

Educational Debt and Reported Career Plans among Internal Medicine Residents

Furman S. McDonald, MD, MPH; Colin P. West, MD, PhD; Carol Popkave, MA; and Joseph C. Kolars, MD

Background: Physicians often enter the workplace with substantial debt. The relationship between debt and reported career plans among internal medicine residents is unknown.

Objective: To determine distributions of educational debt among internal medicine residents and associations of debt with reported career plans.

Design: Cross-sectional survey using data from the annual Internal Medicine In-Training Examination Residents Questionnaire completed by U.S. categorical internal medicine residents.

Setting: Categorical internal medicine residencies in the United States.

Participants: 22 563 residents in their third (final) year of residency, representing 74.1% of all eligible U.S. categorical internal medicine residents from 2003 through 2007.

Measurements: Distributions of educational debt were tabulated. Proportions of residents choosing career plans were calculated for various levels of debt.

Results: International medical graduates represented 48.7% of the cross section and had considerably less debt than U.S. medical graduates: 53.8% of U.S. medical graduates had debt of \$100 000 or greater and 60.2% of international medical graduates had none. U.S. medical graduates with debt of \$100 000 to \$150 000 were less likely than those with no debt to choose a subspecialty career (57.5% vs. 63.5%). U.S. medical graduates with debt of \$50 000 to \$99 999 were more likely than those with no debt to choose a hospitalist career (8.5% vs. 6.2%), and this preference increased with increasing debt level (10.0% for those with >\$150 000 debt). These associations are more pronounced for U.S. medical graduates than for international medical graduates.

Limitation: The study addressed total educational debt, but not when it was incurred, and did not allow inferences related to causality.

Conclusion: Educational debt is associated with differences in reported career plans among internal medicine residents.

Ann Intern Med. 2008;149:416-420.

www.annals.org

For author affiliations, see end of text.

Most graduates of U.S. medical schools accumulate substantial debt, resulting from the cost of their education and their absence from the workplace (1). The Association of American Medical Colleges reported that in 2003, more than 81% of U.S. medical graduates (USMGs) had educational debt, with a median debt of \$100 000 for graduates of public medical schools and \$135 000 for graduates of private medical schools (2). In 2007, more than one third of USMGs (41.2%) had debt greater than \$150 000 (3).

Upon completion of residency training, internists may choose to enter the workforce or to continue with fellowship training in a subspecialty. During fellowship, compensation is typically substantially less than that for those who begin work as a hospitalist or as a general internist immediately upon completion of residency training. However, after fellowship training, some subspecialists can more than double their compensation relative to those in internal medicine positions where additional training is not required (4).

Debt has been hypothesized to influence medical students' career choices (5–14), but the impact of debt on the decision to subspecialize among internal medicine residents is unknown. We sought to assess the association of educational debt with reported career plans among a national cross section of internal medicine residents in their final year of training.

METHODS

This analysis was performed on a cross section of internal medicine residents in U.S. categorical training programs who voluntarily completed the Residents Questionnaire (Appendix, available at www.annals.org) at the time of their annual Internal Medicine In-Training Examination. This national, standardized examination is offered to internal medicine residents through a cooperative effort among the American College of Physicians, the Association of Program Directors in Internal Medicine, and the Association of Professors of Medicine (15). The accompanying Residents Questionnaire is constructed each year by the Internal Medicine In-Training Examination Steering Committee to collect resident opinions about the examination and other issues important to internal medicine training (16). This survey includes questions regarding ultimate career plans and current levels of educational debt.

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

See also:

Print

Editorial comment. 429

Web-Only

Appendix

Conversion of graphics into slides

Statistical Analysis

Because residents are likely to change reported career plans before completion of residency (17), we chose to analyze responses only from residents in their third (final) year of training in U.S. categorical internal medicine residency programs, including those in primary care internal medicine programs (Table 1). All data were analyzed retrospectively after completion of the 2007 Internal Medicine In-Training Examination. Graphic and tabular displays were used to assess the data for unusual trends and patterns of interest (Tables 1 and 2). The assessment of these data is primarily descriptive with regard to debt (Table 2).

Because compensation varies for trained internal medicine subspecialists, the associations with debt were analyzed separately for residents who chose the more highly compensated subspecialties and those who chose subspecialties in which compensation is lower. Gastroenterology, cardiology, and hematology/oncology were considered the more highly compensated internal medicine subspecialties, in which the median total annual compensation for private practice physicians is \$382 000 (4). Rheumatology, endocrinology, infectious diseases, and geriatrics were considered the subspecialties in which compensation is lower; the median total annual compensation for private practice physicians is \$184 000 (4). For comparison, the median annual compensation is \$166 000 for private practice in general internal medicine and \$176 000 for hospitalist physicians (4).

All analyses were conducted by 1 investigator using SAS software (SAS Institute, Cary, North Carolina). Because of multiple comparisons, results were considered statistically significant if *P* values were 0.01 or less.

Role of the Funding Source

This study received no funding.

RESULTS

For the 5-year study, almost all U.S. categorical internal medicine residency programs participated in the Internal Medicine In-Training Examination (99.1% overall; range per year, 97.4% to 100.0% [Table 1]). From these programs, 22 563 residents in their third (final) year of training responded to questions about their ultimate career plan and debt. This sample represents 74.1% of all third-year internal medicine residents nationally between 2003 and 2007 (Table 1). Men and international medical graduates (IMGs) made up 58.9% and 48.7% of the sample, respectively. The distribution of the sample with regard to demographic variables of sex, medical school, and program type was similar to the overall distribution of these variables for the years of the study, as reported by the American Board of Internal Medicine (18).

Of the total study group, 45.6% of residents reported educational debt in excess of \$50 000. However, the distributions of debt differed substantially between USMGs,

53.8% of whom reported \$100 000 or greater debt, and IMGs, 60.2% of whom reported no debt. U.S. medical graduates were more likely than IMGs to subspecialize (60.4% vs. 57.3%) (Table 2).

Among USMGs, those with \$100 000 to \$150 000 debt were less likely than those with no debt to choose a subspecialty career (57.5% vs. 63.5%). U.S. medical graduates with \$50 000 to \$99 999 debt were more likely than those with no debt to choose a hospitalist career (8.5% vs. 6.2%), and this preference increased with increasing debt level (10.0% for USMGs with >\$150 000 debt). We observed no associations between levels of educational debt and plans to pursue higher-compensated versus lower-compensated internal medicine subspecialties among USMGs; that is, the relative proportions of these reported

Table 1. Participant Characteristics

Variable	Participants (n = 22 563), n (%)
Sex	
Male	13 292 (58.9)
Female	9170 (40.6)
Missing	101 (0.5)
Type of student	
USMG	11 572 (51.3)
IMG	10 991 (48.7)
Program type	
Categorical only	20 891 (92.6)
Primary care	1672 (7.4)
Program size*	
≤25	2318 (10.3)
26–50	6904 (30.6)
51–75	6051 (26.8)
76–100	3283 (14.5)
101–125	2317 (10.3)
126–150	1051 (4.7)
>150	639 (2.8)
Region	
West	2540 (11.3)
Midwest	5352 (23.7)
Northeast	9379 (41.6)
South	5292 (23.5)
IM-ITE year†	
2003	4091 (18.1)
2004	4590 (20.3)
2005	4498 (19.9)
2006	4687 (20.8)
2007	4697 (20.8)

IMG = international medical graduate; IM-ITE = Internal Medicine In-Training Examination; USMG = U.S. medical graduate.

* Program size is based on the total number of residents per program who took the IM-ITE.

† The total numbers of U.S. categorical internal medicine residencies participating in the IM-ITE compared with the total number of U.S. categorical internal medicine residencies each year of the study from 2003 to 2007 were 391 of 391 (100.0%), 390 of 390 (100.0%), 387 of 392 (98.7%), 385 of 388 (99.2%), and 379 of 389 (97.4%), respectively (18). The total numbers of U.S. categorical internal medicine postgraduate third-year residents during each year of the study from 2003 to 2007 were 5973, 6017, 6060, 6280, and 6134, respectively (30 464 in total). (Lattie GC. American Board of Internal Medicine. Personal communication.)

Table 2. Debt Level and Reported Career Plans for USMG and IMG Postgraduate Third-Year Internal Medicine Residents

Category	Overall	Debt Level				
		None	\$1–\$49 999	\$50 000–\$99 999	\$100 000–\$150 000	>\$150 000
USMG, %						
Specialization*						
GIM	22.8	20.9	22.1	21.6	25.6	22.5
Hospitalist	8.4	6.2	6.9	8.5	8.8	10.0
All subspecialties†	60.4	63.5	62.9	60.5	57.5	59.6
Other (not IM)‡	2.0	2.1	1.7	2.2	1.9	2.1
Undecided	6.4	7.2	6.5	7.1	6.1	5.8
Subspecialization						
Cardiology	14.4	15.7	13.5	13.1	14.0	15.1
Endocrinology	4.3	5.0	4.1	4.9	4.0	3.8
Gastroenterology	9.4	9.8	10.5	9.3	8.9	9.1
Geriatrics	1.4	1.4	1.4	1.2	1.3	1.7
Hematology/oncology	9.0	8.7	11.3	9.9	8.3	8.2
Infectious disease	4.3	4.8	5.2	3.9	4.3	3.8
Nephrology	5.8	6.0	6.5	6.2	5.9	5.2
Pulmonary/CC	6.8	6.7	5.7	6.6	6.4	7.6
Rheumatology	3.3	3.4	3.5	3.6	3.0	3.4
Other subspecialty	1.7	2.0	1.4	1.9	1.5	1.7
Compensation§						
Higher-compensated subspecialty	32.8	34.2	35.4	32.3	31.2	32.4
Lower-compensated subspecialty	13.3	14.6	14.0	13.6	12.6	12.6
Total, n	11 572	2032	1332	1981	2948	3279
IMG, %						
Specialization*						
GIM	24.8	24.9	22.6	27.7	25.9	26.7
Hospitalist	9.7	9.5	10.1	7.9	9.4	12.1
All subspecialties†	57.3	58.4	58.3	54.4	52.3	50.3
Other (not IM)‡	1.6	1.4	1.3	2.6	2.8	2.4
Undecided	6.6	5.7	7.7	7.4	9.6	8.2
Subspecialization						
Cardiology	12.3	12.1	13.7	13.1	11.1	10.5
Endocrinology	4.2	4.9	3.9	3.1	3.0	1.6
Gastroenterology	6.6	6.1	7.3	8.4	6.9	6.5
Geriatrics	1.8	1.9	1.5	1.6	1.9	1.9
Hematology/oncology	8.0	8.4	8.0	6.8	7.1	6.5
Infectious disease	4.3	4.8	3.9	2.9	3.8	3.3
Nephrology	7.9	8.1	8.1	7.6	6.6	6.4
Pulmonary/CC	8.4	7.9	8.8	8.7	9.4	10.6
Rheumatology	2.9	3.6	2.3	1.6	1.5	1.6
Other subspecialty	0.9	0.7	0.9	0.8	1.1	1.6
Compensation§						
Higher-compensated subspecialty	26.8	26.6	29.0	28.3	25.1	23.5
Lower-compensated subspecialty	13.2	15.1	11.5	9.1	10.1	8.3
Total, n	10 991	6614	2307	647	533	890

CC = critical care; GIM = general internal medicine; IM = internal medicine; IMG = international medical graduate; USMG = U.S. medical graduate.

* These categories contain all possible reported career plan options. The percentages for these 5 options sum to 100% overall and for each debt level.

† "All subspecialties" is the sum of the individual subspecialties listed under "Subspecialization."

‡ A reported career plan not in IM.

§ Higher-compensated subspecialties were gastroenterology, cardiology, and hematology/oncology. Lower-compensated subspecialties were rheumatology, endocrinology, infectious diseases, and geriatrics (4). These groups are listed contiguously to allow comparison between extremes of compensation across debt levels.

career plans were similar across debt levels despite both declining with increasing debt (Table 2). The associations between debt and career choice among USMGs did not differ for men or women.

For IMGs, subspecialty career plans seemed to decrease as debt increased, from 58.4% of residents with no debt to 50.3% of those with debt greater than \$150 000. Similarly, the proportion of IMGs with no debt who reported plans to pursue a hospitalist career was smaller than that of those at the highest debt level (9.5% vs. 12.1%).

However, the total number of IMGs with greater debt was relatively small, and neither association was statistically significant (Table 2). Debt was associated with preference for higher-compensated versus lower-compensated subspecialties among IMGs (Table 2).

DISCUSSION

Our main finding is that educational debt is associated with differences in reported career plans among the inter-

nal medicine residents we surveyed. A particular strength of our study is the size of the cross section, which represents 74.1% of all final-year categorical internal medicine residents in the United States between 2003 and 2007. Both USMGs and IMGs were less likely to choose subspecialty careers as debt level increased. Increased debt was also associated with preference for hospitalist careers and, to a lesser extent, general internal medicine careers (Table 2). The association of debt with choosing a hospitalist career has not been previously reported. However, studies on the relationship of debt and reported career plans did not identify this as a separate discipline for analysis (5–7, 9–13, 19–27).

The magnitude of educational debt is substantially higher for USMGs than for IMGs (Table 2), presumably because of the expense of higher education in the United States. Although earlier studies suggest that IMGs choose subspecialty careers at a higher rate than that of USMGs (16, 28, 29), this was not confirmed in our study, in which we note a modest relative increase in subspecialty preference among USMGs compared with IMGs (60.4% vs. 57.3% [Table 2]). For USMGs, no meaningful differences in the distribution of debt were observed between men and women. However, for IMGs, the ratio of men to women increased as debt increased, and men, but not women, were less likely to report a subspecialty career plan at debt levels greater than \$150 000; albeit relatively few IMGs have this level of debt overall.

We were surprised to find that the inverse association of debt with preference for a subspecialty career persisted for residents pursuing more highly compensated subspecialties. This may suggest that the potential for greater earning power does not offset the delays in compensation associated with subspecialty training for residents with educational debt. For IMGs, debt was associated with a relative preference for more highly compensated subspecialties compared with lower-compensated subspecialties at the highest debt levels. However, we did not account for other variables that factor into the choice of a specific subspecialty.

We searched the published medical literature up to February 2008 regarding debt and career choice by using MEDLINE. Most studies on the relationship between debt and career choice surveyed medical students before or soon after graduation (5–7, 9–13, 19, 21–27). Stratification of career choice for general medicine versus an internal medicine subspecialty was not included. These studies often focus on the inverse association of debt and lifestyle preference on primary care disciplines. However, the impact of the duration of postgraduate training (for example, 3 years of internal medicine training alone vs. 6 years with a subsequent 3-year fellowship) has not been explicitly examined. Our findings are consistent with observations from a small study that found that internal medicine residents with greater debt were more likely to choose a career in general internal medicine (20).

Our study has limitations. First, this is primarily a

simple descriptive study, which, by design, prevents any inference about causality. Choosing a particular career within internal medicine is a complex decision that is affected by other variables, such as discipline interest, perceived job availability, prestige, and many others that were not accounted for in this study. It would be necessary to consider these other variables to build a model capable of robustly assessing the association of a reported career plan as a function of debt. Second, debt is self-reported, and we could not distinguish the impact of debt accumulated before medical school. We also could not exclude the possibility that particularly high levels of debt (>\$250 000) might have different associations with reported career plans relative to lower levels of debt. Third, the questionnaire asked for residents' "ultimate career plan" in their final year of training. Many residents would have already been selected for fellowship training, but some may subsequently choose to pursue fellowship training after working temporarily as a generalist or hospitalist. Finally, intrinsic to the design of the Internal Medicine In-Training Examination survey, the target respondents are residents who have already chosen internal medicine training. We cannot infer information about educational debt from the decisions of other individuals, specifically those of medical students who pursue training programs other than internal medicine.

Future research related to debt and reported career plans should explore the relationship of other factors in addition to debt that may affect career choice to allow appropriate adjustment for these factors. The influence of debt on the ultimate career plans of individuals in fields other than internal medicine and, specifically, at the interface of medical school and graduate medical training in other disciplines, should be explored.

In conclusion, increased debt was associated with a decreased frequency of plans to pursue an internal medicine subspecialty and an increased preference for general medicine and hospitalist careers. For USMGs planning on a subspecialty career, increased debt was not associated with decisions to pursue more highly compensated subspecialties. These observations may help to inform the discussions about the impact of debt on career preferences of physicians.

From the Mayo Clinic, Rochester, Minnesota, and the American College of Physicians, Philadelphia, Pennsylvania.

Note: Dr. Kolars is the chair of the Internal Medicine In-Training Examination Steering Committee that writes the Internal Medicine In-Training Examination Residents Questionnaire. Drs. McDonald and West had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Acknowledgment: The authors thank Ms. Glenda C. Lattie, Director of Registration at the American Board of Internal Medicine, for her assistance in obtaining the data on the total number of U.S. categorical postgraduate third-year residents.

Potential Financial Conflicts of Interest: *Employment:* C. Popkave (American College of Physicians).

Reproducible Research Statement: *Study protocol and data set:* Not available. *Statistical code:* Available from Dr. West, Mayo Clinic, 200 First Street SW, Rochester, MN 55905.

Requests for Single Reprints: Joseph C. Kolars, MD, Mayo Clinic, 200 First Street SW, Rochester, MN 55905; e-mail, kolars.joseph@mayo.edu.

Current author addresses are available at www.annals.org.

References

1. Widge A, Christensen A, Ding A, Brown D, Das M, Garner R, et al. 2003 Report of the American Medical Association—Medical Student Section Task Force on Medical Student Debt. Chicago: American Med Assoc; 2003. Accessed at www.ama-assn.org/ama1/pub/upload/mm/15/debt_report.pdf on 26 June 2008.
2. Jolly P. Medical School Tuition and Young Physician Indebtedness Association of American Medical Colleges. Washington, DC: Association of American Colleges; 2004. Accessed at https://services.aamc.org/Publications/index.cfm?fuseaction=Product.displayForm&prd_id=102&prv_id=113 on 26 June 2008.
3. Association of American Medical Colleges. Medical School Graduation Questionnaire All Schools Summary Report. 2007. Accessed at www.aamc.org/data/gq/allschoolsreports/2007.pdf on 26 June 2008.
4. Medical Group Management Association. Academic Practice Compensation and Production Survey for Faculty and Management. Englewood, CO: Medical Group Management Association; 2007:48-9.
5. Baker LC, Barker DC. Factors associated with the perception that debt influences physicians' specialty choices. *Acad Med.* 1997;72:1088-96. [PMID: 9435716]
6. Bazzoli GJ. Does educational indebtedness affect physician specialty choice? *J Health Econ.* 1985;4:1-19. [PMID: 10271142]
7. Colquitt WL, Zeh MC, Killian CD, Cultice JM. Effect of debt on U.S. medical school graduates' preferences for family medicine, general internal medicine, and general pediatrics. *Acad Med.* 1996;71:399-411. [PMID: 8645411]
8. Cooter R, Bross TM, Erdmann JB. Factors influencing students' borrowing that may affect their specialty choices and other after-graduation behaviors. *Acad Med.* 1998;73:71-6. [PMID: 9447205]
9. Dial TH, Haviland MG. Money talks: why debt and specialty choice are not strongly linked [Letter]. *Acad Med.* 1994;69:470. [PMID: 8003162]
10. Kassebaum DG, Szenas PL. Relationship between indebtedness and the specialty choices of graduating medical students: 1993 update. *Acad Med.* 1993;68:934-7. [PMID: 8259971]
11. McLaughlin MA, Daugherty SR, Rose WH, Goodman LJ. The impact of medical school debt on postgraduate career and lifestyle. *Acad Med.* 1991;66:S43-5. [PMID: 1930525]
12. Rosenblatt RA, Andrilla CH. 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. *Acad Med.* 2005;80:815-9. [PMID: 16123459]
13. Rosenthal MP, Diamond JJ, Rabinowitz HK, Bauer LC, Jones RL, Kearl GW, et al. Influence of income, hours worked, and loan repayment on medical students' decision to pursue a primary care career. *JAMA.* 1994;271:914-7. [PMID: 8120959]
14. Tonkin P. Effect of rising medical student debt on residency specialty selection at the University of Minnesota. *Minn Med.* 2006;89:46-7, 49. [PMID: 16846185]
15. Internal Medicine In-Training Examination. 2007. Accessed at www.acponline.org/education_recertification/education/in_training/ on 15 March 2008.
16. Garibaldi RA, Popkave C, Bylsma W. Career plans for trainees in internal medicine residency programs. *Acad Med.* 2005;80:507-12. [PMID: 15851467]
17. West CP, Popkave C, Schultz HJ, Weinberger SE, Kolars JC. Changes in career decisions of internal medicine residents during training. *Ann Intern Med.* 2006;145:774-9. [PMID: 17116922]
18. Resident & Fellow Workforce Data. Accessed at www.abim.org/about/exam-Info/data-workforce.aspx on 26 June 2008.
19. Bland CJ, Meurer LN, Maldonado G. Determinants of primary care specialty choice: a non-statistical meta-analysis of the literature. *Acad Med.* 1995;70:620-41. [PMID: 7612128]
20. Diehl AK, Kumar V, Gateley A, Appleby JL, O'Keefe ME. Predictors of final specialty choice by internal medicine residents. *J Gen Intern Med.* 2006;21:1045-9. [PMID: 16836624]
21. Frank E, Feinglass S. Student loan debt does not predict female physicians' choice of primary care specialty. *J Gen Intern Med.* 1999;14:347-50. [PMID: 10354254]
22. Kassebaum DG, Szenas PL. Factors influencing the specialty choices of 1993 medical school graduates. *Acad Med.* 1994;69:163-70. [PMID: 8311892]
23. Kassebaum DG, Szenas PL, Caldwell K. Educational debt, specialty choices, and practice intentions of underrepresented-minority medical school graduates. *Acad Med.* 1993;68:506-11. [PMID: 8507320]
24. Marci CD, Roberts TG. The increasing debt of medical students: how much is too much? *JAMA.* 1998;280:1879-80. [PMID: 9846787]
25. Silliman RA, Dittus RS, Velez R, Wartman SA, Young MJ, Fletcher RH. Debt, moonlighting, and career decisions among internal medicine residents. *J Med Educ.* 1987;62:463-9. [PMID: 3599034]
26. Spar IL, Pryor KC, Simon W. Effect of debt level on the residency preferences of graduating medical students. *Acad Med.* 1993;68:570-2. [PMID: 8323651]
27. Tudor C. Career plans and debt levels of graduating U.S. medical students, 1981-1986. *J Med Educ.* 1988;63:271-5. [PMID: 3357177]
28. Grosso LJ, Goode LD, Kimball HR, Kooker DJ, Jacobs C, Lattie G. The subspecialization rate of third year internal medicine residents from 1992 through 1998. *Teach Learn Med.* 2004;16:7-13. [PMID: 14987167]
29. Nelson HD, Matthews AM, Patrizio GR, Cooney TG. Managed care, attitudes, and career choices of internal medicine residents. *J Gen Intern Med.* 1998;13:39-42. [PMID: 9462493]

Current Author Addresses: Drs. McDonald, West, and Kolars: Mayo Clinic, 200 First Street SW, Rochester, MN 55905.

Ms. Popkave: American College of Physicians, 190 N. Independence Mall West, Philadelphia, PA 19106.