

The Impact of U.S. Medical Students' Debt on Their Choice of Primary Care Careers: An Analysis of Data from the 2002 Medical School Graduation Questionnaire

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Abstract

Purpose

To examine the hypothesis that medical students' rising total educational debt is one of the factors that explains the recent decline in students' interest in family medicine and primary care.

Method

The authors used results from questions on the Association of American Medical Colleges' 2002 Medical School Graduation Questionnaire that focused on students' debt and career choices. Logistic regression was used to determine the independent association of students' debt with career choices, while controlling for students' demographic characteristics.

Results

In 2002, 83.5% of graduating students were in debt, and the average student owed US \$86,870. Minority students had higher levels of debt. Students reported that higher levels of debt influenced their future career choices, and there was an inverse relationship between the level of total educational debt and the intention to enter primary care, with the most marked effect noted for students owing more than \$150,000 at graduation. Total debt was associated with a lower likelihood of choosing a primary care career, but factors such as gender and race appeared to have more explanatory power. Female students were much

more interested in primary care—and especially pediatrics—than were male students; African American students were more interested in inner-city practice than was any other identified racial or ethnic group.

Conclusion

In 2002, students' debt levels were high and increasing. Although students with higher debt levels were less likely than were their counterparts to pursue a career in primary care, the effect was modest when demographic characteristics were taken into consideration.

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Most medical students borrow money to finance their medical education.¹ As tuition and the cost of living increase, students' debt levels have risen much more rapidly than has the rate of inflation.² Most students leave medical school owing large sums of money.³

A previous study showed that debt influences students' career choices, although the effect was relatively small.⁴ The choice of medical discipline and practice location is shaped by many forces, and students' debt is but one of these forces. The relative importance of debt in career choice may be changing, however, because of continued increases

in students' debt level at a time of relatively stagnant physician incomes.⁵ The recent decline in interest in family medicine and primary care may partly be a result of students' rising debt.^{6,7}

For this study, we used data from the 2002 Medical School Graduation Questionnaire (GQ) of the Association of American Medical Colleges (AAMC) to examine the hypothesis that students' debt is systematically related to their intended career choices, after controlling for students' race, gender, and age. Specifically, we used data supplied by medical students at graduation to shed further light on the declining interest in primary care and family medicine and isolate the independent effect of students' debt.

Method

We obtained a data file from the AAMC that contained responses to selected items from the 2002 GQ, including students' demographic characteristics, total debt levels and sources of debt, and future career plans. Demographic data included students' age at graduation, gender, and

racial and ethnic self-identification. Debt-related questions included the source and amount of debt and an item asking the student to indicate the extent to which their level of educational debt influenced their career choices. We used total educational debt—regardless of the source—as the independent variable. Primary care was defined as one of the three following specialties: general internal medicine, excluding internal medicine subspecialties; general pediatrics, excluding pediatrics subspecialties; and family medicine.

The GQ also asked students whether they intended to practice in an underserved area. Students who responded “yes” were asked to indicate the likely location of that practice, either a rural or an inner-city community. Unfortunately, the GQ did not ask all students to designate their probable future rural or urban practice locations.

All personal identifiers were removed from the data file. The University of Washington Institutional Review Board reviewed and approved the research plan.

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Table 1

Characteristics of Medical Students Who Responded to the Association of American Medical Colleges' Medical School Graduation Questionnaire, 2002*

Characteristic	Mean	Median	SD	Minimum	Maximum
Age in years	27.7	27.0	3.4	21	54
% African American	7.0	NA	NA	NA	NA
% Underrepresented minority [†]	10.9	NA	NA	NA	NA
Medical student debt in US \$	79,235	80,000	58,495	0	300,000
Total educational debt in US \$	86,870	90,000	63,010	0	450,000

* The number of respondents ranged from 14,092 to 14,240.

[†] In the 2002 Graduation Questionnaire, underrepresented minorities were defined as African Americans, American Indians/Alaska Natives, Mexicans/Chicanos, and Hawaiians and Puerto Ricans.

We used univariate and multivariate statistical techniques to test the study hypothesis and used logistic regression to determine the independent contribution of students' total indebtedness to their career choice decisions, while controlling for students' demographic characteristics.

Results

In 2002, 14,240 medical students completed the GQ. The average student was 27.7 years (SD = 3.37). Seven percent of respondents identified themselves as African American, and 10.9% identified themselves as members of underrepresented minorities (URMs), defined by the AAMC to include African Americans, American Indians/Alaska Natives, Mexicans/Chicanos, and Hawaiians and Puerto Ricans.

The total average debt (no. = 14,097) was US \$86,870, with a very wide standard deviation of US \$63,010. Eighty-

three percent of respondents reported having some debt, and their average debt was US \$104,071. The highest debt load reported was US \$450,000. Ninety-one percent of students' total debt was accumulated during medical school. (See Table 1.)

As Table 2 shows, debt load was highly associated with race and ethnicity. Students with larger amounts of total debt were much more likely to be African American or members of another URM. While 16.5% of all graduating students were debt free, only 5% of URMs had no debt at graduation. The average African American student reported US \$102,909 in total debt—the highest of any of the available racial categories—as compared to US \$76,049 for Asian students, with other racial groups falling between these two extremes. Students attending public medical schools had lower debt loads.

Debt load was systematically related to students' intended career choices, although the results were more nuanced than we had hypothesized. (See Table 3.) Students with larger debts were much more likely to report that debt influenced their career choices. It is less clear from the data how debt actually affected them. There was a modest inverse relationship between increasing debt and the decision to select a primary care residency; the impact was greatest in the 17.8% of students whose debt exceeded US \$150,000.

Students with higher debt loads were slightly more likely to plan to work in underserved areas than were their less indebted peers. Over 40% of students with an interest in serving underserved populations indicated an interest in rural practice. However, because of limitations in the GQ design, it is impossible to know what proportion of the entire class was interested in rural practice.

Students who expressed interest in a future career working in rural underserved areas were disproportionately male (54.1% versus 40.0%, $p = .003$) and much less likely to be African American (4.1% versus 24.7%, $p < .0001$) or members of another URM (11.9% versus 33.3%, $p < .0001$). Debt load was not highly correlated with the decision to work in rural underserved rural areas; those indicating such an interest had a debt load of US \$90,827 versus US \$95,126 for those without such plans ($p = .05$).

Table 2

Debt Loads of 14,097 Medical Students, by Students' Characteristics, From Responses to the Association of American Medical Colleges' Medical School Graduation Questionnaire, 2002

Medical Students' Total Debt (in US\$1,000s)	Medical Students' Characteristics						
	No. (%)	Mean age in years	% White*	% Male [†]	% African American*	% Under-represented minority**	% in public medical school*
0	2,330 (16.5)	27	64	58	3	5	54
1–49	1,948 (13.8)	27	60	55	6	9	65
50–99	3,493 (24.8)	28	65	54	8	12	74
100–149	3,796 (26.9)	28	69	55	8	12	69
150–199	1,851 (13.1)	28	65	55	9	14	29
200–249	538 (3.8)	29	65	55	9	12	18
≥ 250	141 (1.0)	29	55	60	11	15	20

* $p < .0001$

[†] $p = .0489$

** In the 2002 Graduation Questionnaire, underrepresented minorities were defined as African Americans, American Indians/Alaska Natives, Mexicans/Chicanos, and Hawaiians and Puerto Ricans.

Table 3

The Relationship between Medical Students' Total Debt Load and Their Future Career Choices, from Responses to the Association of American Medical Colleges' Medical School Graduation Questionnaire, 2002

Medical students' total debt (in US \$1,000s)	% of medical students who			
	Reported that debt influenced their career choices* (no. = 14,174)	Intended future primary care career** (no. = 12,613)	Planned to serve in underserved areas* (no. = 14,175)	Planned to serve in underserved rural areas* (no. = 3,048)
0	14	33	15	35
1-49	18	35	21	44
50-99	29	35	24	44
100-149	39	34	23	42
150-199	50	30	23	35
200-249	55	29	24	33
≥ 250	62	21	25	40

* $p < .0001$.

† Primary care includes family practice, general internal medicine, and general pediatrics.

‡ $p = .0015$. Only students intending to practice in underserved locations were asked to respond to this question.

As shown in Table 4, total debt load was only modestly related to career choice, after controlling for students' other characteristics. Students with higher debt loads were significantly less likely to go into a primary care discipline, but the independent explanatory power of this variable was small. It is interesting that this relationship did not attain statistical significance for the individual disciplines of family practice, general internal medicine, or general pediatrics, but the relationship did attain statistical significance when the disciplines were combined into primary care.

The factors that best predicted students' career choices were the students' demographic characteristics,

in particular race and gender. African American students as a group were far more likely than were other students to plan to practice in underserved inner-city locations and were extremely unlikely to consider rural practice. They were just as likely as were others to plan to choose primary care careers, although less likely to entertain the choice of general pediatrics. Other URM students, by contrast, showed very little interest in working in underserved areas or in becoming family physicians.

Gender also seemed to exert a major influence on future career plans. Male students were less interested in all three of the primary care disciplines

by a wide margin. Male students who were interested in serving in underserved communities were much more likely to consider rural practice and much less likely to entertain inner-city practice. Female students, by contrast, were more interested in all the primary care disciplines, with a very strong preference for pediatrics. Students' age had relatively little effect: Older students were somewhat more likely to plan to enter family medicine, and were less likely to become pediatricians, all other factors being held constant.

Discussion

Debt levels of U.S. medical students

Medical students' career choices have a profound influence on the shape and

Table 4

Medical Students' Characteristics Associated with Medical Students' Career Choices (Odds Ratios), from Responses to the Association of American Medical Colleges' Medical School Graduation Questionnaire, 2002

Students' Characteristics	Medical students' career choices (odds ratio)						
	Primary care (no. = 2,705; 21.7%)	Family medicine (no. = 1,148; 9.2%)	General internal medicine (no. = 739; 5.9%)	General pediatrics (no. = 818; 6.6%)	Underserved practice (no. = 3,031; 21.7%)	Rural underserved (no. = 1,228; 40.6%)†	Inner-city underserved (no. = 1,497; 49.6%)†
Age	0.99	1.07 [‡]	0.99	0.95 [‡]	1.05 [‡]	1.04 [‡]	0.97 [‡]
Male	0.65 [‡]	0.61 [‡]	0.72 [‡]	0.22 [‡]	0.64 [‡]	1.57 [‡]	0.61 [‡]
African American	0.88	1.0	0.99	0.72 [‡]	4.10 [‡]	0.13 [‡]	6.35 [‡]
Other underrepresented minority*	1.01	0.58 [‡]	1.15	0.87	0.28 [‡]	1.53 [‡]	0.61 [‡]
Total debt	0.96 [‡]	1.04	0.96	0.98	1.06	1.00	1.05

* In the 2002 Graduation Questionnaire, underrepresented minorities were defined as African Americans, American Indians/Alaska Natives, Mexicans/Chicanos, and Hawaiians and Puerto Ricans.

† Represents only students who intended to practice in underserved areas.

‡ The confidence interval for this result does not include 1.0.

dynamics of the U.S. medical care system. The U.S. medical school environment and practice world tend to support those who choose specialized careers. As a result, many observers believe that there are persistent shortages in the number and proportion of medical students who enter primary care careers, despite a spectrum of private and governmental interventions designed to address this problem.

The issue has been thrown into sharp relief in recent years by the rapid and persistent decline in the number of students entering primary care, especially in its most generalist form, family medicine. Many reasons have been suggested for this trend including the increasing amount of debt assumed by medical students during a period when physicians' incomes have been relatively stagnant.⁸

Our study demonstrates that medical students' debt is a force to be reckoned with. In 2002, 83.5% of medical students graduated in debt, and their average debt load exceeded US \$100,000. In a 1998 study, a substantial number of students had debts in excess of US \$150,000, and minority and low-income students tended to carry more debt than did their nonminority peers.⁹ Amortizing the US \$104,000 debt of the average indebted medical student, assuming an interest rate of 6%, requires paying roughly \$15,000 a year for ten years, an amount that may affect students' decisions about where to live, whether they can buy a house, and when they can start their families. Although medical students believe that debt affects their career choices, the independent impact of debt on their career choices in 2002 was modest. It is quite possible that substantial numbers of students are dissuaded from pursuing a medical career because the prospect of incurring large amounts of debt is unacceptable, and the rising cost of medical education may well prevent many capable but less wealthy students from pursuing a medical career.

The effect of debt on primary care career choices

It is not surprising that many students—and the majority of students with debts over \$150,000—report that debt influences their career choices. One study showed that students with higher levels of debt were less likely to enter into the

primary care disciplines.¹⁰ Another study showed that high debt levels led students to consider practicing in an underserved area.¹¹ This may be a result of the availability of loan-repayment funds at the federal and state levels for physicians who agree to practice for specific lengths of time in areas that have been officially designated as underserved.

The association of students' debt with the choice of primary care as a career persisted when we controlled for medical students' and medical schools' other factors, but the independent effect was modest in 2002. Only when the three primary care disciplines were combined was increasing debt level associated with a small decline in interest in primary care. Although other studies suggest that addressing debt could be used to increase the proportion of students choosing primary care, our results suggest that the impact would be small. However, at a time when it is becoming increasingly difficult to fill primary care residencies with graduates of U.S. medical schools, even small changes may be meaningful.

It is important to note that educational debt is rising much faster than the rate of inflation. From 1999 to 2004 total educational debt as reported in the GQ increased by 23.01%, while the Consumer Price Index increased by only 9.24%. As debt consumes a greater proportion of the disposable income of new primary care physicians, debt may have an even greater impact on career choice.

The effect of demographic characteristics on primary care choice

Our study demonstrates a relationship between race, gender, and career choice, a relationship that dwarfs the independent impact of debt. Female medical students were much more interested than were male medical students in all the primary care specialties and far more interested in pediatrics. Seventy-six percent of all the students planning to go into general pediatrics were women, although only 44.6% of all respondents were women.

Members of minority groups also had very distinctive preference patterns. African American students indicated a very high degree of interest in practicing in underserved inner-city areas and had less interest in pediatrics, all other factors being equal. Other URM groups showed

less interest in family medicine or practices in underserved areas, after controlling for other factors.

Factors predicting rural underserved practice

Although the design of the GQ prevented us from looking at the rural or urban practice intentions of the entire student cohort, we did focus on the roughly 20% of students with an interest in practicing in underserved rural locations. Debt load appeared unrelated to this particular career decision for this subset, a result similar to that obtained in an earlier study.¹² In our study, male physicians appeared more likely than did female physicians to be interested in rural practice, as were older students and members of non-African American minority groups. African American students seemed to have very little interest in this potential career choice—only 50 African American students, 4% of all African American students, indicated that they had selected this future career path.

Limitations and caveats

Our study had several important limitations. First, we report what medical students intended to do at graduation from medical school, which may not accurately reflect their actual career trajectories. The specialty choices were probably quite accurate, since the GQ was completed at a time when students had already made residency choices and they had no incentive to provide inaccurate information to their medical schools. The decisions about future practice in underserved locations were much more speculative, simply because it would be years before these students actually started practicing.

Second, the structure of the GQ precluded our knowing very much about the intentions of the entire cohort to practice in rural or urban locations. Unfortunately, information was available about these intentions only from the relatively small number of students who indicated an interest in practicing in underserved areas. It would certainly be useful if the GQ could be expanded to ask this question of all graduates.

Third, we were limited to the items on the GQ. We know from other studies that a variety of other factors—from the size of the town where students were

educated to Medical College Admission Test scores—are related to career choice. Because we were limited to the anonymous data captured in the GQ, we could not explore these other relationships.

Fourth, our study covers only one year, during an era in which other trends within medical schools, society, and the health care system were leading to declining interest in primary care. In the future, students' career choices will be affected not only by students' level of indebtedness, but by the relative importance of primary care in an evolving health care system.

Policy implications and conclusions

The declining interest in primary care disciplines is a product of many factors. While medical students' debt appears to be one of the factors in the choice of the primary care disciplines, it is probably decisive only for those students with high levels of debt.⁴ For the cohort that graduated in 2002, students with more than US \$150,000 debt were much less likely to enter into a primary care field. It is likely that these high debt loads disproportionately affect minority students, who come from more economically disadvantaged backgrounds and graduate from medical school with significantly higher debt loads.

It has been suggested that medical schools and governments address this issue by restraining the increases in tuition and making more aid available for students.^{11,13} Certainly such a policy would reduce stress on young physicians and make it more feasible for low-income and minority students to consider medical education.^{14–18} But it is probably unrealistic to expect major public subsidies for all future members of the medical profession.

Our study also demonstrates that the demographic characteristics of graduating students help to shape future career choice. Women were far more likely than were men to consider any of the primary care careers, even after

controlling for other variables. One study showed that students with a desire for technical mastery were more likely to choose subspecialties, especially surgical specialties.¹⁹ These findings suggest that women may choose certain specialties because of their affinity with the traditional social roles of women—pediatrics and obstetrics are excellent examples—or because they see primary care as allowing them more flexibility as they also raise and nurture families.

Finally, our study shows that the one of the most important ways medical schools can influence students' career choices is through selection policies. A dramatic example is the marked interest of African American students in future practice in underserved inner city areas. Medical students' debt is important at the margin—and more important for certain designated groups—but we are unlikely to shape the future organization of our health workforce simply by manipulating students' debt levels.

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