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Gender and Future Salary: Disparate Trends in Internal Medicine Residents

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Financial factors are associated with career decisions among medical students. There is a strong positive correlation between the mean income of physicians practicing in a specialty and the percentage of training positions for that specialty filled by US allopathic medical school graduates (USMGs).¹ Nationally, about 60% of residents who specialize in internal medicine (IM) go on to pursue subspecialty fellowships.² These subspecialties have a wide range of mean salaries for their practicing physicians. It is unknown if resident career choice within the subspecialties shows an association with future salary similar to that seen in medical student specialty choice.

A different financial factor, educational debt, has been shown to associate with subspecialty choice. For IM residents, USMGs tend to have higher levels of educational debt than their international medical graduate (IMG) counterparts; increased levels of debt are

associated with decreased subspecialty pursuit for both men and women compared with careers in general internal medicine or hospital medicine.² Although debt attenuates subspecialty pursuit similarly for men and women, other financial factors related to career choice may vary by gender. Disparities do exist in subspecialty career choice, as women are historically underrepresented in some subspecialty fields, particularly cardiology and gastroenterology.^{3,4} These fields also have the highest mean salaries among their subspecialists. It remains unclear whether the role future salary plays in subspecialty choice depends on gender.

We sought to assess the relationship between IM subspecialty choice and potential future salary by origin of medical school (USMG or IMG) and gender.

METHODS

Published data about fellows in training and mean salaries for physicians was used to assess trends separately for origin of medical school and gender, while data collected in a previous cross-sectional survey of IM residents was analyzed to assess evidence of statistical interaction between these 2 factors.

The percentage of fellowship positions filled in IM subspecialties by USMGs and women for 2007 was recently published.⁵ The mean annual salary in 2007 for practicing physicians in different subspecialties was obtained from the annual American Medical Group Association survey of physician salaries.⁶ Nine subspecialties had data available from both sources: cardiology, endocrinology, gastroenterology, geriatrics, hematology,

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ogy/oncology, infectious disease, nephrology, pulmonary/critical care, and rheumatology. These data were used to investigate the relationship between mean salary and percent of fellowship positions filled by USMGs and by women.

To assess the possible statistical interaction between gender and medical school origin, data from the Internal Medicine In-Training Examination (IM-ITE) Residents Questionnaire were utilized.² Administered annually in October, IM-ITE is a test of medical knowledge for internal medicine residents with near-complete participation of US internal medicine residency programs.^{2,7,8} The years 2003-2006 were chosen so that the third-year residents surveyed would be representative of the subspecialty fellows who had likely begun their advanced training by the 2007 academic year. A representative copy of the IM-ITE Residents Questionnaire, demographic characteristics, and distribution of career choices among participants in the survey over the dates of our study has been published.² The same 9 subspecialties listed previously were used, with the addition of general internal medicine and hospitalist careers.

This study was approved by the Mayo Clinic institutional review board.

STATISTICAL ANALYSIS

To assess the strength and direction of the linear relationship between percent of fellows in training and future mean salary, Pearson product-moment correlation coefficients were calculated for both USMGs and women. Combining the summarized IM-ITE survey

data with mean salaries, a multivariate linear regression model was then used to assess the effects of medical school origin, gender, mean salary, and their statistical interactions on percent pursuing each of the subspecialties. Reduced models (that ignored statistical interactions, medical school origin, or gender) were compared against the full model using F tests based on the general linear test approach.⁹

To assess the agreement between the 2 data sets, the percent reporting a career choice in each of the subspecialties was calculated for residents from the IM-ITE data and matched by subspecialty to the percent of fellowship positions filled. Pearson product-moment correlation coefficients were then calculated for both USMGs and women.

All analyses were performed by one author (AJH) using SAS software (SAS Institute Inc., Cary, NC).

PERSPECTIVES VIEWPOINTS

- The association between salary and subspecialty choice among internal medicine residents is strongly positive for men, but strongly negative for women; ie, proportionately more men pursue subspecialties with higher mean salaries, and more women pursue subspecialties with lower mean salaries.
- The association between gender and salary for subspecialty choice among internal medicine residents is similar regardless of whether the resident trained in a US or international medical school.

RESULTS

The total number of fellows in training, percent of fellowship positions filled by USMGs and women, and annual mean salary for practicing subspecialists were tabulated (Table 1). There was a positive correlation between mean salary and percent of USMG fellows ($R = .67$, $P = .05$) (Figure 1). Geriatric medicine had the lowest mean salary (\$177,392) and percent of USMG fellows (28.9%), while cardiology and gastroenterology had the highest mean salaries (\$370,295 and \$356,388, respectively), with equivalent percent of USMG fellows (65.3%).

Table 1 Fellows in Training as of December 1, 2007 by Medical School Origin, Gender, and Potential Future Salary

Subspecialty	Fellows n	USMG		Women		Mean Salary for Practicing Physicians
		n	%	n	%	
Cardiology	2372	1550	65.3	446	18.8	\$370,295
Endocrinology	536	320	59.7	361	67.4	\$204,217
Gastroenterology	1212	791	65.3	358	29.5	\$356,388
Geriatric medicine	246	71	28.9	136	55.3	\$177,392
Hematology/oncology	1329	780	58.7	576	43.3	\$280,339
Infectious disease	740	394	53.2	353	47.7	\$213,496
Nephrology	808	356	44.1	285	35.3	\$240,145
Pulmonary/critical care medicine	1247	634	50.8	343	27.5	\$265,907
Rheumatology	408	236	57.8	238	58.3	\$208,285

USMG = United States allopathic medical school graduates.

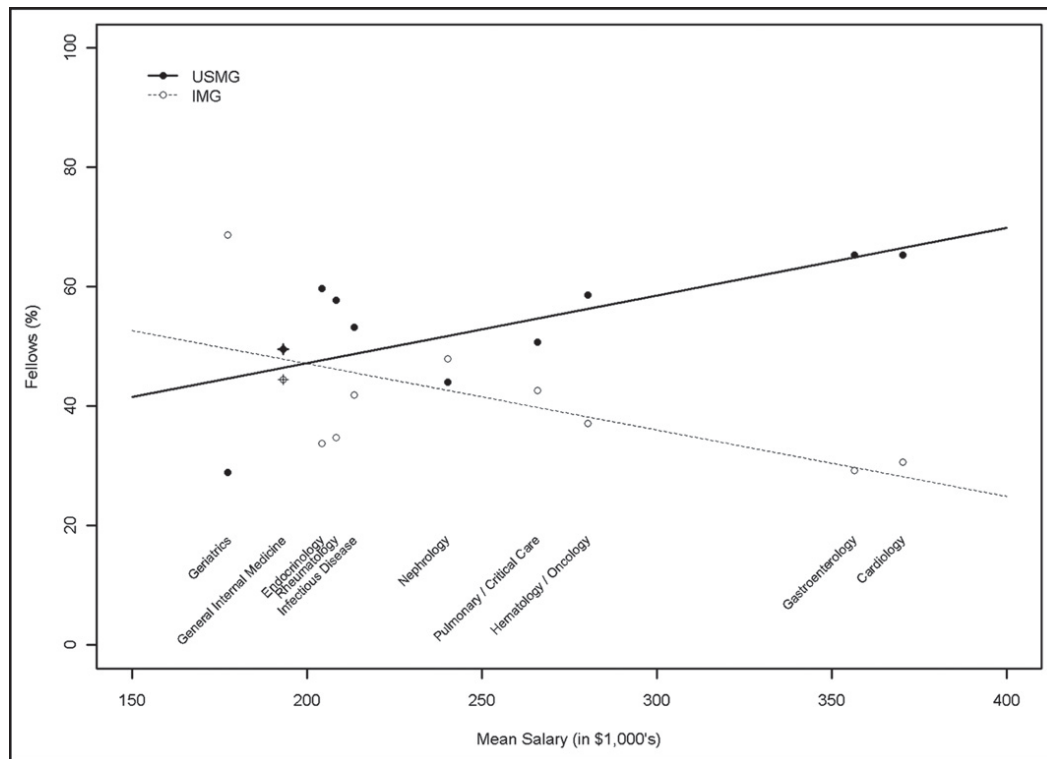


Figure 1 Fellows in training by medical school origin. Percent of fellows who were US allopathic medical school graduates (USMG) and percent who were international medical graduates (IMG) by subspecialty plotted against mean salary. The data points for general internal medicine reflect the breakdown of all 22,026 internal medicine residents for comparison and were not included when calculating correlations.

For women in subspecialty training, there was a strong negative correlation between mean salary and percent of women fellows ($R = -.83$, $P = .005$) (Figure 2). Endocrinology had the highest percent of women fellows (67.4%) and the second lowest mean salary (\$204,217), while cardiology had the lowest percent of women fellows (18.8%), followed by critical care medicine (27.5%) and gastroenterology (29.5%).

For the years 2003-2006, nearly all US categorical IM residency programs (99.5%) participated in IM-ITE.² From these programs, 17,015 residents in their third (final) year of training responded to questions about their gender, origin of medical school, and career plans (Table 2). This sample represents 69.9% of all third-year categorical IM residents nationally from 2003-2006.² USMGs and women made up 51.3% and 40.0% of the sample, respectively.

There was strong agreement between 2007 fellows in training and 2003-2006 third-year IM resident-reported career choice for both USMG ($R = .90$; $P < .001$) and women ($R = .99$; $P < .001$). The full multivariate linear regression model for percent reported career choice, accounting for future mean salary, medical school type, and gender, and their interactions explained a significant proportion of the variability in career choice ($R^2 = .62$; $P < .001$). The data do not

suggest that the effects of medical school origin and gender depend significantly on one another ($P = .22$). Within gender, career choice trends with future mean salary were similar for USMGs and IMGs (Figure 3). This observation is supported by the failure of a general linear test to reject the hypothesis that medical school origin is not an important factor in reported career choice after accounting for gender ($P = .10$). A reduced model for reported career choice accounting only for gender and salary still accounts for more than one half of the variability in career choice ($R^2 = .53$; $P < .001$). In summary, the inclusion of medical school origin and its interaction with gender did not significantly improve upon just using gender and salary to predict reported career choice percentages.

DISCUSSION

A relationship between physician salaries and career decisions among medical students has been shown.¹ Less is known about the role similar factors play among IM residents considering subspecialty careers. The major contribution from this article is evidence that higher-paid subspecialties are pursued at a higher rate by men than women, regardless of whether they trained in US or international medical schools.

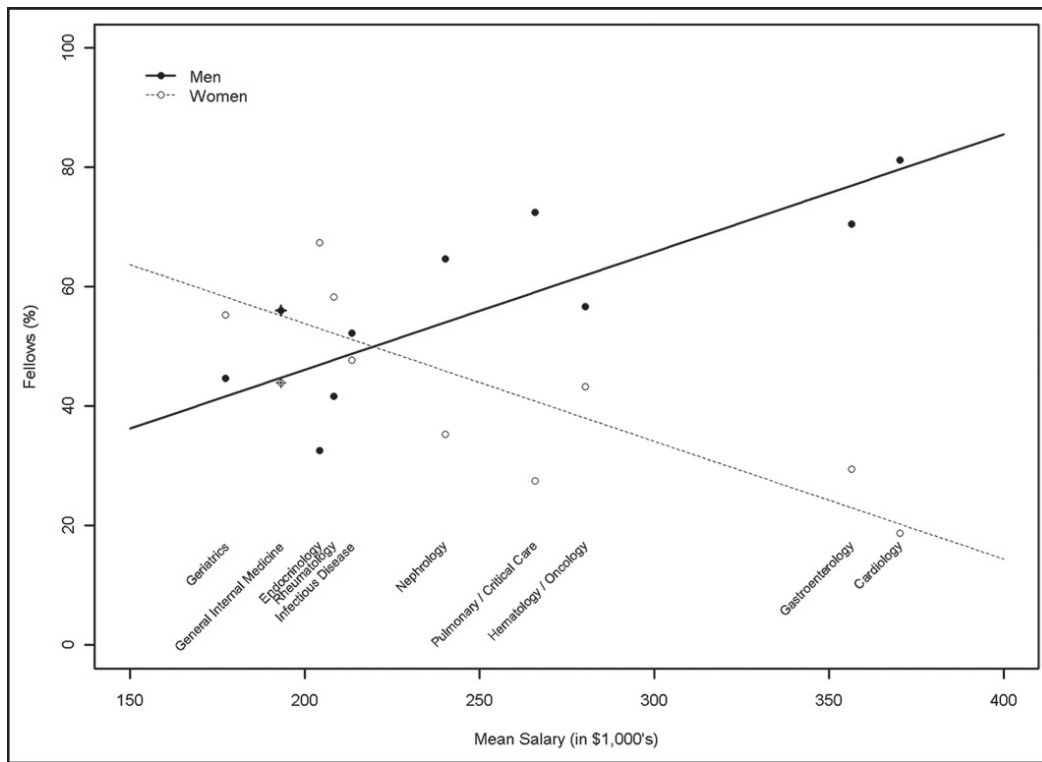


Figure 2 Fellows in training by gender. Percent of fellows who were men and percent who were women by subspecialty plotted against mean salary. The data points for general internal medicine reflect the breakdown of all 22,026 internal medicine residents for comparison and were not included when calculating correlations.

For medical students obtaining a categorical position in an IM residency program, the range of potential future salaries is similar to that of medical students choosing to train in other specialties.

The ratio between the mean salary of a cardiologist (\$370,295) and geriatrician (\$177,392) is 2.1, similar to the ratio of 2.2 for a radiologist (\$414,875) and a family physician (\$185,740).¹ In addition to this range of po-

Table 2 Third-year Categorical IM Residents (2003-2006) Intended Career by Gender and Medical School Origin

Subspecialty	Residents n	Men				Women			
		USMG		IMG		USMG		IMG	
		n	%	n	%	n	%	n	%
Cardiology	2360	1062	45.0	844	35.8	254	10.8	200	8.5
Endocrinology	718	122	17.0	115	16.0	253	35.2	228	31.8
Gastroenterology	1403	626	44.6	376	26.8	245	17.5	156	11.1
General internal medicine	3822	867	22.7	1077	28.2	892	23.3	986	25.8
Geriatric medicine	259	36	13.9	82	31.7	73	28.2	68	26.3
Hematology/oncology	1464	426	29.1	370	25.3	393	26.8	275	18.8
Hospitalist	1530	424	27.7	522	34.1	313	20.5	271	17.7
Infectious disease	729	189	25.9	193	26.5	180	24.7	167	22.9
Nephrology	1214	376	31.0	418	34.4	181	14.9	239	19.7
Pulmonary/critical care medicine	1284	384	29.9	526	41.0	214	16.7	160	12.7
Rheumatology	566	112	19.8	92	16.3	188	33.2	174	30.7
Other subspecialty	185	74	40.0	36	19.5	54	29.2	21	11.4
Other (non-IM)	356	126	35.4	104	29.2	82	23.0	44	12.4
Undecided/multiple	1125	314	27.9	309	27.5	268	23.8	234	20.8
Total	17,015	5138	30.2	5064	29.8	3590	21.1	3223	18.9

IM = internal medicine; USMG = United States allopathic medical school graduates; IMG = international medical graduates.

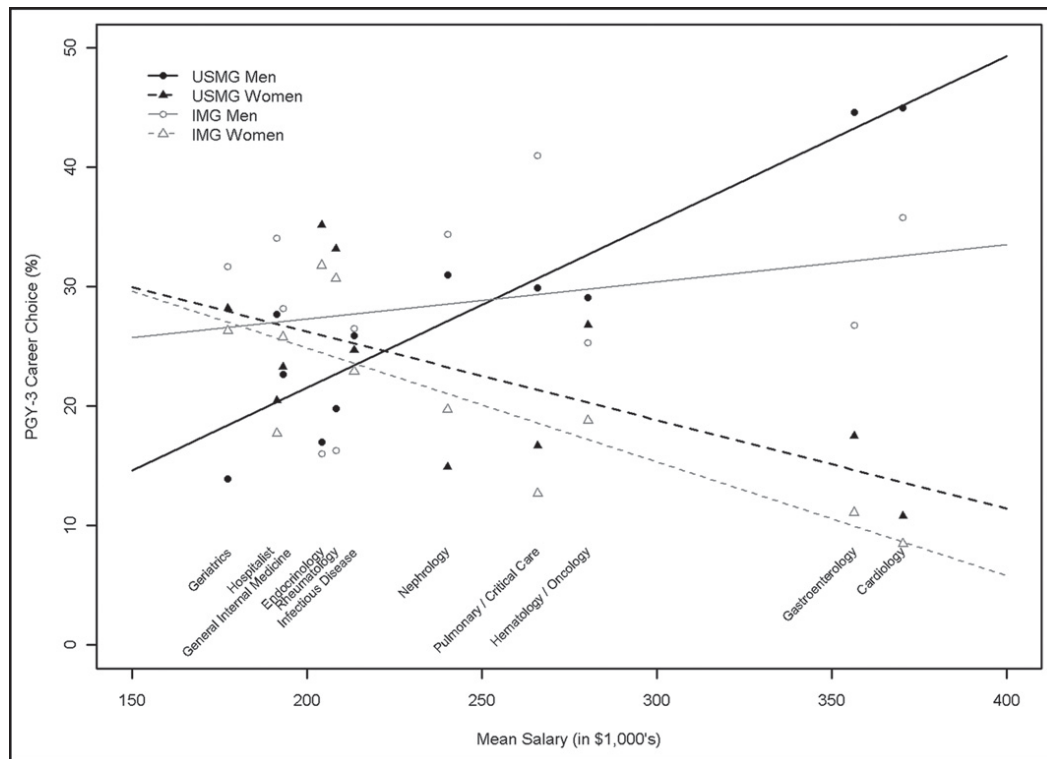


Figure 3 Third-year internal medicine resident career plans by medical school origin and gender. Percent of postgraduate year 3 (PGY-3) internal medicine (IM) residents who indicated a career choice in one of 9 subspecialty fields, general internal medicine, or hospital medicine plotted against mean salary. The percents were broken down by gender and if they were US allopathic medical school graduates (USMG) or international medical graduates (IMG).

tential future salaries, other factors are likely to be associated with subspecialty choice, including medical school experiences, lifestyle, educational debt, and gender.^{2,8,10,11}

The percentage of third-year IM residents from US medical schools was 48% in 2007, down from a high of 58% during the previous 10 years.¹² Over this same time period, the percentage of USMGs filling first-year subspecialty fellowship spots had grown from 46% to 55%. Using this 55% as an average fill rate for USMGs, we can see that USMGs pursued cardiology and gastroenterology (both 65.3%) at more than 10% above the expected rate, while nephrology (44.1%) and geriatric medicine (28.9%) fill rates were more than 10% below expected (Figure 1).

Upon first inspection, the relationship between percent of USMG subspecialty fellows and future salary is similar to that of US medical students entering specialty residency training ($R = .67$ and $.82$, respectively).¹ This assessment offers some evidence that future salary may play a role in subspecialty choice by IM residents, much like it has been shown to do for specialty choice among medical students.¹ This univariate relationship, however, does not account for potential confounding variables like gender.

Women made up 44% of third-year residents in 2007, an 8% increase over the previous 10 years.¹² For that same year, women filled just 35% of first-year fellowship spots, an 11% increase over the same time period.¹² Using this 35% as an average fill rate for women, we can see that women pursued endocrinology (67.4%), rheumatology (58.3%), geriatrics (55.3%), and infectious disease (47.7%) at more than 10% above the expected rate, while the cardiology fill rate (18.8%) was more than 10% below expected (Figure 2).

When we look at gender, which was not available in the previously published specialty analyses,^{1,13} we see a strong negative correlation ($R = -.83$) between percent of women fellows and future salary. This negative association is seen in female USMG and IMG fellows alike. If sex is accounted for, medical school origin is no longer a significant contributor to the relationship between future salary and subspecialty choice.

Our study is not without limitations. This observational study does not allow inferences related to causality. As with any observational study, other factors not accounted for in our analyses may affect the results, and we have no way to assess their possible influence or interactions. However, the model developed from our data does account for 62% of the variance seen in the data, indicating that while other factors may be impor-

tant, future salary and gender are likely significant contributors to overall subspecialty training choice for most internal medicine residents.

Our data are unable to address several interesting questions: Are women systematically paid less, decreasing the overall salaries of the subspecialties they prefer? Do gender biases exist toward certain subspecialties for nonmonetary reasons, such as perceived lifestyle? Does a lack of female role models in certain subspecialties perpetuate a lower number of female residents? We believe these questions frame important areas to explore and warrant further research.

In conclusion, IM resident subspecialty choice is strongly associated with future salary. Proportionately more men pursue subspecialties with higher mean salaries, while more women pursue subspecialties with lower mean salaries, regardless of whether they are USMG or IMG.

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