

The Influence of Race and Gender on Family Physicians' Annual Incomes

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Purpose: Specialty, work effort, and gender have been shown to be associated with physicians' annual incomes. We hypothesized that provider race might also be associated with differences in family physicians' incomes. Therefore, we conducted a study that used survey data to explore the relationship between provider gender and race and family physicians' annual incomes.

Methods: We used survey responses collected by the American Medical Association (AMA) throughout the 1990s from 786 white male, 20 black male, 159 white female, and 12 black female actively practicing family physicians. We then used linear regression modeling to determine the influence of race and gender on physicians' annual incomes after controlling for work effort, provider characteristics, and practice characteristics.

Results: Female family physicians reported seeing substantially fewer patients and working fewer annual hours than their male counterparts. After adjustment for work effort, provider characteristics, and practice characteristics, black men's mean annual income was \$178,873, or \$9,309 (5.5%) higher than that for white men (95% Confidence Interval (CI), -\$18,410 to \$37,028); white women's was \$135,531, or \$14,579 (8.6%) lower (95% CI, -\$25,969 to -\$3,189); and black women's was \$107,733, or \$36,963 (22%) lower (95% CI, -\$71,450 to -\$2,476).

Conclusions: During the 1990s, female gender was associated with lower annual incomes among family physicians, substantially so for black women. These findings warrant further exploration to determine what factors might cause the gender-based income differences that we found. (J Am Board Fam Med 2006;19:548-56.)

Female gender has long been associated with lower incomes among US physicians, even after adjusting for work effort.¹ A 1979 study found that female family physicians had lower incomes but were younger and had different practice arrangements than their male counterparts.² More recent studies that also adjusted for physician age and specialty³⁻⁶ revealed similar income disparities, although one found that the combination of specialty status, per-

sonal data, and female internists' less lucrative practice arrangements eliminated income differences.⁷ Less is known about the influence of race on physicians' incomes. In 1972, black physicians were reported to have different practice characteristics than their white counterparts,⁸ and a 1977 article suggested that analyses of the geographic distribution and work characteristics of black physicians should be conducted⁹; however, analyses of differences between black and white physicians' incomes have not been published.

Whether income disparities among physicians is attributable to race or gender is of interest. First, blacks and women represent an increasingly large proportion of medical students,^{10,11} residents,¹² the overall practicing physician workforce,^{11,13,14} and family physicians.² Second, because black primary care physicians are more likely to care for the underserved^{15,16} as well as the medically indigent and those with greater illness burdens,¹⁷ their annual incomes might rationally suffer.

The objective of this analysis was to explore the influence of race and gender on the incomes of black and white family physicians, after adjusting

This article was externally peer reviewed.

Submitted 24 February 2006; revised 8 June 2006; accepted 12 June 2006.

From the Veterans Affairs Outcomes Group Research Enhancement Awards Program (REAP), Dartmouth Medical School, White River Junction, VT.

Funding: This work was supported in part by Veterans Affairs Health Services Research and Development Grant REA 03-098. Dr. Wallace was supported by an Advanced Career Development Grant from Veterans Affairs Health Services Research and Development.

Conflict of interest: none declared.

Disclaimer: The views expressed in this article do not necessarily represent the views of the Department of Veterans Affairs or of the US government.

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for work effort, practice characteristics, and provider characteristics that are likely to influence physician incomes.

Methods

Data Source

Between 1992 and 2001, the AMA conducted regular telephone surveys of physicians that collected a broad variety of individual physician level data, including weeks and hours of practice, number of patient visits seen, provider characteristics, practice characteristics and physician incomes.^{18–25} Although these references give a summary of statistics for physicians, we obtained the primary data from the surveys conducted between 1992 and 2001 and use those data for our analyses. The survey was designed to provide representative information on the population of all actively practicing, nonfederal physicians who spend the greatest proportion of their time in patient care activities; weights for each respondent were calculated to correct for potential bias created by unit nonresponse, survey eligibility, and to ensure that physician responders reflected the national distribution of physicians.²⁵

Survey Methods

Each year, the telephone-administered survey was conducted on a random sample of physicians from the AMA Physician Masterfile who are eligible for the survey. The AMA Physician Masterfile contains current and historical information on all physicians in the United States, including AMA members and nonmembers, and graduates of foreign medical schools who reside in the United States and who have met the educational and credentialing requirements necessary for recognition as physicians.²⁶ The following physicians were excluded from the survey process: doctors of osteopathy, foreign medical graduates with temporary licensure, inactive physicians, physicians who were sampled during the past 5 years, physicians who are on the “do not contact” list, physicians not practicing in the United States, and physicians who have no license to practice medicine. In addition, after initial screening, federally employed physicians and physicians who spent less than 20 hours each week in patient care activities were excluded.

The following field procedures were developed to minimize nonresponse bias: 2 weeks before data collection, advance letters were sent describing the

process and the survey; many specialty organizations provided endorsement letters; and summaries of the types of questions to be asked regarding the financial activities of the practice were provided in advance of the survey. In addition, a minimum of four callbacks to respondents were made before abandoning interview efforts, letters encouraging participation were sent to physicians who initially refused participation, and refusal conversion attempts were made by select interviewers.²⁵

Survey Weights

Survey weights were derived by first dividing the AMA Physician Masterfile population and survey respondents into 200 cells defined by specialty, years since the respondent received an MD (doctorate of medicine degree), AMA membership status, and board certification status. Unit response rates were constructed as the ratio of the number of physicians in the population to the number of respondents in each cell. Second, an eligibility correction was used, as only nonfederal patient care physicians—excluding residents—are eligible. The eligibility correction divides the subset of the population for which eligibility is known into 40 cells (according to years in practice, AMA membership status, gender, and board certification) and calculates the proportion of physicians in each cell who are eligible. This defines the eligibility weight. The overall weight applied for a given respondent is the product of the unit response weight and the eligibility weight.²⁵

Sample

Although the survey had been conducted for much longer, this analysis was limited to data collected between 1992 and 2001 for two reasons. First, during the study period, physicians were categorized into different specialty groups in a way that allowed for the disaggregation of responses from family physicians and general practitioners. Second, these were the most recent data available for analysis and, therefore, likely to be the most relevant to the currently practicing physician workforce.

A sequential process of eliminating survey respondents was used to ensure that all the physicians included in the analyses were comparable (Figure 1). We were interested in studying actively practicing family physicians, not the minority of physicians who were primarily researchers, medical educators, administrators, or hospitalists. Therefore,

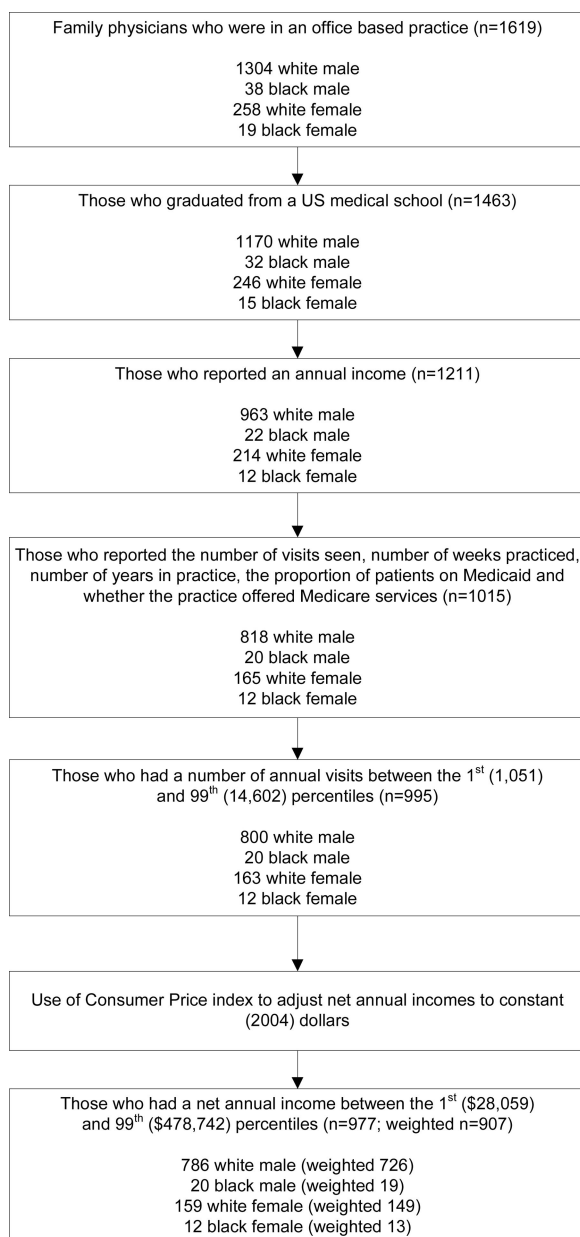


Figure 1. Sequential process of selecting survey respondents to include in the final analysis.

1619 self-identified black or white physicians who were identified as practicing family practice in an “office-based practice” were included as potential subjects in the study, distributed as follows: 1304 white male, 38 black male, 258 white female, and 19 black female family physicians. We initially restricted the sample to those respondents who graduated from a US medical school and provided information on key variables, leaving a total of 1015 family physicians: 818 white males, 20 black males, 165 white females, and 12 black females. Because

we were concerned that some of the data reported at the extremes of key variables—namely the number of annual patient visits conducted and the annual reported incomes—were either incorrect or dramatically atypical for practicing family physicians, we excluded respondents who were extreme outliers (less than the 1st percentile and greater than the 99th percentile of the sample) in annual patient visits and net incomes. This process left a total of 977 family physicians available for analysis: 786 white males, 20 black males, 159 white females, and 12 black females. Using survey weights, these respondents represented 906 respondents, or 726 white male, 19 black male, 149 white female, and 13 black female family physicians.

Variables Proposed to Influence Physicians’ Incomes

From the AMA dataset, three types of independent variables that were likely to influence the dependent variable—net annual income—were extracted.

Physician Work Effort

Although it has been demonstrated that hours worked is an important variable in analysis of physician incomes,^{3–6,27} the number of visits a physician completes each year may also influence annual incomes. Although private practice physicians typically bill based on patient visits, physicians who are employed by health care systems are likely to have either quotas or incentive based production bonuses associated with patient visit volumes such that compensation methods are unlikely to be related to use of health services per person.²⁸ Indeed, among the study sample, there was a modest linear relationship between inflation-adjusted annual physician incomes and annual patient visits seen ($r = 0.49$, $P < .001$) than with annual hours worked ($r = 0.28$, $P < .001$).

Provider Characteristics

When making comparisons of physician incomes, age is usually included as a confounding variable.^{3–6} Over the working lifetime, incomes demonstrate an “inverted U” pattern²⁹ that typically peaks near age 55 for primary care physicians,^{30,31} or after 20 to 25 years of practicing medicine. To dispel a concern that race or gender might influence the age at which a physician entered medical school, we incorporated the number of years that respondents had been practicing medicine into the analysis instead of physician age. Among the study sample,

the number of years practicing medicine was highly correlated with age ($r = 0.89$, $P < .001$). In addition, because practice arrangements, such as having an ownership interest in the practice, has been associated with differences in annual income among physicians,⁷ we included in the analysis whether the physician was an employee of a health care system, as opposed to a full or partial owner of the practice, in the analysis. Finally, because board certification has been associated with higher incomes,³² we included board certification status as an independent variable in the analysis.

Practice Characteristics

Physicians who live in different US Census regions have been shown to have modestly different annual incomes^{18–25}; therefore, we collected information on the US Census region in which the practice was located. In addition, because physicians who live in sparsely populated settings may have lower³³ or higher³⁴ incomes, we classified responding physicians' county codes into three categories of metropolitan settings (less than 50,000, between 50,000 and 500,000, or greater than 500,000). Finally, black physicians' annual incomes may reasonably be lower because of their disproportionate service the medically indigent and those who are under- or uninsured.¹⁷ Therefore, we incorporated into the analysis variables that likely reflect disproportionate service of that population: whether the practice provides Medicare services and the reported proportion of patients in the practice who are on Medicaid.

Calculated and Dummy Variables

We used the consumer price index³⁵ to adjust reported net annual income to constant 2004 dollars—so-called inflation adjusted annual incomes. For instance, to inflate income reported for 1995 to 2004 dollars, we multiplied the reported income in 1995 by the consumer price index in 2004 (188.9) and then divided that figure by the consumer price index in 1995 (152.4). We multiplied the reported number of weeks worked in the last year by the total number of hours worked in the last week and the total number of visits seen in the last week to calculate the annual number of hours worked and the annual number of visits seen, respectively. Because of the “inverted U” relationship between number of years practicing medicine and annual incomes, we constructed dummy variables that re-

flected the categorization of years practicing medicine into 5-year increments, from 0 to 5 years practicing through 40 plus years practicing. Although we used these dummy variables in the regression analysis, we aggregated them into 10-year increments through 30-plus years practicing for the purposes of demographic comparisons.

Analysis

We hypothesized that, after adjusting for factors likely to influence physicians' incomes, race and gender would be independently associated with family physicians' incomes. To explore this hypothesis, we used a linear regression model that adjusted for practice and provider characteristics likely to influence physicians' incomes. We used dummy variables for each race-gender combination to calculate regression coefficients and 95% CI in a regression model that incorporated the independent variables detailed above and used consumer price index adjusted annual incomes as the dependent variable. We used SPSS statistical software (Version 11.5, Chicago, IL) and survey weights for all analyses. This study was approved by Dartmouth Medical School's Committee for the Protection of Human Subjects, Hanover, NH (CPHS No. 17707).

Results

After adjusting incomes only for inflation, white male family physicians had mean net annual incomes of \$169,564 (Table 1). Compared with white men, black men had mean annual inflation adjusted incomes that were \$19,559 (11.5%) higher, white women had incomes that were \$34,033 (20%) lower, and black women had incomes that were \$61,831 (36%) lower. Although black male family physicians reported seeing 2% more visits and working 11% more hours than their white male counterparts, white and black women reported seeing 25% and 39% fewer visits, respectively, and working 12% and 17% fewer annual hours, respectively, than white men.

White and black male family physicians had practiced medicine longer than white or black women; no black women who responded to the survey had practiced more than 20 years. Women of either race were more likely to be employees, as opposed to having an ownership interest in the practice. Family physicians' rates of board certifi-

Table 1. Comparison of inflation adjusted income, work effort, provider and practice characteristics of family physicians, by race and gender (data obtained from the American Medical Association for years 1992–2001).

	Family physicians			
	Male		Female	
	White	Black	White	Black
Number of family physicians in the analysis	786	20	159	12
Inflation adjusted annual income (mean, in 2004 dollars)*	\$169,564	\$189,123	\$135,531	\$107,733
Physician work effort				
Total annual visits	6,396	6,555	4,790	3,892
Total annual hours worked	2,707	2,999	2,390	2,246
Provider characteristics				
Years in medical practice (mean)	17.8	16.9	11.9	10.9
Less than 10 years (%)	14.6	15.8	31.5	23.1
10–19 years (%)	47.9	59.5	59.5	76.9
20–29 years (%)	23.0	10.5	7.4	0.0
30 years or longer (%)	14.5	15.8	1.3	0.0
Ownership interest, and board certification				
Physician is an employee (%)	42.2	47.4	61.7	69.2
Physician is board certified (%)	85.7	90.0	85.8	83.3
Practice characteristics				
Census region of practice				
Northeast census region (%)	14.3	5.3	13.5	0.0
North Central census region (%)	29.5	15.8	29.1	0.0
Southern census region (%)	34.7	73.6	28.9	84.6
Western census region (%)	21.5	5.3	28.2	15.4
Practice setting				
Less than 50,000 population (%)	24.7	10.5	22.0	0.0
Population between 50,000 and 500,000 (%)	33.9	21.0	26.1	23.1
Population greater than 500,000 (%)	41.4	68.4	51.9	76.9
Service population				
Proportion of patients on Medicaid (%)	12.9	14.8	15.8	26.7
Proportion providing Medicare services (%)	99.0	100	95.3	100

* We used the consumer price index³⁵ to inflation-adjust reported net annual income to constant 2004 dollars. For instance, to inflate income reported for 1995 to 2004 dollars, we multiplied the reported income in 1995 by the consumer price index in 2004 (188.9) and then divided that figure by the consumer price index in 1995 (152.4).

cation were similar for both genders and races. Black family physicians of both genders were more likely to live in the Southern US Census region and less likely to live in the Northeastern or Western regions. Black family physicians were less likely to live in settings with a population less than 50,000 and more likely to live in settings with populations greater than 500,000. Compared with the other groups, a much larger proportion of black female family physicians' service population was enrolled in Medicaid. The vast majority of black and white, male and female physicians provided Medicare services.

The regression model accounted for 28% of the variance in annual incomes (Table 2). Higher numbers of annual visits were associated with higher

incomes, and the anticipated inverted-U lifetime earnings curve was reflected in the model. Although board certification was strongly associated with higher incomes, not having an ownership interest in the practice, living in less populated settings, and serving a higher proportion of Medicaid patients were modestly associated with lower incomes. After adjustment for these variables, black men's mean annual income was \$9,309 (5.5%) higher than that for white men, although not statistically significantly so (95% CI, −\$18,410 to \$37,028). White women's mean annual income was \$14,579 (8.6%) lower than that of their white male counterparts (95% CI, −\$25,969 to −\$3,189); and black women's was \$36,963 (22%) lower (95% CI,

Table 2. Results of the Regression Analysis.

	Coefficient	95% CI
Physician work effort		
Total annual visits	\$12.06	\$10.17–\$13.96
Total annual hours worked	\$1.13	(\$4.83)–\$7.08
Provider characteristics		
Years in medical practice (10 to 15 years is referent)		
Less than 5 years	(\$38,339)	(\$64,237)–(\$12,440)
5 to 9 years	(\$3,887)	(\$16,092)–\$8,318
10 to 19 years	\$6,672	(\$7,103)–\$20,446
20 to 24 years	(\$520)	(\$12,643)–\$11,604
25 to 29 years	\$1,038	(\$18,229)–\$20,305
30 to 34 years	(\$15,411)	(\$31,688)–\$865
35 to 39 years	(\$34,419)	(\$63,795)–(\$5,042)
40 years or more	(\$19,353)	(\$43,563)–\$4,858
Ownership interest, and board certification		
Physician is an employee	(\$5,848)	(\$14,491)–\$2,795
Physician is board certified	\$15,980	\$4,173–\$27,788
Practice characteristics		
Northeast census region	(\$17,043)	(\$30,077)–(\$4,009)
North Central census region	(\$14,576)	(\$24,816)–(\$4,336)
Western census region	(\$9,856)	(\$20,933)–\$1,221
Less than 50,000 population	(\$5,643)	(\$16,638)–\$5,352
Population between 50,000 and 500,000	(\$13,756)	(\$23,086)–(\$4,426)
Service population		
1% increase in patient population on Medicaid	(\$187)	(\$479)–\$105
Proportion providing Medicare services	\$5,013	(\$27,725)–\$37,752
Race/gender characteristics (white male is referent)		
Black male	\$9,309	(\$18,410)–\$37,028
White female	(\$14,579)	(\$25,969)–(\$3,189)
Black female	(\$36,963)	(\$71,450)–(\$2,476)

* Our regression model used consumer price index adjusted annual income (2004 dollars) as the dependent variable. Coefficients are denominated in 2004 dollars. Parentheses indicate negative values. Adjusted R square for the model = 0.28.

–\$71,450 to –\$2,476). Adjusted incomes with 95% CI for each group are presented as a proportion of white men's adjusted mean annual incomes in Figure 2.

Discussion

This study examined provider and practice characteristics that were likely to be associated with physicians' annual incomes. Our analysis revealed differences attributable to race and gender in those characteristics. Even after adjusting net annual incomes for observed differences, we found that female gender independently contributed to lower net annual incomes among office based family physicians. Annual incomes for white and black male family physicians were not different; incomes for

white and black female family physicians were substantially lower than those for men.

We found a strong association between higher annual incomes and work effort, particularly the number of patient visits. This finding is intuitive: physician reimbursement is commonly based on the volume of patients seen. The finding that female black physicians have a much larger proportion of Medicaid patients in their practices is interesting. Although consistent with previous findings that black physicians are more likely than whites to care for the underserved and medically indigent,^{15–17} in this study, the findings were most pronounced for black women. Our regression analysis confirmed that providing services to a large proportion of patients who are enrolled in Medicaid adversely influence physicians' incomes. Un-

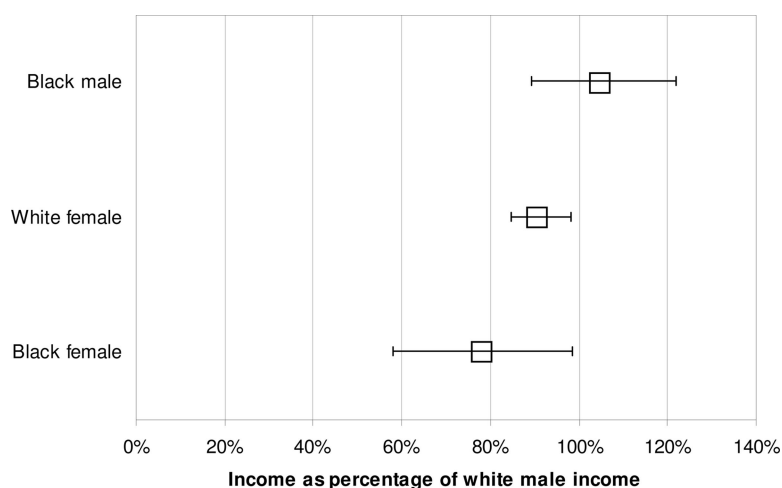


Figure 2. Adjusted annual incomes for black male, white female, and black female family physicians as a proportion of that for white male family physicians, with 95% CI.

doubtedly, this association reflects the low reimbursement rates provided by Medicaid funded health care services.

The association between higher annual incomes and board certification is consistent with findings from the early 1980s.³² This association might be explained in part by a propensity for provider organizations to require board certification for employment, by requirements by third-party payers that providers have board certification, or by market forces that use board certification as a marker for quality that is indirectly reimbursed.

It was disconcerting to find that black and white female family physicians had annual incomes that are discounted compared with that of their male counterparts. Although the anticipated 8.6% reduction in annual incomes found for white women was similar than that found in other studies that compared work-effort adjusted female to male physicians incomes,^{3–6} those analyses did not take into account the plethora of provider and practice variables that we examined here. Indeed, the only study that incorporated a similar, though not as extensive, complement of variables into the analysis found no difference between male and female physicians' incomes.⁷ Although limited by the small number of respondents, the 22% anticipated income differential between white male and black female family physicians is daunting, and suggests an additive effect of race and gender on annual incomes for this group.

This analysis has several limitations. First, the number of black respondents to the survey was

small; therefore, the ability to generalize findings about the racial differences that we found may be limited. A larger sample of black physicians would improve confidence in these findings. Second, the study was limited by the methods used by the AMA in their conduct of an annual survey of physicians, a survey that demonstrated substantial year-to-year variation in number of respondents and experienced a survey response rate that declined from 71% to 55% during the time period examined. However, the ability to combine ten years of data strengthened the study and offered a much more robust dataset than would have been the case had fewer years of data been available. Third, our modeling assumed a linear relationship between hours worked, patient visits and net annual incomes. Our model would not capture nonlinear relationships—for instance, should working fewer hours be associated with a disproportionate reduction in practice costs. More sophisticated economic modeling would be required to capture those differences. Fourth, the study was inherently limited by the data available from the survey. Other variables that might influence physicians' incomes, such as the gender- and race-specific differences in charity care provided, and whether the physician practiced obstetrical care (historically a contributor to higher incomes among family physicians³⁶) were not available in the data source that we used.

Fifth, we were not able to examine differences in the quality of care provided by white and black, male and female family physicians. This is an important limitation—higher incomes might be jus-

tified for family practitioners who provide higher quality care. However, several studies suggest that female primary care providers provide higher quality of care than their male counterparts: during the period studied, female physicians were more likely to provide preventive care,^{37–42} engage in more positive communication dyads,^{43,44} and provide greater levels of patient satisfaction than their male counterparts.^{40,45} These studies suggest that, to the degree that quality is associated with higher incomes, our findings likely underestimated the income difference associated with gender among family physicians.

Finally, our findings are of an associative, not causative, nature. Additional study is required to determine causal pathways that might be associated with the lower incomes that female family physicians experienced. A variety of potential explanations for our findings may exist—for instance, male family physicians may have more successful negotiation skills, different practice arrangements, different subspecialty practice types, and academic ranks than their female counterparts. However, differences in these factors may themselves be indicators of discrimination; therefore, future efforts will need to discern gender differences not only in outcome measures—adjusted annual incomes—but also in process measures. Further, an understanding of women physicians' perception of any differences—particularly whether they are desired—will be important to delineate in future work.

Despite these limitations, the results of this study suggest that provider gender is independently associated with lower annual incomes among family physicians. These findings should be contextualized, however. Foremost, the anticipation of financial returns should not drive the choice to enter the medical profession; the results presented here are therefore unlikely to dissuade women from entering family practice. In addition, physicians derive many nonfinancial benefits from their roles, including the satisfaction of helping patients, the ability to serve their communities, and the opportunity to model for others of similar backgrounds the advantages of pursuing higher education. These benefits are likely to be highly motivating regardless of physician gender or race.

Although salary differences between men and women may be common and stable among nonprofessionals,⁴⁶ it seems untoward that a profession that embraces equity as a cornerstone of medical

practice quality⁴⁷ should tolerate gender-based inequity in pay. Female family physicians have achieved the same level of education, have made the same time commitment to training, and have experienced the same direct and opportunity costs required of such commitment⁴⁸ as their male counterparts. Additional efforts to elucidate the underlying causes of any salary differences and to suggest remedies are warranted.

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