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The Association Among Specialty, Race, Ethnicity, and Practice Location Among California Physicians in Diverse Specialties

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Abstract

Background—Minority physicians are more likely than their counterparts to work in underserved communities and care for minority, poor, and uninsured patients, but much of this research has examined primary care physicians alone. Few have investigated whether non–primary care specialists of minority backgrounds are more likely to serve the underserved than nonminority specialists.

Objective—We examined whether underrepresented minority (URM) physicians from a wide variety of specialties are more likely than non-URM physicians to practice in underserved communities.

Methods—Using California Medical Board Physician Licensure Survey (2007) data for 48 388 physicians, we geocoded practice zip codes to medically underserved areas (MUAs) and primary care health professional shortage areas (HPSAs). Logistic regression models adjusting for age, gender, specialty, and other characteristics were used to explore associations with race, ethnicity, specialty, and designated underserved areas.

Results—We found that African American, Latino, and Pacific Islanders were more likely to work in MUAs and HPSAs than were white physicians (adjusted odds ratio, 1.22–2.25; $p < .05$). Similar patterns of practice in MUAs and HPSAs by physician race and ethnicity were found when performing the analyses separately among primary care physicians and physicians in non–primary care specialties.

Conclusion—In summary, our study underscores the importance of underrepresented minority physicians in all specialties for the physician workforce needs of disadvantaged communities. To improve health care for underserved communities, continued efforts to increase physician diversity are essential.

Keywords

workforce; physicians; access; underserved

INTRODUCTION

The limited racial and ethnic diversity of the health care workforce has been implicated as a contributor to disparities in health care access and health outcomes. The Institute of

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Medicine concluded that producing a diverse and adequate physician supply, particularly for geographic areas with many poor, racial/ethnic minority, and uninsured residents, is one of several solutions for eliminating health disparities.^{1,2} In medically underserved areas, both an adequate supply of primary care physicians and greater physician racial-ethnic diversity is associated with decreased disparities in access to care.³

Minority physicians are more likely than their counterparts to work in underserved communities and care for minority, poor, and uninsured patients.⁴⁻⁸ However, prior studies have almost exclusively focused on African American and Latino physicians, with limited examination of Asian, Pacific Islander and other racial/ethnic minority physicians, and have tended to only focus on primary care physicians. Historically, studies of minority physicians have included only African Americans, Mexican Americans, Native Americans, and mainland Puerto Ricans. Few have investigated whether non-primary care specialists of minority backgrounds are more likely than nonminority specialists to serve the underserved. We conducted a study to examine whether physician race/ethnicity was associated with the likelihood of physicians practicing in disadvantaged communities in California, using a large statewide sample that included physicians of diverse backgrounds and specialties.

METHODS

Sample

We used data from the 2007 California Medical Board Relicensure Survey.⁴ The California Medical Board licenses physicians with doctor of medicine (MD) degrees and requires physicians to renew their license every 2 years and complete a brief survey questionnaire with each license renewal application. Detailed survey methods have been reported elsewhere.⁵ Survey response rate was 83%. We included responses from the most recent survey data available if a physician responded to the survey in different years. Respondents were included in the data set if they reported that they were active in patient care, practicing in California, and not in residency/fellowship training (N = 61 138). For this analysis, we further restricted our sample to the 48 388 physicians who reported their race, ethnicity, and specialty. We obtained institutional review board approval through University of California, San Francisco and RAND Health institutional review boards.

Main Predictors

The questionnaire asked physicians to self-identify their race and/or ethnicity from a list of 27 categories. Physicians were allowed to report more than 1 racial or ethnic category. Less than 5% of our sample reported 2 or more races. Similar to previous studies, we assigned physicians who reported more than 1 ethnicity to a single ethnic group based on the following algorithm: a physician who reported African American and another ethnicity was assigned to the African American group; a physician who reported Latino but not African American was assigned to the Latino group; and similarly for Native Americans, Asians, Pacific Islanders, and whites in that rank order.⁶ The survey included several categories for these overall categories. For example, our Pacific Islander category included Fijian, Filipino, Guamanian, Hawaiian, Samoan, Tongan, and other Pacific Islanders. Similarly, Asian and Latinos would provide more detailed breakdowns of their ethnicity. Completion of the item on race or ethnicity was voluntary.

Based on previous workforce studies, we collapsed responses from 51 possible specialty choices into 7 categories: primary care (family medicine, general internal medicine, general pediatrics), facility-based (anesthesiology, emergency medicine, and radiology), surgical specialties, medical subspecialties, obstetrics/gynecology, psychiatry, and other specialties. We defined *specialists* as physicians who were not primary care physicians.

Covariate Measures

The survey also included items on weekly hours in patient care (categorized as 1–9, 10–19, 20–29, 30–39, and 40 hours) and board certification (yes/no). Data on physician gender (female/male), age (categorized as <35, 35–44, 45–54, and 65 years), and medical school of graduation (categorized as US graduate *or* international medical graduate) were obtained from the California Medical Board administrative license file.

Outcome Measures

Using physician-reported zip code for their primary practice location, respondents were geocoded to a state-defined medical service study area (MSSA). MSSAs are rational service areas defined by state agencies for health workforce planning and federal designations. Consistent with prior published studies,^{7,9} we used 2 measures to identify MSSAs that were disadvantaged communities: medically underserved area (MUA) and primary care health professional shortage area (HPSA). These 2 categories are not mutually exclusive, with 26 out of 490 California MSSAs qualifying as a HPSA. MUAs are designated by the federal government for having a combination of health disparities and relatively low local health care resources. HPSAs are designated by the federal government based on several criteria, including having less than 1 primary care physician for every 3500 residents. We included in the HPSA categories all MSSAs that were designated as falling in a whole county of population group primary care HPSA.⁸

Analysis

We calculated the proportion of physicians in each racial or ethnic group practicing in each type of federally designated shortage area (HPSA and MUA). We used χ^2 tests to assess statistically significant differences between groups. We then stratified the sample of physicians by specialty group and calculated the proportion of clinicians by race and ethnicity in each specialty group practicing in a HPSA or MUA.

Using multiple logistic regression models, we determined the odds of working in a HPSA or MUA for physicians in different racial/ethnic groups relative to their white counterparts. Physician age, gender, patient care hours, place of medical school graduation (US or international medical graduate, physician specialty), and board certification were included in the models as covariates. We used studies in the literature to guide our inclusion of these covariates in regression models.^{6–11} In a second set of regressions models, we performed a regression on each outcome (practice in a HPSA or MUA) after stratifying the sample into 2 separate specialty groupings, a primary care group and a non–primary care group, to explore possible interaction among race, ethnicity, and specialty groups broadly defined. Finally, in a sensitivity analysis, we also used multiple regressions to examine the magnitude of adjusted associations between missingness for race, ethnicity, and practice in the designated outcome measures. The analyses were performed using STATA version 10.0 (Stata Corp, College Station, Texas).

RESULTS

Eighty-four percent of the physicians were either white (61.6%) or Asian (23.4%), with smaller percentages of physicians from other racial/ethnic groups (Table 1). African American, Latino, Pacific Islander, and other racial/ethnic minority physicians were more likely to be in primary care specialties than were white physicians. Overall, on unadjusted analyses, a greater proportion of nonwhite physicians than white physicians worked in MUAs and HPSAs (Figure). For example, 15% of white physicians practiced in an MUA, compared with 28% of African American physicians, 24% of Latino physicians, 19% of

Asian physicians, 23% of Pacific Islander physicians, and 21% of other physicians ($p < .001$)

Table 2 shows the same general trends in among each specialty group, with a lower proportion of white physicians than of physicians of other ethnicities tending to practice in a HPSA or MUA. African Americans who specialized in primary care, a medical subspecialty, obstetrics/gynecology, psychiatry, or surgery had the highest percentage of physicians practicing in MUA-designated areas compared to other racial or ethnic groups in the respective specialties. African American physicians in most specialties were significantly more likely than white physicians to practice in a HPSA. Latino and Pacific Islander physicians were also more likely than white physicians in most specialty groups to practice in MUAs or HPSAs. For several of the specialty groupings, Asian physicians were also significantly more likely than white physicians to work in a MUA or HPSA.

Table 3 shows the results of adjusted regression models. In model 1, after adjusting for age, gender, graduate status, board certification, specialty, and practice hours, Latinos, African Americans, Asians, Pacific Islanders, and “other” physicians were generally more likely than white physicians to work in MUAs and HPSAs (Table 3). Physicians in most of the non–primary care specialties were significantly less likely than primary care physicians to practice in an MUA or HPSA, adjusting for race, ethnicity, and the other covariates in the model. When stratified by primary care and non–primary care specialties, the same general patterns were found in the regression analyses (Table 3, models 2 and 3). Within both the primary care and non-primary care groups, a significantly greater proportion of African American, Latino, Pacific Islander, and Asian physicians than of white physicians worked in these areas. The exception to this pattern was for practice in HPSAs, where Asian and Pacific Islander primary care physicians were not significantly more likely than white primary care physicians to work in a HPSA.

Excluding those with missing race or specialty did not change the main results; however, those in MUAs were less likely to report race ($p < .05$) than those in other areas as well as those who were older, male, noninternational medical graduates, board certified, and in non–primary care specialties. Those missing specialty designation were more likely to be in a HPSA and were also more likely to be older, male, white, board certified, a noninternational medical graduate, and work more hours ($p < .05$) than their counterparts.

DISCUSSION

Through comparing practice locations among physicians with a wide range of specialties and racial or ethnic groups, we found that physicians from groups historically underrepresented in medicine, including African Americans, Latinos, and Pacific Islanders, are significantly more likely than their white counterparts to practice in underserved communities in California. By demonstrating that physicians in almost all specialties who are African American or Latino are more likely than non-Latino whites to practice in disadvantaged communities, our study extends findings from previous research on physician race, ethnicity, and practice location that, with rare exceptions, only included primary care physicians.^{4–8} Our study indicates that physicians in all specialties from racial and ethnic groups underrepresented in medicine tend to be significantly more likely than white physicians in the respective specialties to practice in underserved communities.

Using a larger physician sample than prior studies, we also have been able to examine some racial and ethnic groups often not systematically assessed in prior research. In particular, Pacific Islanders and other less-populous racial and ethnic groups have been largely unexamined in prior studies due to small sample sizes and inadequate statistical power. In

analyses stratified by specialty, Asian physicians were also more likely than white physicians to practice in underserved areas. The current definition of *underrepresented in medicine* from the Association of American Medical Colleges states “*Underrepresented in medicine* means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population.”¹⁰ Pacific Islanders are not historically underrepresented nor explicitly stated in the current definition, yet they are considered an underrepresented minority group in California and many other states. Our findings are particularly revealing for this group and emphasize the role of Pacific Islanders in serving disadvantaged areas.

We also were able to use 2 commonly used definitions of *underserved areas*. Using both HPSA and MUA in our analysis underscores that these 2 definitions capture different types of areas with differing physician supply characteristics. Although these definitions are based on primary care supply, specialty supply is intrinsically linked to populations needs and health care demands. These findings underscore the importance of the ongoing federal debate on how to define and categorize underserved and shortage areas.¹¹

Our study has several strengths, including the large sample size, detailed information on physicians’ race and/or ethnicity, and more reliable data on patient care hours and practice zip code than that available from national physician databases, including the American Medical Association Masterfile. Our study also has several limitations. First, using cross-sectional survey data from California allows us to only analyze one state’s patterns. Although this state-level data set has strengths as noted above, our findings may not be generalizable to other states. Secondly, we do not have information available regarding number of practice locations, federal or state loan obligation requirements, or practice at federally qualified health centers, which may influence work in an underserved area. Furthermore, some specialists, such as those that are facility-based, are likely to practice at hospitals that are not often located in disadvantaged communities. Finally, although the response rate of the survey is much higher than that for most physician surveys, there may be potential nonresponse bias from the physicians who did not complete the survey.

From a policy perspective, many organizations argue that the United States needs more physicians from ethnic groups underrepresented in medicine.^{1,14} In California, Latinos are one-third of the state’s population but comprise only 5.2% of the state’s physicians.¹⁰ African Americans are 6.7% of the state’s population but comprise only 3.2% of California’s physicians. Our results suggest that increasing the diversity of the physician workforce would preferentially improve physician supply and patient access in disadvantaged communities. Minority health professionals have been shown to be an important part of health care delivery for the underserved, including those from low socioeconomic backgrounds or in the National Health Service Corps.¹²

Moreover, our study shows that this implication holds not just for primary care physicians, but for underrepresented minorities in most specialties. Promoting greater diversity in the physician workforce across specialties is an important strategy for improving access, enhancing culturally and linguistically competent care, and eliminating health disparities. Studies have shown that doctor-patient racial concordance may increase patient participatory decision making,¹³ communication,¹⁴ and patient satisfaction,¹⁵ although some controversy exists as to whether these benefits of racial concordance translate into better health outcomes for minorities.^{16,17} In addition, one study found that minority patients choose physicians due to preference and language, not simply due to geographic accessibility.¹⁸

The Sullivan Alliance and Institute of Medicine have released comprehensive recommendations to promote increased health professions diversity.^{2,19} These

recommendations include increased investment in educational health career pipeline programs for minority and disadvantaged students, such as the federally funded Centers of Excellence and Health Careers Opportunity Programs, establishing enforceable accreditation standards that promote diversity, and strengthening institutional commitment to student and faculty diversity at medical schools. These reports have also called attention to the critical role of historically black colleges and universities and other minority serving institutions in recruiting and training underrepresented minority health professionals.

CONCLUSION

In summary, our study underscores the importance of underrepresented minority physicians in all specialties for the physician workforce needs of disadvantaged communities.

Increasing the diversity of the physician workforce should be an essential component of a national physician workforce strategy to improve health care for underserved communities and eliminate health care disparities.

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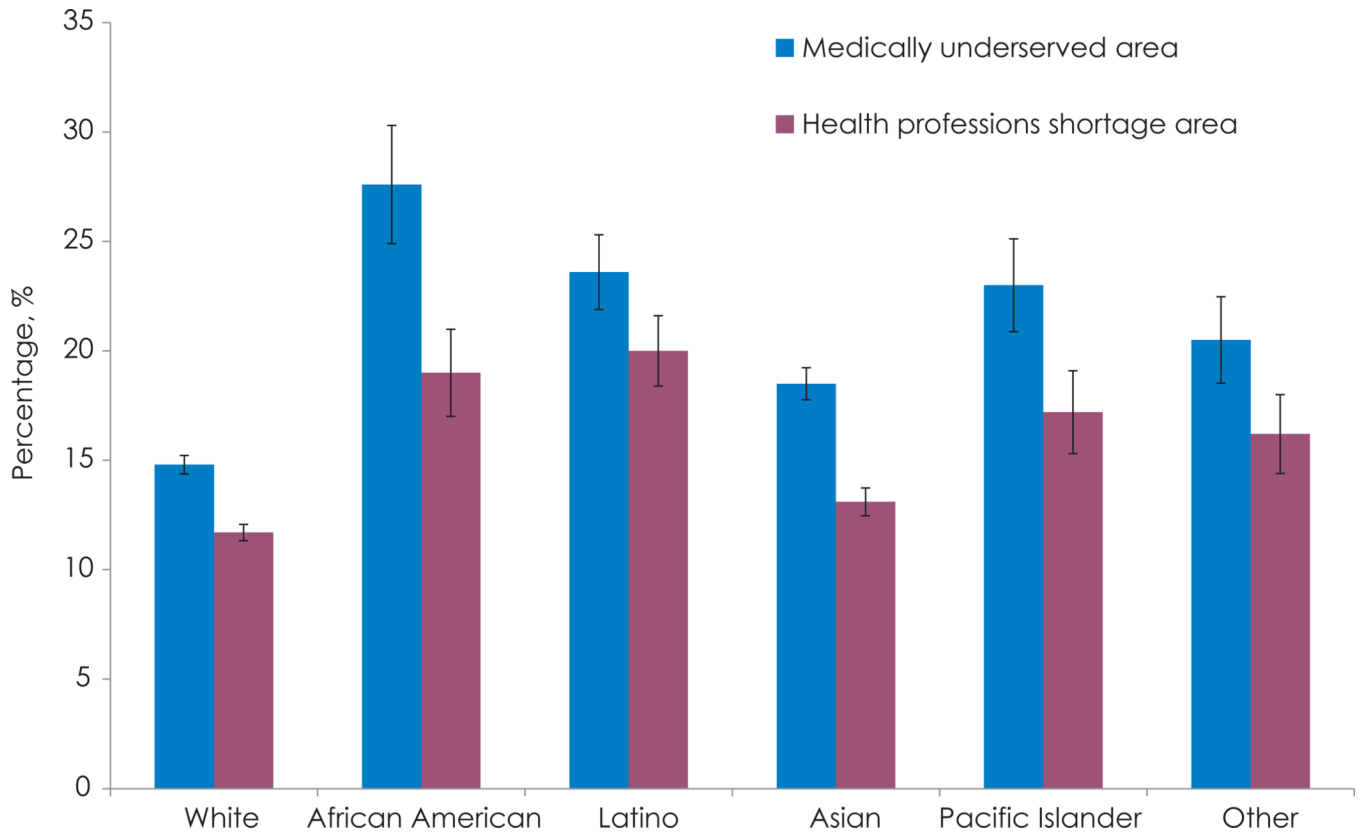


Figure. Unadjusted Percentage of Physicians by Race in Designated California Shortage Areas Medically underserved area and health professional shortage area percentages represent proportion of physicians in each racial/ethnic group working in an medically underserved area or health professional shortage area.

Table 1
Physician Characteristics and Practice Location Shortage Designation by Race and Ethnicity in California^a

	White	African American	Latino	Asian	Pacific Islander	Other	Total
Total, n	29 797	1555	2475	11 303	1585	1673	48 388
Specialty, %							
Primary care ^b	29.0	38.1	46.7	40.9	54.6	42.6	34.3
Medical subspecialties	11.2	7.9	9.5	13.6	8.6	11.9	11.5
Obstetrics/gynecology	5.2	9.7	6.7	4.5	3.2	5.3	5.2
Surgical specialties	17.6	13.1	11.0	4.4	7.1	10.4	15.2
Psychiatry	8.2	6.4	6.6	12.1	9.5	6.0	7.2
Facility-based ^c	10.9	7.8	6.6	11.2	7.9	10.4	10.5
Other	17.9	16.9	12.8	13.2	13.3	13.3	16.0
Age, y, %							
<35	2.5	3.3	4.6	6.7	3.3	6.0	3.7
35–44	19.6	25.5	28.9	35.2	24.5	29.5	24.4
45–54	28.9	32.9	35.7	25.6	30.3	29.3	28.7
55–64	31.0	24.6	21.4	22.0	25.0	24.9	27.8
65	18.1	13.6	9.4	10.4	16.9	10.3	15.4
Gender, %							
Male	75.8	63.3	71.2	67.4	54.4	67.7	72.3
Female	24.2	36.7	28.8	32.6	45.6	32.3	27.8
International graduate status, %							
United States	85.5	88.7	69.5	56.0	70.2	54.7	75.0
International	14.5	11.3	30.5	44.0	29.8	45.3	25.0
Patient care hours per week, %							
1–9	7.8	5.4	3.9	3.8	3.7	4.3	6.4
10–19	8.6	7.3	6.2	5.1	4.6	5.8	7.4
20–29	13.4	11.1	11.7	9.6	8.0	10.1	12.1
30–39	20.2	19.9	21.6	20.5	18.6	19.4	20.2
40	50.1	56.3	56.6	60.9	65.1	60.4	54.0

^a All categories are significantly different at $p < .001$ using χ^2 test.

^b Primary care = family medicine, internal medicine, and pediatrics.

^c Facility-based = anesthesiology, emergency medicine, and radiology.

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Table 2

Percent of Racial and Ethnic Groups by Specialty Practicing in Designated Service Areas in California^a

Characteristic	Practice Location Shortage Designation	
	Medically Underserved Area, %	Health Professional Shortage Area, %
Primary care ^b		
White	16.5 (15.4–17.2)	14.0 (13.2–14.7)
African American	31.5 (27.8–35.3)	21.8 (18.4–25.1)
Latino	25.8 (23.3–28.3)	24.4 (21.9–26.8)
Asian	19.6 (18.5–20.8)	14.6 (13.6–15.6)
Pacific Islander	21.8 (19.1–24.6)	16.4 (13.9–18.9)
Other	22.1 (19.1–24.6)	19.5 (16.6–22.4)
<i>P</i> value	<.001	<.001
Medical subspecialties		
White	12.7 (11.5–13.8)	9.0 (8.1–10.0)
African American	23.4 (15.9–30.9)	17.7 (11.0–24.5)
Latino	20.8 (15.6–25.9)	13.1 (8.8–17.5)
Asian	16.6 (14.7–18.4)	11.3 (9.7–12.9)
Pacific Islander	23.4 (16.2–30.5)	15.3 (9.3–21.4)
Other	16.1 (11.1–21.2)	9.6 (5.4–13.6)
<i>P</i> value	<.001	.001
Obstetrics/gynecology		
White	13.8 (12.1–15.6)	11.6 (10.0–13.2)
African American	27.3 (20.2–34.5)	17.3 (11.3–23.4)
Latino	23.5 (17.0–30.0)	18.1 (12.2–23.9)
Asian	15.9 (12.7–19.0)	9.4 (6.9–11.9)
Pacific Islander	24.0 (12.0–36.0)	14.0 (4.3–23.7)
Other	24.7 (15.7–33.7)	19.1 (10.9–27.3)
<i>P</i> value	<.001	.004
Psychiatry		
White	15.1 (13.7–16.6)	10.5 (9.3–11.7)
African American	32.3 (23.1–41.6)	23.2 (14.9–31.6)
Latino	28.4 (21.4–35.4)	20.4 (14.1–26.6)
Asian	24.6 (20.8–28.3)	15.8 (12.6–19.0)
Pacific Islander	26.5 (19.4–33.6)	21.2 (14.6–27.7)
Other	21.8 (13.7–29.9)	16.8 (9.5–24.2)
<i>P</i> value	<.001	<.001
Surgery		
White	13.7 (12.7–14.6)	10.7 (9.9–11.6)
African American	26.5 (20.4–32.5)	20.1 (14.6–25.6)
Latino	18.4 (13.7–23.0)	13.2 (9.2–17.3)
Asian	16.2 (14.2–18.1)	11.9 (10.2–13.6)
Pacific Islander	23.2 (15.4–31.1)	23.2 (15.4–31.1)

Characteristic	Practice Location Shortage Designation	
	Medically Underserved Area, %	Health Professional Shortage Area, %
Other	19.0 (13.1–24.8)	13.2 (8.1–18.3)
<i>P</i> value	<.001	<.001
Facility-based specialties ^c		
White	15.1 (13.8–16.3)	11.1 (10.0–12.2)
African American	19.8 (12.7–27.0)	16.5 (9.9–23.2)
Latino	18.4 (12.4–24.4)	16.0 (10.3–21.6)
Asian	17.7 (15.6–19.8)	11.9 (10.1–13.7)
Pacific Islander	22.4 (15.1–29.7)	17.6 (10.9–24.3)
Other	14.4 (9.1–19.6)	13.8 (8.7–18.9)
<i>P</i> value	.06	.04

^a*P* values assessed by χ^2 tests.

^bPrimary care = family medicine, internal medicine, and pediatrics.

^cFacility-based = anesthesiology, emergency medicine, and radiology.

Table 3

Adjusted Odds Ratios of Physicians Practicing in California Designated Areas for all Physicians and by Medical Specialty Groups

	Practice Location	
	Shortage Designation	
	Medically Underserved Area	Health Professional Shortage Area
Model 1: All Physicians		
Race/ethnicity		
White (Ref)	1.0	1.0
African American	2.25 ^c (2.00–2.52)	1.78 ^c (1.56–2.03)
Latino	1.68 ^c (1.52–1.86)	1.75 ^c (1.58–1.95)
Asian	1.22 ^c (1.14–1.30)	1.06 (0.98–1.13)
Pacific Islander	1.45 ^c (1.28–1.65)	1.33 ^c (1.15–1.53)
Other	1.36 ^c (1.20–1.54)	1.34 ^c (1.16–1.53)
Specialty		
Primary care (Ref)	1.0	1.0
Medical subspecialties	0.77 ^c (0.70–0.84)	0.62 ^c (0.57–0.69)
Obstetrics/gynecology	0.87 ^a (0.78–0.98)	0.78 ^c (0.69–0.89)
Surgical specialties	0.82 ^c (0.76–0.89)	0.74 ^c (0.68–0.81)
Psychiatry	0.98 (0.90–1.08)	0.80 ^c (0.72–0.90)
Facility-based	0.88 ^c (0.80–0.95)	0.76 ^c (0.69–0.83)
Other	0.92 (0.86–0.99)	0.79 ^c (0.73–0.86)
Model 2: Primary Care Physicians		
Race/ethnicity		
White (Ref)	1.0	1.0
African-American	2.49 ^c (2.07–2.99)	1.75 ^c (1.43–2.16)
Latino	1.81 ^c (1.56–2.09)	1.97 ^c (1.70–2.29)
Asian	1.22 ^c (1.10–1.35)	1.00 (0.90–1.12)
Pacific Islander	1.31 ^b (1.09–1.56)	1.09 (0.89–1.33)
Other	1.39 ^b (1.16–1.69)	1.40 ^b (1.14–1.71)
Model 3: Specialists Physicians		
Race/ethnicity		
White (Ref)	1.0	1.0
African-American	2.10 ^c (1.81–2.44)	1.81 ^c (1.52–2.16)
Latino	1.57 ^c (1.37–1.81)	1.52 ^c (1.30–1.78)
Asian	1.20 ^c (1.11–1.30)	1.09 (0.99–1.19)
Pacific Islander	1.68 ^c (1.40–2.01)	1.67 ^c (1.37–2.05)
Other	1.32 ^c (1.12–1.57)	1.27 ^a (1.05–1.53)