

MD-PhD Program Graduates: Current Workplaces, Research Effort, and Types of Research They Do

Physician-scientists play an essential role in medicine by making new discoveries and linking those discoveries to clinical applications that improve the health of our nation. One pathway to becoming a physician-scientist is through training in MD-PhD dual-degree programs. These programs combine medical training, graduate school, and research training into an integrated curriculum. More than 90 MD-PhD programs currently enroll about 5,400 trainees with the goal of training physicians who can combine clinical perspectives with research for a career that blends both. Since 1964 some of the programs have received National Institutes of Health (NIH) National Institute of General Medical Sciences (NIGMS) support in the form of institutional Medical Scientist Training Program (MSTP) training grants.

This *Analysis in Brief* (AIB) examines the types of workplaces that program graduates enter, the research and clinical efforts of alumni employed in academia, and, for those doing research, the types of research they do. The research presented here is part of a comprehensive study to assess whether MD-PhD programs are collectively training a diverse cohort of women and men who can combine their clinical perspectives with high-quality research across a broad spectrum of disciplines. The careers of MD-PhD program graduates were tracked to determine where the graduates work, how they divide their time between research and other activities, what kinds of research they do, how successful

they have been at securing research funding, whether there are sex-related differences in outcomes, and how satisfied graduates are with the decision they made to attend an MD-PhD program. The full report, *National MD-PhD Program Outcomes Study*, is available [here](#).¹

Methods

This study was a joint effort of the AAMC educational research community, the MD-PhD Section of the AAMC Group on Graduate Research, Education, and Training (GREAT), and the leadership of the individual MD-PhD programs. Eighty programs participated, collectively representing 91.3% of trainees enrolled in 2014, including 44 of the 45 programs that were receiving NIGMS MSTP funding at the time the data were collected. The participating

programs identified 10,591 alumni. Surveys were completed in 2015 by 6,786 alumni, and the responses were combined with data for all alumni from the AAMC Student Records System, AAMC Faculty Roster, and GME Track® databases.

Results

Analysis of the current primary workplace for the 4,645 MD-PhD program alumni survey respondents who have completed postgraduate training shows that of the individuals who responded to the survey, 3,025 (65.1%) reported working full time in academia, and 681 (14.7%) were in private practice (see Table 1). Others were working at the National Institutes of Health (NIH) or other research institutes, at federal agencies, and in biotech and pharmaceutical industries (538, 11.6%). The most popular residency fields were internal

Table 1. Current Workplace of Respondents Who Have Completed Postgraduate Training

Workplace	Total		Men		Women	
	Number	Percentage	Number	Percentage	Number	Percentage
Academia full time	3,025	65.1%	2,331	65.8%	694	62.9%
Academia part time	143	3.1%	97	2.7%	46	4.2%
NIH	89	1.9%	70	2.0%	19	1.7%
Federal agency	88	1.9%	68	1.9%	20	1.8%
Research institute	51	1.1%	38	1.1%	13	1.2%
Industry	310	6.7%	254	7.2%	56	5.1%
Private practice	681	14.7%	504	14.2%	177	16.0%
Consulting/law/finance	41	0.9%	32	0.9%	9	0.8%
Other	217	4.7%	148	4.2%	69	6.3%
Total	4,645	—	3,542	—	1,103	—

Note: Information was provided by 4,645 survey respondents. *Federal agency* refers to non-NIH agencies, *research institute* refers to nongovernmental research institutes, *industry* includes pharmaceutical and biotechnology, and *private practice* includes all nonacademic clinical practice. Total percentages do not add to 100% because of rounding.

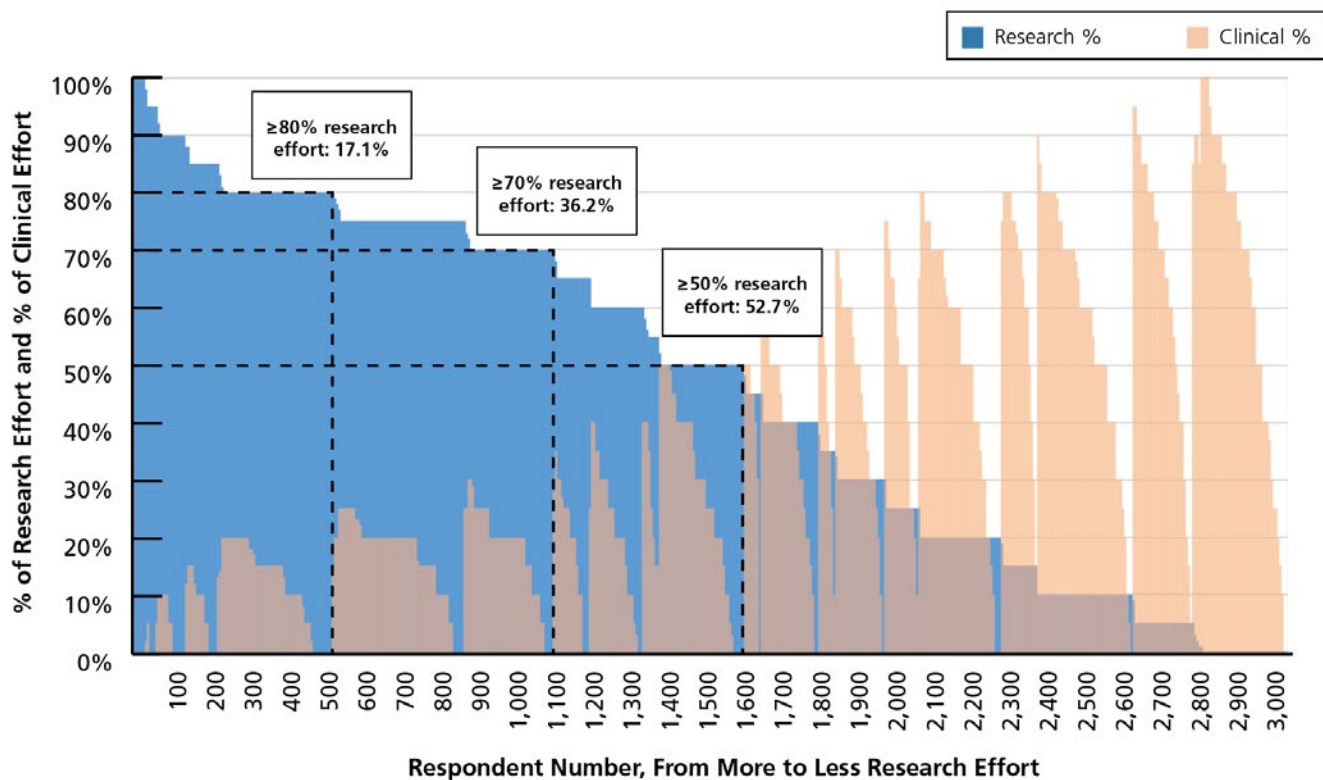


Figure 1. Research and clinical effort reported by participating program alumni employed in academia.

Note: The histogram shows percentage research and percentage clinical effort for each individual who responded, arranged from left to right by decreasing research effort. The markers show the percentages of respondents who reported at least 80%, 70%, and 50% research effort.

medicine, pathology, pediatrics, and neurology, which collectively attracted 2,753 (59.2%) alumni (data not shown).

The results also show how respondents with full-time academic appointments apportion their time between research, clinical care, teaching, administration, and consulting. Within each range of percentage effort for research, the amount of time devoted to clinical responsibilities varies considerably, reflecting variations in the amount of time spent on other activities (see Figure 1). More than half of respondents (52.7%, or 1,593 of 3,025) reported devoting at least half their time to research. However, only 22.7% (687 of 3,025) reported devoting more than half their time to clinical activities.

Respondents reported being involved in many types of research, including basic, translational, patient-oriented, and health services (see Figure 2). The largest proportion of the alumni, about 60% across all cohorts, indicated that they were doing translational

research. Basic science research came second, and patient-oriented research next. Relatively few respondents reported doing health services research, yet many of the health services researchers reported doing other types of research as well, especially patient-oriented and translational research. Notably, funding for the research of graduates of MD-PhD programs comes from a variety of sources, including private foundations, philanthropy, industry, and government (data not shown). Since many respondents reported research support only from non-NIH sources, using NIH funding as a surrogate marker for being engaged in research undercounts the research activities of program graduates.

Discussion

Concerns have been raised repeatedly about the size of the physician-scientist workforce.²⁻⁵ The 2014 NIH Physician-Scientist Workforce (PSW) Advisory Group report summarized those concerns, finding that compared with PhD scientists, few physicians are engaged in biomedical research.⁶

The PSW report also showed that the physician-scientist demographic is increasingly made up of older investigators approaching retirement age. As a result, the report forecast a decline in the number of physician-scientists as older investigators retire and too few younger investigators are available to replace them.

The results of the MD-PhD Program Outcomes Study show that more than three-quarters (80%) of MD-PhD program alumni survey responders are employed in workplaces where they can do research. Their job mix varies, but on the whole, it reflects the activities for which they were trained and is consistent with the goals of MD-PhD programs.

Interestingly, for those employed in academia, the data show that the research effort distribution is largely a continuum, with almost every value for research effort reported. This is in contrast to a bimodal distribution, in which some alumni spend most of their time on research while others

spend little or none. Regardless of academic affiliation, for those alumni engaged in research, the type of research they do is varied, with the largest portion indicating they were doing translational research, applying ideas from basic discovery to the treatment or prevention of disease.

Finally, while the number of MD-PhD programs has greatly increased since

they began in the 1950s, results from the full MD-PhD Program Outcomes Study suggest that the number of MD-PhD program graduates continues to be insufficient to meet projected physician-scientist workforce needs.⁶ One way to meet those needs is to enhance the pathways medical students can use to pursue a research career. Another is to ensure that as many individuals as possible who embark

on a research career remain on that path during the long years of postgraduate clinical and research training, including when they transition from student to resident and from fellow to faculty. The data in this study highlight the role these uniquely trained MD-PhD program graduates play in linking new discoveries to clinical applications and improvements in our nation's health.

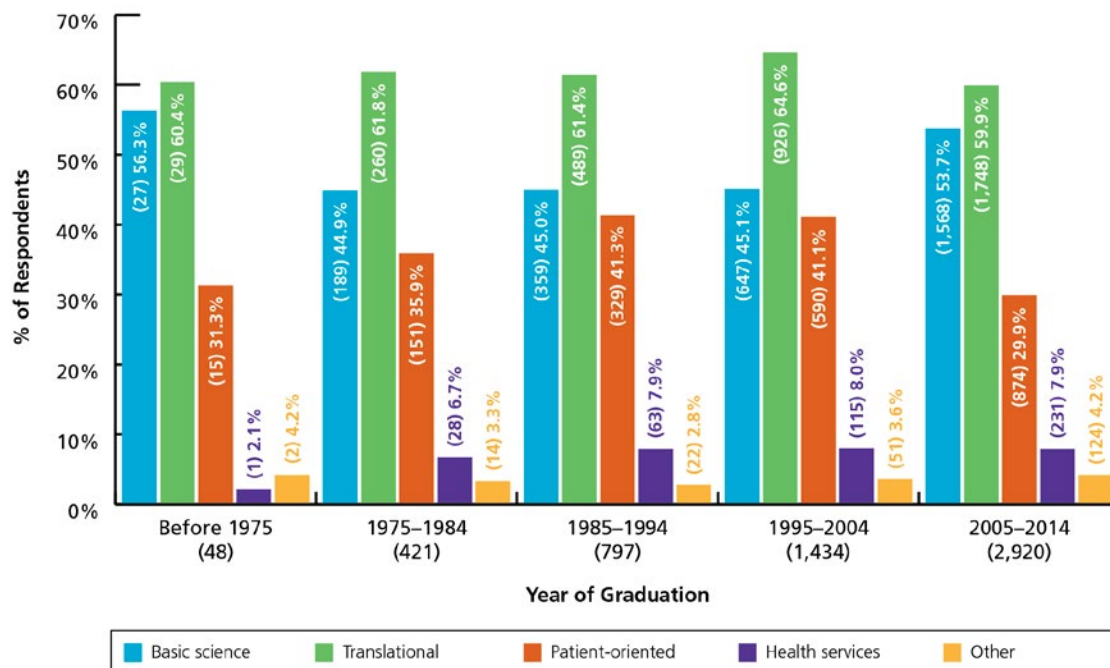


Figure 2. Types of research being conducted by participating program alumni.

Note: Survey respondents were able to select more than one type of research. The percentages can sum to more than 100% because the denominator is the number of unique individuals. The unique number of respondents in each cohort is indicated in parentheses along the x-axis.

Notes

1. Akabas M, Brass L, Tartakovsky I. *National MD-PhD Program Outcomes Study*. Washington, DC: Association of American Medical Colleges; 2018.
2. Wyngaarden JB. The clinical investigator as an endangered species. *N Engl J Med*. 1979;301(23):1254-1259.
3. Schafer AI. The vanishing physician-scientist? *Transl Res*. 2010;155(1):1-2.
4. Mirmira RG. Editorial: The vulnerable physician-scientist. *Mol Endocrinol*. 2014;28(5):603-606.
5. Dickler HB, Fang D, Heinig SJ, Johnson E, Korn D. New physician-investigators receiving National Institutes of Health research project grants: a historical perspective on the “endangered species.” *JAMA*. 2007;297(22):2496-2501.
6. Ginsburg D, Shurin SB, Mills S. *NIH Physician-Scientist Workforce (PSW) Working Group Report*. Bethesda, MD: National Institutes of Health; 2014.

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