Gender Differences in Dermatologists' Annual Incomes

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Careful examination of the relationship between dermatologists' gender and their incomes has not been conducted. We sought to determine the association between gender and the net annual incomes of dermatologists after controlling for physician work effort, provider characteristics, and practice characteristics.

We conducted a retrospective analysis of survey data collected from 266 actively practicing office-based dermatologists who self-identified as white, lived in the United States, graduated from US medical schools, and responded to the annual American Medical Association (AMA) survey of physicians between 1992 and 2002.

White female dermatologists reported seeing 21% fewer patients and working 16% fewer annual hours than white male dermatologists. White female dermatologists had practiced medicine for fewer years than white male dermatologists, were more likely to be employees as opposed to having an ownership interest in the practice, and were equally likely to be board certified. After adjustment for work effort, provider characteristics, and practice characteristics, the mean annual income of white female dermatologists was $215,311, or $81,746 (28%) lower than white male dermatologists (95% CI, $138,098 lower to $25,393 lower; P=.005).

Our findings were limited to white dermatologists and to analysis of data collected in the surveys; we were not able to examine alternative explanations for the income disparities that we found.

During the 1990s, female gender was associated with lower annual incomes among dermatologists practicing in the United States. Researchers should further explore the relationship between the gender and incomes of physicians to determine what additional factors might cause the differences that we found.

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Women historically have earned less income than men. In the United States, however, the disparity appears to be narrowing—the female-male median hourly wage ratio increased from 63% in 1979 to 77% in 1999, purportedly because more women entered the workforce, fewer women received minimum wages, and the real wages of men decreased.[1]

Women have been associated with lower incomes among US physicians, even after adjusting for work effort.[2] Studies that also adjusted for physician age and specialty[3-6] revealed similar income disparities, though one study found that the combination of specialty status, personal data, and the less lucrative practice arrangements of female internists eliminated income differences.[7] However, the thorough analysis of this latter study was limited to a single year and single state and did not evaluate medical subspecialties separately.

Because women represent an increasingly large proportion of medical students,[8,9] practicing physicians,[9-11] and dermatologists,[12] we were interested in determining whether income disparities attributable to gender existed among dermatologists. To date, no studies have compared the incomes of male and female dermatologists. Therefore, we used survey data from the 1990s to explore the association between gender and the incomes of dermatologists after adjusting for physician work effort, provider characteristics, and practice characteristics that were likely to influence the incomes of physicians.

METHODS

Between 1992 and 2002, the American Medical Association (AMA) conducted regular telephone

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surveys of physicians that collected a variety of physician-level data including weeks and hours of practice, provider characteristics, practice characteristics, and incomes.[13-20] The surveys were designed to provide representative information on actively practicing, nonfederally employed physicians who spent the greatest proportion of their time in patient care activities. The weights for each respondent were calculated to correct for potential bias created by unit nonresponse and survey eligibility and to ensure that physician responders reflected the national distribution of physicians.[20]

Survey Methods

Each year, the telephone survey was conducted on a random eligible sample of physicians from the AMA Physician Masterfile.[20] The following physicians were excluded: doctors of osteopathy, foreign medical graduates with temporary licensure, inactive physicians, physicians who were sampled during the past 5 years, physicians who were on the "do not contact" list, physicians not practicing in the United States, and physicians who did not have a license to practice. In addition, after an initial screening, federally employed physicians and physicians who spent less than 20 hours each week in patient care activities were excluded.[20]

The following field procedures were developed to minimize nonresponse bias: 2 weeks prior to data collection, letters were sent describing the process and the survey; endorsement letters were provided by many specialty organizations; and advance summaries of the questions to be asked that related to expenses were provided. In addition, a minimum of 4 callbacks to respondents were made before abandoning interview efforts, letters that encouraged participation were sent to physicians who initially refused participation, and refusal conversion attempts were made by select interviewers. The survey response rate among dermatologists ranged from 56% to 70% each year during the years examined.[20]

Collected data were self-reported.[20] The key dependent variable—net annual income—was collected in response to the question, "What was your own net income from medical practice, to the nearest $1000, after expenses but before taxes? Please include all income from fees, salaries, retainers, bonuses, deferred compensation, and other forms of monetary compensation, but not investment income from medical-related enterprises independent from your medical practice."[20]

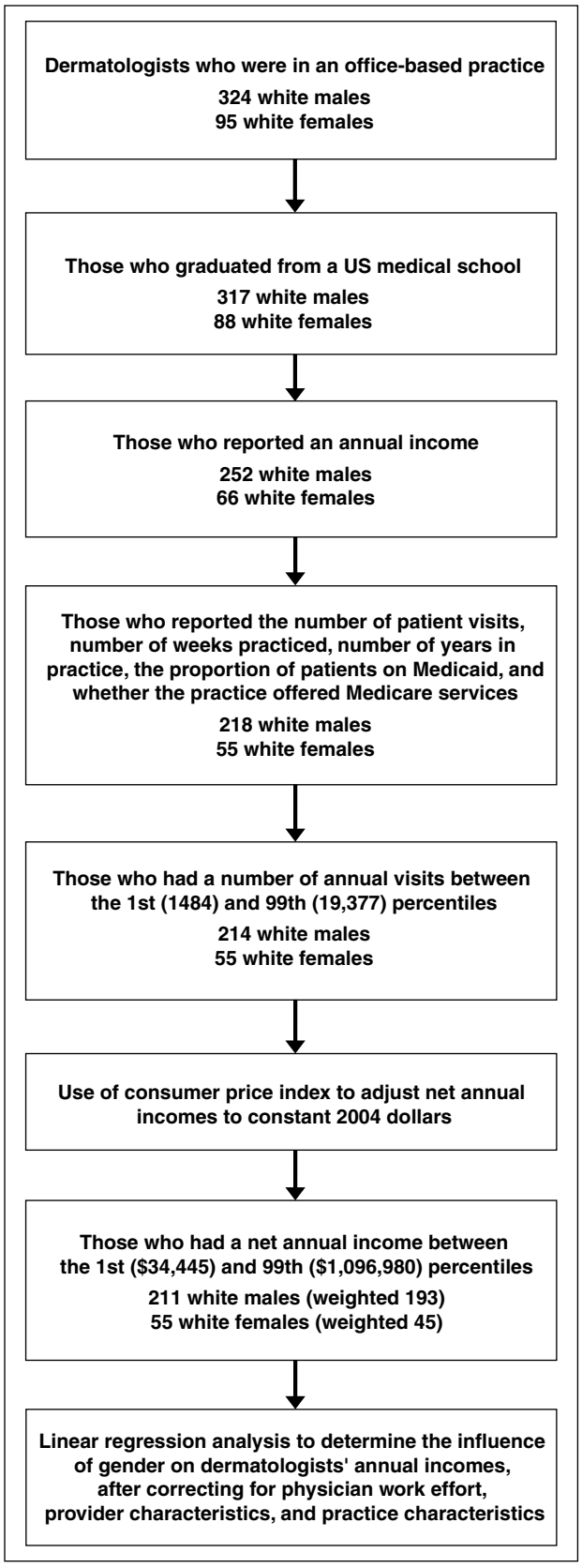
Survey Weights

Survey weights were derived by dividing the AMA Physician Masterfile population and survey respondents into 200 cells defined by specialty, years since the respondent received his/her doctor of medicine degree, AMA membership status, and board certification status.[20] Unit response rates were constructed as the ratio of the number of physicians in the population to the number of respondents in each cell. An eligibility correction was used because only nonfederally employed patient care physicians—excluding residents—were eligible. The eligibility correction divided the subset of the population for which eligibility was known into 40 cells (according to years in practice, AMA membership status, gender, board certification) and calculated the proportion of physicians in each cell who were eligible, which defined the eligibility weight. The overall weight applied for a given respondent was the product of the unit response weight and the eligibility weight.[20]

Sample

Although the telephone survey had been conducted for longer than 1992 through 2002, this analysis was limited to data collected during that time for 2 reasons: first, during the study period, physicians were categorized into different specialty groups in a way that allowed for the disaggregation of responses of dermatologists from those of other medical specialists; second, these were the most recent data available for analysis and therefore were likely to be the most relevant to the currently practicing physician workforce.

A sequential process of eliminating survey respondents was used to ensure that the dermatologists included in the analysis were comparable (Figure). First, because we were concerned that race also may influence physicians' incomes, we included only self-identified white physicians in the analysis. Furthermore, we were interested in studying actively practicing dermatologists who worked in a private practice setting rather than the minority of physicians who were primarily researchers, medical educators, administrators, or hospitalists. Therefore, only self-identified white physicians who were identified as practicing dermatology in an office-based practice were included in the study. We restricted the study sample to those respondents who provided information on key variables, and we excluded respondents who were extreme outliers (<1st percentile, >99th percentile of sample) in annual visits and net annual incomes. This process left 211 white male and 55 white female dermatologists available for analysis. Using survey weights, these respondents represented 193 white male and 45 white female dermatologists.



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Variables Proposed to Influence Physicians' Incomes

From the AMA data set, 3 types of independent variables that were likely to influence the dependent variable—net annual income—were extracted: physician work effort, provider characteristics, and practice characteristics.

Physician Work Effort—Although it has been demonstrated that the number of hours worked is an important variable in the analysis of physicians' incomes,[3-6,21] we believe that the number of patients that physicians see each year may influence their annual incomes. Although physicians in private practice typically bill based on patient visits, employed physicians are likely to have either quotas or incentive-based production bonuses associated with patient visit volumes; thus, compensation methods are unlikely to be related to use of health services per person.[22] Among the study sample, there was no linear relationship between inflation-adjusted annual physicians' incomes and annual hours worked (r=0.10; P=.12), but there was a moderate association between physicians' incomes and the number of annual patient visits (r=0.41; P<.001).

Provider Characteristics—When making gender comparisons of physicians' incomes, age usually is included as a confounding variable.[3-6] Over the working lifetime, incomes demonstrated an inverted U pattern[23] that typically peaked near 55 years of age for primary care physicians,[24,25] or after 20 to 25 years of practicing medicine. To dispel a concern that race or gender may influence the age at which a physician enters medical school, we incorporated the number of years that the respondents had been practicing medicine into the analysis instead of their age. Among the study sample, the number of years practicing medicine was highly correlated with age (r=0.87; P<.001). In addition, because practice arrangements (eg, having an ownership interest in the practice) have been associated with differences in annual incomes among physicians,[7] if the physician was an employee as opposed to a full or partial owner of the practice was included in the analysis. Finally, because board certification has been associated with higher incomes,[26] we included board certification status as an independent variable in the analysis.

Practice Characteristics—Physicians who live in different US Census Bureau regions have been shown to have modestly different annual incomes[13-20]; therefore, information on the US Census Bureau region in which the practice was located was collected. In addition, because physicians who live in sparsely populated settings have been shown to have both lower[27] and higher[28] incomes, this

Table 1.

Comparison of Inflation-Adjusted Income, Physician Work Effort, and Provider and Practice Characteristics of White Dermatologists by Gender

	White Dermatologists		
	Male	**Female**	***P* Value**
Inflation-adjusted mean net annual income (constant 2004 dollars)	$297,057	$189,462	<.001
Physician Work Effort			
Total annual patient visits	7272	5731	.001
Total annual hours worked	2345	1972	.001
Provider Characteristics			
Years in medical practice (mean)	18.8	11.1	<.001
<10 y	21.8%	42.2%	.005
10–19 y	39.4%	53.3%	.2
20–29 y	23.4%	2.2%	.001
≥30 y	15.5%	2.2%	.02
Ownership interest and board certification			
Employee	14.5%	35.6%	.001
Board certified	93.3%	93.3%	1.0
Practice Characteristics			
US Census Bureau region of practice			
Northeast	19.7%	28.9%	.2
North Central	16.1%	13.0%	.6
South	35.2%	35.6%	1.0
West	29.0%	22.2%	.4
Practice setting (population)			
<50,000	4.1%	2.2%	.5
50,000–500,000	31.8%	15.6%	.03
>500,000	64.2%	82.2%	.04
Service population			
Proportion of patients receiving Medicaid services	4.7%	4.7%	.9
Proportion providing Medicare services	99.0%	97.8%	.5

analysis categorized the responding physicians' county codes into 3 categories of metropolitan settings (population, <50,000; 50,000–500,000; >500,000). Finally, because disproportionate service of the medically indigent and those with insufficient health insurance have been hypothesized to decrease physicians' incomes,[29] the variables that are likely to reflect those factors were incorporated into the analysis—the reported proportion of patients in the practice who are on Medicaid and if the practice offers Medicare services.

Calculated and Dummy Variables

We used the consumer price index to adjust reported net annual income to constant 2004 dollars (inflation-adjusted net 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 past year by the total number of hours worked in the past week and the total number of patients seen in the past week to calculate the annual number of hours worked and the annual number of patient visits, respectively. Because of the inverted U relationship between the number of years practicing medicine and annual incomes, we constructed dummy variables that categorized the number of years practicing medicine into 5-year increments ranging from 0 to 5 years practicing medicine through 40 years or more. Although we used these dummy variables in the linear regression analysis, we aggregated them into 10-year increments through 30 years or more practicing medicine for the purposes of demographic comparisons.

Analysis

We hypothesized that after adjusting for factors likely to influence physicians' incomes, gender would be independently associated with dermatologists' incomes. To explore this hypothesis, we used a linear regression model that adjusted for the provider and practice characteristics that were likely to influence physicians' incomes. We simultaneously entered the independent variables listed above and gender to calculate dollar-denominated regression coefficients and 95% confidence intervals in a model that used consumer price index–adjusted net annual income as the dependent variable. Because physicians' incomes are lognormally distributed, we performed an additional analysis that used log-transformed data and had almost identical results. For ease of interpretation, we reported nontransformed results here. We used SPSS® (version 11.5) and survey weights for all analyses. This study was approved by the Dartmouth Medical School Committee for the Protection of Human Subjects, Hanover, New Hampshire.

RESULTS

After adjusting only for inflation, white male dermatologists had mean net annual incomes of $297,057; white female dermatologists had mean net annual incomes that were $107,595 (36%) lower (Table 1). White female dermatologists reported seeing 21% fewer patients and working 16% fewer annual hours than white male dermatologists.

White female dermatologists had practiced medicine for fewer years than white male dermatologists—a small percentage of white females who responded to the survey had practiced medicine for more than 20 years. White female dermatologists also were more likely to be employees as opposed to having an ownership interest in the practice, and they were equally likely to be board certified. White female and male dermatologists were equivalently distributed across US Census Bureau regions. Few dermatologists of either gender worked in areas of low population density; white female dermatologists were more likely to work in highly populated settings. A similarly small proportion of patients of both genders were receiving Medicaid services, and most dermatologists of both genders provided Medicare services.

The regression model accounted for 21% of the variance in annual incomes (Table 2). Higher numbers of annual patient visits were associated with higher incomes; however, increased work time was associated with lower incomes after correcting for number of patients seen, which suggests that productivity (visits per hour) is an important component of income generation among dermatologists. The model revealed the anticipated inverted U lifetime earnings curve. Treating a greater proportion of Medicaid patients was strongly associated with a lower income. After adjustment for these variables, the mean net annual income of white female dermatologists was $81,746 (28%) lower than white male dermatologists (95% CI, $138,098 lower to $25,393 lower; $P=.005$). The mean net annual income for white male dermatologists was $297, 057.

COMMENT

This study examined provider and practice characteristics that were likely to be associated with dermatologists' net annual incomes, revealed differences attributable to provider gender in those characteristics, adjusted net annual incomes for observed differences, and found gender independently contributed to substantially lower net annual incomes among office-based dermatologists.

Our analysis revealed a strong association between higher annual incomes and productivity, defined as the annual number of patient visits. This finding is intuitive: physician reimbursement is mostly based on the volume of patients seen. The hypothesis that providing services to a large proportion of patients who are enrolled in Medicaid may adversely influence physicians' incomes[29] was borne out in the regression analysis. The association between lower annual incomes and populating one's practice with Medicaid patients reflects the low reimbursement rates generally provided by Medicaid-funded healthcare services.

The modest trend between higher annual incomes and board certification is consistent with findings from the early 1980s for physicians in general.[26] This trend may be explained in part by

Table 2.

Linear Regression Model*

	Coefficient	95% CI	*P* Value
Physician Work Effort			
Total annual patient visits	$28.99	$20.56−$37.42	<.001
Total annual hours worked	($46.68)	($81.69)−($11.67)	.01
Provider Characteristics			
Years in medical practice (5−9 y is referent)			
<5 y	($22,692)	($116,790)−$71,407	.6
10−14 y	($53,862)	($115,393)−$7668	.09
15−19 y	$3959	($59,067)−$66,986	.9
20−24 y	($39,686)	($114,060)−$34,688	.3
25−29 y	($1115)	($89,993)−$87,762	1.0
30−34 y	($83,720)	($168,742)−$1302	.05
35−39 y	($107,167)	($221,436)−$7103	.07
≥40 y	($8449)	($203,543)−$186,645	.9
Ownership interest and board certification			
Employee	($33,613)	($89,061)−$21,835	.2
Board certified	$73,598	($7835)−$155,032	.08
Practice Characteristics			
US Census Bureau region of practice (West is referent)			
Northeast	($8839)	($67,455)−$49,366	.8
North Central	($21,895)	($88,157)−$44,366	.5
South	($22,438)	($74,666)−$29,791	.4
Practice setting (population; >500,000 is referent)			
<50,000	($49,160)	($156,393)−$58,074	.4
50,000−500,000	$8150	($38,969)−$55,270	.7
Service population			
1% increase in patient population receiving Medicaid services	($3676)	($6727)−($625)	.02
Proportion providing Medicare services	($141,273)	($340,174)−$57,629	.2
Gender (white male is referent)			
White female	($81,746)	($138,098)−($25,393)	.005

*Coefficients, 95% confidence intervals (CIs), and *P* values for a regression model that uses consumer price index–adjusted net annual income (2004 dollars) as the dependent variable. Coefficients are denominated in constant 2004 dollars. Figures in parentheses indicate negative values. Adjusted R^2 for the model=0.21.

a propensity for provider organizations to require board certification for employment, by third-party payer requirements that providers be board certified, or by market forces that use board certification as a marker for quality that is indirectly reimbursed. However, white male and female dermatologists in our sample were equally likely to be board certified; therefore, board certification status did not contribute to overall lower incomes for females.

After correcting for differences in provider and practice characteristics, it was disconcerting to find that white female dermatologists should expect annual incomes that are so heavily discounted

compared with white male dermatologists. Although the anticipated 28% reduction in annual incomes that was found for white female dermatologists was substantially greater than other studies comparing female-male physicians' incomes that were adjusted for work effort,[3-6] those analyses did not take into account the variety of provider and practice variables that were examined here. The only study that incorporated a similar, though not as extensive, complement of variables into the analysis found no difference between male and female internists' incomes.[7]

This analysis has several limitations. First, because the number of black respondents to the survey was small, we were forced to limit our analysis to white dermatologists. Our findings may not apply to dermatologists of other races.

Second, the study was limited by the methods used by the AMA in its conduct of an annual physicians' survey, which demonstrated substantial year-to-year variation in the number of respondents and experienced a response rate that declined during the time period examined. However, the ability to combine 10 years of data strengthened the study and offered a more robust data set than if fewer years of data had been available.

Third, although incomes were both adjusted to constant dollars and adjusted for regional setting, the analysis was not able to adjust for differences in purchasing power parity across those settings—differences were shown to mitigate constant dollar income differences among rural and urban physician practices.[28]

Fourth, we used a regression model that assumed a linear relationship between hours worked and incomes. We repeated our analyses using alternative independent variables for hours worked, such as hours squared and natural log of hours, and found no difference in our results; however, it is possible that a nonlinear relationship between hours worked and net annual income that we were not able to explore accounted for some of the gender gap in physicians' incomes.

Finally, the study was inherently limited by the data available from the AMA survey. It would have been interesting to explore alternative explanations for the income disparities, such as gender differences in the rate of highly reimbursed procedures, proportion of charity care provided, respondents' educational debt burden and level of satisfaction with their practices, and even differences in the quality of care provided; however, the data that may have answered these questions were not available. The regression model accounted for only 21% of the variance of physicians' incomes. Clearly, additional factors that were not incorporated into the analysis are likely to influence expected physicians' incomes and may mitigate the differences found here.

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

Salary differences between men and women may be common among nonprofessionals[1]; however, it seems untoward that a profession that repudiates gender differences in patient access to and outcomes from healthcare[30] and that embraces equity as a cornerstone of medical practice quality[31] should tolerate gender-based inequity in pay. Female dermatologists have achieved the same level of education, made the same time commitment to training, and experienced the same direct and opportunity costs required of such commitment as male dermatologists.[32] Additional efforts to elucidate the underlying causes of any salary differences and to suggest remedies are warranted.

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