Gender Differences in Physician Income in the United States: A Reexamination

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ABSTRACT

Differences in income between male and female physicians have existed for a while. However, there are inconsistent results in physicians' income. This study seeks to analyze gender differences in physicians' income in the United States. This quantitative study uses secondary data from a physician telephone survey conducted by the 2007 Community Tracking Study. Bivariate associations were examined between the gender and the income variable using the Chi-square test. Multinomial logistic regressions were used to determine the predictor of association between the gender variables and income given the significant variable in bivariate analysis. The results show that male physicians have earned more than female physicians, even after differences in work time, specialty, practice setting, and other characteristics are taken into account. Among physicians involved in a broad range of practice settings, income is unequal for men and women. The underlying reasons for the income inequality should be further explored by collecting and analyzing personal choice information such as negotiating skills, desire to make money, marital status, and number of children in the family as well as by investigating market forces and institutional factors that may affect earnings of physicians.

Keywords: Gender, Differences, Physicians' income

INTRODUCTION

Differences in income between male and female physicians have existed for a while. From the 1970s to 2008, male physicians have earned more than female physicians, even after differences in the number of hours worked, specialty, practice setting, and other characteristics are taken into account (Bobula, 1980; Langwell, 1982; Ogle, Henry, Durda, & Zivick, 1986; Sliberger, Marder, & Willke, 1987; Cohen, Cantor, Barker, & Hughes, 1990; Carr, Friedman, Moskowitz, Kazis, & Weed, 1992; Dial, Grimes, Leibenluft, & Pincus, 1994; Theurl, Winner, 2011).

Since the early 1980s, a number of changes in medicine and society may have narrowed the gap in earnings. Some researchers suggest a decreasing difference in income and hours of work between male and female physicians (Bobula, 1980; Ohsfeldt & Culler, 1986; Carr, Friedman, Moskowitz, & Kazis, 1992). Baker (1996) examined data on earnings from the 1991 Survey of Young Physicians, a nationwide survey of physicians under 45 years with two to nine years of practice experience. The results were compared with data from the 1987 Survey of Young Physicians and with data on the physicians' earnings with 10 or more years of experience from the American Medical Association's 1991 Socioeconomic Monitoring System survey. Results indicated that no evidence supported young male and female physicians, with the same characteristics, earned different amounts in 1990.

However, McMurray et al. (2000) and Gravelle, Risa, Rita. (2011) found a $22,000 income gap in gender supported by more recent data, suggesting that further increases in the number of female physicians would not reduce the gap in income (Angier, 1999). Kaplan and colleagues (1996) also found substantial earning differences by gender in a national survey of academic pediatricians.

Although differences in income between male and female physicians have been studied, there are inconsistent results in physicians' income. Pursuing this question, we sought to reexamine physicians' income by gender. The data for this study is from the Community Tracking Study (CTS) Physician Survey, a nationally representative telephone survey of 12,280 direct patient-care physicians. The physician survey sample, the largest in recent history, was designed to be representative of direct patient care physicians in the continental United States, as well as in selected communities, or sites. Two research questions need to be examined. First, were there any gender gaps in income? And second, what were the important factors accounting for the variation in physicians' earnings?

LITERATURE REVIEW

A study based on the 2001 AMA Patient Care Physician Survey reported that unadjusted median income among physicians were different by various physician characteristics such as employment type, specialty, census division, board certification status, gender, age, and country of medical school graduation (Kane and Loeblich 2003). Individual factors, for example age, gender, education, training, and hours worked per week, have been found to be associated with variations in physicians' income (Pope and Schneider, 1992). However, an interesting trend found in the AMA study was a widening gender gap of earnings among physicians in the late 1990s, continuing into the current millennium (Ya-Chen, Shih and Konrad (2007).

In medicine, marked gender differences in income and hourly pay are reported in many countries (Theurl and Winner, 2010). Studies conducted in the 1970s through the early 1990s indicated that men earned more than women after adjusting for specialty, number of hours worked, and practice setting, among other factors (Ohsfeldt & Culler, 1986, Carr, Friedman, Moskowitz, Kazis, & Weed, 1992). For instance, Kehrer (1976), analyzing survey data from the American Medical Association, estimates a gender gap in average hourly earnings of about 30 percent. Ohsfeldt & Culler (1986) indicated that men in medicine earned 13 percent more per hour than that of women in 1981 and 1982, after adjusting for differences in potentially confounding characteristics. More recent studies found that even after adjusting for physician age and specialty, the income disparities still exist between males and females (Baker, 1996: Wallace & Weeks, 2000). There are gender differences in pay even for individuals with considerable investments in human capital working in the same profession (Bertrand et al, 2009).

In the past generation, women have made up an increasing percentage of the U.S. physician workforce. Yet women have lagged behind men in measures of career success. As of 1994–1995, women accounted for 41% of medical students, 33% of residents, and 25% of full-time medical school faculty (Bickel, Galbraith, & Quinnie, 1995). Among faculty, full professorships were held by 10% of women compared with 31% of men (Bickel, Galbraith, Quinnie, 1995). This gender gap has been explained by the later entry into medicine by large numbers of women, fewer working hours or lower productivity among women, or gender bias; various studies have reached different conclusions (Tesch, Wood, Helwig, Nattinger, 1995). However, other research states that women's wages increased relative to men's because more women entered the workforce, fewer women received minimum wages, and the real wages of men decreased (Mishel, Bernstein, Schmitt, 2001).

Gender disparities have been found since 1980s in all specialties. Weeks & Wallace (2007) examined gender differences among psychiatrists and found that providers and practice characteristics were likely to be associated with psychiatrists' annual incomes, which revealed differences attributable to provider gender in those characteristics, adjusted net annual incomes for observed differences, and found that gender was independently associated with lower net annual incomes among office-based psychiatrists. Research by Weeks., Wallace & Mackenzie (2007) which examined gender differences in anesthesiologists' annual incomes found that even after adjusting for work effort, provider characteristics, and practice characteristics, white females' mean annual income was $236,628, or $60,337 (20%) lower than that for white males (95% confidence interval, $81,674 lower to $39,001 lower; $P < 0.001$). Another research by Weeks, Wallace (2006), which examined gender differences in internist annual incomes, found that after adjusting for work effort, provider characteristics, and practice characteristics, white females' salary was $159,415 or $36,609 (19%) lower than white males.

METHODS

Data Source

The Center for Studying Health System Change (HSC) documents changes in health care systems over time and tracks the effects of those changes on people. Through surveys and site visits, HSC seeks to describe and analyze how the interactions of providers,

insurers, policy makers and others determine the accessibility, cost, and quality of locally delivered health care. The core of these efforts are HSC's Community Tracking Study (CTS) and Health Tracking Surveys, a set of periodic surveys and site visits that have allowed researchers to analyze information about local markets and the nation as a whole. The data for this study is from the Community Tracking Study physician survey conducted in 2007.

The survey was designed to be representative of direct patient care physicians in the continental United States as well as in selected communities or sites. Sites were first stratified by regions of the country according to medium and large metropolitan sites (200,000 persons or more), small metropolitan sites (less than 200,000 persons), and nonmetropolitan sites to ensure representation of these areas (Metcalf, Kemper, Kohn, et al., 1996). The classification of Metropolitan sites was based on Metropolitan Statistical Areas which were defined by the Office of Management and Budget, while the Bureau of Economic Analysis Economic Areas was used to define nonmetropolitan sites.

The 60 sites were selected with a probability in proportion to population to ensure representation of all US physicians and also stratified to ensure diversity by region and size. The sample of physicians for each of the 60 sites was randomly drawn from the American Medical Association (AMA) and the American Osteopathic Association Master files. The sample includes active nonfederal office- and hospital- based physicians in selected specialties who spend at least 20 hours per week in direct patient care. While primary care physicians were oversampled, radiologists, anesthesiologists, pathologists, and a few no patient care specialists (e.g. legal medicine) were excluded. Residents and fellows were also excluded. The average length of the telephone interview was 20 minutes. The CTS had data on 12,280 physicians in 2007. These physicians contributed an overall response rate of 61%.

Dependent Variables

Our dependent variable was the net income (after expenses, before taxes) from the practice of medicine in 2007. Respondents were asked the following questions: "What was your own gross income from the practice of medicine after deducting expenses but before taxes? The total of incomes include contributions to retirement plans made for you by the practice and any bonuses, as well as fees, salaries, and retainers but exclude investment income. " Annual income was listed in the following broad categories: under $50,000; $50,000 to $99,999; $100,000 to $149,999; $150,000 to $199,999; $200,000 to $249,999; $250,000 to $299,999; and over $300,000.

Independent Variables

The key independent variable was a dummy variable with values of 2 for a male physician and 1 for a female physician. On the basis of previous studies of physicians' earnings (Kehrer, 1976; Langwell, 1982; Ohsfeldt & Culler, 1986; Baker, 1996; McMuway et al., 2000), control variables were also introduced into the analysis: age, years in practice, doctor type (MD or DO), board certification, whether they were a primary care physician, average weeks practicing medicine, practice type (1:solo; 2:group; 3:HMO; 4:school; 5:hospital; 6:other), multiple practices (provide practice: one or more than one), number of physicians, ownership status(owner or other), and whether the practice was located in a metropolitan area (rural, small metropolitan area with less than 200,000 population, and

large metropolitan area with greater than 200,000). All measures were derived from the Physician Survey, except for gender, which were obtained from the American Medical Association and American Osteopathic Association master files.

Methods of Analysis

Descriptive characteristics of respondents were given as the mean or frequency. Continuous measures were compared using t tests, and frequencies were compared using the Chi-square test. We tested bivariate associations between the gender variable and the income variable using the Chi-square test. Variables within each category of characteristics were examined first; all correlations were below the levels where multicollinearity would be considered problematic. Separate analyses were conducted for male physicians and female physicians to facilitate analysis of differential determinants between the groups. Multinomial logistic regressions were used to determine the association between the gender variables and income. The regression model has been applied to clarify the association between gender and income variable after adjusting for the confounding effect. Adjusted odds ratios and 95% confidence intervals were estimated to describe the association between gender and income.

Results

Table 1 demonstrates the cross-tabulations for the control variables and gender. The characteristics of the respondents of the survey are presented in Table 1.

The age ranged from 29 to 102 years; thirty-nine percent were in their forties or fifties. Ninety-two percent were MD; 85.6% were board certified; 59.0% were PCPs. The average number of weeks spent in a year was 47.12; thirty-six percent were in solo practice; the remainder was in group practice. Group practice arrangements were described as affiliated with a medical school by 7.6%, hospital-based by 13.7%, and staff model health maintenance organization-based by 5.9%; fewer than 11.3% described other categories. About 91% of the physicians provide patient care in one practice; 31.2% are full owners of their practices; 87.3% of the sample resides in a large metropolitan with more than 200,000 people.

The mean age of male physicians (47.5) is higher than that of female physicians (42.3). There are two types of doctors: MD and DO. The percentage of female physicians (94.0%) is higher than male physicians (91.6%). Between primary care physicians and specialists, female physicians were more likely to be in primary care fields (75.7%), compared to 57.8% of men. In general, male physicians spent more numbers of weeks working: averaging 47.4 weeks in a year.

About seventy percent of male physicians were in solo or group practice, while female physicians were more likely to be in the HMO-staff model, medical school, or hospital-based practice. Thirty-four percent of male physicians were full owners of their practices, compared with 22.2% of female physicians. In non-large metropolitan region, male physicians constituted 13.7%, compared to 9.2% of female physicians.

The distribution of different income levels among male and female physicians is different (χ^2 =1307.68, p < .001). In the seven categories such as under $50,000; $50,000 to $99,999; $100,000 to $149,999; $150,000 to $199,999; $200,000 to $249,999; $250,000 to $299,999; and over $300,000 etc., male physicians are primarily located in the $100,000 to

$149,999 (31.2%) and $150,000 to $199,999 (23.4%) categories, while female physicians are located in the $50,000 to $99,999 (31.9%) and $100,000 to $149,999 (39.3%) categories.

Table 1: Description of physicians by select characteristics

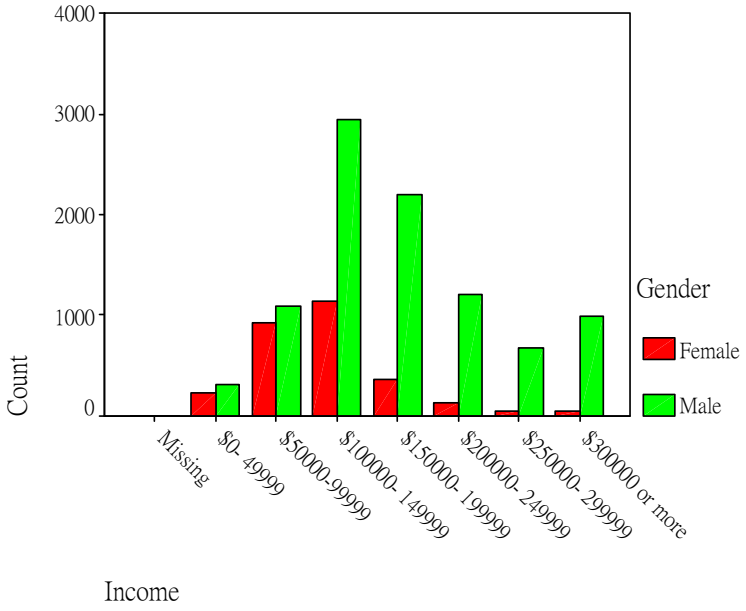
	Total N=12304	Male N=9410	Female N=2894		
	N(%)/mean(sd)	N(%)/mean(sd)	N(%)/mean(sd)	t /χ^2	p-value
Personal characteristics					
Age	46.30(10.36)	47.54(10.59)	42.28(8.41)	24.47	0.001***
Doctor type				16.89	0.001***
MD	11339(92.2)	8620(91.6)	2719(94.0)		
DO	965(7.8)	790(8.4)	175(6.0)		
Board certification status				2.54	0.11
Nonboard member	1705(13.9)	1380(14.7)	390(13.5)		
Board member	10534(85.6)	8030(85.3)	2504(86.5)		
Primary care physicians				299.13	0.001***
Not PCP	5040(41.0)	3968(42.2)	704(24.30)		
PCP	7264(59.0)	5442(57.8)	2190(75.7)		
Number of weeks spent in a year	47.12(5.36)	47.44(4.84)	46.07(6.68)	12.1	0.001***
Practice setting					
Practice type				230.57	0.001***
Solo	4397(35.7)	3560(37.8)	837(28.9)		
Group	3166(25.7)	2562(27.2)	604(20.9)		
Staff model HMO	732(5.9)	493(5.2)	239(8.3)		
Medical school	941(7.6)	620(6.6)	321(11.1)		
Hospital- based	1688(13.7)	1186(12.6)	502(17.3)		
Other	1380(11.2)	989(10.5)	391(13.5)		
Number of practice				1.38	0.24
1	11147(90.6)	8509(90.4)	2638(91.2)		
2+	1157(9.4)	901(9.6)	256(8.8)		
Number of physician				185.28	0.001***
1	2846(23.1)	2358(25.1)	488(16.9)		
2-3	1661(13.5)	1325(14.1)	336(11.6)		
4-10	1986(16.1)	1560(16.6)	426(14.7)		
11+	2240(18.2)	1696(18.0)	544(18.8)		
Owner				141.06	0.001***
Not owner	8470(68.8)	6219(66.1)	2251(77.8)		

owner	3834(31.2)	3191(33.9)	643(22.2)		
Metropolitan region				43.25	0.001***
Large	10744(87.3)	8115(86.2)	2629(90.8)		
Small	396(3.2)	322(3.4)	74(2.6)		
Non	1164(9.5)	973(10.3)	191(6.6)		

Table 2: The cross-tabulation of gender and income

	Male	Female	χ^2	P value
$0-49999	315(3.3%)	238(8.2%)	1307.68	<.001***
$50000-99999	1083(11.5%)	924(31.9%)		
$100000-149999	2936(31.2%)	1138(39.3%)		
$150000-199999	2199(23.4%)	364(12.6%)		
$200000-249999	1212(12.9%)	133(4.6%)		
$250000-299999	674(7.2%)	48(1.7%)		
$300000 or more	989(10.5%)	49(1.7%)		
Missing	2	0		
Total	9408	2894		

Figure 1: The frequency of gender by income groups



We adopted multinomial logistic regression first to study the relationship between gender and income. The results show that each income level compares to $300,000 or more (the highest level), female physicians are 15.25, 17.22, 7.82, 3.34, and 2.22 times more

(significant) than male physicians. Then, focusing on control variables from past studies, we used t-tests or the Chi-square test to find potential related factors. Based on the preliminarily significant variable results ($p < .05$), we put them into logistic regression as control variables. Finally, each income level compares to $300,000 or more (the highest level), female physicians are 13.61, 14.05, 5.66, 2.68, and 1.98 times more (significant) than male physicians. Female physicians are still found in the lower income category ($0 to $49,999, $50,000 to $99,999, $100,000 to $149,999) compared to their counterparts.

Table 3: The Multi-nominal Logistic regression result of gender and income

	Female: Male 之 OR (95% CI)	Adjusted Female: Male 之 OR (95% CI)
$0-49,999/$300,000 or more	15.25 (10.94- 21.27)***	13.61 (9.58- 19.33)***
$50,000-99,999/$300,000 or more	17.22 (12.76- 23.25)***	14.05 (10.28- 19.19)***
$100,000-149,999/$300,000 or more	7.82 (5.83- 10.51)***	5.66 (4.17- 7.69)***
$150,000-199,999/$300,000 or more	3.34 (2.46- 4.54)***	2.68 (1.95- 3.68)***
$200,000-249,999/$300,000 or more	2.22 (1.58- 3.11)***	1.98 (1.40- 2.79)***
$250,000-299,999/$300,000 or more	1.44 (0.95- 2.17)	1.40 (0.93- 2.12)

Note: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Several factors that were distributed differently between men and women were associated with earnings (Table 1). Age, doctor type, primary care physician, number of weeks spent in a year, practice type, number of physicians, ownership status and metropolitan region were all associated with differences in earnings. In general, characteristics that were associated with lower earnings were also associated with the personal characteristics and practice settings occupied by women.

DISCUSSION

We found an important income differential between male and female physicians. This differential is explained in part by the clustering of women in less lucrative practice settings and in personal characteristics. Women also spent fewer weeks seeing patients. However, even after adjusting for these differences, women earned a significantly lower annual income than their male counterparts.

Our findings contrast in part with those of Baker (1996), who found no salary differential for young physicians of all specialties (who had been in practice 2 to 9 years) but found a significant gender differential for physicians in practice for 10 or more years. Our findings are consistent with those of McMurray et al (2000), who used data from a national survey of practicing female and male physicians in both primary care and subspecialty fields and showed that earnings differed significantly between men and women. A possible reason accounting for these inconsistent results is that Baker (1996) found no adjusted salary differential among physicians in practice 10 or fewer years but noted a gap among those who had practiced longer. This may reflect a cohort effect or a reduction in the income differential with greater time out of training. Our study included physicians who would have been eligible for Baker's cohort. The young cohort studied by Baker would have been in practice for 9 to 16 years in 1997 and would have been included in our study group. Therefore, although caution must be exercised in cross-study

comparisons, it may be more likely that the widening income differential with time in practice reflects greater gender-specific income differences with greater time out of training, showing an age effect.

Inequities in financial compensation have historically existed between male and female physicians. In a recent study of internists in Pennsylvania (Weeks, Wallace 2007; Ness et al., 2000), women reported being more likely than men to spend fewer hours seeing patients, practicing in the least lucrative settings, and choosing lower paying specialties as salaried employees. Yet, even after adjusting for these differences, hourly earnings were significantly higher (14 percent) for men. Men's earnings substantially exceeded women's earnings among physicians with no academic affiliation, in high-income specialties and in general internal medicine (Ness et al., 2000). Gender-specific preferences in type of practice also play a role in female doctors' lower earnings. The AMA reports that female physicians are about twice as likely as men to be employed by a hospital, HMO, group practice, or other organizations. Forty-three percent of female doctors are employees, compared with twenty-two percent of men. There are just fifty-seven percent of female doctors who either work alone, work with a partner, work as part owner in a group practice, or who work as an independent contractor. For male doctors, this share is seventy-nine percent. While independent practitioners generally earn more money, they also tend to work longer hours and must contend with more paperwork and other administrative duties. Female physicians may work less than male physicians for the same reasons while other female physicians control their number of work hours. Two-thirds of practicing female physicians also have children. Although they have broken many traditional barriers, women still remain the primary family caretakers. Female physicians work fewer hours, on average, because of the time-consuming nature of family responsibilities. In one study that included full-time pediatricians, men contributed to 19 percent of their family's childcare and 26 percent to household duties. Women pediatricians took charge of 66 percent of childcare and 63 percent of household duties. Another reason for the lower incomes of female doctors is their tendency to choose lower-paying specialties such as internal medicine, pediatrics, and family practice. Specialists such as radiologists, surgeons, and cardiologists typically earn more money than these primary-care practitioners. According to AMA there were 54 percent of women residents in pediatrics in 1990. But they were just 5 percent of residents in vascular surgery, one of the best-paying medical subspecialties. The above results are same as ours: a greater percentage of female physicians are employees but not owners or primary care physicians, and most of them are in medical school or staff model HMO.

CONCLUSION

In conclusion, despite a trend towards equality, income differentials persist between female and male physicians. We found that among physicians involved in a broad range of practice settings, there is an inequality in income between men and women. Male physician tend to earn more than female. Male physicians were more likely in solo or group practice as well as full owners of their practices, while female physicians were more likely to be in the HMO-staff model, medical school, or hospital-based practice. Age, doctor type, primary care physician, number of weeks spent in a year, practice type, number of physicians, ownership status and metropolitan region were all associated with differences in earnings. In general, characteristics that were associated with lower earnings were also associated with the personal characteristics and practice settings occupied by women. The

underlying reasons for the income inequality should be further explored by collecting and analyzing personal choice information such as negotiating skills, desire to make money, marital status, and number of children in the family as well as by investigating market forces and institutional factors that may affect earnings of physicians.

IMPLICATION

This study presents several important implications for physicians, academic purposes and the administrator of institution. The results presented in this paper have positive implications for women in medicine. In the past, women in professional occupations either choose to pursue their careers or quit their jobs to have children, however nowadays it appears that women are able to combine career and family with some degree of success. Women physician were able to reduce their hours and weeks worked without suffering any significant reductions in their hourly earnings in order to taking care of their family as something worth. The results suggest that female physicians tend to have lower salary because they are employees, not owners or primary care physicians, and most of them are in medical school or staff model HMO. Females prefer shorter workweeks even though their jobs do not limit work hours. The results suggest that the earning gap does not reflect adverse selection but rather individual choices given time constraints imposed perhaps by family responsibilities. The decision is based on personal choice, even though it is not clear that these earnings differences will persist in the future, particularly if their children become older. For academic purposes, this study can be used a references for further research in terms of gender differences in physicians. For the administrator of institution, the effort to attract more women involved in varied specialty fields, including the rarest woman specialty, vascular surgery, needs to be improved.

There are several strengths of this study. First, the CTS data set is large and designed to represent the nation. The sample size of the CTS is larger than any previous data set used to analyze physician income. Second, we control most of the variables identified in previous literature. Third, the data set is highly regarded and has been productively analyzed within other rigorous studies.

This is a cross-sectional study, so only limited inferences can be drawn from the results. For example, the metropolitan variable is consistent and strongly correlated with income. We cannot determine, however, whether it is working in large metropolitan areas that improve income or whether it is the type of physician (already wealthy) who chooses to live in a large metropolitan. Similar problems plague the interpretation of the statistically significant correlations with the board certification and full owner variables. These correlations, again, could only reflect self-selection. Second, even among those who responded, recall biases may have occurred. This factor would have inflated the observed gender difference in earnings if men generally over-report or women under-report income. Third, factors beyond gender are strongly related to physicians' earnings. We adjusted many of these factors in our multivariable models. However, we did not have measures available from the survey such as: negotiating skills, desire to make money, presence of two-income families, marital status, and number of children in the family that may influence gender differences in earnings. Finally, income is recorded in crude $50,000 increments in the CTS. This is not similar to continual variable data, which can be obtained from most other income studies for further delicate data analysis.

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