

Match Rates Into Higher-Income, Controllable Lifestyle Specialties for Students From Highly Ranked, Research-Based Medical Schools Compared With Other Applicants

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Abstract

Background Factors impacting medical student specialty career choice are poorly understood, but may include income potential and lifestyle features such as limited and predictable work hours.

Methods Data from the National Resident Matching Program and the San Francisco Match were used to examine match rates into higher-income controllable lifestyle (CL), lower-income CL, and noncontrollable lifestyle (NCL) specialties from 2002 to 2007. We studied 3 cohorts: students from highly ranked, research-based medical schools, other US senior medical students, and independent applicants (consisting mostly of graduates from foreign medical schools).

Results By 2007, 22.5% of students from highly ranked schools matched into a higher-income CL specialty compared with 16.5% of other US seniors and 8.4% of independent applicants. During the study period, students from highly ranked schools increased their

match rate in higher-income CL specialties by 7.9%, while all cohorts experienced declines in match rates for NCL specialties. Compared with other US seniors, students from highly ranked schools were more likely to match into higher-income CL specialties (odds ratio [OR], 1.46; 95% confidence interval [CI]: 1.27–1.68), while independent applicants were much less likely to do so (OR, 0.46; 95% CI: 0.42–0.51). Independent applicants had the highest odds (OR, 2.38; 95% CI: 2.25–2.52) of matching into NCL specialties.

Conclusions All cohorts had declining match rates into NCL specialties from 2002 to 2007. When compared with other US seniors, students from highly ranked schools had the highest odds of matching in higher-income CL specialties, while independent applicants had the highest odds of matching into NCL specialties. These trends are important to consider in light of recent efforts to better balance the physician workforce.

Background

Over the last decade, there has been a declining interest among medical students in pursuing careers in primary care.^{1,2} Concurrently, there has been a general decline in the hours per week physicians work, most noticeably among physicians younger than age 45.³ In contrast, there has been rising

interest in fields that offer better lifestyles, better pay, and more controllable work hours.^{4,5} The term *controllable lifestyle* has been used to describe specialties that offer regular and predictable work hours, which may leave more personal time for leisure, family, and avocational pursuits.^{4,6–9}

Although the scope and relative contributions of competing factors in the minds of applicants is unknown, reports in the lay press suggest that high-income subspecialties are differentially attracting top students:

The vogue for such specialties is part of a migration of a top tier of American medical students from branches of health care that manage major diseases towards specialists that improve the life of patients—and the lives of physicians, with better pay, more autonomy and more-controllable hours... Medical school professors and administrators say such discrepancies are dissuading top students at American medical schools from entering fields, like family medicine, that manage the most prevalent serious illness. They are being replaced in part by graduates of foreign medical schools, some of whom return to their home countries to practice.¹⁰

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In this study, we compared trends in match rates within controllable lifestyle (CL) specialties with those of noncontrollable lifestyle (NCL) specialties, specifically internal medicine, family medicine, and pediatrics. We studied 3 cohorts from 2002 to 2007: students from highly ranked, research-based medical schools, other US senior medical students, and independent applicants (consisting mostly of graduates from foreign medical schools). Our objective was to determine whether students from highly ranked, research-based medical schools are more likely to match into CL specialties than other US seniors or independent applicants.

Methods

Specialty-Related Characteristics

For the comparison of match rates in programs that lead to either a CL or NCL specialty, the following 9 specialties were identified as having a more CL consistent with classification in previous studies: anesthesiology, dermatology, emergency medicine, neurology, ophthalmology, otolaryngology, pathology, psychiatry, and radiology.^{4,6–9} These specialties were classified as CL because they offer more opportunity to have regular and predictable work hours. The NCL specialties were chosen as fields with less controllable work hours that lead to either primary care or subspecialty practice and included internal medicine, family medicine, and pediatrics. Combined medicine-pediatrics residency training programs were excluded from the study because of their small sample size.

The average annual salary for each specialty in this study was obtained from the American Medical Group Association's 2007 Physician Compensation Survey¹¹ and is reported in 2007 US dollars. Annual compensation data were chosen to correspond to the timing of the end of the study period.

Cohort Definitions

In this study, we categorized residency applicants into 3 mutually exclusive cohorts. The cohort identified as “students from highly ranked schools” consisted of students that attended a medical school ranked in the top 10 of the 2007 *U.S. News & World Report* ranking of research-based medical schools.¹² These rankings are based on medical college admission test scores, grade point average, and acceptance rate (20%); quality assessment from medical school deans and residency program directors (40%); research funding from the National Institutes of Health (30%); and faculty resources (10%). In 2007, 3 schools were tied for 10th place, and therefore 12 schools were listed as being ranked in the top 10 medical schools. Each of these schools was ranked highly throughout the study period.

The cohort identified as “other US seniors” consisted of all graduating students from US medical schools and

excluded students from the highly ranked schools in this study. The cohort identified as “independent applicants” consisted of all independent applicants within the residency match process not categorized within the other 2 cohorts. The majority of this group was composed of foreign medical graduates (74%–77%), while a smaller minority was composed of graduates from US medical schools during a prior year (10%–12%) and osteopathic medical schools (13%–15%).¹³

Residency Match Data

Residency match lists were used to tabulate the number of students from highly ranked schools that matched into a specialty for each year from 2002 to 2007. Match data were obtained through 1 of 2 methods. Three medical schools posted their match lists online for public access. Most schools generally post only the most recent year's match list online, so for the other 9 schools, the dean of student affairs at each medical school was e-mailed a minimum of 2 requests for either residency match lists or residency match data. Six of the schools responded by sending the requested material; the other 3 either declined or did not reply. Therefore, the students from highly ranked schools in this study represent 9 of the 12 schools designated as being ranked in the top 10 in 2007. Several of the deans asked that their school remain anonymous, so the names of the medical schools included in this study are not reported.

Data regarding the number of other US seniors and independent applicants that matched into each specialty were obtained by request from the National Resident Matching Program and the San Francisco Match Program.^{14–18}

Statistical Analysis

Study analysis compared 3 categories of specialties: higher-income CL, lower-income CL, and NCL. The CL specialties were categorized as “higher income” if their average annual income was above the mean annual income of all specialties in the study.

From 2002 to 2007, the percentage of each of the 3 cohorts matching into each of the specialties in the study was estimated as a proportion of their respective overall match (all specialties, including those not in this study). Candidates matching in combined programs, such as internal medicine-dermatology, were very few and were accounted for overall, but were not accounted for as matching within either internal medicine or dermatology.

For each of the cohorts, change in the match rate among categories of specialty groups was compared between the first and second half of the study period. Match rates for each specialty were pooled between 2002–2004 and 2005–2007. Data are reported as the relative percentage of change between the 2 time periods.

To determine the odds that students from each cohort matched into 1 of the 3 categories of specialty groups, odds

TABLE 1 SPECIALTY CLASSIFICATION AND AVERAGE ANNUAL INCOME ^a		
Category	Specialty	Average Annual Income (\$ in Thousands)
Higher income, controllable lifestyle	Radiology	415
	Anesthesia	345
	Otolaryngology	327
	Dermatology	316
	Ophthalmology	296
Lower income, controllable lifestyle	Emergency medicine	256
	Pathology	248
	Neurology	223
	Psychiatry	201
Noncontrollable lifestyle	Internal medicine	193
	Family medicine	191
	Pediatrics	186
Mean		266

^a Source: Dorsey et al 2003, American Medical Group Association 2007.

ratios and 95% confidence intervals were estimated using 2 × 2 contingency tables consisting of the number of students that matched or did not match for the year 2007, using US seniors as the referent group.

This study was approved by the institutional review board at the University of Pennsylvania.

Results

Specialty Characteristics

In 2007, the mean annual income among all specialties in this study was \$266 298 (TABLE 1). Higher-income CL specialties (radiology, anesthesia, otolaryngology, dermatology, and ophthalmology) had average annual incomes ranging from \$295 510 for ophthalmology to \$414 875 for radiology, compared with lower-income CL specialties, which ranged from \$200 871 to \$255 530. The NCL had the lowest annual incomes among all specialties in the study, ranging from \$185 913 to \$193 162.

Trends in Match Rates

In 2002, there were 1190 students from the highly ranked schools in this study that matched into a residency program, composing 7.8% of residency positions filled by 15 227 US seniors and 5.8% of the positions filled by all 20 670 applicants. These proportions stayed roughly constant through 2007, when the number of matched students from highly ranked schools was 1225, which composed 7.5% of

residency positions filled by 16 262 US seniors and 5.3% of all 23 253 applicants.

In 2007, 22.5% of students from highly ranked schools matched into a higher-income CL specialty, compared with 16.5% of other US seniors and just 8.4% of independent applicants (TABLE 2). Although match rates were fairly similar among lower-income CL specialties overall, they varied significantly among NCL specialties. Approximately 33% to 35% of students from highly ranked schools and other US seniors matched into NCL specialties, while almost 55% of independent applicants matched into the same fields.

Between the first half (2002–2004) and second half (2005–2007) of the study period, all 3 cohorts had relative declines in match rates into NCL specialties (FIGURE 1). However, there were diverging trends in match rates into CL specialties. Relative changes in match rates into higher-income CL specialties were higher for students from highly ranked schools, essentially unchanged for other US seniors, and lower for independent applicants. Relative changes in match rates into lower-income CL specialties were significantly lower for students from highly ranked schools, higher for other US seniors, and lower for independent applicants.

In 2007, the odds of matching into specialty groups for students from highly ranked schools and independent applicants varied when compared with other US seniors (FIGURE 2). Odds of matching among students from highly ranked schools compared with other US seniors were almost 1.5 times greater for higher-income CL specialties (odds ratio [OR], 1.46; 95% confidence interval [CI]: 1.27–1.68) and were no different for both lower-income CL specialties and NCL specialties. Odds of matching among independent applicants compared with other US seniors was half as much for higher-income CL specialties (OR, 0.46; 95% CI: 0.42–0.51), no different for lower-income CL specialties, and more than double for NCL specialties (OR, 2.38; 95% CI: 2.25–2.52).

Discussion

This is the first study to compare trends in residency match rates for CL and NCL specialties among students from highly ranked, research-based medical schools, compared with other US senior medical students and independent applicants. We found that, during the study period, students from highly ranked schools had the largest decline (6.9%) in their match rate for NCL specialties among the 3 cohorts and had almost 1.5 times higher odds of matching into higher-income CL specialties when compared with other US seniors in 2007. Independent applicants had a relatively smaller decline (1.0%) in their match rate into NCL specialties and, in contrast, had 2.4 times higher odds of matching into NCL specialties when compared with other US seniors in 2007.

TABLE 2 PERCENTAGE OF EACH COHORT MATCHING INTO EACH SPECIALTY, 2007^a

Category	Specialty	Students From Highly Ranked Schools (N = 1225)	Other US Seniors (N = 15 037)	Independent Applicants (N = 6994)
Higher income, controllable lifestyle	Radiology	6.0	5.1	2.6
	Anesthesia	6.9	6.2	3.8
	Otolaryngology	2.7	1.4	0.2
	Dermatology	3.0	1.4	1.0
	Ophthalmology	3.8	2.3	0.7
	Overall	22.5	16.5	8.4
Lower income, controllable lifestyle	Emergency medicine	6.5	6.8	3.9
	Pathology	1.6	1.8	2.4
	Neurology	1.9	1.9	3.1
	Psychiatry	4.2	3.9	5.2
	Overall	14.2	14.4	14.7
Noncontrollable lifestyle	Internal medicine	19.4	16.2	29.2
	Family medicine	4.7	6.9	17.2
	Pediatrics	11.3	10.1	8.2
	Overall	35.4	33.5	54.5

^a Note: Percentages do not add up to 100% because some specialties (eg, general surgery, radiation oncology) are not included in this study.

The crisis in the balance of the physician workforce has been speculated to be partly the result of a variation of physician income among medical specialties, work-related stresses concentrated in primary care practice compared

with CL specialties, and a medical education system that favors training in non–primary care fields.¹ Staiger and colleagues³ found that nonresident physicians younger than age 45 have decreased the hours they worked per week by

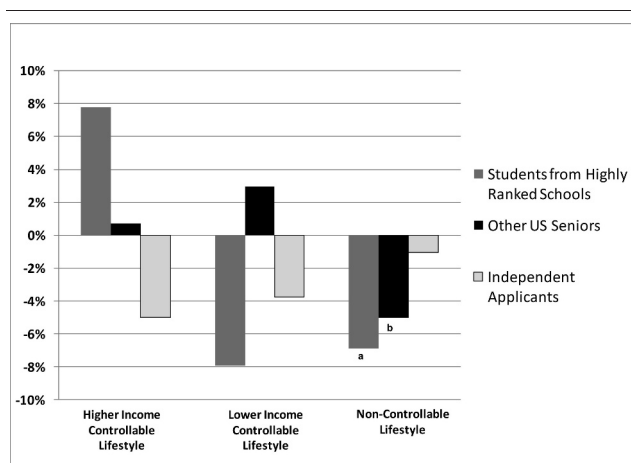


FIGURE 1 RELATIVE CHANGE IN MATCH RATE FROM 2002–2004 TO 2005–2007

Pooled match rates among students from highly ranked schools, US seniors, and independent applicants during the first and second half of the study period for higher-income controllable lifestyle, lower-income controllable lifestyle, and primary care specialties. Statistical significance for the change over time is indicated by ^a for $P < .05$ and ^b for $P < .01$.

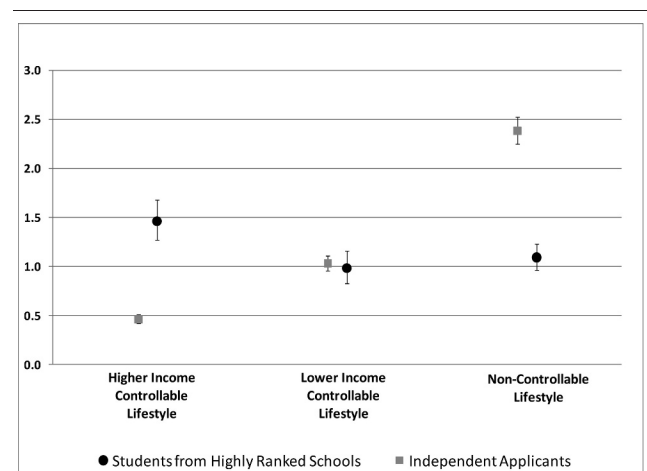


FIGURE 2 ODDS OF MATCHING INTO A SPECIALTY COMPARED WITH US SENIORS, 2007

Odds ratios and 95% confidence intervals for students from highly ranked schools and independent applicants matching into higher-income controllable lifestyle, lower-income controllable lifestyle, and primary care specialties, relative to US seniors.

more than 7% over the last decade. This has further compounded the problems caused by the physician shortage.

This study has important implications for potential health reform initiatives to modify the future balance of the physician workforce. First, income and career lifestyle continue to play an essential role in residency match rates, with higher-income CL specialties being very competitive and filled at a significantly higher rate from students at highly ranked, research-based medical schools than other US seniors or independent applicants. Although research-based medical schools likely have increased opportunities for students in specialized fields when compared with other schools, they also likely have more funding and opportunities within primary care fields. Research-based medical schools should develop initiatives to encourage students to enter NCL and primary care fields. Nationally, further efforts should be focused on improving income and lifestyle differences between CL, NCL, and primary care specialties.

Second, the United States currently relies heavily on foreign medical graduates to fill NCL specialties, and more specifically to provide primary care for the country.¹⁹ Our study confirms that this trend was ongoing from 2002 to 2007, and will likely continue unless significant changes take place. In the setting of fixed CL specialty positions, increasing the number of residency applicants, including foreign medical graduates, could help to expand the primary care workforce.

Third, simply increasing the number of NCL residency positions, many of which currently go unfilled, is not likely to solve the problem. More study should be conducted to assess whether more exposure to research influences students to choose CL specialties or whether it allows students to become more attractive when residency program directors of CL specialties select among candidates.

There are several limitations to our study. First, data regarding students from highly ranked, research-based medical schools are only as accurate as the residency match lists that were obtained. Some medical schools allow students to refrain from listing their name on the match list if it is publicly available online. Although we were told by the schools that typically very few students withhold their information, we are unable to document the exact number and career choice of such students. Second, we were able to obtain data from only 9 of the 12 medical schools ranked in the top 10. We cannot be sure of the match rates of the 3 schools not included in this study. Third, our study includes data on students and applicants that matched in certain specialties. It does not assess the number of students that applied for or ranked a particular specialty, which would be a better measure of true interest. Fourth, data on physicians who entered specialties through agreements outside the National Resident Matching Program and San Francisco Match Program are not known, and may not exactly parallel the available data. Fifth, our study assessed match

rates in NCL specialties that could lead to primary care practice. However, we were unable to quantify the proportion of applicants that matched into an NCL specialty and pursued fellowship training. Therefore, the data in this study do not represent the applicants that ultimately practiced primary care, but rather the applicants that matched into an NCL specialty that could lead to training in primary care or subspecialty practice.

Finally, although we have identified that the differences in match rates for students from highly ranked schools compared with other US seniors and independent applicants are highly associated with differences in match rates in CL and NCL specialties, we cannot assume a causal relationship between income, work hours, or lifestyle and match rates for these students. Unmeasured variables that are tightly linked to income, such as prestige and case mix, may play important roles in career choice.

Conclusions

Match rates in NCL specialties had relative declines for all 3 cohorts during this study period. When compared with other US seniors, students from highly ranked schools had the highest odds of matching in higher-income CL specialties, and independent applicants had the highest odds of matching into NCL specialties. These trends are important to consider in light of recent health care reform efforts, including attempts to better balance the future physician workforce to meet societal needs and to make careers in NCL specialties, such as fields in primary care, more attractive.

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