

## **Exploring U.S. Medical Education Expansion: Implications and Challenges**

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### **Abstract:**

In recent years, U.S. medical school enrollment has grown rapidly due to increases in class size and a surge in new medical schools. Entry-level graduate medical education positions, however, have been growing at a significantly slower pace, with more rapid expansion in subspecialty fellowship positions. Since the GME positions serve as the ticket to practicing medicine in the U.S., this disconnect could limit the ability of our medical education system to meet the nation's workforce needs. It could also limit the opportunities of international medical graduates, who are increasingly U.S. citizens who have traveled abroad for their medical school training. The current political and fiscal climate in the U.S. points to the very real prospect of cuts in federal funding of graduate medical education. This threat increases the risk of a surfeit of medical school graduates confronting a paucity of GME opportunities. This paper details these trends, and explores the possible implications in the short and medium term around workforce development, costs, and population health.

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## **Introduction**

The United States faces distinct challenges with regard to ensuring an adequate supply of physicians to meet the nation's needs. In recent years, medical school enrollment has grown rapidly due to increases in class size and a surge in new schools, but graduate medical education, while growing, has not kept pace. Implementation of the Affordable Care Act will place further strain on a system that already will be struggling to care for a growing and aging population with an aging physician workforce. Yet there is little political will to increase federal funding of GME due to the national spotlight on deficit reduction. During an earlier balanced budget showdown, Medicare funding of residency positions was capped at 1997 levels. Medicare funding of GME is once again at risk in deficit reduction discussions, but this time with the prospect of significant cuts, despite widespread concern about workforce shortages as the nation prepares to add 32 million Americans to the ranks of the insured.

## **Undergraduate Medical Education Trends**

Medical school enrollment in the U.S. has been increasing rapidly over the past several years after nearly two decades of relative stability. In 2006, due to concerns about an impending shortage of physicians, the Association of American Medical Colleges (AAMC) called for a 30% increase in medical school enrollment above 2002 levels which has helped generate a significant growth in enrollment, with plans for more to come. Enrollment has increased 13.2% above 2002 levels and is projected to reach 30% as early as 2016.<sup>1</sup> This expansion has been driven in part by the establishment of new medical schools, but more so by expansion efforts taking place at the 125 schools that existed in 2006 (which account for two-thirds of the projected growth).

Since 2006, ten new medical schools have received preliminary accreditation and are therefore eligible to enroll medical students (though one school has subsequently lost accreditation)<sup>2</sup>. There are an additional 8 schools that have initiated the accreditation process and if they come to fruition as planned will contribute towards reaching the 30% target by 2016.<sup>3</sup> There are numerous other schools that are under consideration but have yet to apply for accreditation that may yield additional aggregate growth.

Enrollment at osteopathic schools is also increasing rapidly. These schools are projected to more than double their first year enrollment between 2002-2015, growing from 3,079 to 6,222 students, due to increases in class size at existing schools as well as the 15 new schools that have enrolled their first students since 2002. By 2015, the medical and osteopathic schools are expected to have a combined increase in enrollment of 35 percent, producing almost 7,000 more U.S. trained doctors who will be seeking residency positions compared to 2002 (see Table 1). Given this growth in undergraduate medical education, there is widespread concern that we will soon approach a point where there will be more U.S. trained physicians seeking entry into GME than there will be available positions.

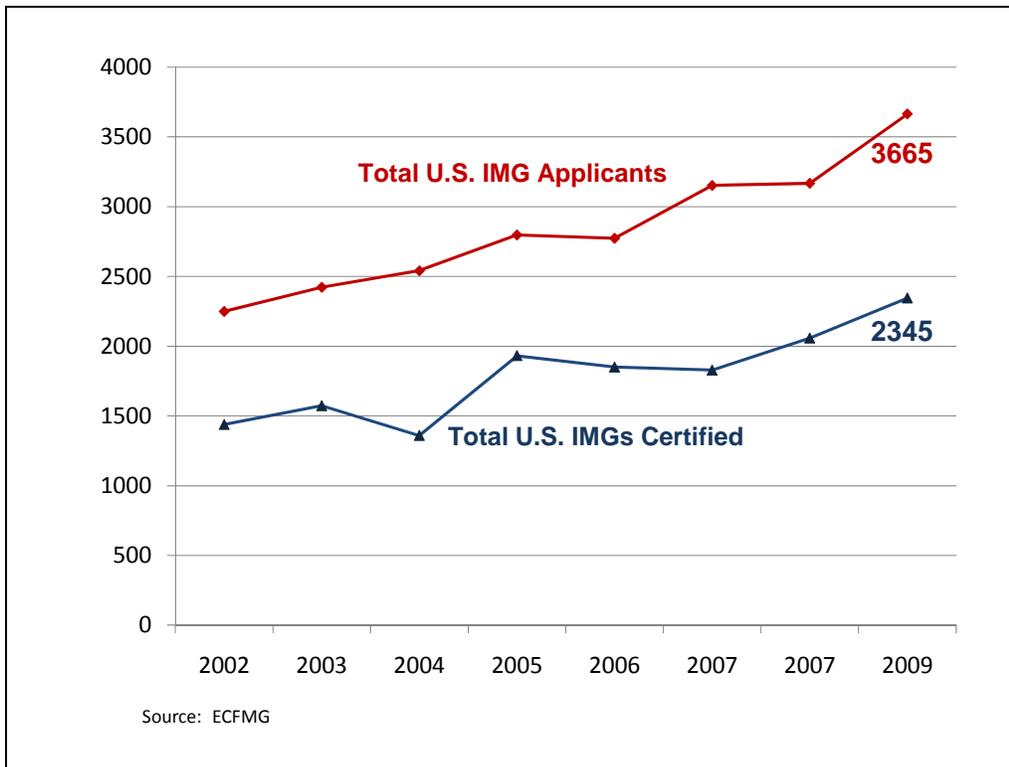
**Table 1. Medical and Osteopathic Actual and Projected First-year Enrollment Growth, 2002, 2010, and 2015 (existing schools only)**

	2002	2010			2015		
	Enrollment	Enrollment	# increase	% increase	Enrollment	# increase	% increase
M.D.	16,488	18,665	2,177	13%	20,181	3,693	22%
D.O.	3,079	5,233	2,154	70%	6,222	3,143	102%
Total	19,567	23,898	4,331	22%	26,403	6,836	35%

Source: 2010 Medical School Enrollment Report, AAMC

In addition to the growth in the number of students enrolling in M.D. and D.O. schools in the U.S., an increasing number of U.S. citizens are going to medical school outside the United States. In order to enter residency training in the U.S., they must first receive certification from the Educational Commission for Foreign Medical Graduates (ECFMG). Between 2002 and 2009, the number of U.S. citizens seeking ECFMG certification increased 55%. The majority (75%) of U.S. IMG certification applicants were students at Caribbean schools. Of the 3,662 U.S. IMG applicants in 2009, two out of three (64%) received ECFMG certification and are part of the growing cadre of U.S. citizens seeking entry into graduate medical education, the next step in the process for becoming a practicing physician in the U.S.

**Figure 1. Total Number of U.S. IMG Applicants for ECFMG Certification and Number Certified, 2002-2009**

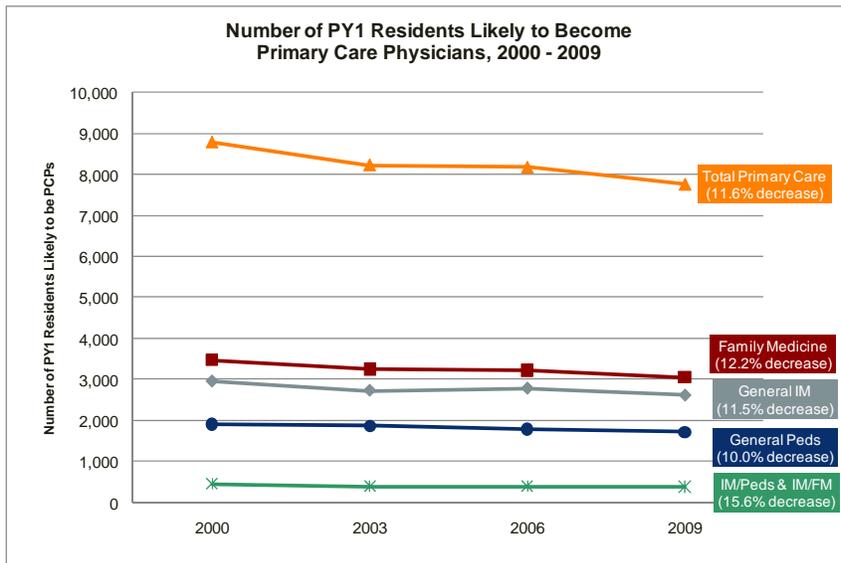


## GME Trends

The Balanced Budget Act of 1997 capped Medicare funding of GME at 1996 levels, but following a temporary slowing, growth in GME has resumed.<sup>4</sup> At the time there were less than 100,000 residents in training and there are now 115,798 total positions as of AY2011-12.<sup>5</sup> Growth in the new positions has not been evenly distributed across specialties, with the highest levels of growth being in subspecialty positions. Between 2000 and 2009, the number of entry level residency positions increased by 6.9% (n=1,662) and the number of residents entering subspecialty training increased by 53.5% (n=3,269). (Macy Report, 2010). During that time, there has been a 12% decline in the number of residents who are likely to become primary care physicians. While there have been modest increases in the number of residents entering primary care residency programs (Family Medicine, Internal Medicine, Pediatrics, and the combined IM/Peds and IM/FM programs), more are going on to pursue subspecialty training than have in past years (see Figure 2).

Although it appears that primary care is on a steady decline, it is important to remember that specialty choice trends wax and wane depending on the environment. Interest in primary care was at its apex in the mid-1990's when the prospect of managed care caused concern that gate keepers would drive down demand for specialists. Interest in the field could change again depending on the job market, changes in reimbursement policies, or if the implementation of new care management programs, such as the medical home, make primary care more appealing to new entrants. For the past two years, the number of U.S. MDs matching into family medicine has been on the rise, perhaps as the result of increased focus on primary care.<sup>6</sup>

Figure 2



Notes: To calculate the number likely to become practicing primary care physicians the number entering residency training in one of the field's subspecialization pathways was subtracted from the number entering the primary care pipeline specialty that same year (e.g. the number entering cardiology, gastroenterology, etc. was subtracted from the number entering internal medicine). Preliminary year residents were excluded from the counts.

Source: GME Track

The Association of American Medical Colleges projects the nation will face a shortage of 91,500 physician full-time equivalencies (FTEs) by 2020 with current GME entry rates. Even if GME continues to grow at a rate of 0.9% between now and 2020 as it has since 2002, we would only increase the number of residents entering training between now and 2020 by a total of 16,700 and the number entering the workforce by at most 8,400 (under the unlikely scenario that they all would complete three year residency training positions and not pursue subspecialty residencies or fellowships). This would offset the projected shortages by less than 10%, so other solutions will be required in order to meet projected demand.

### **GME Financing**

In the U.S., graduate medical education is funded through a complex mix of federal and nonfederal sources. A complete discourse on the details of GME financing is beyond the scope of this paper, but an overview is necessary to understand factors that may impede or facilitate expansion of the number and type of residents trained in the U.S. The federal government provides substantial funding through the Medicare insurance program that covers nearly all adults over the age of 65 years. This funding is distributed to teaching hospitals as a premium on payments for services reimbursed for the care delivered to seniors. The total additional payment is calculated, in part, upon the number of interns and residents being trained by that hospital. Medicare GME is subdivided into “direct” GME and “indirect” GME payments. The former, at around \$3 billion per year, are intended to cover the actual costs of providing training to residents, including resident stipends and benefits, faculty salary and benefits attributable to the teaching mission, etc. Indirect GME payments total more than \$6 billion yearly, and are provided as supplements to teaching hospitals’ patient care reimbursements for the “extra” costs of care in a teaching environment, including highly specialized clinical services in these settings, more complex patient populations, and increased costs incurred by extra testing and reduced efficiency thought to be related to care provided by residents.

Indirect GME costs have been targeted for several years by groups who argue that these funds exceed empirical estimates of the added costs of patient care in teaching hospital settings. In 2010, the Medicare Payment Advisory Committee (aka MedPAC, the independent agency advising Congress on the Medicare program) recommended that the “excess” indirect funds be reallocated in an incentive-based manner intended to promote high quality education and enhance accountability of training programs.<sup>7</sup> Threats to Medicare funding of GME are particularly acute at present, given the debt reduction mandate presently confronting the U.S. Congress.

After Medicare, Medicaid is the second largest explicit payer of GME training in the U.S. Medicaid funding for GME is not mandatory, but has been traditionally funded through state and federal fee-for-service and/or managed care payments. These funds are also at risk, given the dire situation for many state budgets across the nation with present high rate of unemployment. At present 41 states and D.C.

have funds going to teaching hospitals for GME through the Medicaid program, a decrease from 45 states as recently as 2006.<sup>8</sup>

Additional funding for GME comes from a variety of sources. The Veteran's Administration invests roughly \$1 billion annually in GME training. Freestanding children's hospitals have a separate mechanism for funding that works similarly to Medicare calculations, but is determined through an annual appropriations process that calls into question its stability. For instance, President Obama recommended discontinuing this line of funding in his draft budget for 2012. An unspecified number of GME positions is funded by the teaching hospitals themselves, a number which has increased consistently since the 1997 Balanced Budget Act capped the number of positions per teaching hospital funded through Medicare.

### **UME and GME Relationship - Looking out to 2020**

Undergraduate and graduate medical education levels are both increasing, but GME is not keeping pace with UME trends. This could eventually lead to a scenario where there are equal numbers of U.S. graduates as there are entry level positions into GME. A recent article in the *New England Journal of Medicine* provides three different scenarios for entry level GME positions relative to expected growth in the number of MD and DO graduates, 1) GME remains flat at 2010 level, 2) the current rate of increase continues at 0.9% per year, and 3) there is a 1% per year reduction in entry level positions.<sup>9</sup>

In the 'flat at 2010 level' scenario where the number of GME entry level positions levels remains constant between now and 2020, the likely result is a steady decline in the number of international medical graduates able to enter training in the U.S. Over the past decade, approximately 7,000 have entered residency training each year and their number would be reduced significantly under this scenario where UME graduates would approach the number of entry level positions sometime after 2020.

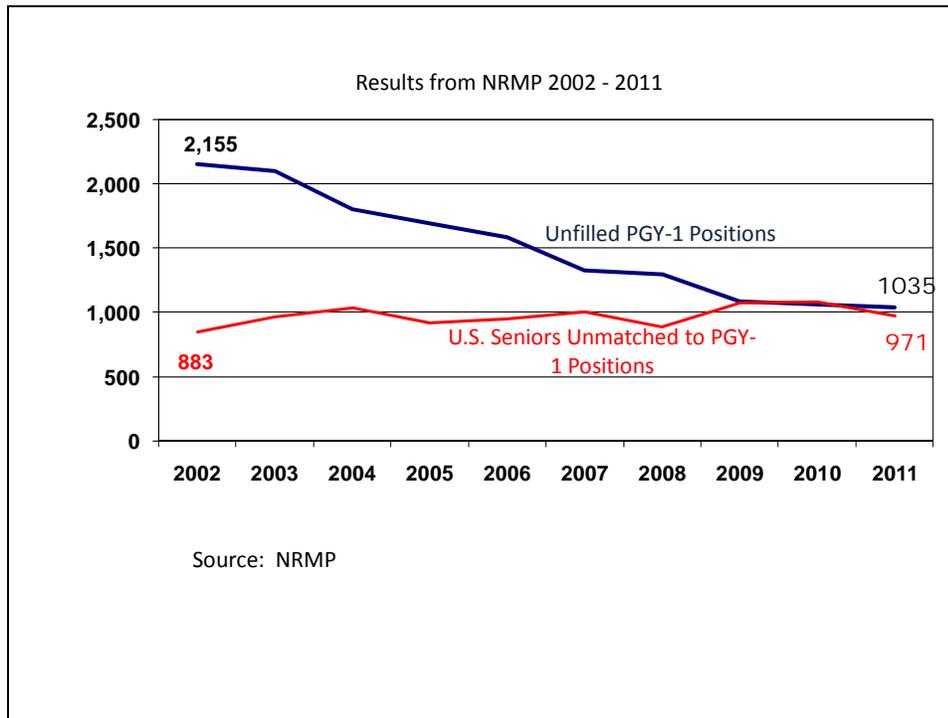
In the "current rate of increase (0.9%/yr)" scenario, there would still be a reduction in the number of positions available for IMGs, but not at nearly the same levels as in the first scenario. However, many are concerned this level of growth is unsustainable without additional federal dollars to support GME, much less with the very real threat of cuts in federal funding of GME.

The last scenario shows that with a 1% per year reduction in entry level positions, there would be fewer entry level residency positions than U.S. graduates as early as 2016-2017. Several states (TX, GA, FL) have already begun to project they will have more medical graduates than available residency positions in the coming decade, even at current funding levels.<sup>10 11</sup>

A potential early warning system of the consequences of the UME-GME nexus is "the Match". Every year, the National Residency Match Program (NRMP) applies an algorithm that compares student rankings of their preferred residency programs with the programs' ranking of the students to match entrants into residency training programs. Students that are not matched participate in what is known as the "scramble" to find an unfilled residency position. Since 2002, there has been a steady decrease in the number of unfilled positions in the match, while the number of unmatched U.S. seniors has

remained fairly stable around 1,000 per year. Consequently, the number of unmatched residents has been nearly equal to the number of unfilled positions for the past three years (see Figure 3). This is often interpreted as a signal of increased problems to come without growth in GME. More work is required, however, to better understand the dynamics of the unmatched U.S. graduates and what role that plays relative to the increased competition for limited positions.

Figure 3



### GME Decision Making

There is no centralized decision-making body in the U.S. that oversees GME policy and decides which types of specialty training should be offered or what number of positions should be offered. While the federal government provides just under \$10 Billion dollars per year in funding for GME through Medicare, there are very few requirements on how those dollars are spent. Teaching hospitals can decide which specialties to offer and the number of positions in each specialty. The two accrediting bodies for GME residency programs (Accreditation Council for Graduate Medical Education and American Osteopathic Association) do not take into account the number of existing training programs in that field, nor an assessment of the adequacy of the size of the workforce in that specialty, when determining whether or not to accredit a particular program. Their mandate is to assess the quality of the training programs regardless of any considerations of whether the nation needs more or fewer doctors in any given specialty.

States play a limited role in determining allocation of GME positions. Some states do link Medicaid funding of GME to rural and inner city primary care needs, but this is relatively small compared to overall funding levels.<sup>12</sup> A few states are going to an all payer model for GME, where private insurance companies are required to contribute to GME. However, there is little evidence that such models are constructed to include accountability measures or allocate funds using a centralized decision-making process.<sup>13</sup>

Recently, there have been a growing number of voices calling for increased accountability in GME financing, with a particular emphasis on directing resources toward primary care. (Macy, MedPAC, COGME).

The ACA did include development of a National Health Workforce Commission which was charged with evaluating GME policies as one of several areas to address. While members of the Commission were selected, the appropriations have yet to materialize. Members of the Commission may end up being rotated off before the Commission even gets the chance to meet.

Part of the problem with a national GME policy board is a lack of robust data to make informed policy decisions. There is limited data on the physician supply, beyond estimates of the number practicing in a particular specialty. While the National Center for Health Workforce Analysis is undertaking efforts to improve the quality of data on all health professions, it will take time to build the datasets. An even bigger constraint on centralized planning and oversight could potentially center on how to define need.

Many advocated for including provisions for increased federal funding of GME positions as part of the Affordable Care Act. However, lack of consensus in the health care community over how the funding increases would be allocated across specialties made it easy for legislators to leave that decision to another day. That day now happens to coincide with a new budget climate that makes it highly unlikely additional funds will be available and, furthermore that cuts in funding may end up being implemented – a scenario that few, if any, would have predicted in 2010 when the Affordable Care Act was passed.

The Affordable Care Act (ACA) did include two provisions that will likely yield a modest increase in the number of residents entering primary care and general surgery. 1) Approximately 700 unused positions that were funded under the 1997 Balanced Budget cap have primarily been reallocated to primary care and general surgery programs at teaching hospitals in eleven states that were deemed high need based on the states' resident to population ratio and the percentage of population living in health professional shortage areas (HPSAs).<sup>14</sup> 2) Funding to develop teaching health centers would also contribute an additional 500 primary care physicians over the next ten years. While these physicians will be an important contribution, the nation is projected to have a shortage of over 45,000 primary care physicians by 2020.

## **Current Federal Budget Crisis – GME is a Target**

The fate of future federal funding levels for GME will be decided this fall by the Joint Select Committee on Deficit Reduction, which is charged with cutting the federal deficit by at least \$1.2 trillion over the next decade. One frequently cited target is Medicare financing of GME.

The president's budget recommends a \$9 Billion reduction in federal support for GME over ten years. Other options under consideration could lead to even greater cuts. Recommendations from the Bowles-Simpson commission could cut federal expenditures on GME by \$6 Billion by 2015 and \$60 Billion by 2020. If the Joint Committee is not able to come up with a recommendation by the end of November then cuts will be applied across the entire federal budget. This possibility could end up being the best option from a teaching hospital perspective as cuts would be distributed across the board versus on select programs, such as Medicare funding of GME.

On September 23, 2011, the Resident Physician Shortage Reduction Act was introduced in the Senate and proposes to increase Medicare funding of GME by 15,000 positions over five years. The likelihood of this legislation being passed into law seems uncertain at best in this current political and economic climate but provides a contrast to the proposed cuts outlined above.

It is unclear how these proposed cuts would translate in terms of future residency positions. Teaching hospitals currently fund positions over their 1996 Medicare caps, but will they be willing to subsidize even more positions, and in which specialties? The evidence so far is that there are greater increases in subspecialties than in core specialties absent new funding. However, there is no past data to model how cuts in Medicare funding of GME would play out. In order to gain insights into how programs would respond, ACGME surveyed Designated Institutional Officers (DIOs) at teaching hospitals and asked them to indicate how they would respond to cuts of 33% and 50% in funding. Based on the results of the survey, ACGME concluded funding decreases in Medicare would lead to a reduction in the number of training programs and positions, ranging from a loss of nearly 20,000 positions under the 33% reduction to 33,000 positions under the 50% reduction scenario. Furthermore, under the 50% scenario they estimate that one out of four entry level positions (the pipeline) would be lost.<sup>15</sup> While this survey is based on theoretical scenarios, it nonetheless points to the very real possibility of decreasing the pipeline of new physicians at a time when the nation is projected to face significant shortages of physicians.

## **Impact on Health Care Cost**

If our nation's efforts at fiscal constraint in healthcare lead to a contraction in GME positions, it is difficult to know exactly what impact this will have on health care costs. On one hand, this could lead to fewer physicians entering practice in the U.S., which would in turn promote greater opportunities for advanced practice nurses and physician assistants, among others. It is generally believed that these providers practice at lower cost than physicians, if only due to their lower wages. If true physician shortages develop, and competition across the country for essential services ramps up, then recruitment costs for physicians may rise significantly, and retention may become more challenging.

Some suspect that diminished support for GME will disproportionately impact “core” specialties rather than subspecialties, with primary care being at greatest risk.<sup>16</sup> This too may adversely impact costs of care. It has been shown that costly emergency department utilization increases in the U.S. when access to health insurance increases without a concomitant increase in the number of primary care physicians willing to see those patients.<sup>17 18</sup> Furthermore, increasingly fragmented care can be induced by insufficient access to primary care providers, resulting in costly inefficiencies, not to mention decreased quality of care.

Changes in medical school size and GME financing structure may offer new opportunities to meet the challenges of rising costs of health care. These changes present a critical chance for individual schools to reflect on how physicians are trained, and how they might be trained better. Foremost amongst these opportunities from a cost standpoint include training in shared-decision making (which improves patient satisfaction and has been shown to be cost-saving, as informed patients are often less interested in high-cost procedures than physicians),<sup>19 20</sup> clinical training in settings using innovations that enhance efficiency and effectiveness of care, and training in team-based medicine.

On the other hand, if GME positions were to expand in concert with the significant growth of medical school graduates, the impact on intermediate term costs would be somewhat more predictable. First, there are the cost implications of the GME expansion itself, estimated at several billion dollars. In addition, there is a significant amount of research supporting the thesis that medical costs are higher in regions with a higher supply of physicians in the U.S.<sup>21 22</sup> This is particularly true in areas with a high supply of specialists, whose services are typically more intensive and costly. Paradoxically, supply of physicians is often not correlated with the health needs of the population. This has been demonstrated across a number of populations and specialties, including preterm infants/neonatologists,<sup>23</sup> and heart disease/cardiologists.<sup>24</sup> Pediatricians and (to a lesser degree) family physicians locate disproportionately in regions with high socioeconomic status, leaving children in high poverty communities with the lowest number of primary care physicians to serve their needs.<sup>25</sup> Given strong evidence that physicians preferentially locate in areas with higher per capita counts of physicians, there is reason to suspect that training more physicians will, at the very least, make reining in health care costs more challenging.

Furthermore, with disproportionate growth of subspecialty fellowship opportunities in GME positions over the past decade, coupled with some contraction in family medicine training positions, our output of new physicians into increasingly subspecialized fields may tend to exacerbate rising costs of health care in the U.S. Indeed, recent trends show that in all specialties there is a substantial increase in the proportion of physicians electing to subspecialize.<sup>26</sup> It is important to note that some of this apparent increase may be artifactual, as there has been an ever-expanding number of subspecialty fields recognized in recent years. Thus some who had been practicing as *de facto* subspecialists without a certifying board in the past now have a means to be recognized as such (e.g. child abuse specialists).

### **Population Health**

The impact on the health of the population stemming from growth in the workforce is uncertain. It is known that certain populations, particularly in rural and underserved inner cities, have a longstanding

deficit in access to physicians. Furthermore, the physician workforce in rural practice is significantly older than in other areas, and without replacement in the near future, these areas stand to have even greater difficulty maintaining access to care. Simply producing more physicians in aggregate, in an abstract hope that more will go to underserved communities is a highly inefficient mechanism to achieve access for these populations.

However, medical schools and residencies have an important role to play to increase the likelihood that their trainees will serve these populations. First, it is known and not the least bit surprising that individuals from rural backgrounds are more likely to return to rural areas to practice. Unfortunately, the percent of entering medical students who have rural backgrounds has been in steady decline. Reviews have confirmed that minority physicians are more likely to serve underserved populations.<sup>27</sup> Black/African-American, Hispanic, and Indian/Native American entrants to medical school have seen a slight increase over the past decade.<sup>28</sup> Several studies point to the importance of rural and inner city clinical experiences in generating and/or sustaining interest among students and residents in practicing in these communities.<sup>29 30</sup> Thus, medical schools and primary care GME programs have the opportunity to demonstrate their efforts to better meet the healthcare needs of underserved populations through the workforce they produce.

However, the declining interest among US-trained physicians in the primary care fields jeopardizes these efforts. In the absence of other incentives, it is likely that rural and inner city populations will be the first to feel the negative impact of an insufficient supply of primary care providers. Such barriers to access may be lessened through novel care delivery models, including expanded use of nurse practitioners and physician assistants as well as other caregivers.

To date, the influx of international medical graduates -- who make up 25% of the U.S. physician workforce -- has provided the new physicians to continue to fill primary care residency positions. If GME positions remain stagnant relative to the growth of U.S. medical school graduates, it is likely that the number of IMGs gaining access to GME positions will decline. Current U.S. policy for non-U.S. citizen physicians has provided the only mandatory service obligation among any non-federal physicians in the country: To maintain their visas, non-US-citizen physicians are obligated to service in underserved communities for a predetermined period. If this pool of physicians dries up as the GME training opportunities become fewer, many communities that have come to rely on these physicians will suffer. Incentivizing US-trained physicians to practice in these communities may be a viable option to replace this workforce, but federal funding for such incentive-based programs, such as the National Health Service Corps, tends to wax and wane and is perennially under threat.

### **Potential for “Crowding out” Growth in Roles of Nurse Practitioners (NPs) and Physician Assistants (PAs)**

In the U.S., pressures to bring the rising costs of health care under control are increasing steadily, and are not going away. Therefore, efforts to enhance efficiency in the health care system while maintaining or improving quality are very high priorities for all healthcare leaders and policymakers.

These efforts, captured under the new catchphrase of “maximizing value” in healthcare, suggest that roles of lower cost caregivers, including NPs and PAs, will continue to be explored if not expanded. It is very unlikely that NPs and PAs will be crowded out by growth in the numbers of physicians in the U.S., even if GME positions somehow were to expand significantly.

An open question, however, is the degree to which physician organizations will feel compelled to protect the scope of practice “turf” their members have held, if competition between professions becomes more acute. These scope of practice battles have been taking place for years in the legal system across states in the U.S., and may intensify. As NPs and PAs expand in number and seek broader practice opportunities, concomitant physician workforce growth may hinder this progress. On the other hand, it is important to note that physician-led organizations, including the AAMC, increasingly recognize and support the important role of teams in health care, and the importance of NPs and PAs (amongst other professions) in meeting the workforce needs of society.

## **Conclusion**

The pipeline of physicians in the U.S. is growing in terms of the number of first year enrollees in medical school as well as in the number of entry level positions into graduate medical education. However, they are not increasing at the same rate. Undergraduate medical education has been increasing by 2 percent a year while GME has increased at a slower pace of less than 1 percent a year. There is growing concern that the number of entry level residency positions will approach the number of graduates of MD and DO schools in the next decade. The current fiscal climate could lead to decreased federal funding of GME which will put into question the likelihood of sustained growth in GME, particularly for primary care residency positions. Even sustained growth in GME would generate less than a tenth of the physician workforce projected to be needed by 2020 to care for a growing and aging population and the 32 million newly insured. Other solutions are going to be required to ensure access to care for all. Redesigning care delivery models, payment incentive reforms, and increased use of nurse practitioners and physician assistants are likely options for reducing demand in increasing the effective supply, but each has its own challenges and uncertainties.

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