Monetary and Nonmonetary Costs and Benefits of a Public Health Master's Degree in the 21st Century

Angela J. Beck, PhD, MPH, Jonathon P. Leider, PhD, Heather Krasna, MS, and Beth A. Resnick, DrPH

As postsecondary tuition and debt levels continue to rise, the value proposition of higher education has been increasingly called into question by the popular media and the general public. Recent data from the National Center for Education Statistics now show early career earnings and debt, by program, for thousands of institutions across the United States. This comes at an inflection point for public health education—master's degrees have seen 20 years of growth, but forecasts now call for, at best, stagnation.

Forces inside and outside the field of public health are shifting supply and demand for public health master's degrees. We discuss these forces and identify potential monetary and nonmonetary costs and benefits of these degrees.

Overall, we found a net benefit in career outcomes associated with a public health master's degree, although it is clear that some other master's degrees likely offer greater lifetime earning potentials or lower lifetime debt associated with degree attainment. We outline the issues academic public health must engage in to successfully attract and train the next generation of public health graduates. (*Am J Public Health*. 2020;110:978–985. doi:10.2105/AJPH.2020.305648)

As tuitions and debt levels continue to rise, the value proposition of higher education has been called into question by the popular media and the general public.[1]

Wages in many occupations, including public health, have not kept pace with tuition increases, leaving many graduates with mounting debt. Public health graduate education, with 20 years of growing enrollment and a proliferation of master's degree programs, had been fairly immune to these challenges.[2] Yet, recent enrollment slowdowns and data on student debt to earnings after graduation raise critical questions regarding the value proposition of a public health master's degree. These questions are increasingly important given the attention on the value of public health as a result of the COVID-19 pandemic.

There are several factors to consider when one is determining the value proposition of a graduate degree, including tuition cost and debt load, earnings, career outcomes, and vocational preferences. Articles in the popular media have compared recently released National Center for Education Statistics (NCES) data of median debt acquired when receiving graduate degrees with median earnings 1 year after graduation.[3,4] These aggregate measures, although crude as they lack sensitivity to specific degree types and future earnings potential, provide a useful prompt to consider the factors of which a prospective student may be mindful when considering graduate education. This article summarizes the history and growth of public health education and the changing landscape of graduate education, and uses first-destination employment trends 1 year after graduation and cumulative degree-associated debt to consider the value proposition for public health master's degrees.

HISTORY AND GROWTH OF PUBLIC HEALTH EDUCATION

The 1915 Welch Rose report laid out a vision for public health education in response to the need for trained practitioners to control disease and promote health at a population level.[5] Schools of public health were first funded primarily by foundations to train professionals in laboratory science with an emphasis on infectious disease. Public health education efforts were bolstered in 1935 by federal funding for public health workforce development. In response, schools of public health provided generalist Master of Public Health (MPH) degrees with a focus on field work and practical training.[6] The curriculum addressed skills needed by public health departments, which was the primary employment sector of public health graduates. Over time, more specialized master's programs emerged to address public health issues such as tropical diseases, environmental sanitation, and industrial hygiene.[6] When funding to support public health education began to wane in the 1950s, schools pursued research funding. This moved public health education away from its roots in community-based practical training and more toward laboratory science, health

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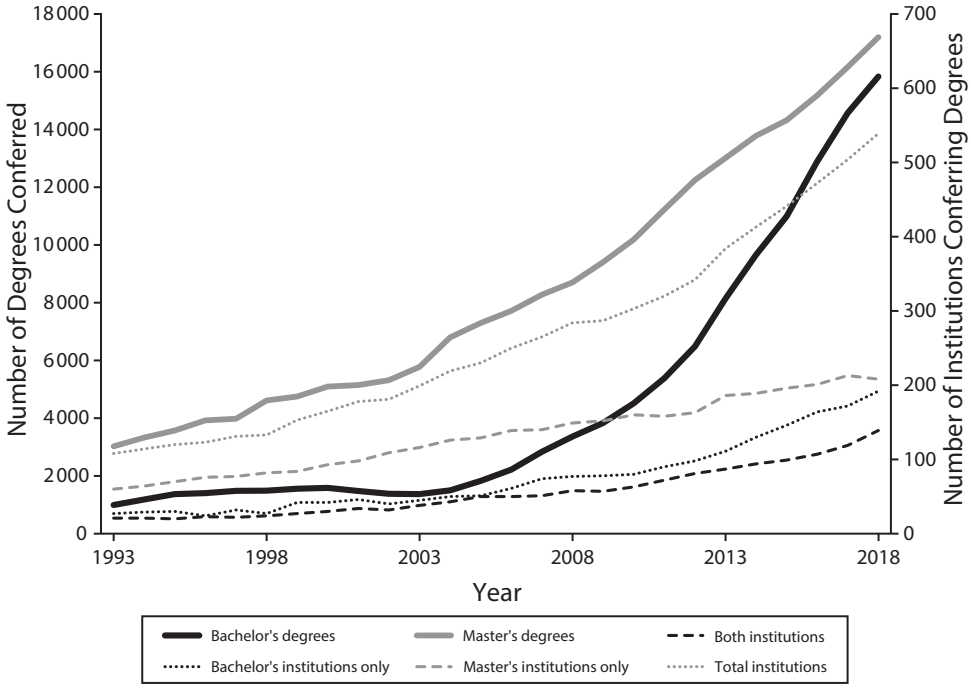
services research, and related social sciences.[5,6]

The 21st century introduced emerging challenges of globalization, scientific and technological advances, and climate and demographic changes. Public Health 3.0 re-envisioned the role of governmental public health to lead a cross-disciplinary approach to improving population health in the nation's communities.[7] Continuous quality improvement is now essential to public health and requires a shift to more strategic skills related to systems thinking and leadership. The advent of advanced data systems and Big Data are among the most significant changes in the practice of public health in the last century. Computerized data collection across agencies, health care providers, and other data sources enable complex analyses and visualizations of data on population health, but present a multitude of technical challenges.[8]

Public health education is adapting to meet these modern challenges and opportunities to advance interdisciplinary approaches and technical skills. A decade apart, the 2003 Institute of Medicine (IOM) committee and the 2011–2015 Association of Schools and Programs of Public Health (ASPPH) Framing the Future Task Force engaged stakeholders across the field to chart the course for the future of public health education across the continuum from K–12 to doctoral education, consistent with a modern Public Health 3.0 vision.[8] These efforts resulted in revised accreditation requirements from the Council on Education for Public Health in 2016 for competency-based bachelor's and graduate curricula with an emphasis on interdisciplinary practical skills and technical knowledge to advance delivery of the essential public health services and improve population health outcomes.

Postsecondary education in public health accelerated greatly in the 21st century, raising questions about the viability of the growing number of programs across the country. Almost nonexistent until the 1990s, public health bachelor's degree conferrals have grown 12% each year since 1992, on average, and are expected to overtake master's degrees as the most awarded public health degree in the early 2020s.[9,10]

At the master's level, public health has been one of the fastest-growing degree types in the United States for a decade.[2,10] In 2018, more than 300 institutions reported offering public health master's degrees, up from 69 in 1992 (Figure 1). The MPH remains the most common graduate public health degree, accounting for 71% of all ASPPH members' public health master's degrees in 2018 (Figure A, available as a supplement to the online version of this article at http://www.ajph.org).[11–13] As we enter the next decade, the trajectory of public health master's degree enrollment is expected to plateau and perhaps even invert.[2] This is of significant concern to institutions offering graduate public health education, as well as to public health workforce researchers. We surmise, based on our review of the literature and observations from other fields, that 3 major factors are contributing to this shift: (1) external forces pressing on graduate education, (2) public health employment, and (3) student debt and earnings. These factors are considerations for the value proposition of public health graduate education.



Source. National Center for Education Statistics.

FIGURE 1—Number of Public Health Bachelor's and Master's Degrees, and Number of Institutions Offering Public Health Bachelor's and Master's Degrees: United States, 1993–2018

EXTERNAL FORCES ON GRADUATE EDUCATION

In the United States, demographic shifts have resulted in fewer high-school graduates to fill the postsecondary pipeline.[14,15] Compounding this is a relative decline in higher education enrollment from non-Hispanic Whites, yielding a smaller prospective student pool collectively even as more students of color attain greater levels of postsecondary education.[16] Furthermore, it is well documented that positive economic conditions (e.g., recently low unemployment)[17] decrease incentives to pursue higher education—especially graduate education. However, economic stresses associated with the COVID-19 pandemic could

result in a greater demand for graduate education, and perhaps public health specifically.[11] Finally, recent declines in first-time master's-level international enrollments in the United States are of concern (4% decline from 2017 to 2018), as international students received 12% of public health master's awards in 2011 to 2018.[17] Graduate education has seen enrollment declines across several sectors (e.g., business, law) over the 21st century because of these conditions. Growth in public health graduate education has continued, but has slowed in recent years. Public health may also be subject to these national trends, although the unknown impact of COVID-19 is a complicating factor.

PUBLIC HEALTH EMPLOYMENT

Career pathways for public health master's graduates shifted from governmental public health to private entities in the late 20th and early 21st centuries, concurrent with public health funding declines and more curricular focus on specialized areas. In a 1992 longitudinal study, 42% of 1956-to-1965 public health graduates found their first employment after graduation in "health departments." By contrast, only 17% of 1976-to-1985 graduates' first employment was in health departments.[12]

ASPPH data show 1-year postgraduation outcomes between 2015 and 2017 on a total of 43 903 graduates at all degree levels of public health schools and programs.[13] In addition, the National Association of Colleges and Employers (NACE) has collected sporadic first-destination data for public health graduates approximately 6 months after graduation since 2014. Both ASPPH and NACE data indicate that early career outcomes for public health master's graduates are comparable to graduates in other fields, with NACE reporting 12.6% of public health graduates were seeking employment or further study in 2018 (vs 10.6% overall), and ASPPH showing only 4% of 2015-to-2017 reported public health graduates were still seeking a job 1 year after graduation.[13,18] The largest percentage of 2015-to-2017 master's graduates reported jobs in the sectors of health care (28%), government (19%), and academia (19%).[13]

Given the recent rise in public health undergraduate education, there is great interest in comparing postgraduate outcomes at the graduate and undergraduate level. Although data are still developing at the bachelor's level, early signs indicate a high percentage of bachelor's public health graduates seeking employment in for-profit firms (34% of those employed) or pursuing further study after graduation (25% vs 11% master's graduates).[13] Three quarters of these bachelor's graduates were pursuing a degree in public health (44%) or medicine (31%).[13] In short, although it is reasonable to inquire whether bachelor's degrees in public health will lead to substitution effects, more data are needed to draw a definitive conclusion.

The decentralized and varied state and local governmental structure coupled with the lack of licensure for public health workers creates challenges to characterizing and studying the governmental public health workforce.[16,19,20] However, the Public Health Workforce Interests and Needs Survey (PH WINS), fielded in 2014 and 2017 to public health staff in US state and local government agencies,[21] showed that only 14% of the workforce had public health degrees of any type.[21,22] In 2017, undergraduate public health degrees were reported by 4.2% of PH WINS respondents, a slight increase from 2014.[23] Governmental workers with public health master's degrees disproportionately hold technical or scientific positions (e.g., epidemiologist) compared with other master's degree holders (e.g., health administration, public policy).[24] If public health graduates are not going into government, where do they end up—and do they need a public health master's degree to get there?

To explore this question, we can first attempt to assess whether the occupations that employ public health master's graduates are hiring fast enough to keep up with the number of graduates. The US Bureau of Labor Statistics reported that the occupations with the highest predicted percent increase in employment through 2028 are statisticians, biostatisticians, and clinical data managers (projected growth of 31%); postsecondary health specialties teachers (professors of health-related topics; 23%); medical and health services managers (18%); social and community services managers (program managers for human services, mental health, youth, and aging nonprofits; 13%); and health educators (11%; Table A, available as a supplement to the online version of this article at http://www.ajph.org).[25] As public health–related industries are among the fastest-growing in the United States,[25] demand for public health master's graduates in the private sector should remain high, although there may be competition from a proliferation of data analytics and related degrees to cater to employers' needs in these industries.[25] Eight of the top 20 fastest-growing industries are health-related, and several others value skills addressed in MPH programs, such as data analysis and programming, management, and scientific and technical consulting services.[25]

Although impact of the global pandemic on public health employment is yet to be determined, demand for public health master's graduates in the private and nonprofit sectors can be reasonably expected to remain strong, but similar conclusions likely cannot be reached for governmental public health, where new job growth has been stagnant since the Great Recession and retirees are sometimes not replaced.[26,27] Overall job growth is projected to decline through 2024 in the federal government (–1.5%), and job growth in local and state government is growing much more slowly (0.4%) than in many other sectors that are competing to hire public health master's graduates, such as health care and social assistance (1.9%) or professional services (1.5%).[25]

STUDENT LOAN DEBT AND EARLY CAREER EARNINGS

In 2019, NCES released data on cumulative federal loan debt by degree level and earnings for first-destination employment from graduates of postsecondary programs in the United States by institution.[28] Although there are significant deficiencies in making value judgments about postsecondary degrees for any field solely with these data, we believe its release is a significant and beneficial push toward transparency in higher education. Aggregate

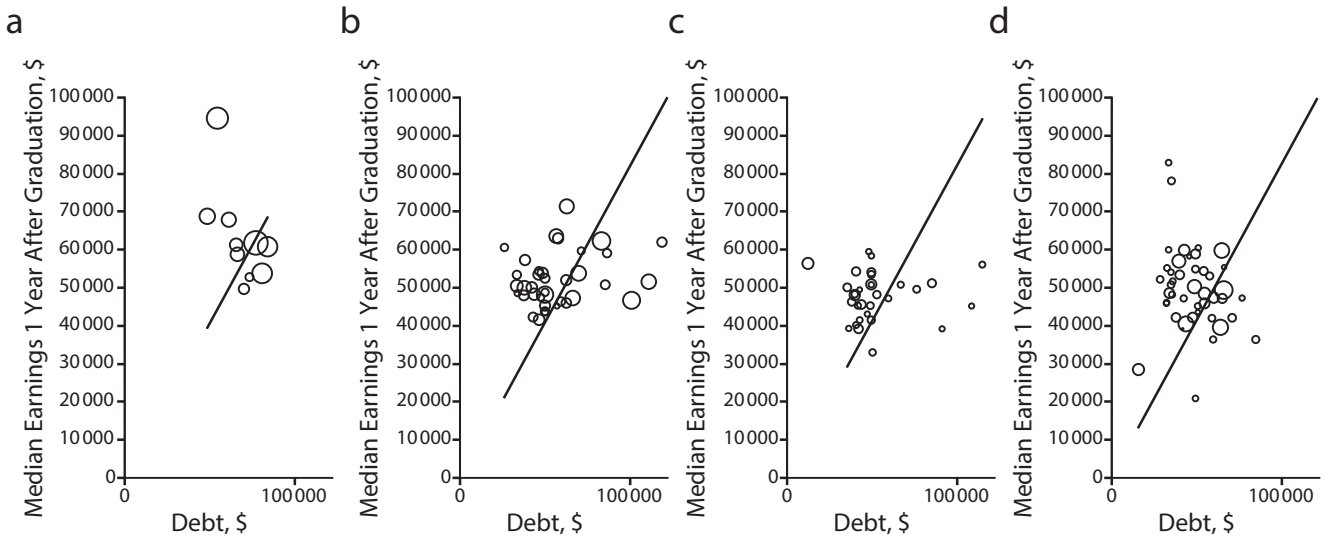
ASPPH and NACE employment data can now be supplemented with publicly available, institution-level NCES data. Critical questions raised by the availability of these institutional- and program-specific data may be uncomfortable to consider but are necessary to strategically chart the future of public health education and for the field.

The ratio of early career degree–associated debt and earnings is decidedly mixed for master's degrees in public health. According to ASPPH first-destination outcomes data for 4518 graduates, median salary for public health master's students employed full-time was $60 000 overall and ranged from $50 000 among those employed full-time at academic institutions (n = 780) to $70 000 at for-profit corporations (n = 839).[13] NCES data indicate public health (Classification of Instructional Programs [CIP] code 51.22) master's students have a median debt load of $52 263 and first-destination earnings of $48 866. This is markedly lower than ASPPH data points because NCES data (1) include both full-time and part-time earnings outcomes and (2) do not include epidemiology, biostatistics, or health policy analysis graduates. Debt and earnings ratios vary widely across institutions and do not appear contingent on *US News & World Report* rankings,[29] which may serve as a proxy for perceived institution prestige by prospective students (Figure 2). Although top-10-ranked public health schools have median higher earnings generally for a variety of reasons, they also collectively have higher median debt. Forty-four percent of schools had median debt outstrip median earnings 1 year after graduation.[28]

In terms of NCES median first-destination earnings and median masters' degree–associated debt, public health (debt = $52 263; earnings = $48 866) is "middle of the pack" among the largest master's programs in the United States for degrees awarded in 2016 and 2017 (Figure 3).[28] Public health may be perceived as a lower financial value to early career professionals compared with the most common master's degree, a Master of Business Administration, with median debt and earnings of $43 000 and $59 000, respectively, and compared with computer science (debt = $36 000; earnings = $100 000) or electrical engineering (debt = $26 000; earnings = $97 000).

However, public health performs similarly to peer master's degree programs such as social work (debt = $47 000; earnings = $44 000) and public administration (debt = $51 000; earnings = $51 000). Education master's degrees tend to have less median debt and comparable first-destination earnings, though long-term prospects for growth and increased lifetime earnings in education are uncertain.[30] Nursing outcomes for master's students 1 year after graduation are strong (debt = $47 000; earnings = $93 000), likely attributable in part to specialty nursing degrees such as those for nurse anesthetists, nurse practitioners, or critical care nurses.

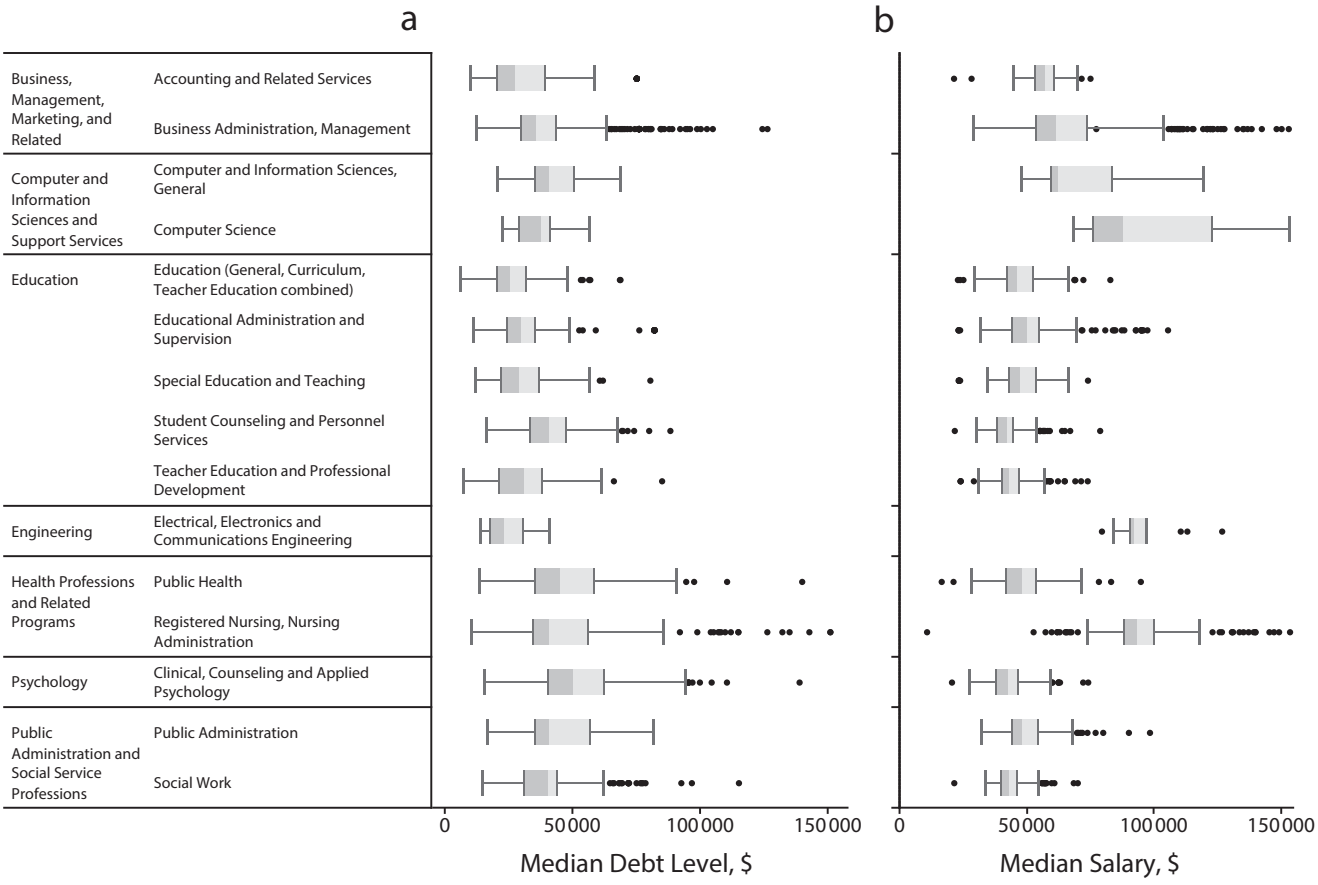
Another consideration in the value of an MPH degree is that few scholarship and repayment programs currently exist to fund public health graduate education, particularly compared with professions benefitting from the National Health Service Corps or teacher loan forgiveness programs, among others. Lack of scholarship and repayment programs may have a negative impact on recruitment into the governmental public health workforce when vacancies arise if



Source. National Center for Education Statistics.

Note. X-axis is cumulative federal loan debt associated with obtaining master's degree. Y-axis is median earnings 1 year after graduation. Size of markers relates to total number of master's degrees in public health awarded by the institution. Reference line represents where earnings = debt. Schools shown to the left of the reference line are those for which first-year earnings exceed cumulative federal student loan debt associated with a student's master's degree. Schools to the right are those for which debt exceeds earnings.

FIGURE 2—Median First-Year Earnings Debt in Public Health by 2019 *US News & World Report* Rankings of (a) Top 10, (b) 11–50, (c) > 50, (d) Unranked: United States, 2015–2017



Source. National Center for Education Statistics.

Note. X-axes represent median cumulative federal loan debt from the master's level by institution and median earnings 1 year after graduation by institution. National Center for Education Statistics does not have complete information on debt and earnings for each student (see Table A for counts).

FIGURE 3—Median Debt by Institution in Largest 15 Master's Programs: United States, 2015–2017

students choose private-sector employment over the public sector solely for financial reasons.[26]

DATA LIMITATIONS

As these findings are considered, along with the 1-to-1 comparisons of earnings versus debt featured in the popular press,[3,4] their limitations are also worth considering as these analyses (1) underestimate out-of-pocket spending by using debt instead of debt plus foregone salaries (for full-time, residential master's degrees) and (2) underestimate net benefit by showing only first-year earnings outcomes, given the significant lifetime earnings associated with early career promotions and pay raises[30] or career prospects bolstered by previous education and student credentials, as well as student access to the respective institutional faculty and alumni network. Relatedly, certain higher-paid positions are only available to those with master's degrees.

There are 2 other important data limitations to consider. First, NCES data lack specificity of degree concentration for public health and thus exclude disciplines with distinct CIP codes such as epidemiology, biostatistics, or health policy analysis, which tend to have good employment outcomes and higher salaries within the field (Table A).[13] Second, we were unable to disaggregate the MPH from other public health master's degree types.[28] This is potentially significant, as master's degree types are associated with differential earnings outcomes (e.g., MPH vs Master of Health Administration [MHA]. We also cannot fully discern the impact of dual-degree students—dual degrees represented approximately 5% of total MPH graduate conferrals in 2000 to 2018. However, about 1.5% were MPH and Doctor of Medicine (MD) and less than 1% each were MPH and Juris Doctor (JD), MPH and Master of Business Administration (MBA), or MPH and Master of Science in Nursing (MSN; traditionally, higher-paying professions); the remainder are MPH and Master of Social Work (MSW) or another dual degree of a traditionally lower-paying profession.[31] We do not expect inclusion of these cases would positively shift the median earnings dramatically, though it might increase debt measures as those data represent cumulative federal debt at the master's level.

ON THE VALUE OF A PUBLIC HEALTH MASTER'S DEGREE

Graduate-level education is often marketed explicitly as having high return on investment (ROI). ROI compares the monetary benefits relative to the monetary costs. ROI calculators abound on the Internet to determine whether a degree is the right investment for a prospective student. In our view, although potential earnings, forgoing one's salary while pursuing a full-time residential degree, and debt are all critical factors when one is making career choices, it would be more appropriate to view decisions about graduate school in any field through a cost–benefit analysis lens, with explicit acknowledgment that nonmonetary benefits (and costs) are reasonable considerations. Nonmonetary costs associated with pursuing graduate school might include academic or financial stress associated with graduate education. Potential benefits such as the interest in the curriculum, engagement, and personal value of engaging in service work can be challenging to quantify. Vocational decision-making theories indicate that jobseekers take multiple factors into account when looking for employment. These include job function and career interest,[32] with public health occupations attracting individuals with interests in research, administration, and service to others; lifestyle and values; the ease or difficulty of finding a job in different sectors; and public service motivation.[33] This suggests that some individuals are less financially motivated because of strong interest in serving the public. One study found that participants were willing to forfeit $17 300 to $22 639 in average yearly income to work "in a more rather than less meaningful job."[34(p3)] Furthermore, salary is only marginally correlated with work satisfaction.[35] Earnings and debt are appropriately recognized as key considerations—but should not be the sole consideration—when one is making decisions about graduate education.

First-destination earnings and salary data from NCES show that there are graduate degree options that have stronger 1-year postgraduation salary–to–cumulative degree debt ratios than public health. For our field's direct competitors (arguably, the Master of Public Administration, Master of Public Policy, and MSW), early career outcomes and debt are similar. In consideration of benefits, we note that employment data show public health degree portability, in that graduates have skills sought by employers across varied industries and sectors. Because public health is a field, not a discipline, graduates work in many types of positions and have good mobility.[6,13,26] The unemployment rate is low 1 year after graduation (4%).[13,18] Although public health master's graduates may be found in a variety of job roles and industries, most find relatively well-paying jobs in health care, nonprofits, and in more traditional public health areas.

Public health tends to have favorable outcomes associated with job satisfaction and sense of purpose.[6,26] Although more specific data are needed from public health master's graduates across the range of employers, survey data from state and local health department workers show job satisfaction rates greater than 80%.[21] Approximately 67% of employees in the government sector and 65% in the nonprofit sector report that their jobs give them a greater sense of identity beyond just being a way of making money, as compared with only 42% of employees in the for-profit sector. Employees in health care find their work gives them a sense of identity (62%), as do those in education (70%) and science, technology, engineering, and mathematics (STEM) fields (66%), as compared with only 37% of those working in retail or 42% in hospitality.[36] In addition, government has historically offered higher levels of health and retirement benefits than other sectors, though benefit generosity has been decreasing in recent years.[37] This may further contribute to government being a less attractive employer to new graduates.[26,27]

There are some other considerations related to the value proposition of a public health master's degree. Data do not yet suggest that bachelor's graduates are supplanting master's graduates in the workforce.[9,23] However, more data are needed to assess this important question and consideration of other related factors, such as potential impact of COVID-19, and whether a weaker economy could change employment patterns and if some jobs are more likely to be filled by bachelor's-trained workers than master's-trained. Additional study is also needed to determine whether the increasing number of degree programs available from a range of institutions including accredited and nonaccredited and for-profit programs will further divide the applicant pool in a time of decreasing enrollment, declines in state funding support, and rising tuition. These factors may eventually affect the value of the degree.

CONCLUDING THOUGHTS

Public health occupies a unique interdisciplinary space in the US graduate education and postgraduation employment landscape. It is neither solely a hard nor social science. It does not train students in 1 discipline, but in an array. Public health graduates do not have a single employment focus, but one that varies depending on public health degree type, institution attended, and personal interests and skill sets.

Considering the value proposition of a complex field is itself a complex endeavor. It is worth noting considerations of reflexivity and bias in this work—we are employed by schools of public health and have ourselves pursued graduate education in the field; thus, there is a natural incentive to articulate a positive value proposition for the degrees our schools offer and that we support and have earned ourselves. Yet, as workforce and public health education researchers, we have employed tools to help us rigorously assess our core question about the value proposition of public health master's degrees. With these biases acknowledged, we posit that this article may be most useful if it can accomplish 3 things.

First, we hope this article may help prospective public health graduate students, as well as academic recruiters and advisors, ask and answer key questions when considering the costs and benefits, monetary and otherwise, of a public health master's degree.

Second, we hope this article may push governmental public health decision-makers to recognize the potential breadth and depth of the talent pool of the new generation of master's trained graduates to address 21st

century problems using Public Health 3.0 approaches of interdisciplinary systems thinking and skills such as data and policy analysis. However, to ensure such a competent governmental public health workforce, it is imperative to recognize that these graduates face considerable financial challenges and need traversable pathways to governmental employment with viable compensation. It may be the case that students want to pursue public service, but impossibly low or uncompetitive salary scales coupled with lengthy and cumbersome hiring processes deter them.[13,38] Without efficient and smooth hiring processes that include more robust practice-based scholarships, loan repayment, or meaningful and functional debt forgiveness options,[39] a governmental public health workforce shortfall among technically savvy and well-educated graduates becomes likely.[26]

Third, this article aims to spur US academic public health leadership to recognize the importance of maximizing student benefit while minimizing costs. Graduates' aggregate salary and debt data are now publicly accessible at the institution level. This will likely prompt more news articles, further academic research, and additional data collection to calculate more refined ROI for specific degree programs within individual institutions. Transparency should be embraced and used to accelerate transformation and innovation of public health education to address 21st century public health challenges. It is our view that the need to maximize positive early career outcomes and minimize student loan debt is a field-wide issue that persists across all rankings, types of school (public vs private), and geography. This is both a moral and prudential imperative.

We have identified potential monetary and nonmonetary costs and benefits of public health master's degrees. Overall, our findings indicate a net benefit in career outcomes associated with a public health master's degree. However, it is clear that some other master's degrees likely offer greater lifetime earning potentials or lower lifetime debt associated with degree attainment. There are other master's degrees that might be more personally fulfilling to those interested in public service or education than a public health degree can offer, and some degrees that are more remunerative. Yet, whether in hospital administration, public health practice, academic research, corporate work, or nonprofit leadership, graduate public health education provides students with training suitable for a variety of sectors and meaningful careers to work to protect and promote the health of the public.

We conclude with a call to all stakeholders in public health education to acknowledge these difficult value proposition questions and use them as an opportunity to innovate and advance the public health education continuum. As we face continuing public health challenges, we must keep the IOM's premise that a well-trained workforce is critical to protecting the public's health at the forefront of our efforts to chart the course for the second century of public health education. AJPH

CONTRIBUTORS

A. J. Beck conceptualized the project, contributed to the first draft, and provided critical review. J. P. Leider conceptualized the project, analyzed data, contributed to first draft, and provided critical review. H. Krasna contributed to the Public Health Employment section, analysis of National Association of Colleges and Employers (NACE) employment outcomes data, Bureau of Labor Statistics occupational growth projections by Standard Occupational Classification, and Classification of Instructional Programs code, and added vocational decision-making and career theory as part of analysis of the nontangible value of a public health degree. B. A. Resnick edited the document for flow, organization, and clarity, and provided overall input and guidance on article content and implications for the field.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

HUMAN PARTICIPANT PROTECTION

This article did not involve human participants and therefore did not require institutional board review.

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