

How Trainees Finance Their Medical Education: Implications of Higher Education Act Reform

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Context: The Public Service Loan Forgiveness (PSLF) program is among several repayment programs currently available for recipients of federal student loans. Medical education debt has continued to expand at a rapid pace in the decade since PSLF was created. Proposed changes to the Higher Education Act would substantially transform how future medical trainees finance and repay medical education debt.

Objective: To better understand relationships between debt and personal stress, as well as between repayment- and forgiveness-program use, in the context of competing legislation.

Methods: Surveys were sent to all Accreditation Council for Graduate Medical Education–accredited internal medicine residency programs (osteopathic and allopathic).

Results: From a potential pool of 579 residents, data were obtained from 403 unique respondents (response rate, 69.6%) at 12 residency programs, for a program response rate of 2.2%. Of these respondents, 290 (71.9%) completed the demographic portion of the survey. Median education debt was \$225,000. Residents with the top quartile of debt burden were more likely to use PSLF (odds ratio [OR], 3.27; $P=.02$), more likely to enter loan forbearance (OR, 2.14; $P=.03$), and indicated a higher level of stress (OR, 5.94; $P<.001$) compared with those in the second and third quartiles.

Conclusion: Proposed legislative changes to the Higher Education Act would scale back loan repayment options and also eliminate PSLF for future borrowers. Our data suggest that higher debt burdens are associated with increased debt-related stress. Given program popularity and growing use, along with growing concerns of physician burnout, policy makers should weigh the potential downstream effects of policy change on prospective future physicians.

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The tuition and affordability of medical education continues to be an important topic of debate. Median debt for allopathic medical school graduates is \$180,000; for osteopathic medical school graduates, median debt is \$240,000.¹⁻³ Although mean indebtedness for allopathic graduates has held steady in recent years,^{1,4,5} a surge in representation of osteopathic graduates in the physician workforce coupled with increasing numbers of graduates from private institutions will

continue to drive indebtedness upward.⁶ It should also be noted that these are lagging data, representing 2012 to 2016, and the years leading up to the publication of this article have likely already influenced indebtedness. The burden of debt has changed over time, and so have tools used by young physicians to repay it.

The Public Service Loan Forgiveness (PSLF) program, created under the College Cost Reduction and Access Act of 2007, is among several federal student repayment programs available to recipients of federal student loans.^{7,8} Under PSLF, indebted professionals are able to discharge the remainder of their federal student loans after making 120 qualified loan payments during concurrent full-time employment for an eligible public service employer. This program runs separately from but in parallel to the federally mandated student loan repayment programs outlined in the Higher Education Act (HEA). The growth and popularity of the program among medical graduates is well documented; anticipated participation rates have risen from 47.8% in 2011 to 73.2% in 2017.^{4,5}

Congress is periodically charged with reauthorizing the HEA to allow for review, revision, and improvement of existing education legislation.⁹ In December 2017, the Promoting Real Opportunity, Success, and Prosperity through Education Reform (PROSPER) Act was introduced by the Republican-led House of Representatives as a model for reauthorizing the HEA.¹⁰ Arising from dialogue generated by the PROSPER Act among policymakers, researchers, undergraduate leadership, and students, House Democrats offered an alternative reauthorization plan titled the Aim Higher Act (AHA).¹¹ These competing pieces of legislation propose considerable education reform that will affect a future generation of medical trainees.

In the wake of rising medical graduate indebtedness, a body of literature has emerged that links debt with higher risks of physician burnout,¹² depression,¹³ and skepticism regarding policy changes.¹⁴ Previous studies have investigated the economic utility of medical education¹⁵ and the performance of different

repayment plans over time.¹⁶ To date, the impact of growing medical education indebtedness on resident use of PSLF and whether legislative volatility influences repayment use has not been considered. In this cross-sectional survey of internal medicine (IM) trainees, we sought to better understand relationships between debt and personal stress, as well as between repayment- and forgiveness-program use in the context of competing legislation.

Methods

Study Design

We reviewed published surveys regarding residency finances and career decisions to reference how the structure and content could be tailored to our focus of interest.¹⁷⁻²² While multiple validated tools exist for capturing information about physician stress and burnout, self-reporting via 1 or 2 questions has become an acceptable screening method.²³ Data were collected and managed with REDCap (Research Electronic Data Capture) tools hosted at Mayo Clinic.²⁴ The survey was piloted at the host institution with a total of 19 residents, faculty, and program directors to evaluate content, question clarity, and administration time (10-15 minutes) and to ensure that the survey platform was effective. The survey was evaluated for lack of bias and comprehensiveness by physicians in academic and private practice. A total of 77 multiple-choice questions and 1 optional free-text question were included in the final 8-page version of the disseminated survey ([Appendix](#)). Questions assessed use of loan repayment and forgiveness strategies, loan forbearance, personal stress, specialty selection, career decisions, financial education, and financial tools used. This investigation was approved by the institutional review board at the Mayo Clinic in Scottsdale, Arizona.

Sample, Outcome Measures, and Data Collection

This anonymous survey was distributed to all IM residency programs accredited by the Accreditation

Council for Graduate Medical Education (ACGME; 410 allopathic and 132 osteopathic programs). Program directors were provided a digital copy of the survey via email and were asked to forward a web link for the REDCap platform survey to their trainees, regardless of training year. Second and third emails were sent to all nonresponding program directors (3 and 6 months after the initial email contact). No remuneration was offered to residents or program directors. The focus was on IM programs, as IM is the most frequently chosen residency specialty, accounting for the largest proportion of ACGME-accredited positions. Furthermore, IM trainees can pursue primary care or subspecialty fields of practice.²⁵

Data Analysis

We assessed the associations between the amount of medical education debt and (1) use of various loan repayment and forgiveness strategies, (2) loan forbearance, and (3) personal stress. Several components of the survey were not considered in the current analysis (questions about specialty selection, career decisions, financial education, and financial tools used). Univariable associations between the amount of medical school debt and the above questions were analyzed with χ^2 tests, Fisher exact tests with Monte Carlo *P* values, and analysis of variance tests with standard statistical methods. Relationships of interest were evaluated with the use of a univariable proportional odds ratio (OR) model with logistic regression, and *P* < .05 indicated statistical significance. Categorical data were expressed as number of respondents and percentage of sample. SAS Studio Basic 3.7 (SAS Institute Inc) was used for statistical analysis.

Results

Survey Respondents

In total, 12 IM residency program directors disseminated the survey to their trainees, yielding a program participation rate of 2.2% (12/542). Participating programs included Charleston Area Medical Center/West

Virginia University (Charleston Division), Mercy Hospital (St Louis, Missouri), Methodist Health System (Dallas, Texas), Oklahoma State University Center for Health Sciences (Tulsa), Redmond Regional Medical Center (Rome, Georgia), St Vincent Hospital (Worcester, Massachusetts), Yale-New Haven Medical Center (Connecticut), University of Oklahoma School of Community Medicine (Tulsa), University of Kansas Medical Center (Kansas City), Mayo Clinic (Scottsdale, Arizona), Mayo Clinic (Jacksonville, Florida), and Scott and White Medical Center (Temple, Texas). Data were obtained from 403 unique respondents from a potential pool of 579 (response rate, 69.6%); of these, 290 (71.9%) completed the demographic portion of the survey. Respondent demographic data are shown in [Table 1](#).

Resident Debt, Stress, and Repayment

[Figure 1](#) shows the varying levels of educational debt reported. The median respondent educational debt (undergraduate plus medical school) was \$225,000. Respondents were stratified into quartiles based on level of indebtedness, excluding the 76 respondents without debt: quartile 1, less than \$175,000; quartile 2, \$175,000 to \$225,000; quartile 3, \$225,000 to \$300,000; and quartile 4, greater than \$300,000. A considerable percentage of residents described themselves as having high levels of stress, especially those with higher debt burden ([Table 2](#)).

Overall, income-driven repayment (IDR) was the most popular repayment tool, with 77.1% participation. Among the various IDR options, income-based repayment (IBR) and pay as you earn (PAYE) were the most frequently used. Current or planned loan forbearance was 20.5% across all debt groups. Planned participation in PSLF was recorded by 40.6%, and an additional 27.5% were uncertain about whether they would enroll in the program in the future ([Table 3](#)).

Respondents in quartile 4 were more likely to have high levels of stress (OR, 5.94; *P* < .001) than those in quartile 1 ([Table 4](#)). Those in quartile 1 were less likely to enter forbearance on their educational debt

Table 1.
Respondent Characteristics^a

Characteristic	No. (%)
Male sex	170 (58.6)
Medical school	
US allopathic	144 (49.7)
US osteopathic	93 (32.1)
International or other non-US medical school	30 (10.3)
Caribbean medical school	23 (7.9)
Training program (traditional)	
Allopathic university-based	156 (53.8)
Allopathic community-based	98 (33.8)
Osteopathic university-based	14 (4.8)
Osteopathic community-based	22 (7.6)
Level of training	
PGY1	100 (34.5)
PGY2	86 (29.7)
PGY3	90 (31.0)
PGY4	12 (4.1)
PGY5	1 (0.3)
Living situation	
Single or partnered but living alone	89 (30.7)
Married or cohabiting	176 (60.7)
Single, with roommates	25 (8.6)
Total household income, USD	
0-34,999	2 (0.7)
35,000-49,999	37 (12.8)
50,000-74,999	121 (41.7)
75,000-99,999	48 (16.6)
100,000-149,999	65 (22.4)
≥150,000	17 (5.9)

^a 290 respondents (71.9%) completed the demographic portion of the survey.

Abbreviation: PGY, postgraduate year.

(OR, 0.21; $P=.005$), whereas those in quartile 4 were more likely (OR, 2.14; $P=.03$) compared with those in quartiles 2 and 3. Those without debt were more likely

to have low levels of stress than those with debt (OR, 10.44; $P<.001$) (Table 4).

The median time anticipated for loan repayment was 11 to 15 years for quartile 4 and 6 to 10 years for quartile 1, with 72.9% of those in either quartile 1 or 4 using IDR. Compared with those in quartiles 2 and 3, residents with a higher debt burden were more likely to use the PSLF program (OR, 3.27; $P=.02$), whereas those in quartile 1 were less likely (OR, 0.29; $P=.005$). Residents in quartile 4 were more likely to use forbearance (OR, 2.14; $P=.03$) and those in quartile 1 were less likely (OR, 0.21; $P=.005$). The revised PAYE plan was more popular among respondents in quartile 4, and those with higher debt were less likely to use the standard repayment option instead of IDR compared with those in quartiles 2 and 3 (OR, 0.14; $P=.01$).

Discussion

More than 80% of newly graduated physicians assume a sizeable debt to finance medical school. Although physicians often describe their work as a calling or a profession, most residents are deeply in debt, and this burden may have lasting psychological implications, such as decreased perception of societal worth and increased expectations of receiving a high income.²⁶

Medical residency is a time of high physical and mental demands, and although the ACGME has addressed many sources of stress inherent to postgraduate training, financial burdens may also contribute to resident burnout and should also be considered. Debt affects physical and mental health, including anxiety, and it is associated with an increased suicide risk (up to 7-fold higher than that of individuals without debt).^{27,28} In this era of increased burnout and decreased work satisfaction,²⁹ increased financial stress may be an additional burden that interferes with trainee resilience. When queried about plans for loan repayment, most respondents in the current study indicated that they could not start paying down their debt during residency. Residents had a median debt of

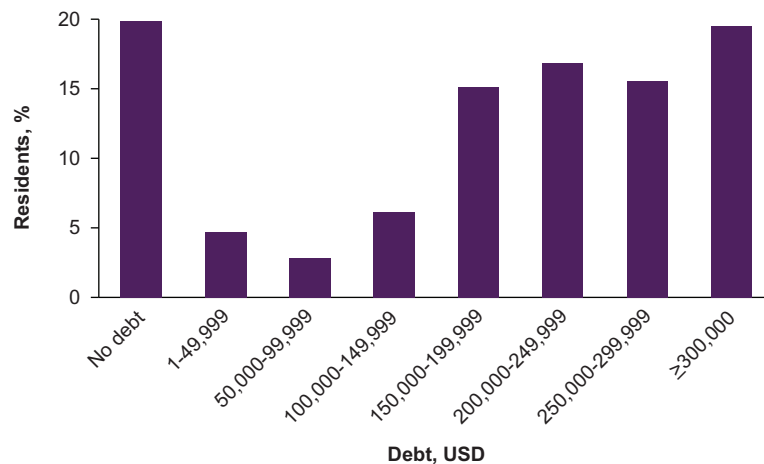


Figure 1. Medical education debt of 403 residents in 12 US internal medicine residency programs.

\$225,000, and 77% of residents used IDR plans with loan balances continuing to compound during residency, even as they made monthly payments of hundreds of dollars.

Of the IDRs, the most frequently used program (with over a third of respondents participating) was IBR, which is also the oldest program. Another 20% of respondents using IDR chose Revised PAYE. This plan has a lower monthly payment compared with IBR, and it offers an interest subsidy for those unable to pay down the balance on their loans, which makes it a suitable choice for residents.

Respondents in the top quartile of loan burden were more than twice as likely to enter forbearance as those in the middle quartiles (Table 4). Although loan deferment was once an excellent option for medical trainees, when Congress changed loan repayment regulations in 2007, residents no longer qualified for deferment during training and were left with forbearance as an option. In forbearance, no payments are made, and loans compound annually during a resident’s training. With this option, the increased loan balance could compound tens of thousands of excess dollars over an extended repayment period.

Table 2. Resident Stress Level Associated With Debt Quartile (N=403)^{ab}

Perceived stress level	Any educational debt		Debt quartile ^c		
	Yes	No	Quartile 1	Quartiles 2-3	Quartile 4
Low	43 (13.5)	61 (80.3)	24 (27.0)	15 (8.7)	4 (6.9)
Medium	144 (45.1)	13 (17.1)	41 (46.1)	88 (51.2)	15 (25.9)
High	132 (41.4)	2 (2.6)	24 (27.0)	69 (40.1)	39 (67.2)

^a Data are given as No. (%).

^b Stress levels were significantly different (χ^2 test) when comparing those with and without any educational debt ($P<.001$) and comparing those with debt, stratified by quartiles ($P<.001$).

^c Quartile 1, less than \$175,000; quartile 2, \$175,000 to \$225,000; quartile 3, \$225,000 to \$300,000; and quartile 4, greater than \$300,000.

Table 3.
Repayment Tool Utilization, Stratified by Debt Quartile Among Internal Medicine Residents (N=403)^{ab}

Item	Quartile 1	Quartiles 2-3	Quartile 4	Total
Repayment strategy				
Total respondents	69	144	49	262
Standard	18 (26.1)	21 (14.6)	2 (4.1)	41 (15.6)
IDR	44 (63.8)	116 (80.6)	42 (85.7)	202 (77.1)
Private consolidation	4 (5.8)	6 (4.2)	5 (10.2)	15 (5.7)
NHSC/IHS	2 (2.9)	0 (0)	0 (0)	2 (0.8)
Military	1 (1.4)	1 (0.7)	0 (0)	2 (0.8)
IDR subgroups				
Total respondents	44	116	42	202
PAYE	14 (31.8)	45 (38.8)	8 (19)	67 (33.2)
RePAYE	7 (15.9)	19 (16.4)	18 (42.9)	44 (21.8)
ICR	1 (2.3)	1 (0.9)	0 (0)	2 (1.0)
IBR	18 (40.9)	45 (38.8)	16 (38.1)	79 (39.1)
Unsure	4 (9.1)	6 (5.2)	0 (0)	10 (5.0)
Will/did the respondent enter forbearance?				
Total respondents	71	149	53	273
Yes	4 (5.6)	32 (21.5)	20 (37.7)	56 (20.5)
Will the respondent use PSLF?				
Total respondents	72	151	53	276
Yes	17 (23.6)	68 (45.0)	27 (50.9)	112 (40.6)
No	36 (50)	43 (28.5)	9 (17)	88 (31.9)
Unsure	19 (26.4)	40 (26.5)	17 (32.1)	76 (27.5)

^a Data are given as No. (%) unless otherwise indicated.

^b Quartile 1, less than \$175,000; quartile 2, \$175,000 to \$225,000; quartile 3, \$225,000 to \$300,000; and quartile 4, greater than \$300,000.

Abbreviations: IBR, income-based repayment; ICR, income-contingent repayment; IDR, income-driven repayment; NHSC/IHS, National Health Service Corps/Indian Health Services; PAYE, pay as you earn; PSLF, public service loan forgiveness; RePAYE, revised pay as you earn.

An alarming finding was that more than 40% of IM resident respondents are relying on PSLF to repay their medical school debt. This rate increases to 51% for resident respondents in the top quartile of loan burden (Table 3). Although a previous investigation showed that medical students planned to use PSLF, no data on rates of use by residents have been documented.³⁰ All participating institutions in our study were

PSLF-eligible. PSLF requires working at a nonprofit or government institution and making 120 qualifying payments under the standard repayment plan or an IDR plan. Payments made to the Direct Loan program during residency via an IDR count toward this total of 120. Given the differences in resident and postgraduate salary, the smaller payments made during training ultimately yield a larger loan balance being forgiven at

Table 4.
Interquartile Repayment Tool Utilization Analysis Among Internal Medicine Residents (N=403)

Item	Analysis	OR (95% CI)	P value
PSLF			
Yes	Debt: Q4 vs (Q2-3)	0.29 (0.12-0.69)	.005
Yes	Debt: Q1 vs (Q2-3)	1.81 (0.56-5.85)	.32
Repayment			
Private consolidation	Debt: Q1 vs (Q2-3)	2.09 (0.54-8.15)	.29
IDR	Debt: Q1 vs (Q2-3)	0.40 (0.19-0.84)	.02
Private consolidation	Debt: Q4 vs (Q2-3)	2.74 (0.75-9.94)	.13
IDR	Debt: Q4 vs (Q2-3)	3.47 (0.78-15.54)	.10
IDR subgroup			
PAYE	Debt: Q1 vs (Q2-3)	0.76 (0.34-1.71)	.51
RePAYE	Debt: Q1 vs (Q2-3)	0.90 (0.32-2.51)	.84
PAYE	Debt: Q4 vs (Q2-3)	0.49 (0.19-1.26)	.147
RePAYE	Debt: Q4 vs (Q2-3)	2.61 (1.10-6.17)	.03
Forbearance			
Yes	Debt: Q1 vs (Q2-3)	0.21 (0.07-0.62)	.005
Yes	Debt: Q4 vs (Q2-3)	2.14 (1.08-4.23)	.03
Stress			
High	Debt: Present vs absent	0.36 (0.07-1.81)	.21
Low	Debt: Present vs absent	10.44 (4.39-24.81)	<.001
High	Debt: Q4 vs (Q2-3)	5.94 (2.43-14.52)	<.001
Low	Debt: Q1 vs (Q2-3)	0.72 (0.20-2.60)	.62

Abbreviations: IDR, income-driven repayment; OR, odds ratio; PAYE, pay as you earn; PSLF, Public Service Loan Forgiveness; Q, quartile; RePAYE, revised pay as you earn.

the end of 10 years. The consistent use of IDR programs and the reliance on PSLF leaves future medical trainees more vulnerable to legislative changes than previous generations. Because all of the aforementioned programs are part of the federal government's Direct Loan program, they would be subject to change under the competing proposals for reauthorizing the HEA.

The PROSPER Act proposes substantial changes to federal loan type, loan limits, loan repayment, and loan forgiveness program options. The current variety of Direct Loan options available to borrowers would

be supplanted by the new federal ONE loan. All federal ONE loans would be unsubsidized and origination fees would be eliminated. Parent loans would be limited and there would be no equivalent of the current unlimited Grad PLUS program. An aggregate federal loan cap of \$235,5000 for professional students would be implemented.¹⁰

Although this measure is intended to control cost increases, over a third of residents in our study had medical educational loan debt exceeding this proposed cutoff. It can thus be deduced that many future trainees

may not be able to fully finance their medical education with federal student loans. It is also notable that this aggregate loan cap falls below the median indebtedness of osteopathic graduates. Given the rapid rise in tuition costs during the past decade, capping federal loans has concerning implications, including forcing medical students into potentially higher-interest private loans that do not offer the same protections as federal loan programs. While medical institutions could theoretically be incentivized to improve operational efficiency to have cost of attendance fall under the aggregate loan cap, it is also possible that schools could use the \$235,500 value as a cap on tuition, with fees and cost of living needing to be separately financed through the private lending industry. It is unclear whether these economic hurdles would affect the number of students choosing to attend medical school in general.

Although the PROSPER Act does not directly reference PSLF, the legislation would eliminate future PSLF enrollment by making Federal ONE loans not eligible for PSLF. Current borrowers with the existing basket of eligible loans would continue to be PSLF eligible. The downstream effects of eliminating PSLF on future physician participation in academic, government, and non-for-profit organizations cannot be fully quantified, but a reasonable assumption would be that the lack of financial incentive to practice in these capacities would yield lower participation. Given that many physicians in these positions serve vulnerable populations, the negative health consequences of elimination could be drastic. These concerns, specifically the threat to PSLF, are echoed by multiple stakeholders, including the American Association of Colleges of Osteopathic Medicine, AOA, and other medical organizations.³¹

Striving for a similar goal of simplifying the current repayment system, the AHA reduces the number of loan repayment options from 8 to 2: a fixed repayment plan and an IBR plan. However, this IBR plan would calculate borrower payments as 10% of their income that exceeds 250% of the federal poverty level. Contrasted with the current IBR system of calculating payments based on discretionary income (income that

exceeds 150% of the federal poverty line), the end result would be lower monthly payments for the majority of trainees. PSLF is preserved under the AHA, and the definition of PSLF-eligible employment is expanded to include health care professionals working in public service jobs who are prohibited by state law from being hired directly by a hospital or another health care facility. Like PROSPER, the AHA also repeals loan origination fees.¹¹

With more than three-quarters of medical residents currently using an IBR plan, and with half of those with higher debt levels planning on using PSLF, most residents will be affected by HEA reauthorization. While the final legislative product will likely represent a compromise of priorities between the various stakeholders, the distinct differences between proposals highlights the potential impact of public policy changes on trainees and their long-term financial security. The multifactorial nature of graduate debt and the methods of repayment underscore the importance of establishing an ongoing dialogue among academic institutions, national medical organizations, and policy makers to generate effective policy.

Our study has several limitations. All data were self-reported, and there is a risk of response bias from residents with higher debt loads. Additionally, programs with higher financial literacy and individual residents with a higher level of financial knowledge or interest may have preferentially chosen to respond to our survey. While the response rate was relatively high (403/579) among participating programs, overall program participation was low (12/542). Although participating programs were located in various areas of the country, most were in the Midwest or South, which may have introduced regional bias. Survey completion was only 72%, with a significant number of respondents failing to complete the demographics section at the end of the instrument; this may have affected the generalizability of findings. Although 23.7% of matriculating US graduates are from osteopathic schools,^{32,33} more than 30% of our respondents were osteopathic medical school graduates, which may reflect regional differences. These variances should be

considered before generalizing these findings to all IM residents, although the overall debt totals for respondents were consistent with the established averages for all American Association of Colleges of Osteopathic Medicine and Association of American Medical Colleges graduates. Last, because of constraints of the survey instrument, nonvalidated questions were used to assess stress and burnout, which hampers the link between standardized stress/burnout values and debt burden.

Further investigation is needed to assess evolving trends in debt and how debt affects resident stress, burnout, and resiliency. Future areas for research include the use of standardized stress and burnout questionnaires (Maslach Burnout Inventory, Perceived Stress Scale) as part of a thorough and validated psychometric tool. Given substantial differences in remuneration across various IM subspecialties and differences in overall training length associated with some subspecialties, which yield longer stretches of IDR payments at a pregraduate salary, further investigation into subspecialty selection and loan forgiveness program participation is warranted. Indebtedness is widely understood but poorly described in the literature, so additional data are necessary to inform policy and help address the needs of new physicians and the population who require reliable access to health care. Finally, an analysis by training program and the incorporation of other residency specialties was not conducted, but could represent areas of future investigation.

Conclusion

Graduate indebtedness is an influential variable that affects new physicians. To generate effective policy in this changing environment, education cost, methods of financing, and repayment models must be scrutinized. Participation of academic institutions, national medical organizations, and policy makers is necessary to develop policies that sufficiently encourage the next generation of physicians to meet the health care needs of the United States.

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