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Physician Competition: Entry and Substitution

Based on BFI Working Paper No. 2026-48, "Physician Competition: Entry and Substitution," by Joshua D. Gottlieb, University of Chicago, and Sean Nicholson, Cornell University

The physician pipeline, which is regulated by caps on medical school seats and which directs the most proficient trainees to high-paying specialties, faces competition from the rise of nurse practitioners, physician assistants, and other mid-level practitioners, forcing competition policy in physician markets to look beyond conventional concentration measures and to focus on rules that govern who can provide medical care.

If supply is restricted while demand is constant, the price of a restricted good will rise. This elegant observation has profound implications. For example, in his 1945 work with Simon Kuznets, Milton Friedman describes how regulatory barriers for the supply of medical doctors create market power, the result of which is higher incomes relative to dentists, a profession that had no such barriers to entry. To wit: "… average income in medicine exceeds average income in dentistry by more than it would if entry into the two professions were equally easy."[1]

However, in recent years physicians' power to restrict competition has eroded as competing occupations and new technologies have allowed others to provide services previously limited to MDs. This work offers a framework to study the effects of competition between physicians and such substitutes as nurse practitioners, physician assistants, certified registered nurse anesthetists, doctors of osteopathic medicine, foreign-trained physicians, telemedicine, and emerging artificial intelligence tools.

To begin, the authors describe the competition in this space as occurring in two stages. First, potential physicians compete to enter medical school and then again to enter more desirable (often higher-paid) specialties. Regulatory caps on medical-school seats and residency slots, especially for high-paying specialties, ration entry, enable high returns for those who gain these slots, and steer the most academically accomplished trainees toward lucrative fields. Second, once they are practicing, physicians then compete among themselves and with other provider substitutes in the market for patients. As noted above, barriers to entry for non-physician medical occupations have eroded, thus expanding capacity and mitigating physician shortages.

The barriers have been eroding since the late 1980s, when various rules changed in ways that hampered physicians' ability to control entry. Further, changes in the demand side of the equation have weakened physicians' collusive power. For example, most consumers buy care through a private insurer that negotiates prices on their behalf; the three largest insurers alone cover 122 million people. In addition, Medicaid is now the second largest state expenditure after K-12 education, and states have incentives to

[1] Friedman, Milton, and Simon Kuznets. 1945. Income From Independent Professional Practice. New York, NY: National Bureau of Economic Research, viii.

ensure that enough physicians (and physician substitutes) accept low prices to treat low-income patients. Finally, there has been moderate growth of medical school and residency program positions since 2000, including substantial growth of mid-level healthcare practitioners who are increasingly allowed to compete with physicians, especially in providing primary care.

The key, then, to the market for physicians is that competition is restricted by rules about who and how many can become doctors or otherwise provide care. The authors first review important facts about the market for physicians and health-related care in the United States:

- From 1980 to 2025, the US population grew by 50 percent, with age 64+ growing by 140 percent, and 80+ nearly tripling; these groups use a disproportionate share of healthcare.
- During this time, the number of first-year positions in traditional US medical schools that award the Doctor of Medicine (MD) degree increased by only 34 percent. This is not from lack of interest on behalf of students. In 2025, there were 2.3 times as many applicants to US MD programs as available positions. This ratio has exceeded 2 every year since 2003.
- The United States has 2.7 practicing physicians per 1,000 population compared to the average of 3.8 for OECD countries. The average annual growth rate of physicians per capita in the United States between 2000 and 2022 (0.8 percent) is about one-half of the average growth rate for OECD countries (1.5 percent).
- The American Association of Medical Colleges (2021) predicts a shortage of up to 124,000 physicians in 2034. Economic measurements of physician concentration within geographic areas reinforce these data.
- Finally, in 1983, 41 percent of physicians were in solo practice. Today that number is 12 percent, with 55 percent employed by a health system, and 4 percent by private health insurers such as UnitedHealthcare/Optum.

So, what would a pro-competitive policy in the physician market look like? Such a policy would incorporate a review of two factors: the upstream gatekeeping institutions that restrict supply, and the downstream rules that determine who or what can substitute for physician care.

Upstream gatekeeping

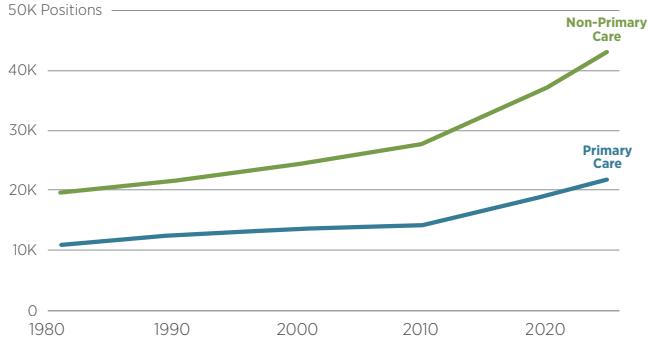
The supply of US physicians is first set by the market for medical residents, as graduates from medical school must receive residency training to practice medicine. Almost all first-year residency positions are allocated through a matching program based on the needs of resident hospitals and the requests of residents. Residents then spend several years (from three to upwards of six or more, depending on whether they are in a primary care or specialty program) training in these residency programs.

The quantity of physician students in the pipeline was set, per 1976 congressional guidance, by an advisory committee that predicts future needs. In 1981, the committee predicted a surplus of 145,000 physicians by 2000, or 23 percent of the projected workforce, and recommended restricting enrollment in US medical schools and the flow of immigrating international medical school graduates. Congress responded by eliminating medical school subsidies. This had the intended effect; the number of students graduating from those schools essentially remained constant until the mid-2000s.

In 2005, a successor to the original committee predicted a shortage of 85,000 physicians by 2020 and recommended that US medical schools expand enrollment. States and specialty societies concurred, including the Association of American Medical Colleges, which recommended a 30 percent increase in MD training capacity in 2006.

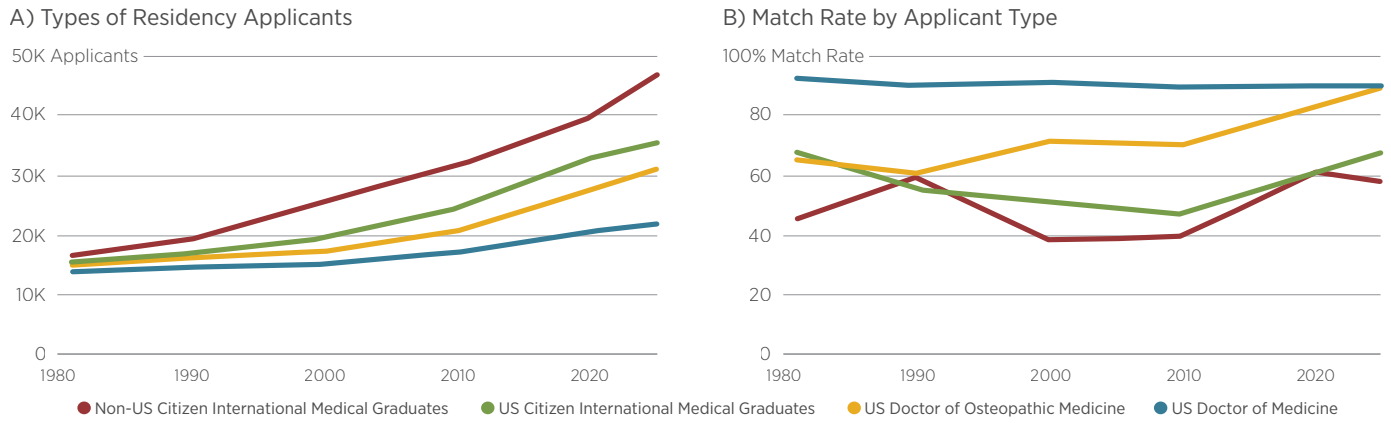
See the accompanying Figure 1 for an illustration of these patterns. In 1981, 19,700 first-year residency positions were available to medical school graduates in 22 different specialties, with

Figure 1 · Residency Positions Offered



Note: Authors' calculations using data from the National Resident Matching Program (NRMP) and the American Osteopathic Association (Fusco and Wachtler, 1992; Obradovic, Bronersky and Winslow-Falbo, 2002). Before 2020, MD and DO residency programs operated separate match systems; the figure combines positions from both.

Figure 2 · Applicants and Matches



Note: Authors' calculations using data from the National Resident Matching Program (NRMP) and the American Association of Colleges of Osteopathic Medicine (American Association of Colleges of Osteopathic Medicine, 2024). In Panel A, the "DO" series shows the number of graduates from DO schools, regardless of whether they entered an osteopathic residency or the NRMP. All other series show applicants participating in the NRMP. (IMG participation in the osteopathic residency match was negligible.) Match shares in Panel B are based exclusively on NRMP applicants and matches.

55 percent of slots in primary care specialties. Given the earlier predictions of physician oversupply, total residency positions grew by only 42 percent between 1981 and 2010, but after that expanded more rapidly.

When we turn to applications, we can see in Figure 2 that residency applicants grew much more quickly than available positions. Note that as the forecasts for future physicians shifted from surplus to scarcity, the number of applicants to the Match almost doubled between 2000 and 2025. Panel (a) depicts the number of residency applicants by type of applicant, grouped by four medical school categories: a conventional US-based medical school that grants a Doctor of Medicine degree (MD); a US-based medical school that grants a Doctor of Osteopathic Medicine (DO) degree, which offers similar preparation as an MD but with a different emphasis; US citizens who graduated from a non-US medical school; and foreign citizens who graduated from a non-US medical school.

In 1981, there were 2,600 fewer applicants than available first-year residency positions, and panel (b) shows that 93 percent of MD graduates were successfully matched. At that time, match rates for other applicant types were below 68 percent because MD graduates were generally perceived by residency programs to be the most qualified.

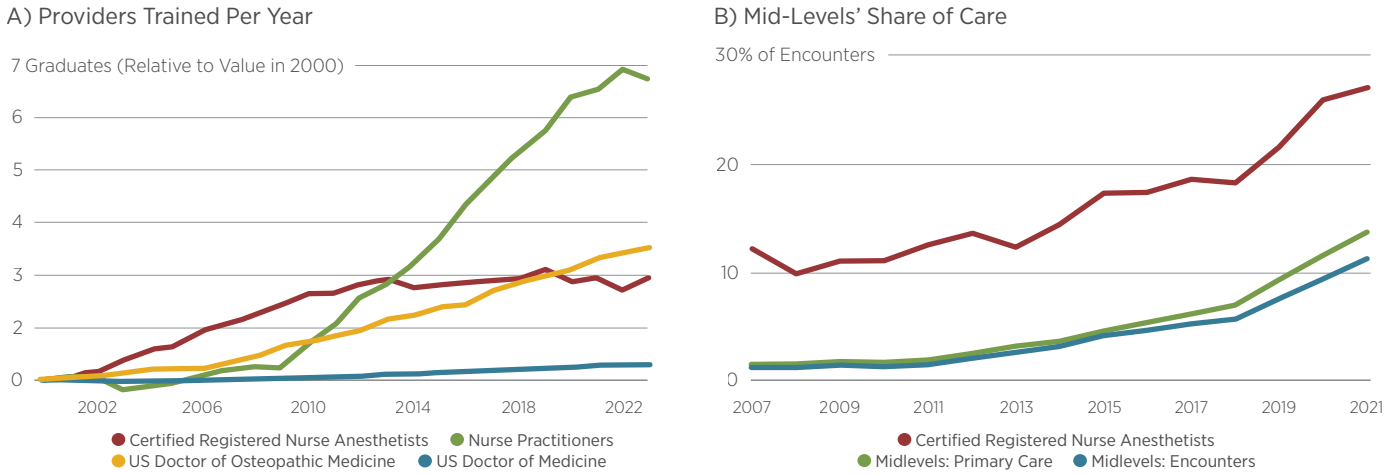
Upstream gatekeeping is further influenced by such important factors as financial support for medical residents and barriers to entry into specialized practices. Readers are encouraged to read the working paper for more discussion on these and related topics, as it not only provides an important primer on facts relating to physician markets, but also an analysis of those facts and their implications for policy.

Downstream rules

While the quantity of physician substitutes has increased over time, including in reaction to supply and demand shocks, those positions are still regulated by states; in addition, physicians have maintained some control over those markets. These downstream effects are reflected in earnings, for example, anesthesiologists earned $523,000 on average in 2024 versus $232,000 for certified registered nurse anesthetists; nurse practitioners and physician assistants earned $129,000 and $133,000 on average, respectively, less than one-half of what primary care physicians earn.

That said, the growth of mid-level practitioners is real. Since 1984, 27 states have passed liberal nurse practitioner "scope of practice" laws, which allow nurse practitioners to diagnose and treat patients independently, including ordering and interpreting tests and writing prescriptions. In other states, a nurse practitioner can only perform tasks under the supervision of a physician or other healthcare provider. Figure 3 illustrates these changes. As Panel (a) shows, training of non-MD providers, and especially of nurse practitioners, has expanded much more rapidly than that of physicians. And panel (b) illustrates the shifting provision of three specific types of care, with rapid growth in the share of anesthesia procedures provided by certified registered nurse anesthetists and an expansion of both primary care and overall professional services provided by nurse practitioners.

Figure 3 · Training Rates of Physicians and their Substitutes



Note: Panel A reports the number of students graduating in each category listed (MD = Medical Doctor; DO = Doctor of Osteopathic Medicine), based on authors' calculations of data from the Department of Education's Integrated Postsecondary Education Data System (IPEDS), relative to the value in 2000. Panel B is reproduced from Gottlieb et al.'s (2025b, Figure C.8) calculations based on MarketScan private insurance claims data, and shows CRNAs' share of anesthesia claims, NPs' share of office visits, and NPs' share of broader professional claims.

Bottom Line: There are important limits to competition in the healthcare market that are not addressed by usual antitrust policy. This essay argues that three types of entry barriers play an important and under-appreciated role in competition policy: medical school slot limitations that may be binding and create **rents** for those who succeed; specialties that may have even stronger incentives to limit training and competition; and state laws that regulate the training required to provide particular types of care. Policy analysis of competition policy in healthcare should account for these restrictions.

rents: in economics, rent refers to the income earned by a resource owner for a factor of production beyond what is necessary to keep it in its current use, often due to market inefficiencies or unique advantages. In this case described here, physician incomes are higher under rules that limit their number (see Milton Friedman quote at the top of this Brief).

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