

Financial Implications of Physician Specialty Choice

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ABSTRACT

PURPOSE: To examine the approximated financial outcomes of physicians by specialty and to determine whether these correlate with mean USMLE Step 1 scores.

METHODS: Specialty-specific data from the Association of American Medical Colleges Careers in Medicine website were analyzed for total length of training, mean USMLE Step 1 scores, average hours worked per week, and median clinical practice salary for physicians. Hourly wage and estimated net worth at retirement were calculated. Coefficients of determination (R^2) were calculated to evaluate the relationships between hourly wage, annual salary, and estimated net worth at retirement with competitiveness as measured by USMLE Step 1 scores of matched residents.

RESULTS: Across all 37 specialties studied, the mean hourly wage was $\$136 \pm \40 , ranging from $\$78$ (Geriatrics) to $\$249$ (Neurosurgery). Mean weekly hours worked across all specialties was 54.6 ± 6.4 , ranging from 43.4 (Pediatric Emergency Medicine) to 71.1 (Vascular Surgery). At retirement, the mean estimated net worth for all physicians was $\$4,517,600 \pm \$1,793,095$, ranging from $\$1,927,779$ (Child & Adolescent Psychiatry) to $\$8,947,885$ (Neurosurgery). Step 1 scores, as a marker of specialty competitiveness, correlate with specialty compensation – the strongest association was with hourly wage ($R^2 = 0.6678$), then annual salary ($R^2 = 0.6424$), and finally by estimated net worth at retirement ($R^2 = 0.6158$).

CONCLUSION: In this study, mean Step 1 scores for each medical specialty were positively correlated with compensation, including absolute salary, hourly wage and estimated net worth at retirement.

KEYWORDS: residency, physician salary, competitiveness, hourly wage, retirement, estimated net worth, lifestyle

INTRODUCTION

Medical student specialty choices influence future clinician workforce composition. Understanding drivers in that selection process is important given multiple evolving factors within the current healthcare landscape, including

population aging [11], shortages of certain specialties [12-15], expanding patient access [16], sub-specialization trends [17], increasing population [28], reimbursement model changes [29, 30], and physician professional satisfaction [31]. Residency positions in certain specialties go unfilled each year [25], frequently in specialties with lower salaries [19, 24] or in those with perceived lack of schedule control [45].

Multiple factors impact specialty selection by medical students [32-40], including compensation and lifestyle. Previous studies have demonstrated that increased medical student debt burden [18-23, 26, 27] has increasingly driven career choice based on anticipated specialty income [33-37]. In recent years, greater numbers of medical students have chosen specialties such as radiology and anesthesiology, while fewer have chosen general surgery and family medicine [41-47]. Medical students' perception of "controllable lifestyle" – primarily determined by workload, hours worked, and on-call schedule – has been demonstrated as a major determinant of specialty selection [39, 46].

The purpose of this study was to 1) evaluate financial outcomes of different specialties and 2) to assess if financial outcomes correlate with specialties' match competitiveness as approximated by average USMLE Step 1 scores.

METHODS

This investigation evaluated all specialty data published on the Association of American Medical Colleges (AAMC) Careers in Medicine website (<https://www.aamc.org/cim/>) accessed in June 2016. Used primarily as a tool for medical student career decision making, the AAMC website aggregates the latest residency and specialty data. For every specialty, we recorded the listed total length of training [4], mean USMLE Step 1 scores [2], average hours worked per week [3], and median clinical practice salary for non-academic physicians [1].

To integrate compensation and workload, hourly wage was calculated by dividing median clinical practice salary by 49 weeks (mean number of weeks worked per year) [5] by hours worked per week. To better incorporate a measure of lifestyle, specialties were stratified into quartiles by hours per week worked. To assess long-term financial outcomes of the different specialties, estimated net worth at 65 years old (the average age of retirement) [6] was calculated. Estimated

net worth (assets – liabilities) at retirement were calculated by tracking the overall estimated net worth of each specialty by post-graduate year (PGY). We assumed all PGY1s were 26 years old (PGY40 = 65 years old); all specialties had the same \$200,000 medical school debt [7]; a constant 6% student loan interest rate based off current federal direct loan rates [8]; zero loan payments made during residency [9]; loans paid off at a rate of 20% of annual salary until debt-free; a savings rate of 10% of salary once debt-free – which also encompasses relative expenditures; and an 8% savings interest growth rate.

Coefficients of determination (R^2) were calculated to evaluate the strength of relationships between hourly wage, annual salary, and estimated net worth at retirement to USMLE Step 1 scores of matched residents – a well-established surrogate of specialty competitiveness [10]. Microsoft Excel (Microsoft Corporation, Redmond, WA) was utilized for statistical analysis with a p-value of $p < 0.05$ utilized for significance.

RESULTS

All 37 specialties and subspecialties listed on the AAMC website that had both salary and weekly hours data available were included in the analysis. Of those, 22 specialties had mean USMLE Step 1 scores available for our analysis of competitiveness.

Specialties were ranked by hourly wage (Table 1). For all specialties included, mean hourly wage was $\$136 \pm \40 , ranging from \$78 (Geriatrics) to \$249 (Neurosurgery). Mean weekly hours worked was 54.6 ± 6.4 , ranging from 43.4 (Pediatric Emergency Medicine) to 71.1 (Vascular Surgery).

Within hours worked per week quartiles, specialties were ranked by hourly wage (Table 2).

Specialties were ranked by estimated net worth at retirement age of 65 – highlighting the interplay between attending salaries and training duration opportunity costs (Table 3).

Specialty competitiveness correlates with measures of compensation (Figures 1–3) – the strongest association was with hourly wage ($R^2 = 0.6678$), then annual salary ($R^2 =$

Figure 1. Relationship between USMLE Step 1 scores of matched residents and attending annual salary

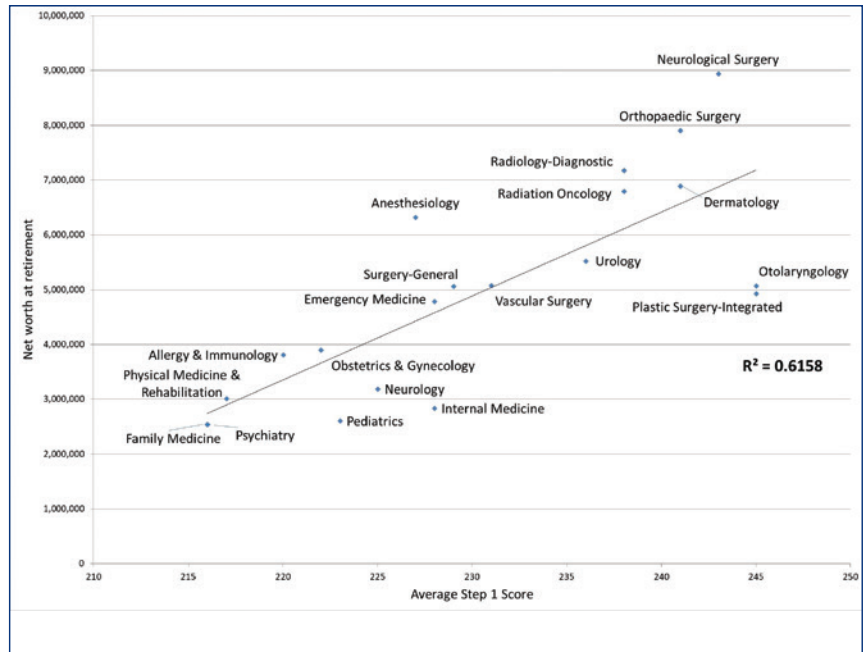
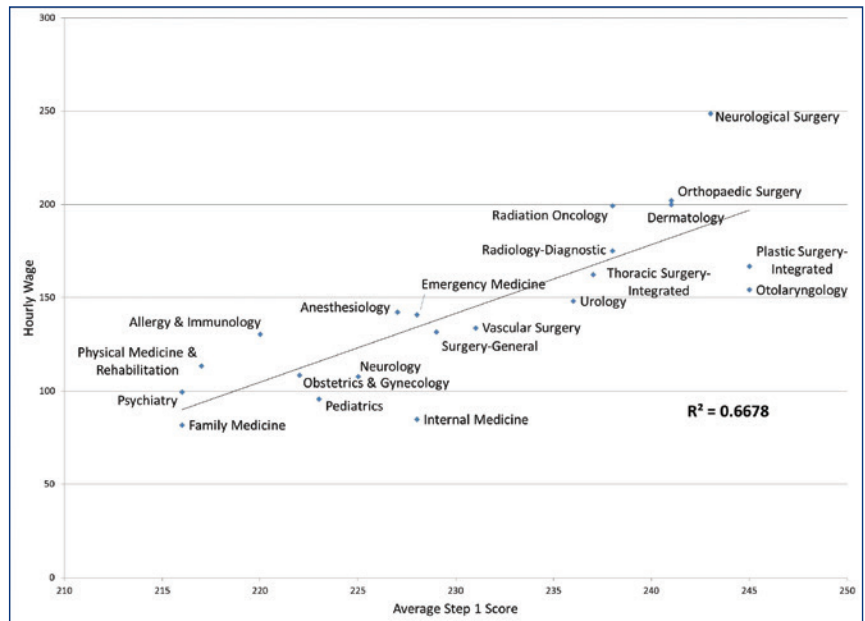


Figure 2. Relationship between USMLE Step 1 scores of matched residents and attending hourly wage



0.6424), and then by estimated net worth at retirement ($R^2 = 0.6158$). The specialties above the fitted line compensate better than the trend suggested for their competitiveness; and specialties below the fitted line are compensated less than the trend predicted for their competitiveness.

Table 1. Hourly wage rankings

Wage Rank	Specialty	Hourly Wage (\$)	Hours/Week	Median Annual Salary (\$)
1	Neurological Surgery	249	58.2	710,000
2	Dermatology	202	45.4	450,080
3	Orthopaedic Surgery	200	57.0	559,137
4	Radiation Oncology	199	51.8	506,023
5	Gastroenterology	186	56.0	510,671
6	Radiology-Diagnostic	175	58.0	498,122
7	Plastic Surgery	167	52.0	425,668
8	Hematology & Oncology	163	52.7	421,093
9	Thoracic Surgery	162	62.8	500,000
10	Otolaryngology	154	53.1	401,944
11	Cardiovascular Disease	151	57.5	426,295
12	Urology	148	58.1	422,624
13	Ophthalmology	148	51.0	370,063
14	Anesthesiology	143	61.0	426,047
15	Emergency Medicine	141	46.4	320,816
16	Vascular Surgery	134	71.1	466,895
17	Surgery-General	132	59.4	383,598
18	Allergy & Immunology	131	49.3	315,710
19	Pediatric Emergency Medicine	127	43.4	270,142
20	Nephrology	118	56.0	323,702
21	Pulmonary Disease	118	61.4	354,313
22	Physical Medicine & Rehabilitation	114	45.4	252,621
23	Neonatal-Perinatal Medicine	110	64.3	345,061
24	Obstetrics & Gynecology	109	58.0	309,028
25	Neurology	108	50.8	268,925
26	Critical Care Medicine	108	66.9	354,003
27	Child & Adolescent Psychiatry	100	47.6	234,319
28	Psychiatry	100	46.5	227,191
29	Pediatrics	96	47.0	220,853
30	Endocrinology, Diabetes & Metabolism	93	48.5	221,098
31	Infectious Disease	93	53.4	243,179
32	Rheumatology	90	53.6	236,517
33	Internal Medicine	85	54.9	229,000
34	Family Medicine	82	52.6	211,452
35	Geriatric Medicine	78	55.3	210,870
Mean		135	54.5	360,773

Table 2. Hourly wage rankings by workload quartile

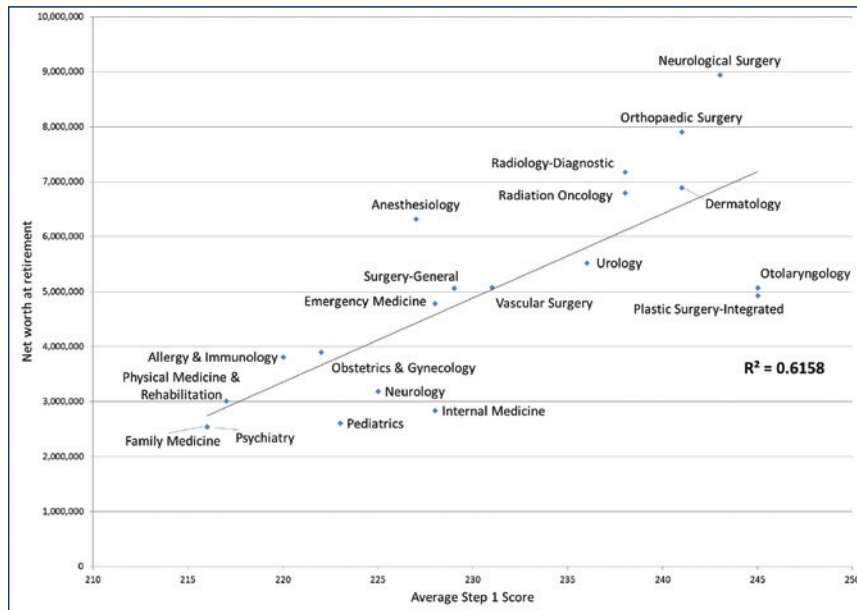
Workload Quartile	Hourly Wage Rank within Quartile	Specialty	Hourly Wage (\$)	Hours/Week	Median Annual Salary (\$)
1st	1	Dermatology	202	45.4	450,080
	2	Emergency Medicine	141	46.4	320,816
	3	Allergy & Immunology	131	49.3	315,710
	4	Pediatric Emergency Medicine	127	43.4	270,142
	5	Physical Medicine & Rehabilitation	114	45.4	252,621
	6	Neurology	108	50.8	268,925
	7	Child & Adolescent Psychiatry	100	47.6	234,319
	8	Psychiatry	100	46.5	227,191
	9	Pediatrics	96	47.0	220,853
	10	Endocrinology, Diabetes & Metabolism	93	48.5	221,098
			1st Quartile Mean	121	47
2nd	1	Radiation Oncology	199	51.8	506,023
	2	Plastic Surgery	167	52.0	425,668
	3	Plastic Surgery-Integrated	167	52.0	425,668
	4	Hematology & Oncology	163	52.7	421,093
	5	Otolaryngology	154	53.1	401,944
	6	Ophthalmology	148	51.0	370,063
	7	Infectious Disease	93	53.4	243,179
	8	Rheumatology	90	53.6	236,517
	9	Family Medicine	82	52.6	211,452
			2nd Quartile mean	140	52
3rd	1	Orthopaedic Surgery	200	57.0	559,137
	2	Gastroenterology	186	56.0	510,671
	3	Radiology-Diagnostic	175	58.0	498,122
	4	Cardiovascular Disease	151	57.5	426,295
	5	Urology	148	58.1	422,624
	6	Nephrology	118	56.0	323,702
	7	Obstetrics & Gynecology	109	58.0	309,028
	8	Internal Medicine	85	4.9	229,000
	9	Geriatric Medicine	78	55.3	210,870
			3rd Quartile Mean	139	57
4th	1	Neurological Surgery	249	58.2	710,000
	2	Thoracic Surgery	162	62.8	500,000
	3	Thoracic Surgery-Integrated	162	62.8	500,000
	4	Anesthesiology	143	61.0	426,047
	5	Vascular Surgery	134	71.1	466,895
	6	Surgery-General	132	59.4	383,598
	7	Pulmonary Disease	118	61.4	354,313
	8	Neonatal-Perinatal Medicine	110	64.3	345,061
	9	Critical Care Medicine	108	66.9	354,003
			4th Quartile Mean	146	63

Table 3. Estimated net worth at retirement by specialty

Net worth at retirement ranking	Specialty	Years of training	Debt at residency graduation (\$)	Estimated net worth (thousands of \$)			
				PGY-10	PGY-20	PGY-30	At retirement (age 65)
1	Neurological Surgery	7	(304)	90	1,223	3,668	8,948
2	Orthopaedic Surgery	5	(270)	157	1,148	3,290	7,912
3	Radiology-Diagnostic	5	(270)	153	1,051	2,991	7,179
4	Dermatology	4	(254)	79	1,038	2,893	6,897
5	Radiation Oncology	5	(270)	106	963	2,811	6,802
6	Gastroenterology	6	(286)	85	924	2,734	6,643
7	Thoracic Surgery-Integrated	6	(286)	76	888	2,642	6,428
8	Anesthesiology	4	(254)	149	939	2,645	6,328
9	Thoracic Surgery	7	(304)	(44)	731	2,304	5,697
10	Urology	5	(270)	74	772	2,278	5,530
11	Vascular Surgery	7	(304)	(65)	632	2,041	5,083
12	Otolaryngology	5	(270)	52	695	2,083	5,078
13	Surgery-General	5	(270)	71	710	2,089	5,065
14	Ophthalmology	4	(254)	80	710	2,068	5,002
15	Cardiovascular Disease	6	(286)	11	642	2,004	4,944
16	Plastic Surgery-Integrated	6	(286)	11	640	1,998	4,931
17	Hematology & Oncology	6	(286)	7	625	1,959	4,839
18	Emergency Medicine	3	(239)	115	713	2,004	4,792
19	Plastic Surgery	7	(304)	(91)	588	1,886	4,688
20	Pulmonary Disease	5	(270)	38	596	1,801	4,401
21	Critical Care Medicine	5	(270)	38	595	1,798	4,394
22	Obstetrics & Gynecology	4	(254)	40	534	1,600	3,903
23	Allergy & Immunology	5	(270)	(5)	510	1,558	3,820
24	Nephrology	5	(270)	4	477	1,500	3,707
25	Neonatal-Perinatal Medicine	6	(286)	(60)	442	1,455	3,641
26	Neurology	4	(254)	15	421	1,299	3,195
27	PM&R	4	(254)	(8)	399	1,228	3,018
28	Pediatric Emergency Medicine	5	(270)	(56)	376	1,203	2,988
29	Internal Medicine	3	(239)	25	385	1,162	2,841
30	Pediatrics	3	(239)	11	343	1,061	2,611
31	Psychiatry	4	(254)	(43)	324	1,030	2,552
32	Family Medicine	3	(239)	(5)	338	1,037	2,544
33	Rheumatology	5	(270)	(94)	277	940	2,371
34	Infectious Disease	5	(270)	(87)	263	921	2,341
35	Geriatric Medicine	4	(254)	(66)	247	839	2,118
36	Endocrinology, D&M	5	(270)	(112)	210	775	1,993
37	Child & Adolescent Psychiatry	6	(286)	(157)	184	736	1,928

Abbreviations: PM&R - Physical Medicine and Rehabilitation; Endocrinology, D&M - Endocrinology, Diabetes, and Metabolism

Figure 3. Relationship between USMLE Step 1 scores of matched residents and estimated net worth at retirement



DISCUSSION

As numerous demographic, political, and economic trends shape healthcare access, quality, and costs, it is becoming increasingly important to understand how drivers of medical student specialty selection may help optimize future provider workforce composition. While previous studies have highlighted the influence of financial reimbursement [18-23, 26, 27, 32-40] and lifestyle [39, 41-47] as major factors on specialty selection, this is the first investigation to evaluate the interplay between financial reimbursement and average number of hours worked. This is additionally the first study to reveal that variance in match competitiveness for different specialties is directionally more strongly explained by variance in hourly wage—a metric integrating both remuneration and lifestyle—than annual salary alone.

As debt levels continue to rise [18-23], compensation structures evolve [29,30], and more women enter medicine [48], the combination of remuneration and lifestyle will continue to impact medical student specialty selection. Various studies [12-15] have forecasted future insufficiencies of primary care providers. Our data reveal that that these providers not only receive some of the lowest salaries, but that hour-for-hour they also receive among the lowest hourly wages. The influence of both compensation and lifestyle may be reflective of a larger trend affecting young professionals in and outside of medicine [49-52].

One limitation of this study is the determination of specialty competitiveness solely by average USMLE Step 1 score. Ideally, the proportion of applicants to each specialty that matched into the specialty would have also been considered. Another study limitation is the quality of the

original data aggregated on the AAMC website. The data represent previous years and may not perfectly reflect this year's trends (1). However, medical students turn to the AAMC and this same data for helping with career decisions. We therefore believe that this imperfect data was appropriate for present analysis, reflecting the latest material available to the primary audience. Although only non-academic physician compensation data was analyzed, academic physicians make up a smaller proportion of practitioners and consistently report lower salaries across specialties [55]. Additionally, the accuracy of projections for estimated net worth at retirement are limited by the accuracy of our underlying assumptions for age at PGY1, medical school debt, student loan interest rates and repayment patterns, retirement savings rates, and savings growth rates. However, as these assumptions were held constant between specialties, systematic error may only minimally

affect the results of our inter-specialty comparisons.

Understanding how remuneration and lifestyle influence medical student specialty selection can help medical schools, graduate medical education programs, employers, legislators, and insurers craft appropriate incentives to attract aspiring physicians to certain specialties.

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