
Non-poverty areas				
High black§	3	12.1	14.8	100
High Hispanic, not high black	5	32.5	38.7	60
Neither high Hispanic nor high black	61	49.9	92.9	26

*High black and high Hispanic refer to areas above the 85th percentile in terms of the percentage of black and Hispanic residents, respectively, in the population. Areas of poverty were defined as those in which more than 25 percent of the households had yearly incomes below $15,000.

†Values are the mean numbers of active physicians providing patient care in office-based practice.

‡Physician-shortage areas were defined as those with fewer than 30 office-based primary care physicians per 100,000 population.

§The relatively small number of rural community areas with high proportions of black residents precluded our analyzing these areas according to the proportion of Hispanic residents.

We also examined differences in patients' racial and ethnic characteristics after controlling for the racial and ethnic makeup of the community. We calculated the mean proportion of patients covered by Medi-Cal (California Medicaid) and uninsured patients cared for by physicians in each racial–ethnic category. Among graduates of UCSF Medical School, we analyzed differences among physicians of differing racial and ethnic groups in the demographic features of their practice locations.

RESULTS

Supply of Physicians and Demographic Characteristics of the Community

The supply of physicians was much more strongly associated with the proportion of black and Hispanic residents in the community areas than with the areas' income level (Table 1). Among urban communities, the lowest physician-to-population ratio occurred in areas of poverty that had high proportions of both black and Hispanic residents. Urban areas of poverty that had neither a high proportion of black nor a high proportion of Hispanic residents had nearly three times as many primary care physicians per capita as areas with high proportions of both black and Hispanic residents. Similar patterns occurred in urban areas that were not poor. Even among rural areas, which had 40 percent fewer physicians overall than urban areas, the supply of physicians was lowest in areas with high percentages of minority-group residents, with the result that most rural areas with high proportions of black or Hispanic residents had a shortage of physicians.

In multiple regression analyses, the supply of physicians in both urban and rural areas remained inversely associated with the proportion of black and Hispanic residents (Table 2). For example, the regression coefficients in Table 2 indicate that in urban areas a 10-percentage-point absolute increase in the proportion of black residents in an area was associated with the presence of 8.9 fewer primary care physicians per 100,000 residents. After adjustment for race and ethnic group, the proportion of households with incomes below $15,000 was not significantly related to supply of physicians in the regression analyses. The same pattern was found when these demographic variables were used to predict whether an area met the definition of a physician-shortage area (data not shown).

Physicians' Race or Ethnic Group and Demographic Characteristics of the Community

Among the 1008 physicians surveyed, 71 percent responded; 39 (5 percent) identified themselves as black, 44 (6 percent) as Hispanic, 113 (16 percent) as Asian, and 522 (73 percent) as white. Eighty-one percent were men. The respondents and nonrespondents did not differ with respect to sex or whether they received training inside or outside the United States, but internists, family practitioners, and younger physicians were somewhat more likely to respond than others.

In general, Hispanic and black physicians practiced in areas with fewer primary care physicians per capita (Table 3). Their practices tended to be in poorer areas than those of non-Hispanic white physicians. Physicians generally practiced in areas with relatively high proportions of residents of their own race or ethnic group. Black physicians practiced in areas where the mean percentage of black residents was nearly five times as high as in areas where other physicians practiced (Table 3). Similarly, Hispanic physicians practiced in areas where the mean percentage of Hispanic residents was considerably higher than in areas where other physicians practiced.

Table 2. Association of Characteristics of Communities with the Supply of Primary Care Physicians.*

CHARACTERISTIC	URBAN COMMUNITIES		RURAL COMMUNITIES	
	REGRESSION COEFFICIENT	95% CI	REGRESSION COEFFICIENT	95% CI
Household income <$15,000 (%)	0.55	−0.14 to 1.3	−0.3	−0.98 to 0.39
Black race (%)	−0.89†	−1.4 to −0.40	−1.35‡	−2.7 to −0.05
Hispanic (%)	−0.9†	−1.2 to −0.56	−0.57†	−0.90 to −0.23
Mean age (yr)	1.57	−1.4 to 4.6	0.09	−2.8 to 3.0
Male sex (%)	−0.24	−2.1 to 1.6	−0.08	−1.4 to 1.3
	$R^2 = 0.18$		$R^2 = 0.21$	

*The data are from the multivariate analysis. CI denotes confidence interval.
†P≤0.001.
‡P≤0.005.

Physicians' Race or Ethnic Group and Patients' Race or Ethnic Group and Insurance Status

Physicians of each race or ethnic group cared for larger numbers of patients of their race or ethnic group. The difference was most striking for black physicians, who cared for nearly six times as many black patients as did other physicians, on average (Fig. 1). Hispanic physicians cared for nearly three times as many Hispanic patients as did other physicians.

In multivariate analyses, the only characteristic of the physician that predicted caring for a higher proportion of black patients was black race (Table 4). The regression coefficients in Table 4 indicate that, after adjustment for all other measured characteristics of physicians, black physicians cared for 42.9 percent more black patients than did other physicians of other races. Similarly, a physician's being Hispanic predicted his or her caring for Hispanic patients. In addition, in

Table 3. Relation between the Race or Ethnic Group of Physicians and the Characteristics of the Communities Where They Practice.*

RACE OR ETHNIC GROUP	PRIMARY CARE PHYSICIANS/ 100,000	RESIDENTS LIVING IN POVERTY (%)	BLACK RESIDENTS (%)	HISPANIC RESIDENTS (%)
Black (n = 39)	61†	48†	32†	35†
Hispanic (n = 44)	52	28	5	43
Non-Hispanic white (n = 522)	90	19	5	18
Asian (n = 113)	68	32	8	31

*The values shown are means.
†P<0.001 for the comparison with the other racial and ethnic groups.

both bivariate and multivariate analyses, family physicians, general practitioners, and graduates of foreign medical schools were more likely to care for Hispanic patients. The rank in terms of the amount of federal research funding of the medical school from which the physician graduated was not associated with the proportion of minority-group members among his or her patients.

We examined whether the higher proportions of black and Hispanic patients in black and Hispanic physicians' practices could be entirely accounted for by the greater proportions of members of these minority groups living in the areas where the physicians practiced. Even after adjustment for the proportion of black residents in the communities, black physicians cared for significantly more black patients, on average (absolute difference, 25 percentage points), than other physicians ($P<0.001$). Similarly, after we controlled for the proportion of Hispanic residents in the area, Hispanic physicians, on average, cared for significantly more Hispanic patients (absolute difference, 21 percentage points; $P<0.001$) than other physicians (data not shown).

Black physicians cared for more patients insured by Medicaid than did other physicians. On average, 45 percent of their patients were insured by Medicaid, as compared with 18 percent of the patients of non-Hispanic white physicians, 24 percent for Hispanic physicians, and 30 percent for Asian physicians ($P\leq0.001$ for each pairwise comparison of black physicians with physicians in the other groups). Hispanic physicians cared for more uninsured patients than physicians of other ethnic groups. On average, 9 percent of their patients were uninsured, as compared with 3 percent for black physicians, 4 percent for Asian physicians, and 6 percent for non-Hispanic white physicians ($P\leq0.03$ for each pairwise comparison of Hispanic physicians with physicians of other ethnic groups).

Choice of Practice Locations among Graduates of UCSF Medical School

Among the 1713 physicians who entered UCSF Medical School between 1969 and 1984, 1251 were non-Hispanic white, 187 were Asian, 163 Hispanic, 107 black, and 5 Native American; these figures include both primary care and non–primary care physicians.

The results were consistent with the findings of the survey of physicians. On average, black physicians practiced in areas with more black residents than did other physicians (14 percent vs. 6 percent, $P<0.001$), and Hispanic physicians practiced in areas with more Hispanic residents than did other physicians (19 percent vs. 12 percent, $P<0.001$).

Discussion

The supply of physicians in California communities is inversely associated with the proportion of black and Hispanic residents, whereas it differs only slightly according to the income level of the areas. This suggests that residents of communities with high percentages of minority-group members may be in particular need of health care services and that physicians who choose to practice in these areas fill a critical need.

Black and Hispanic physicians locate their practices in areas with higher proportions of residents from underserved minority groups. In addition, they care for higher proportions of patients of their own race or eth-

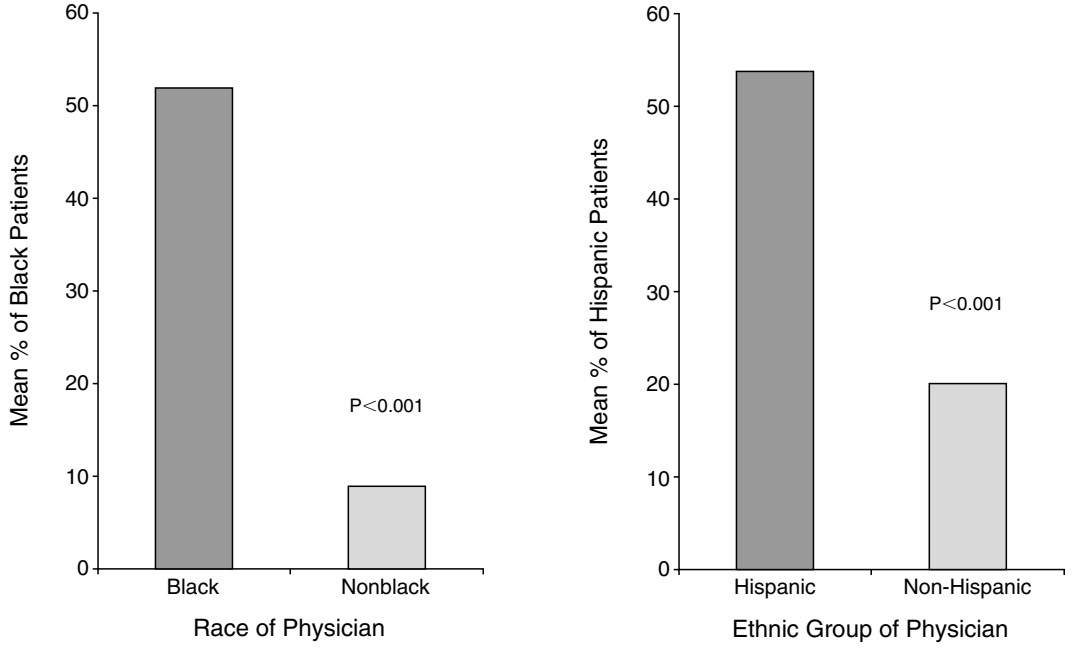

Figure 1. Relation of the Race or Ethnic Group of Physicians in California to the Race or Ethnic Group of the Patients in Their Practices.

Table 4. Association of Characteristics of Physicians with Caring for Black or Hispanic Patients.*

Characteristic	Predicting % of Black Patients		Predicting % of Hispanic Patients	
	regression coefficient	95% CI	regression coefficient	95% CI
Black race†	42.9‡	38 to 47	—	
Hispanic ethnic group§	—		30.2‡	25 to 36
Male sex	0.0	−2.5 to 2.5	−2.0	−5.5 to 1.5
Family or general practice¶	−0.3	−2.3 to 1.7	8.8‡	6.0 to 12
In practice >10 yr	−0.6	−3.0 to 1.7	−2.4	−5.8 to 0.9
Admits patients to public hospital	−0.9	−3.4 to 1.7	1.0	−2.6 to 4.7
Medical school				
Top quartile, U.S.‖	1.1	−1.2 to 3.4	−0.2	−3.5 to 3.0
Foreign	1.6	−0.9 to 4.2	10.9‡	7.4 to 14
Bottom 3 quartiles, U.S.‖	—		—	
	$R^2 = 0.34$		$R^2 = 0.24$	

*The data are from the multivariate analysis. CI denotes confidence interval.

†The reference group was all nonblack physicians.

‡$P<0.001$.

§The reference group was all non-Hispanic physicians.

¶The reference group was general internists.

‖In federal grant funding.

nic group and patients who are uninsured or are covered by Medicaid. Although all physicians tend to treat higher proportions of black and Hispanic patients if they practice in areas where there are more minority residents, black and Hispanic physicians consistently care for disproportionately high numbers of these patients. The practice-location patterns of graduates of UCSF Medical School were similar to those of a cross-sectional sample of primary care physicians. The fact that the physician's race or ethnic group predicted whether he or she would care for greater-than-average numbers of black or Hispanic patients, while the ranking of the medical school where the physician was trained was not predictive, suggests that differences in practice locations between black and Hispanic physicians and other physicians are at least in part reflective of the black and Hispanic physicians' decisions to practice in areas with higher proportions of members of their own race or ethnic group.

Our findings are based on data from California and may not be generalizable to other states. The data we analyzed on patients' racial and ethnic distribution and insurance status were reported by the physicians. However, earlier research suggests that though physicians may overestimate the absolute number of Medicaid patients they care for, the numbers they report are proportional to the number of such patients for whom they actually provide care.[14] Similarly, physicians may overestimate the absolute numbers of minority patients in their practices, but their estimates are likely to be proportional to the actual number of such patients for whom they actually care. Because physicians' reports were the source of information on the race and ethnic group and the insurance status of patients in their practices, we were unable to determine the relation between these two factors for individual patients. Therefore, we could not simultaneously control for patients' race or ethnic group and their insurance status in order to measure the independent effect of each of these characteristics.

Our findings may have implications for affirmative-action policies in education. Despite the fact that black and Hispanic physicians have an important role in caring for poor patients and members of minority groups, they are markedly underrepresented among physicians. In 1990, blacks made up 12 percent of the U.S. population, but only 4 percent of physicians; Hispanics made up 9 percent of the population, but only 5 percent of physicians.[15]

The implementation of affirmative-action programs coincided with dramatic changes in the enrollment of students from minority groups in U.S. medical schools. The proportion of minority matriculants approximately doubled from the late 1960s to the mid-1970s, during the period when affirmative-action programs were introduced.[16] In the mid-1970s, the percentage of matriculants from underrepresented minorities nationwide stopped rising,[17] and it has been suggested that this leveling off was in part attributable to the Supreme Court's decision in the *Bakke* case, in which a white student successfully claimed that race-based quotas had prevented him from gaining admission to the University of California. The percentage of students from minority groups remained relatively constant at about 9 percent until 1990, when it began to rise again. This change has been attributed to the introduction in the academic year 1990–1991 of the Association of American Medical Colleges' project "3000 by 2000," an attempt to augment existing affirmative-action programs. The program has been accompanied by a 37 percent increase nationwide in matriculants from underrepresented minority groups over five years,[15] and recent figures show that members of underrepresented minority groups currently make up 12 percent of all medical school students.

The value of affirmative-action programs is being widely questioned at both state and national levels. Because these programs have never before been scaled back, it is impossible to predict the effect that such changes could have on the supply of minority-group physicians. However, the strong temporal relation between affirmative-action programs and the number of minority medical students suggests that the medical schools' enrollment of blacks, Hispanics, and others has been responsive to changes in affirmative-action programs. Dismantling these programs might well result in a decrease in the numbers of physicians who are black, Hispanic, or from other ethnic and racial minor-

ities who will graduate from U.S. medical schools and serve U.S. residents.

It is difficult to predict how other changes now occurring in the health care system will affect the physicians who currently provide care for poor people and members of minority groups. The growth of managed care for Medicaid recipients may improve access to primary care and help "mainstream" these patients. It is also possible, however, that the organization of physicians into managed-care groups will exclude minority physicians who have been the traditional providers of care for these patients.

Our data suggest that physicians who are black or Hispanic fill an important role in caring for poor people and members of minority groups. Changes that result in a decrease in the number of physicians from minority groups are also likely to result in poorer access to health care and may ultimately result in reduced health and well-being for a substantial proportion of the population.

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