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Is Medical Education a Public or a Private Good? Insights From the Numbers

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The US educational system has 2, at times competing, goals. Education is commonly viewed as a public good, designed to prepare the workforce that the country needs



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and to educate citizens who contribute to the health of the US democracy. However, education is also seen as a private good, geared toward helping the individual maximize social mobility and personal success.¹ From Virchow in the 19th century to Frenk in the 21st century, thought leaders have embraced the view of medical education as a predominantly public good rather than a private one, maintaining that the purpose of medical education is to improve the health of communities and to decrease the burden of illness and disease.^{2,3} The annual *JAMA* publication of data describing the demographic composition, geographic distribution, and specialty focus of learners and programs in US undergraduate medical education⁴ and graduate medical education⁵ provides an opportunity for the medical profession to once again consider whether the medical education community is designed to strike the appropriate balance between providing a public good and a private good.

A medical education pipeline focused on public good would be designed to prepare the physician workforce that can effectively meet the needs of 21st-century patients and communities for high-quality, evidence-based, and patient-centered care. That ideal workforce would comprise sufficient numbers of primary care and generalist physicians, distributed throughout communities in the United States, so that everyone had ready access to the types of preventive, diagnostic, and therapeutic care they need.⁶ It would be composed of physicians whose gender, race, ethnicity, religion, sexual orientation, disabilities, and other aspects of diversity mirrored that of the populations for whom they care. That workforce would have a sufficient

number and diversity (both discipline and demographics) of physician scientists working to advance understanding of the most challenging health care and biomedical problems. It would be constituted to reflect an awareness of current and anticipated unmet health care needs driven by changes in populations (such as advancing age of the society), illnesses (such as mental illness and opioid addiction), scientific advances (such as genomics and molecular diagnoses), or changes in the way physicians work (such as the ability of technology and big data to change care delivery, research, and education). The data published in this issue of *JAMA* provide some insights into and many questions about the extent to which the systems of education are prepared to meet the expectations of a public good.

It is generally accepted that the United States will face a shortfall of physicians but also is experiencing geographic maldistribution of physicians.⁷ The data presented in this issue demonstrate strides in addressing the projected shortfall of physicians. Between 2006-2007 and 2016-2017, the number of medical schools increased by 20, from 125 to 145, and the number of graduating medical students entering residency training by 3524 (15%), from 15 007 to 18 261.⁴ Between 2011-2012 and 2016-2017, the number of residency programs increased by 1232 (from 9111 to 10 343) and the number of program year 1 (PGY1) residents by 2400 (from 25 538 to 27 938).⁵ The data are less clear on whether there has been success in resolving the geographic maldistribution of physicians. Many new medical schools are designed and located to address the needs of geographic regions that are medically underserved.⁸ For example, Central Michigan University College of Medicine and Geisinger Commonwealth Medical College are located in Mount Pleasant, Michigan, and Scranton, Pennsylvania, respectively. Given that residents are more likely to practice in a region close to the one in which they complete their

training, locating residency programs in areas of greatest need could be beneficial. Yet, data mapping the geographic location of residency and fellowship programs to health care needs are lacking. It may be relevant that the 10 states with the lowest-quality health care, including Oklahoma, Georgia, and Nevada, have fewer residency positions (mean of 28 GME positions per 100 000 residents) than the 10 states with the highest-quality health care, including Massachusetts, Minnesota, and Rhode Island (mean of 42 GME positions per 100 000 residents), although variation in each group is substantial.^{5,9}

Advancing diversity is important for the quality of health care delivery¹⁰ as well as in medical education^{11,12} and the biomedical and social/behavioral research mission.^{13,14} However, the data on achievement of diversity in students, residents, and fellows are mixed. Across schools accredited by the Liaison Committee on Medical Education (LCME), women now comprise 50% of the class. A number of medical schools have classes in which the percentage of women exceeds 55% (including the University of California at Irvine, at Riverside, at San Diego, and at Davis). This majority of women may be a harbinger of things to come as currently more women than men graduate from 4-year colleges.¹⁵ Residency programs are also showing increased gender diversity. Pediatrics (73% women) and obstetrics and gynecology (82% women) are predominantly composed of women, and many specialties show gender parity. However, in some specialties women are underrepresented (specialties with between 25%-40% women: radiation oncology, radiology, general surgery, nuclear medicine, otolaryngology, physical medicine, plastic surgery, vascular surgery, urology) or scarce (specialties with <25% women: clinical informatics, cardiology, orthopedics, pain medicine, sports medicine, thoracic surgery.)⁵

Racial and ethnic diversity in medical schools and residencies is only slightly better than a decade ago.¹⁶ In contrast to the 13.3% of the US public who self-identify on the US Census as black or African American alone, less than 7% of medical school matriculants and approximately 5% of residents and fellows are black. Of the general US public, 17.8% self-identify on the US Census as Latino/Hispanic in comparison to 6.4% of medical school matriculants and 5% of residents and fellows.^{5,16} Residency programs with greater than average residency diversity include obstetrics/gynecology (9% black, 9% Latino/Hispanic), family medicine (8% black, 9% Latino/Hispanic), pediatrics (6% black, 9% Latino/Hispanic), and internal medicine (6% black, 8% Latino/Hispanic).⁵ Similar gaps between population and medical education learner demographics are seen for Native American, Alaskan Native, Native Hawaiian, and Asian/Pacific Islander populations. For residency programs to achieve racial and ethnic parity with the US population and residency census, a very long-standing problem, would require recruiting a minimum of 3300 black PGY1 residents and 4200 Latino/Hispanic PGY1 residents each year, which far exceeds the annual number of underrepresented US LCME-accredited and allopathic medical school graduates.

Thus, efforts to achieve diversity of the ideal workforce must be more substantial and must occur earlier in the educational pipeline.

Data on physician scientists are not included in these standard data tables, although other sources document that the number of physician scientist graduates has plateaued and is probably insufficient to meet the research needs of the future.¹⁷ The information about growth in specialties to address unmet clinical needs is discouraging. The number of residents beginning training in geriatrics (n = 246), pain medicine (n = 287), clinical informatics (n = 45, all specialties combined), genetics/genomics (n = 32), and child psychiatry (n = 411) is lower than the anticipated need. The data provided lack the granularity needed to estimate physicians destined to practice primary care, but other data suggest the number of physicians entering primary care is less than those retiring or leaving the field.¹⁸

The data presented in these annual reports provide insights, but the information is insufficient to draw conclusions about whether the current design of medical education prioritizes the notion of education as a public good, in which schools, programs, and positions in undergraduate and graduate medical education are intentionally engineered to create a workforce capable of meeting current and future health care needs in the United States. While some trends are beginning to show promise, other data suggest that in some situations, the educational structures may be more supportive of the notion of education as a private good, prioritizing the interests and goals of the individual learner and institution for social mobility and economic success.

If translated into actionable information, data can be a powerful catalyst for improvement. To fulfill the goal of improving the health of patients and their communities, the medical education ecosystem must adopt the strategies of high-functioning organizations and establish, share, and analyze specific outcome metrics to drive success. National organizations responsible for the physician education and health care workforce should agree on the type of data to collect, and these organizations should collaborate to present data in a manner that reflects the continuum of workforce preparation and effectiveness from medical school through practice. Dashboards should present data on priority and problem areas, enabling stakeholders to easily track progress toward achieving the aspirations for diversity, career focus (physician scientists and primary care physicians), specialty focus, and geographic distribution. Data on physician workforce should be integrated with data about other health professions, since meeting the health care needs of society will require a robust interprofessional workforce. Educators, leaders, and policy makers should be empowered to use these data to experiment with new pipeline programs, recruitment and admissions strategies, curriculum, financial aid, loan repayment, physician compensation, and other drivers to achieve the societal goals. When this is achieved, medical education will be unquestionably a public good.

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