ISSN: 2767-0023

# Addressing the Surgical Shortage: Revisiting Residency Training Requirements for International Medical Graduates

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Article Type: Review Article Compiled date: May 31, 2021 Volume: 2 Issue: 2 Journal Name: Clinical Surgery Journal Journal Short Name: Clin Surg J Publisher: Infact Publications LLC Article ID: INF1000014 Copyright: © 2021 Karim W Sadik. This is an open access

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Keywords: Surgical Shortage; International Medical Graduates; Surgical Workforce



**Cite this article:** Michael S Sinha, Karim W Sadik. Addressing the surgical shortage: revisiting residency training requirements for international medical graduates. Clin Surg J. 2021;2(2):1–8.

The American Association of Medical Colleges projects a shortage of between 19,800 and 29,000 physicians in the surgical specialties by 2030. General surgery projects the greatest shortfall among surgical specialties, in part because of high rates of graduating residents pursuing fellowships. International medical graduates, many of whom trained in the US, have become a major part of the physician workforce in other specialties, but represent a small part of general surgeons in practice and trainees in general surgery residency programs. We review the evidence for a surgical workforce shortage in detail, discuss the role of International Medical Graduates (IMGs) in US health care, and propose a process by which foreign-trained surgeons can enter the US surgical workforce without having to repeat training in a US residency program. Such a program existed in the US the late 1960s and early 1970s and continues to exist in Canada, among other places; our proposal is modernized to reflect current US health care needs. IMGs offer ethnic, linguistic and cultural diversity that stands to benefit ethnic minorities and refugee communities while adding diversity to the surgical workforce and to surgical education. Once appropriately certified and credentialed, the IMG surgeon can work in a shortage area in exchange for a path toward permanent residency. We believe the surgical workforce will benefit in many important ways from expansion of skilled international medical graduates, just as it has in many other medical specialties.

## **Key Messages**

- The AAMC projects a shortage of between 19,800 and 29,000 physicians in the surgical specialties by 2030.
- We review the evidence for a surgical workforce shortage.
- We discuss the role of International Medical Graduates (IMGs) in the US health care workforce.
- We propose an innovative approach to resolving the shortage.

# Introduction

Ten years after the American Surgical Association's position statement on the US health workforce [1], physician shortages persist in both primary and specialty care [2]. Though debate continues as to the existence and nature of the physician shortage [3,4], the American Association of Medical Colleges (AAMC) anticipates a deficit of between 40,800 and 104,900 physicians by 2030,including a shortfall of between 19,800 and 29,000 physicians in the surgical specialties [2]. The shortage has been further exacerbated by increased health care utilization in the last several years resulting from record high levels of insurance coverage,

largely via the Affordable Care Act's Medicaid expansion [5]. Efforts to expand medical school enrollment through the creation of new medical schools has been successful. Total medical school enrollment increased by 32.8% from 2006-2016, but graduate medical education training positions increased by only 14.5% over the same time period [6]. A disproportionate percentage of these new residency positions are in primary care, which suggests this increase likely did not improve surgical workforce projections [7]. The slowing of residency program expansion began with the Balanced Budget Act of 1997, which effectively capped the number of residency positions in the US. One study estimated that over 150 hospitals could support new general surgery residency programs, but such programs are unlikely to emerge absent new federal funding for such positions [8]. Despite advocacy from several medical organizations, including the American College of Surgeons [7], legislative activity in the realm of graduate medical education remains limited.

## **International Medical Graduates**

A central component of physician workforce dynamics in the US is the role of the International Medical Graduate (IMG). An IMG is a physician who completed medical education outside the US or Canada, consisting of at least four years from a school listed in the International Medical Education Directory of the Foundation for Advancement of International Medical Education and Research. The Educational Commission for Foreign Medical Graduates (ECFMG) assesses the readiness of IMGs to enter residency or fellowship programs in the US that are accredited by the Accreditation Council for Graduate Medical Education (ACGME). In the early1970s, IMGs were actively recruited to the US in an effort to alleviate workforce shortages at the time [9]. This process was halted in 1976 when Congress passed the Health Professions Educational Assistance Act, instituting greater barriers for IMGs seeking to practice medicine in the United States [10]. Now new data from the AAMC suggest that physician retirement will have the greatest effect on physician workforce estimates [2]. Though the American College of Surgeons (ACS) has dismissed AAMC's estimates of the effect of retirement age on projected workforce supply as "too great to be believable," [7] other scholars recognize the challenges associated with the aging of the surgical workforce [11]. The aging of the surgical workforce may disproportionately affect IMGs; a 2010 study found that IMG general surgeons were on average five years older than non-IMGs, with 46% out of training for 20 years or more [12]. We consider whether the time has come to re institute a flexible immigration program for physicians, in order to address workforce shortages (including those in general surgery), using a modernized approach that reflects current physician demands and expectations for the 21st century.

There are two distinct categories of IMGs we discuss in this paper. US IMGs are US citizens who have obtained their medical education abroad, often from Caribbean medical schools. NonUS IMGs are those that have trained abroad and are not US citizens. Combined, these two groups represented 48.0% of all applicants in the 2017 NRMP residency match, but only10.4% of matched categorical surgery positions [13]. Compared to non-US IMGs, US IMGs tend to be younger, more often male, more likely to speak English as their native language, and more likely to practice in primary care [14]. Some studies indicate that US IMGs perform worse than non-US IMGs on training [15] and specialty board examinations [16], but they have less difficulty entering the physician workforce in the United States, as immigration is not an obstacle. In many cases, US-IMGs have the added advantage of completing US-based clinical clerkships during medical school, which ensures they have exposure to the US health care system. Though we acknowledge that the strength and diversity of the physician workforce would be detrimentally impacted by the current administration's attempts to institute ethnic immigration bans, to restrict H-1B visa renewals, and to rescind the Deferred Action for Child Arrivals (DACA) program, these topics are outside the scope of our paper.

#### **Defining the Shortage**

Projections of a US physician workforce shortage have been reported both in primary and specialty care [2]. Representative bodies of internists, family practitioners, and pediatricians have all devoted substantial resources advocating for expansion of the primary care physician workforce. Though much of the attention surrounding workforce needs centers on primary care, surgical shortages, particularly in general surgery, are just as pronounced [17]. In addition to general surgery, surgical specialties such as otolaryngology, burn surgery, critical care surgery, cardiothoracic surgery, plastic surgery, vascular surgery, and transplant surgery continue to project physician workforce shortages. Some researchers have suggested that the workforce is sufficient, but that inefficiency and misaligned incentives limit our ability to effectively care for more people [3]. Geographic data from ACS lends some support for this argument, identifying areas of both shortage and surplus of general surgeons across the United States by 2030.7With an increasing number of surgeons who wish to work part-time, capacity to provide services is also projected to decrease [18]; the AAMC workforce report estimates one Full-Time Equivalent (FTE) to be 50 hours a week. Burnout and depression are also problems affecting the ability of both surgical trainees and attending surgeons to provide high-quality care, and may contribute to both reduced hours and earlier retirement [19].

## **Existing Proposals**

Several proposals for resolving the surgical workforce crisis have been raised [20], some with considerable legislative support. Emphasis on increasing medical school capacity has been successful, but rural medical schools and rural residency programs are key to addressing current and future surgical workforce issues in those communities [21]. In 2017, there were 21,030 firstyear medical students matriculating [22], compared to 43,157 applicants for 27,860 first-year residency positions in ACGMEaccredited programs. Increasing medical school enrollment will not alleviate surgical shortages unless there is a corresponding increase in the number of such residency positions. Legislative efforts to increase the capacity of residency training programs have largely fallen flat in spite of bipartisan support. The Ensuring Access to General Surgery Act was introduced in both the US Senate and House of Representatives in June 2017. If passed, it would direct the Department of Health and Human Services (HHS) to conduct a study on the general surgery shortage, and on the basis of those results, enable the Secretary of HHS to designate "general surgery shortage areas" in the US. Given that 30.5% of the active physician workforce was 60 or older in 2016, some have proposed approaches for delaying physician retirement [23] and encouraging retired physicians to return to practice [24]. Though these strategies may work effectively in primary care, some have raised concerns about aging surgeons, since surgical specialties require maintenance of a skill set that may be diminished by sensory impairment, cognitive impairment, or decreased physiologic capacity as one ages [11,25]. Retainer, or concierge medicine, might be another way to incentivize physicians to remain in the workforce or to take on a greater number of patients [26]. Others have explored the use of telemedicine in the surgical setting [27]. Given that five years is a considerable amount of time to train in general surgery, some have suggested shortening the duration of training for more competent residents; others express concern about the quality of an abbreviated training program, particularly in light of ACGME restrictions on work hours [28]. A national residency exchange has been proposed, which would effectively redistribute the number of resident slots in each medical specialty depending on community need at a given time [29]. Doing so may fill a temporary need but may not assure that those residents continue practicing as a general surgeon in that area upon completion of training. Others have noted a link between training environment and practice location: residents who train in federally qualified health centers, rural health clinics, or critical access hospitals often do return to practice in similar settings after completing training [30]. In surgery, one study found that including a dedicated rural training year can increase the likelihood of a resident's choice to practice rural general surgery upon graduation [31].

An additional challenge, shared by general surgery and primary care, is the number of residents who pursue fellowships rather than practicing as a generalist. By one estimate, 85% of general surgery residents—both in independent and university-based programs—pursue subspecialty fellowships at the end of residency [32,33]. Should those surgeons decide to pursue fellowships, this would further deplete the supply of general surgeons in the workforce, particularly in rural areas, where hospitals may have insufficient patient volume to sustain fellowship programs for interested trainees. Concerned about workforce shortages, one surgeon

encourages specialists with general surgery training to remain engaged in general surgery practice, especially in the beginning of their careers [34]. Others have proposed inclusion of general surgery in the National Health Service Corps Scholarship Program, which provides scholarships and stipends for medical students who commit to practicing for four years in an underserved community after completing residency [35]. Expanding the availability and roles of Nurse Practitioners (NPs) and Physician Assistants (PAs) has helped limit the impact of primary care shortages, but are unlikely to affect surgical shortages [36,37]. Simply put, surgical PAs and NPs are not interchangeable with general surgeons in terms of their training and scope of practice. Missouri recently introduced a new class of provider, the assistant physician, a medical school-trained physician who has not completed an internship or a residency program [38]. Though this approach may have alleviated primary care workforce shortages in rural Missouri, it arguably emerged as a byproduct of residency training shortages and the struggles of some US medical graduates to obtain residency positions. It has not been extended to include the surgical specialties.

#### Toward A New Approach?

International medical graduates may have a central role to play in reducing or eliminating surgical workforce shortages in the United States [39,40]. Though fully acknowledging the current administration's preference for a tighter immigration policy, we believe that developing a mechanism of entry for highly-trained physicians from other countries could help resolve physician workforce shortages in the short-term. If foreign-based postgraduate training of IMGs was recognized, those clinicians could immediately address workforce needs in underserved communities while freeing up residency positions. Currently, some IMGs applying to general surgery residency programs may have previously trained in surgery abroad prior to beginning a USbased residency [41]. Previous experience and training, in fact, often makes non-US IMGs more competitive applicants to fill residency spots over other qualified applicants.

**Current Status of IMGs in the US Physician Workforce:** In response to expanded medical coverage and a projected physician shortage, the US licensed over 60,000 IMGs between 1963 and 1979 to immediately enter clinical practice [42]. Physician migration peaked between 1966–75, gradually declining in the late 1970s once new medical schools were established. Once Congress determined that the US had reached a "self-sufficient" level of domestic medical personnel, it ended the process via the Health Professions Educational Assistance Act of 1976 [43]. Currently, fully-trained non-US IMGs are required to repeat residency training and pass board examinations in order to practice in the US. This policy has a considerable cost to the healthcare system, both in terms of finances and lost productive time. In some cases, these daunting obstacles may push some non-US IMGs to return to school and train as another kind of

medical professional or abandon medicine altogether [40,44]. By 2016, nearly a quarter of all active physicians in the US were IMGs (representing nearly 215,000 physicians). Such physicians play an essential role in caring for underserved populations and are often disproportionately represented in states and counties with higher infant mortality rates, lower socioeconomic status, higher proportion of minorities, and in counties designated as rural [45]. States with the highest percentage of IMGs relative to total active physicians in 2016 were New Jersey, New York, Florida, Illinois, and Michigan. According to the ECFMG, in 2015, the top five countries from which non-US IMGs originated were India, Canada, Pakistan, Lebanon, and Saudi Arabia [46]. Internal medicine, pediatrics, family medicine, general surgery, and neurology were their top specialty choices. In 2015, 622 non-US IMG residents entered general surgery training programs. The relative number of IMGs in general surgery has declined since the 1970s. In 1975, 8.4% of all IMGs were general surgeons; that figure had steadily declined to 2.5% by 2013. In fact, the raw number of IMGs working as general surgeons has not changed significantly in the past four decades: there were 6,786 IMGs in general surgery in 1975 and 6,913 in 2013, representing only a 1.9% increase. This represents a stark contrast to the total number of IMG physicians in the US, which increased by 244.4% over the same time period. Interestingly, from 1975-2013, there was a 1749.9% increase in the number of inactive IMGs in the United States; many of these may be physicians who have completed residency training elsewhere but have not done so in an ACGME-accredited residency program in the US.

Immigration: J-1 and H1-B Visas: Non-US IMGs looking to train in ACGME-accredited residency programs must obtain a visa that permits them to provide medical services in the US, either a J-1 Exchange Visitor visa or an H-1B visa [47]. The ECFMG operates the Exchange Visitor Sponsorship Program, which provides J-1 visas to non-US IMGs training in US residency programs who meet appropriate criteria. The majority of non-US IMG applicants who successfully obtain first year residency spots enter the US on a J-1 visa [46]. When training is complete, the non-US IMG is required to return to his or her home country for a period of at least two years. The two-year home residency requirement can be waived, typically by an Interested Governmental Agency (IGA) willing to sponsor the physician's waiver in exchange for a commitment to practice in an underserved area for three years. The Conrad 30 program, administered by US Citizenship and Immigration Services, provides J-1 visa waivers for approximately 300 physicians a year, but they are usually physicians who have been residency-trained in the US [48]. The H-1B visa is designed for foreigners holding professional-level degrees, including graduates of international medical schools. Unlike J-1 visas, H-1B visa holders are not required to return home for two-years and can remain in the US for professional-level employment for a period of up to six years. Obtaining an H-1B visa has become increasingly difficult, as the number of total applicants in this category has recently increased by 40% while the annual cap on H-1B visas has remained stable at 65,000 per year [49]. H-1B visas also tend not to be allocated to healthcare professionals: in fiscal year (FY)2016, 69.1% of H-1B visas were granted to computerrelated occupations [50]. Only 1.6% of FY 2016 H1-B visas were awarded to physicians and surgeons, a decrease from 2.3% the year before. In addition, many physician H1-B visa holders are employed in academic research positions, not GME training programs. Two bills related to H-1B visas were introduced in the US Senate in 2015. If the Immigration and Innovation Act of 2015 had passed, the annual cap on H-1B visas would have increased from 65,000 to between 115,000 - 195,000. The bill was met with significant opposition due to concerns of fraud and abuse within the program. A rival bill, the H-1B and L-1 Visa Reform Act of 2015, sought to prioritize H-1B visas for applicants holding degrees in a STEM (science, technology, engineering, mathematics) field from a US institution, while cutting the duration of authorized admission in half, from six years to three years. Neither bill was seriously considered by the US House of Representatives. Backed by a campaign promise to end the H1-B visa program, the Trump Administration recently sought to halt extensions of all such visas [51,52]. The US House introduced the Protect and Grow American Jobs Act in January 2017, which would impose additional restrictions on the program, but the bill was referred to the Subcommittee on Immigration and Border Security and has not yet come up for a vote. Because H-1B visas do not have a two-year home rule, non-US IMGs have historically preferred programs that sponsor H-1B visas over those that sponsor J-1 visas where possible. Graduates of US medical schools who are not US citizens favored residency programs supporting H-1B sponsorship (72.1% vs. 7.5%); residency programs, on the other hand, prefer J-1 to H-1B sponsorship (64.2% vs. 32.6%) due to ease of application [53].

Role of IMGs in the Physician Workforce: The health care "safety net" in the US is dependent on a thriving IMG workforce. Data suggests that IMGs accept more Medicare and Medicaid patients and work longer hours than their US medical graduate counterparts [54]. Though partly due to immigration requirements, non-US IMGs are more likely to practice in high-need rural counties and in higher-poverty areas of cities when compared with US medical graduates [55]. A study in New York state revealed that the percentage of J-1 visa waiver IMGs planning to practice in shortage areas was triple that of US medical graduates [56]. Onequarter of community health centers rely on IMGs to fill physician vacancies [57]. In all, J-1 visa waiver physicians currently provide care to over 4 million people living in underserved areas of rural communities in the US [58]. It has been estimated that if all IMGs currently in primary care practice stopped delivering care, "one out of every five 'adequately served' nonmetropolitan counties would become underserved and the percentage of rural counties with physician shortages would rise [from 30.7%] to 44.4%. [59]" Approximately 10% of hospitals in the US are considered to be IMG-dependent [60]. Critical Access Hospitals (CAH), in particular, are heavily reliant on IMGs-59% are internists but less than 6% are surgeons [61]. IMGs make up more than half the medical staff at 16% of CAHs, and 62% of CAHs located in persistent poverty nonmetropolitan counties rely on one or more IMGs, compared to 42% of CAHs in counties without such a designation [61]. Studies have demonstrated that care provided by clinicians of concordant ethnicity improves both quality of care and the physician-patient relationship [62]. Many non-US IMGs are motivated to practice in US communities of similar ethnicity and heritage, creating an opportunity to provide culturally appropriate care to patients in their native languages. This pattern has been observed in practice: non-US IMGs from Hispanic countries are significantly more likely to provide clinical care in areas with high proportions of Hispanics, and Asian non-US IMGs are likewise attracted to areas with higher proportions of Asians [63]. Of note, the AAMC anticipates increased physician workforce demand for Asian and Hispanic physicians in the next 15 years, noting greater needs in metropolitan areas. Though these ethnic disparities in the physician work force may be partially offset through active minority recruitment by US medical schools, IMGs provide rich ethnic, cultural, and linguistic diversity to the US health care system [64]. Quality of care is often cited as a concern regarding non-US IMGs. However, this concern has not borne itself out in the literature. In a large retrospective study, non-US IMGs performed at least as well as US graduates in all studied domains, including patient mortality [65]. In addition, non-US IMGs appear to have less fatigue and higher self-esteem as compared to US medical graduates and US IMGs [66], suggestive of greater resilience and less burnout among IMGs [67]. Other studies have indicated that non-US IMGs struggle with language and communication skills, which improved after imposing a required clinical skills assessment [68]. IMGs may also have a central role in developing and revising cultural competency curricula for medical students and residents. It is worth noting that many of these studies may not apply to general surgery and surgical subspecialties since there are currently such small percentages of IMGs in active practice in those fields.

## **Proposed Solution**

Fully-trained IMGs who are living and working abroad are a viable short-term solution to the immediate workforce shortage facing the United States. We propose a temporary dispensation allowing physicians residing abroad, whose practice and experience matches the workforce needs of the US, to be licensed and board-certified in the US. Access can be restricted by number, discipline, and geography, and subsequently lifted once the Health Resources & Services Administration (HRSA, a division of HHS) determines that the physician workforce shortage issue has been effectively resolved. Where possible, those physicians should be encouraged to return to their home countries occasionally to share knowledge and expertise with local surgeons; this could be built into specialized Continuing Medical Education (CME) requirements for such newly-licensed IMGs. IMGs who are recent graduates of foreign medical schools: Current policy stipulates that IMGs who have no previous postgraduate training must, like all other medical graduates, apply for the residency match. This category of IMGs is on a level playing field compared to US medical graduates in terms of prior education, and they are generally less successful in securing residency positions via the NRMP [69]. However, once trained in the US, creating a path to permanent residency without mandated repatriation would guarantee amore sustained return on investment for the federal funding spent on residency training. As US medical school graduates continue to increase in number without a concordant increase in residency positions, fewer successful IMG residency matches could detrimentally affect coverage in underserved areas [69]. Expanding the Conrad 30 waiver program, which allows physicians to waive the two-year residence requirement, would also enable more IMGs to continue practicing in US shortage areas after residency training.

IMGs with primary care or subspecialty training/experience: Retraining experienced physicians from other countries through mandated completion of US residency programs is not costeffective. There is a lost opportunity to immediately incorporate skilled physicians into the labor force at minimal added cost to the US government. With our proposal in place, physician shortages in certain medical specialties and geographic locations can be accommodated in real-time. A similar system is currently in place in Canada, where physicians from certain high-guality international training programs are allowed to sit for their respective board examinations and practice in Canada without further training [70]. Canada also offers a "fast track" immigration program for high-demand occupations, including physicians [71]. The current knowledge-based requirements for entry should be maintained: USMLE Steps 1-3, ECFMG certification and demonstration of English proficiency. Trained physicians should then be allowed to sit for the US board examination of his or her specialty. Since there is a major concern regarding whether these physicians will have been adequately exposed to the culture of medicine in the US, we propose a partnership with existing physician reentry programs to assess clinical readiness for practice [72]. The Federation of State Medical Boards (FSMB) already offers a Special Purpose Examination (SPEX) as part of its Post-Licensure Assessment Program (PLAS), geared toward physicians who desire a return to clinical practice following a break or absence. This exam-and physician reentry programs more generally-can be repurposed to suit the purpose of evaluating IMGs as well. For a similar cost (average of \$8,000-10,000), non-US IMGs would participate in a physician reentry program, including mentored observation, and sit for the appropriate examination. Should a physician fail the SPEX/ PLAS or unsuccessfully complete a physician reentry program, he or she could then decide either to return to their home country or to pursue the residency match and retrain in the US clinical environment. After completing SPEX/PLAS and physician reentry, an oversight committee, consisting of specialty boards and the

state medical licensing bureau, would determine an individual candidate's eligibility for immediate permanent residence versus an H-1B visa. Physician characteristics to be considered may include previous training and experience (particularly for skillbased specialties such as surgery), location and duration of foreign practice, research experience, and stated commitment to practicing in the United States for an extended duration of time. In order to incentivize appropriately credentialed IMGs to provide stable coverage to underserved areas, the evolution from an H-1B visa to permanent residency and US citizenship can be made contingent on continuous clinical practice in these designated areas for a period of no less than five years. Physicians will also have the opportunity to return to their home country with the option to maintain their US medical license. Specialty-specific vacancies can be advertised in a central database and coordinated such that a new physician is waiting to fill any vacated position.

Process of Recruitment: Under this system, underserved areas of the country could petition the federal government to offer expedited H-1B visas to physicians who could provide a particular benefit to that community. For instance, a heavily Hispanic community could target recruitment of Spanish-speaking or bilingual primary care physicians and specialists. The same applies for refugee communities in the United States, for which provision of healthcare services is often challenging due to language and cultural barriers. A hospital or office-based practice with a pressing vacancy would file a statement of expedited physician need with the US Department of State. Once approved, the position would then open broadly, with applications solicited through a central database. The aforementioned steps for obtaining licensure-passage of specialty board exam and completion of SPEX/PLAS and certified physician reentry program-would be completed before a non-US IMG could be listed in the database and become eligible for hire. The window for applications would close once the position is filled, or after a specified number of competitive applications has been received. Clinicians with foreign medical training who are already part of the US workforce-including those on J-1 visas or visa waivers-would be eligible to apply for these vacancies as well, with permanent residence offered in exchange for relocation to an underserved area of greater need. We believe that an aggressive IMG recruitment effort would significantly alleviate the current physician shortage. Our proposed program could be instituted for a trial period of 5 years, extended by an additional 5 years only if need persists. Primary areas of recruitment will be internal medicine, family medicine, pediatrics, psychiatry, and general surgery. The Bureau of Health Workforce within HRSA can make recommendations for extension or cessation of the program as they, as well as interested organizations like the AAMC, monitor the resolution of physician shortages, both by region and by specialty. Under the Patient Protection and Affordable Care Act of 2010, a National Health Work Force Commission was to be created. Members were appointed at that time, but the Commission was never funded and has never convened.

# Conclusion

Incorporating non-US IMGs into the physician workforce nearly 50 years ago helped to address workforce shortages and alleviate disparities in medical care. Though immigration standards are becoming increasingly stringent, our physician workforce need is significant and policy changes are required for urgent resolution of the shortage. Insurance coverage has expanded significantly under the Affordable Care Act, and physician shortages are projected to become increasingly severe, especially in underserved areas, if non-US IMG access to the US workforce is not expanded. We have laid out a proposal for expanding the non-US IMG physician workforce. Our proposal leaves the current NRMP residency Match system intact for recently graduated IMGs seeking residency training in the US, since there is parity between all applicants within this system. However, we propose carefully considered reforms in immigration policy for IMGs who have previous graduate training in primary care or other specialties. The costs and benefits of eliminating redundant training are difficult to quantify, but could lead to rapid alleviation of physician shortages while simultaneously freeing US-based residency positions to help accommodate the growing numbers of US medical graduates. We also believe that strong immigration incentives will promote the recruitment and retention of the highest-caliber non-US IMG physicians, who could bring both clinical and research capital to the US.

## Acknowledgement

The authors would like to acknowledge Dr. Anthony Komaroff and Dr. Eric Schneider, whose summer class at Harvard T.H. Chan School of Public Health was the impetus for this paper.

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