

The Tragedy of the Medical Education Commons

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“**N**ip. Tuck. Or Else.” jumped out at me from the cover of a *Time* magazine issue this past summer.¹ Subtitled “Why You’ll Be Getting Cosmetic Procedures Even if You Don’t Really Want To,” the article described the huge increase in US physicians who provide cosmetic treatments. Those of us who forego the wide variety of available procedures are now termed *natural agers*, a term that was news to this geriatrician. According to *Time*, in 2014, US doctors performed more than 15 million cosmetic procedures and treatments at patient costs of \$13 billion.¹ I learned that the most common procedure in the United States is breast augmentation, but there are many popular interventions, including the “Cinderella” procedure (to shorten a toe to better fit into high-heeled shoes) and Botox injections, now provided by 83% of dermatologists.¹ Dermatology and plastic surgery are among the most competitive specialties in terms of the ratio of applicants to positions,² with the average annual earnings approximately double that of the average family medicine physician.^{3–6}

This surprising information prompted me to consider our graduate medical education (GME) training pipelines in the context of Professor Garrett Hardin’s 1968 essay, “The Tragedy of the Commons.” In writing about the population explosion, Hardin used the metaphor of the commons, which is overgrazed because of individual self-interest, to the detriment of the larger group.⁷ Although largely inaccurate in terms of actual history,^{8,9} this powerful metaphor of individual pursuits eroding a resource shared by all resonates with workforce issues facing GME today. Hardin’s enduring contribution has been the tenet that future generations must have a moral “voice” in decisions made today. That is, the welfare of future generations should be considered in decisions about resources held in common.

In 2015, the National Resident Matching Program (NRMP) reported the largest main residency match in history with more than 27 000 postgraduate year (PGY) 1 positions, an increase of approximately 600 first-year positions from 2014.¹⁰ In fact, despite warnings of imminent shortages of residency posi-

tions,^{11,12} the overall number of residency positions has been increasing, and the number of first-year positions continues to be greater than the number of US graduating medical student applicants.¹³ The number of positions in specialty matches outside the NRMP also appears to be increasing.¹⁴ However, in what fields are new training slots found?

Despite the 1997 caps for Medicare-funded GME positions, since 2001, resident and fellow positions have increased each year (TABLE). Most of these new positions were funded through Medicaid (the second-largest payer for GME) and nongovernment sources, such as hospitals or departments, sponsoring individual programs. Until recently, most of the increase was in non-primary care subspecialties. In the past 5 years, this trend has altered, with increases in core residency positions in internal medicine and family medicine.¹⁵ In 2015, about half of the new first-year positions offered in the Match were in primary care specialties: family medicine, internal medicine, and pediatrics. While usually 95% of family medicine graduates enter primary care, only about 22% of internal medicine and 45% of pediatrics graduates remain in primary care after training.^{13,16} Examining trends in family medicine, medicine-primary, pediatrics-primary, and medicine-pediatrics residencies may provide a more accurate approach to predicting the future supply of primary care physicians: these numbers remain flat (TABLE).

The cost of training future physicians through residency and fellowship has grown exponentially since the days when residents lived in the hospital and rode in ambulances. Many groups have presented thoughtful proposals for expanding GME funding and positions through increasing the pool of payers for GME and linking payment to training quality, among other approaches.^{16–18} None of these proposals consider a reduction in total funding. Although not an expert in health care politics or policy, I do not perceive a national appetite for increasing funding for GME.

Traditionally, GME-conferring institutions have focused on educational quality and adherence to accrediting body requirements for ongoing and new GME programs. They have less often, or not at all, considered the needs of the region or state in “right-sizing” programs for an optimal distribution of specialties. As long as funding was available and stable, it did not

TABLE

National Resident Matching Program Data^a

Year	Primary Care PGY-1 Positions ^b (% of Total Offered PGY-1 Positions)	Total PGY-1 Positions Offered	Increase Over Prior Year, No. (%)	Total PGY-1 Fellowship Positions Offered	Increase Over Prior Year, No. (%)
2001	4026 (19.5)	20 642	N/A	N/A	N/A
2002	3810 (18.5)	20 602	−40 (−1.5)	N/A	N/A
2003	3712 (17.8)	20 908	306 (1.5)	N/A	N/A
2004	3654 (17.4)	21 192	284 (1.4)	3617	N/A
2005	3528 (16.4)	21 454	262 (1.2)	3753	136 (3.8)
2006	3468 (16.0)	21 659	205 (1.0)	4004	251 (6.7)
2007	3343 (15.3)	21 845	186 (0.9)	4573	569 (14.2)
2008	3340 (15.0)	22 240	395 (1.8)	4931	358 (7.8)
2009	3215 (14.3)	22 427	187 (0.8)	5763	632 (16.9)
2010	3291 (14.4)	22 809	382 (1.7)	6002	239 (4.1)
2011	3425 (14.6)	23 421	612 (2.7)	6276	274 (4.6)
2012	3480 (14.5)	24 034	613 (2.6)	6799	523 (8.3)
2013	3821 (14.6)	26 138	2104 (8.8)	7245	446 (6.6)
2014	3893 (14.6)	26 678	540 (2.1)	8243	998 (13.8)
2015	3990 (14.6)	27 293	615 (2.3)	N/A	N/A

Abbreviations: PGY, postgraduate year; N/A, data not available.

^a Data courtesy of the National Resident Matching Program (NRMP), Results and Data: 2001–2015 Main Residency Match. National Resident Matching Program, Washington, DC. 2015. <http://www.nrmp.org/match-data/nrmp-historical-reports>.

^b Medicine-primary, pediatrics-primary, family medicine, and medicine-pediatrics residency year 1 positions.

Note: These data exclude programs that do not participate in NRMP or have an outside match (eg, plastic surgery). The “all in” rule was effective in 2013, which increased number of positions offered through NRMP. Some fellowships (eg, geriatrics, 2013) joined the Match recently.

matter from whence it came. I have had many discussions with designated institutional officials and program directors, in which the consideration of population needs (as a factor in deciding how to allocate precious residency and fellowship positions) was rejected. The needs of the hospital or medical group to attract more patients for procedures or treatments, or the university department to stimulate research, were more often key factors. When balancing expansion or reduction of positions within a constrained total number, GME leaders also must examine the needs of local and state populations for physicians, particularly those already in short supply, such as primary care, general surgery, and psychiatry. This is particularly relevant because about half of graduates remain in the same region after completing training.^{19–21}

In comparison, while local needs are not always the prime driver of new medical schools, US undergraduate medical education appears to be paying more attention to these needs, with new medical schools usually citing a regional need for primary care physicians as justification for their creation. One successful example is Florida State University (FSU) College of Medicine, founded in 2001 to produce physicians most needed by Florida. Students' clinical

experiences are in community offices and hospitals, and in rural sites. Their Bridge to Clinical Medicine program specifically targets students from underrepresented groups (rural and minorities); by 2014, this group had an overall 97% graduation rate and nearly three-quarters of the graduates were practicing primary care medicine, including in rural areas.²² More than half of all of FSU graduates practice in Florida and 61% practice primary care: these are impressive numbers.²² Florida is at about the median of US states for the numbers of physicians per 100 000 population, at approximately 250, whereas Connecticut, which recently opened a new medical school, has 1 of the highest ratios in the nation with 350 physicians per 100 000 population.²³ Of note, the state with the lowest number, Mississippi (about 180 physicians per 100 000), has no plans for a new medical school, but will slightly expand enrollment within its existing medical schools.²³

Another medical school example is the Michigan State University College of Human Medicine's Rural Physician program, which developed 1 of the first rural medicine training programs in 1971. Compared with their other graduates, those in the rural medicine program are more likely to practice in a rural area

(45% versus 14%, $P < .001$) and in a rural high-need specialty (73% versus 62%, $P = .006$).²⁴ My point is this: reports from a variety of programs offer valuable clues to effective recruitment strategies and curriculum experiences for generating graduates in shortage specialties and for target geographic areas.^{25,26}

The geographic and specialty outcomes of GME-conferring institutions can be tracked through existing national, regional, and institution-specific databases. For example, the internal medicine residency program at the University of New Mexico saw the percentage of their graduates entering primary care practice drop from 25% to 10% by 2006. In 2009, the internal medicine primary care track was created by adding large blocks of time in primary care to the PGY-2 and PGY-3 years.²⁷ Although only a small number have graduated from the primary care track, 11 of 13 (85%) have gone on to practice primary care.²⁷ From national data, Chen and colleagues²⁸ reported that, in 2013, for the 749 GME-sponsoring institutions, 158 institutions produced no graduates from primary care residencies and 184 programs produced more than 80% of all US graduates from primary care residencies. Similar institution-specific outcomes can be traced for other specialties.^{28,29} A review of these data suggest a profound neglect of population needs and the necessity to share the GME “commons.”

It is possible that new funding streams will appear, and we can continue to increase the number of residency and fellowship slots forever. But I doubt it. Rather than waiting for outside forces to impose their views on the distribution of GME positions, we, the leaders of GME programs, should assess, given the ultimately finite number of residency positions, whether their current distribution is truly in the best interests of all the people who share the medical “commons.”

Congress may be paralyzed, but each GME-conferring institution should not be. While others dither, each of us can lead the way at our own institution, to do the hard work to prioritize the types of graduates most needed by our towns, states, or regions. If we can honestly examine the needs of all the people, we may yet avoid the tragedy of the commons.

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