International Medical Graduates in the United States Psychiatry Workforce

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Abstract
Objective This study describes the supply, distribution, and characteristics of international medical graduate (IMG) psychiatrists who provide services in the USA.
Methods Cross-sectional study design, using descriptive statistics based on combined data from the American Medical Association (2020 Physician Masterfile) and the Educational Commission for Foreign Medical Graduates.
Results International medical graduates continue to make significant contributions to the US physician workforce. As a group, they represent 29% of active psychiatrists in the USA, compared to 23% in all other medical specialties. Many IMG psychiatrists were US citizens who obtained their medical degrees outside the USA or Canada, often in the Caribbean. In some states (i.e., Florida, New Jersey), over 40% of active psychiatrists are IMGs. Over 30% of IMG psychiatrists graduated from medical schools in India and Pakistan.
Conclusions This study provides an overview of the psychiatric workforce in the USA, quantifying the specific contribution ofIMGs. Several factors, including immigration policies, continued expansion of US medical schools, and the number of available residency positions, could impact the flow of IMGs to the US. Longitudinal studies are needed to better understand the implications for workforce composition and distribution, and their potential impact on the care of psychiatric patients.

Keywords International medical graduates · Workforce · Medical education · Psychiatry

The United States (US) physician workforce has historically included a large proportion of international medical graduates (IMGs) [1]. Over the past 50 years, their numbers have increased (from 10% in 1963 to 18% in 1970) to currently about 25% [2]. For decades, the numbers of US medical graduates (US MGs) have not been sufficient to fill available graduate medical education (GME) positions [3, 4], resulting in IMGs, both US citizens (US IMGs) and non-US citizens (non-US IMGs), filling these slots [5, 6]. For psychiatry, a 2012 analysis showed that IMGs represent 31% of the total psychiatric workforce and, of 14,379 IMGs in patient care, 32% were residents [7]. Based on an overview of GME (2019–2020), there were 32,624 IMG residents, representing 23% of the residency workforce. For psychiatry programs (n = 257), there were 6337 residents, of whom 21% were IMGs [8].

In recent years, the proportion of non-US IMGs, individuals who were not US citizens at entry to medical school, who matched to positions in psychiatry residency has declined. In 2005, for example, 16.0% of all available first-year residency positions in psychiatry were filled by non-US IMGs, with 6.8% of the positions filled by US-citizen IMGs [9]. Since then, the total number of available first-year psychiatry residency positions has increased from 1026 to 1740, and these ratios have increased; from 2012 onwards, more US-citizen IMGs filled psychiatry residency positions than non-US IMGs. In 2019, 7.7% of all psychiatry positions were filled by non-US IMGs, compared to 8.6% by US IMGs [9]. Based on these data, it is clear that the mix of IMGs entering psychiatry residency positions, at least in terms of citizenship, is changing, likely affecting the composition of the psychiatric workforce.

The resurgence in the popularity of psychiatry for US IMGs was not a result of a decrease in the number of non-
US IMG applicants (numbers increased 24% between 2005 and 2019), rather of a marked increase in the number US-IMG applicants (by 143% between 2005 and 2019). In the same period, the number of non-US IMGs applying for residency positions through the NRMP Match has remained relatively flat [10]. Recent and proposed changes in US immigration policies might have deterred non-US IMGs from seeking higher education opportunities abroad, including in the USA [11]. Unlike US citizens or green card holders, they must obtain work visas [12, 13], a requirement for non-US citizens seeking postgraduate training in the USA. Furthermore, some academic institutions have experienced delays in obtaining visas for incoming IMG residents [11]. Given the resources required to file J-1 visas, residency programs might opt instead to not actively recruit non-US IMGs, with smaller residency programs even more likely to be discouraged to invest in this process. The role of IMGs in the US workforce, both in psychiatry and other specialties, may therefore ebb in the future [14].

The role of IMGs in the US physician workforce, including residency programs, has been described in several publications [15–17]. Compared with graduates from US medical schools, or US IMGs, a greater proportion of non-US IMGs, regardless of specialty, locate to (rural) areas of need [18] and take care of poorer patients [19]. An analysis of IMG and US MG psychiatrists showed that they have different practice patterns, and that “policies that substantially decrease the number of IMG psychiatrists may adversely affect the availability of psychiatrists to treat minorities and other underserved populations” [20].

A recent study showed that in six out of nine geographic regions in the USA, non-US IMG psychiatry residents were underrepresented when compared to the number of foreign-born people living within these regions [21]. This provides further evidence of a shifting workforce that may not align with population health needs.

Recent studies show projected shortages of physicians in the USA in upcoming decades. For example, data from the Association of American Medical Colleges (AAMC) suggest an estimated shortage of between 54,100 and 139,000 physicians by 2033 [22], including shortfalls in both primary and specialty care. Specifically relevant for psychiatric services, the US Department of Health and Human Services estimates, based on a projected increase in demand due to population growth and aging, a workforce shortfall of 18,000 adult psychiatrists by 2030 [23]. Simultaneously, the supply of psychiatrists is expected to decrease by over 25% due to the number of practitioners approaching retirement age and/or seeking a reduced patient workload. In comparison to other specialties, a larger proportion of psychiatrists is over the age of 60 [24]. Despite the retirement of more than half the current workforce over the next decade, a gradual expansion is expected to begin in 2025; however, it is unclear whether the shortage will completely be resolved by 2050 [25]. Psychiatry workforce needs are also influenced by the ability to attract medical students into psychiatric residencies, the model of care delivery in mental health, and the adoption of new technologies and treatments for mental health conditions [24, 25].

Against this background, more insights into the supply, distribution, and characteristics of IMGs in psychiatry can help inform specialty-specific workforce policies. Numerous studies have noted a shortage of specialists, including psychiatrists [24, 25] and particularly child and adolescent psychiatrists [26, 27]. Previous studies have looked at the demographics, distribution, and practice patterns of IMGs in the US healthcare system, such as IMGs from specific regions [28–30] or in specific specialties [15, 16]. Detailed analyses on the role of IMGs in psychiatry in the USA have, however, been lacking. Boulet et al. compared practice profiles of IMGs and US medical graduate psychiatrists, and found that IMGs made up almost one-third of the practicing psychiatry workforce and were more likely to be employed in hospitals [7]. As the data used for that study is over 10 years old, and the focus was on psychiatrists providing patient care, the purpose of this investigation is to provide a current overview of characteristics of IMG psychiatrists who provide services in the USA, including those with non-patient care roles such as administrators, researchers, and teaching faculty.

Methods

Design

We designed a cross-sectional study to describe the psychiatry workforce in the USA, based on previous studies in other specialties [15, 16]. We used the 2020 American Medical Association Physician Masterfile (AMA Masterfile). This includes information on physicians who are currently active in the USA. Individuals are included in the Masterfile either when they enter a medical school accredited by the Liaison Committee on Medical Education (LCME, for US MGs) or when they enter a residency training program accredited by the Accreditation Council for Graduate Medical Education (ACGME, for osteopathic physicians (DOs) and IMGs). Additional information is added from primary sources and surveys of the physicians listed in the Masterfile. The Masterfile includes demographic information for individual physicians, such as gender and birth country, as well as career details, such as year of graduation, self-designated practice specialty, geographic location, type of practice, and present employment.

We combined AMA Masterfile data with data from the Educational Commission for Foreign Medical Graduates (ECFMG) using unique identifiers for individuals. ECFMG certification is required for all IMGs seeking accredited residency training in the USA. IMGs must complete two, and often
three, years of residency training to be eligible for an unrestricted license to practice medicine in any US jurisdiction. Details concerning the ECFMG certification process, including the individual credentialing and assessment requirements, can be found elsewhere [31]. Data from ECFMG used in this study include medical school attended, country of medical school, and country of citizenship at the time of entry into medical school.

**Variables**

We used the available demographic information in our combined dataset of ECFMG and AMA records to extract details on specialty, type of practice, and major professional activity.

The AMA Physician Masterfile contains over 200 self-designated practice specialties. We selected individuals who indicated psychiatry as their specialty or subspecialty based on American Board of Psychiatry and Neurology (ABPN) descriptions for psychiatric (sub)specialty certificates. This included (in alphabetical order) addiction medicine, addiction psychiatry, child and adolescent psychiatry, forensic psychiatry, geriatric psychiatry, pediatric psychiatry, psychiatry, psychoanalysis, and psychosomatic medicine. We excluded subspecialties that focus on providing care for neurodevelopmental disabilities (e.g., clinical neurophysiology) since these neurologically focused subspecialties are generally not considered in discussions about the psychiatric workforce or the distribution of mental health service providers. We excluded combined programs whose principal affiliation is to a primary care specialty, such as internal medicine/psychiatry or family medicine/psychiatry.

We selected all physicians whose self-designated practice specialty was one of the psychiatry designations listed above, and who were active in the US. Physicians marked as “inactive” were excluded. We included residents, full-time hospital staff, physicians in office-based practice, semi-retired physicians, individuals doing locum tenens, researchers, administrators, medical teaching faculty, and others. Information on part-time or full-time equivalents, other than those marked as semi-retired, is not consistently available and was not considered in our analyses. Further information on type of employment (e.g., solo practice, hospital based) and location of practice (by postal code) was extracted. We categorized individuals by type of physician. IMGs were defined as those who graduated from a medical school located outside of Canada or the USA, regardless of citizenship. We used information about citizenship at the time of entry into medical school to categorize IMGs as either US citizens who graduated from a medical school located outside of Canada or the USA (US IMGs), or non-US-citizen IMGs (non-US IMGs).

Part of the process of data merging consisted of using a unique identifier to match individuals across both data sets. The final data set used for analysis was fully anonymized, and data cannot be traced back to individual physicians. Inclusion in either data set is done with consent of the individuals involved, in the case of AMA as part of their member application process, and for the ECFMG as part of the application for certification. In this application, the candidate must agree to allow their data to be used for research, or their record is not included in any study. Since the data are publicly available and all participants agreed that their anonymized data could be used for research purposes, the study was deemed exempt by the Internal Research and Data Review Committee of the ECFMG.

**Analysis**

We used descriptive statistics to summarize the distribution and characteristics of active psychiatrists in the USA. We also made comparisons between IMGs and US MGs, including both MDs and DOs, wherever relevant. Although various comparisons between groups were made, no inferential statistics were applied since the study group includes the whole population of active psychiatrists in the USA.

**Results**

The 2020 AMA Masterfile, which reflects the status of the US physician workforce at the end of 2019, includes 1,002,456 active physicians. This includes full-time hospital staff, individuals in office-based practice, residents, physicians who are semi-retired, administrators, researchers, medical teachers, those completing locum tenens, and others. For 97.0% of those physicians, a self-designated practice specialty was available; 56,363 are in psychiatry (sub)specialties, representing 5.8% of the total active physician workforce in the USA.

Table 1 provides information on the active psychiatry workforce. IMGs (n = 16,470) represent 29.2% of the psychiatry workforce. For all other self-designated specialties, including those physicians not involved in patient care, IMGs (n = 233,844) represent 23.3% of the total active US physician workforce (total active physicians = 1,002,456).

| Type                             | n  | %  |
|----------------------------------|----|----|
| US-citizen IMG (US IMG)          | 3603 |  6.4 |
| Non-US-citizen IMG (non-US IMG)  | 12,280 | 21.8 |
| Unknown IMG                      | 587  |  1.0 |
| All IMG                          | 16,470 | 29.2 |
| US MD                            | 37,341 |  66.3 |
| US DO                            | 2552  |  4.5 |
| All psychiatry (active)          | 56,363 | 100.0 |
Considering citizenship at time of entry to medical school, US IMGs (n = 3603) represent 22.7% of the internationally educated psychiatry workforce and 6.5% of the total psychiatric workforce. Non-US IMGs (n = 12,280) represent 77.3% of the IMG psychiatry workforce and 22.0% of the total psychiatric workforce.

The majority of active physicians in psychiatry are male (57.6%), with a similar proportion for IMGs (57.3%) and US MDs and DOs (57.7%). Compared with the current mean age of US graduates in psychiatric specialties (53 ± 16 years), IMGs are, on average, almost 2 years older (55 ± 14).

Tables 2 and 3 show the active workforce by self-designated specialty and major professional activity, respectively. IMGs are more likely employed as full-time hospital staff or locum tenens when compared to US MGs, and less likely to be administrators or medical teachers. IMG psychiatrists are active in all states and territories. New York, California, and Florida have the largest number of IMGs (2572, 2063, and 1229 respectively), and IMGs constitute (almost) half of psychiatrists in two states (New Jersey 50.6% and Florida 45.2%).

Country of Medical School and Country of Citizenship

Our data set included information on the country of medical school for 16,104 (97.8%) of all active IMGs in psychiatry. The 20 most frequent countries of medical school training, which account for 74.5% of IMGs in psychiatry, are shown in Table 4. Medical schools in India and Pakistan account for over 30% of all IMG psychiatrists. Of all IMGs, 2934 (17.8%) attended medical school in the Caribbean. The top 20 medical schools for IMG providers together account for 28.6% of the current IMG pool in psychiatry, with the top 3 (St. George’s University School of Medicine, Ross University School of Medicine, Dow Medical College) accounting for 9.6%.

Information on citizenship at time of entry to medical school was available for 16,014 (97.2%) of all active IMGs in psychiatry. Based on citizenship at entry to medical school, the largest group consisted of American citizens (n = 3603, 22.7%), closely followed by Indian citizens (n = 3578, 22.5%).

Discussion

International medical graduates play an important role in the provision of health care in the USA. Based on the 2020 AMA Physician Masterfile, IMGs represent nearly 30% of the active psychiatric workforce. Unlike a previous study conducted 10 years ago that focused on IMGs in patient care roles [7], our study looked at the entire psychiatric workforce, including those having administrative and teaching roles. Although the two study cohorts are not directly comparable, except when considering only those physicians in patient care activities, the IMG contribution to psychiatry is changing, both in terms of numbers and composition.

Compared to 2010, and based on psychiatrists in patient care activities, IMGs now represent a smaller percentage of the psychiatry workforce and are more likely to be US citizens at entry to medical school. In 2020, there were 15,136 IMGs in active practice (full-time hospital staff, those in office-based practice, residents), representing 29% of practicing psychiatrists. This compares to 14,379 in 2010 (31%). This percentage decline over one decade is minimal, but the number of US IMGs increased from 2415 to 3410. The number of non-US IMG psychiatrists in patient care activities remained stable over the decade. Assuming that non-US IMGs contribute to the diversity of the workforce, these trends could present challenges with respect to the long-term concordance of patient-provider characteristics (e.g., race, ethnicity, language).

Table 2  Active psychiatry workforce by self-designated specialty

| Self-designated specialty | US MGs (MD + DO) | US IMGs | Non-US IMGs | Total |
|---------------------------|------------------|--------|-------------|-------|
|                           | n    | %    | n          | %    | n    | %    | n          | %    |
| Psychiatry                 | 29,694 | 71.3 | 2475       | 5.9  | 8940 | 21.5 | 41,109     |
| Child and adolescent psychiatry | 7147 | 70.0 | 769        | 7.5  | 2260 | 22.1 | 10,176     |
| Geriatric psychiatry       | 575   | 47.9 | 100        | 8.3  | 524  | 43.7 | 1199       |
| Forensic psychiatry        | 773   | 78.5 | 84         | 8.5  | 123  | 12.5 | 980        |
| Addiction psychiatry       | 495   | 58.8 | 75         | 8.9  | 271  | 32.2 | 841        |
| Psychosomatic medicine     | 355   | 67.6 | 50         | 9.5  | 113  | 21.5 | 518        |
| Addiction medicine         | 362   | 85.0 | 38         | 8.9  | 24   | 5.6  | 424        |
| Psychoanalysis             | 251   | 93.3 | 1          | 0.4  | 15   | 5.6  | 267        |
| Pediatric psychiatry / child psychiatry | 241 | 91.6 | 11         | 4.2  | 10   | 3.8  | 262        |
| Total*                    | 39,893 | 70.8 | 3603       | 6.4  | 12,280 | 21.8 | 55,776     |

*IMG status was unknown for n = 527 (1.3%)
Creating a more diverse physician workforce has been the goal of many organizations, with much greater attention to racial, gender, ethnicity, and sexual identity. IMGs add to that diversity [32], often providing medical services to patients of the same racial/ethnic background. Based on this study and prior investigations, many IMGs in psychiatry come from India. However, as of 2020, the largest group of active IMGs in psychiatry were citizens of the USA at entry to medical school, particularly so for IMGs from medical schools in the Caribbean [33, 34]. Given the declines in ECFMG applicants and certificate holders from South Central Asia, including various Muslim majority nations [35], the mix (in terms of country of medical school training) of IMGs in the USA, including those going into psychiatry, is likely to change even more. The number of IMG residents entering first-year positions in ACGME–accredited GME programs has increased over the past several years, but their overall contribution to the workforce, as a percentage of the total, has decreased steadily, from 25.3% in 2014–2015 to 22.9% in 2019–2020 [8]. These trends, combined with an increase in the number of US IMGs going into psychiatry, is likely to lead to a less diverse physician workforce.

We also found that IMGs in psychiatry were, on average, nearly 2 years older than US graduates. If there is no increase in the number of IMGs entering psychiatry training programs, and if they retire at the same age as US MGs, their representation in the workforce will eventually decrease. These types of long-term shifts in workforce composition could potentially have negative impact on access to care. For example, compared to US MGs, IMGs are more likely to work in the public sector and receive a larger proportion of their income from Medicare/Medicaid [20]. The rules surrounding certain visa conditions might also have an impact: IMGs on J-1 visas are obliged to return to their home country after completing GME, and remain for 2 years before re-entering and working in the USA. A so-called J-1 waiver eliminates the home residency requirement and allows an IMG to stay in the USA to practice in a federally designated shortage area [36] which are predominantly rural. This is problematic, because not only are most psychiatrists trained in major cities, they also tend to find initial employment there. Although geographic spread may occur, such barriers to recruiting IMGs to rural residency programs compound the disparities of psychiatrists’ availability in urban versus rural areas. To illustrate, 75% of counties across the USA have a shortage of prescribing mental health clinicians, including most prominently psychiatrists [37].

**Table 3** Active psychiatry workforce by major professional activity

| Major professional activity | US MGs | US IMGs | Non-US IMGs | Total |
|-----------------------------|--------|---------|-------------|-------|
|                             | n      | %       | n           | %     | n           | %     | n           | %     |
| Office-based practice       | 25,317 | 70.5    | 2438        | 6.8   | 8080        | 22.5  | 35,835      |
| Full-time hospital employment | 5439  | 63.1    | 524         | 0.9   | 2642        | 30.6  | 8626        |
| Resident                    | 4562   | 77.4    | 448         | 0.8   | 532         | 9.0   | 5896        |
| Semi-retired                | 1825   | 72.9    | 84          | 0.1   | 517         | 20.6  | 2504        |
| Administration              | 1112   | 81.3    | 53          | 0.1   | 182         | 13.3  | 1368        |
| Research                    | 697    | 79.9    | 17          | 0.0   | 149         | 17.1  | 872         |
| Medical teaching            | 601    | 82.3    | 19          | 0.0   | 107         | 14.7  | 730         |
| Other                       | 233    | 85.0    | 6           | 0.0   | 31          | 11.3  | 274         |
| Locum tenens                | 107    | 66.5    | 14          | 0.0   | 40          | 24.8  | 161         |
| Total                       | 39,893 | 70.8    | 3603        | 6.4   | 12,280      | 21.8  | 56,266      |

*IMG status was unknown for n = 587 (1.0%)

**Table 4** Medical school country for active IMGs in psychiatry (top 20)

| Medical school country | n     | %    |
|------------------------|-------|------|
| India                  | 3621  | 22.5 |
| Pakistan               | 1257  | 7.8  |
| Philippines            | 1034  | 6.4  |
| Mexico                 | 684   | 4.3  |
| Dominican Republic     | 667   | 4.1  |
| Grenada                | 626   | 3.9  |
| Barbados               | 611   | 3.8  |
| Russia                 | 389   | 2.4  |
| Egypt                  | 377   | 2.3  |
| Nigeria                | 335   | 2.1  |
| Sint Maarten           | 311   | 1.9  |
| Romania                | 278   | 1.7  |
| China                  | 276   | 1.7  |
| Israel                 | 240   | 1.5  |
| Colombia               | 227   | 1.4  |
| Poland                 | 225   | 1.4  |
| Iran                   | 220   | 1.4  |
| Argentina              | 214   | 1.3  |
| South Korea            | 204   | 1.3  |
| Bangladesh             | 194   | 1.2  |
Many states, including New Jersey, Florida, and New York, continue to rely on IMGs to provide psychiatric services. Many of these individuals would have completed residency training programs located in underserved areas in these states and then have chosen to stay there. It is in these states that IMG workforce trends, including specialty choice, are likely to have the most impact. As of the end of 2019, only 20.6% of residents in psychiatry residency programs were IMGs [8]. These individuals, representing a decreasing proportion of all psychiatrists, will populate the future psychiatry workforce. This means that the future pipeline of psychiatrists is likely to be insufficient to deal with the demand for psychiatrists, at least in some areas. To the extent that there are fewer IMG psychiatrists, at least proportionately, this may affect the care of patients with diverse cultural backgrounds and variable English language proficiency. Indeed, research shows that decreasing numbers of IMGs may have long-term implications for psychiatric care, in particular, cultural competency and serving underserved populations [21]. It has been argued that cultural competence is “a cornerstone of diagnosis, therapeutic alliance formulation and treatment plan execution” [38]. IMGs enter residency programs with cross-cultural knowledge, by virtue of their medical training environment, upbringing, and transition into the US medical system, and may bring global perspectives of population health and an understanding of health disparities in disadvantaged communities [21]. It has therefore been argued that a psychiatric workforce needs to reflect the demographic characteristics of the patients they serve [21].

IMGs represent an important, yet just one component, of psychiatric workforce development. Other important considerations include our ability to develop the psychiatry pipeline among aspiring medical students [24, 25], and to evolve to models of care that maximize the utilization of ever-scarce psychiatric and allied mental health professionals [26, 27]. Distribution of workforce, retention, and physician payment models in psychiatry are further considerations. Additionally, the morbidity of mental health and population needs are substantial and can also intensify over time. To that point, it is already evident that the heightened extent of mental health conditions during COVID-19 and beyond will influence future mental health needs and psychiatry workforce planning [39].

This study is not without limitations. First, some of the data, including citizenship and practice specialty, are self-reported. As such, some of the estimates may be biased. Second, and perhaps more important, this investigation provided a cross-sectional overview of IMG contributions to the psychiatry workforce. While we did make comparisons with previous studies that employed the AMA Physician Masterfile data, it would be better to follow individual psychiatrists over time. This would allow the exploration of changes in specialization, practice characteristics, and location where care is provided.

In conclusion, this study provides an overview of the psychiatric workforce in the USA, quantifying the specific contribution of IMGs. Several factors, including immigration policies, continued expansion of US medical schools, and the number of available residency positions, could impact the flow of IMGs to the US. Longitudinal studies are needed to better understand the implications for workforce composition and distribution, and their potential impact on the care of psychiatric patients.

Declarations

Disclosures  On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Considerations  The data are publicly available, and all participants agreed that their anonymized data could be used for research purposes. The study was deemed exempt by the Internal Research and Data Review Committee of the ECFMG.

References

1. Salsberg ES, Forte GJ. Trends in the physician workforce, 1980–2000. Health Aff. 2002;21(5):165–73.
2. Pinsky WW. The importance of international medical graduates in the United States. Ann Intern Med. 2017;166(11):840–1.
3. Iglehart JK. The residency mismatch. N Engl J Med. 2013;369(4):297–9.
4. Boulet JR, Norcini JJ, Whelan GP, Hallock JA, Seeling SS. The international medical graduate pipeline: recent trends in certification and residency training. Health Aff. 2006;25(2):469–77.
5. Hagopian A, Thompson MJ, Kaltenbach E, Hart LG. Health departments’ use of international medical graduates in physician shortage areas. Health Aff. 2003;22(5):241–9.
6. Hart LG, Skillman SM, Fordyce M, Thompson M, Hagopian A, Konrad TR. International medical graduate physicians in the United States: changes since 1981. Health Aff. 2007;26(4):1159–69.
7. Boulet JR, Cassimatis EG, Opalek A. The role of international medical graduate psychiatrists in the United States healthcare system. Acad Psychiatry. 2012;36(4):293–9.
8. Brotherton SE, Etzel SI. Graduate medical education, 2019-2020. JAMA. 2020;324(12):1230–50.
9. National Resident Matching Program. National Resident Matching Program - Report Archives [Internet]. The Match, National Resident Matching Program. [cited 2022 Feb 8]. Available from: https://www.nrmp.org/report-archives/.
10. National Resident Matching Program. Main Residency Match Data and Reports [Internet]. 2019 [cited 2022 Feb 8]. Available from: http://www.nrmp.org/main-residency-match-data/.
11. Majeed MH, Ali AA, Sudak DM. International medical graduates and American psychiatry: the past, present, and future. Acad Psychiatry. 2017;41(6):849–51.
12. Mastri A, Senussi MH. Trump’s Executive Order on Immigration—detrimental effects on medical training and health care. New Engl J Med. 2017;376(19):e39.
13. Duuvier RJ, Abdou MH, Ishak RS, Wiley E, Alwan MB. Implications of a travel ban on US medical education and training. Lancet. 2017;389(10079):1603.
14. Traverso G, McMahon GT. Residency training and international medical graduates: coming to America no more. JAMA. 2012;308(21):2193–4.

15. Duvivier RJ, Wiley E, Boulet JR. Supply, distribution and characteristics of international medical graduates in family medicine in the United States: a cross-sectional study. BMC Fam Pract. 2019;20(1):47.

16. Duvivier RJ, Gusic ME, Boulet JR. International medical graduates in the pediatric workforce in the United States. Pediatrics. 2020;146(6):e2020003301.

17. Ahmed AA, Hwang W-T, Thomas CR Jr, Deville C Jr. International medical graduates in the US physician workforce and graduate medical education: current and historical trends. J Grad Med Educ. 2018;10(2):214–8.

18. Thompson MJ, Hagopian A, Fordeyc M, Hart LG. Do international medical graduates (IMGs) “fill the gap” in rural primary care in the United States? A national study. J Rural Health. 2009;25(2):124–34.

19. Whitcomb ME, Miller RS. Participation of international medical graduates in graduate medical education and hospital care for the poor. JAMA. 1995;274(9):696–9.

20. Blanco C, Carvalho C, Olsson M, Finnerty M, Pincus HA. Practice patterns of international and US medical graduate psychiatrists. Am J Psychiatry. 1999;156(3):445–50.

21. Virani S, Mitra S, Grullón MA, Khan A, Kovach J, Cotes RO. International medical graduate resident physicians in psychiatry: decreasing numbers, geographic variation, community correlations, and implications. Acad Psychiatry. 2021;45(1):7–12.

22. Association of American Medical Colleges. The complexities of physician supply and demand: projections from 2018 to 2033 [Internet]. 2020. [cited 2022 Feb 8] Available from: https://www.aamc.org/media/45976/download.

23. National Center for Health Workforce Analysis. Behavioral health workforce projections, 2016-2030: psychiatrists (adult), child and adolescent psychiatrists [internet]. 2018. [cited 2022 Feb 8] Available from: https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/psychiatrists-2018.pdf.

24. Goldman W. Economic grand rounds: is there a shortage of psychiatrists? Psychiatr Serv. 2001;52(12):1587–9.

25. Satiani A, Niedermier J, Satiani B, Svendsen DP. Projected workforce of psychiatrists in the United States: a population analysis. Psychiatr Serv. 2018;69(6):710–3.

26. Thomas CR, Holzer CE III. The continuing shortage of child and adolescent psychiatrists. J Am Acad Child Adolesc Psychiatry. 2000;45(9):1023–31.

27. Kim WJ. Child and adolescent psychiatry workforce: a critical shortage and national challenge. Acad Psychiatry. 2003;27(4):277–82.

28. Duvivier RJ, Burch VC, Boulet JR. A comparison of physician emigration from Africa to the United States of America between 2005 and 2015. Hum Resour Health. 2017;15(1):41.

29. Tekian A, Boulet J. A longitudinal study of the characteristics and performances of medical students and graduates from the Arab countries. BMC Med Educ. 2015;15(1):200.

30. Duvivier RJ, Boulet J, Qu JZ. The contribution of Chinese-educated physicians to health care in the United States. PLoS One. 2019;14(4):e0214378.

31. EC FMG | Certification [Internet]. [cited 2017 Mar 8]. Available from: http://www.ecfmg.org/certification/.

32. Norcini JJ, van Zanten M, Boulet JR. The contribution of international medical graduates to diversity in the US physician workforce: graduate medical education. J Health Care Poor Underserved. 2008;19(2):493–9.

33. van Zanten M, Boulet JR. Medical education in the Caribbean: quantifying the contribution of Caribbean-educated physicians to the primary care workforce in the United States. Acad Med. 2013;88(2):276–81.

34. Eckhert NL, van Zanten M. US citizen international medical graduates—a boon for the workforce? New Engl J Med. 2015;372(18):1686–7.

35. Boulet JR, Duvivier RJ, Pinsky WW. Prevalence of international medical graduates from Muslim-majority nations in the US physician workforce from 2009 to 2019. JAMA Netw Open. 2020;3(7):e209418.

36. Rural J-1 visa waiver overview - rural health information hub [Internet]. [cited 2022 Jan 24]. Available from: https://www.ruralhealthinfo.org/topics/j-1-visa-waiver.

37. Thomas KC, Ellis AR, Konrad TR, Holzer CE, Morrissey JP. County-level estimates of mental health professional shortage in the United States. Psychiatr Serv. 2009;60(10):1323–8.

38. Bhuji K, Warfa N, Edonya P, McKenzie K, Bhugra D. Cultural competence in mental health care: a review of model evaluations. BMC Health Serv Res. 2007;7(1):15.

39. Buckley PF. Resilience and being thankful. Psychiatr Times. 2020;37(11):1–16. https://www.psychiatrictimes.com/view/resilience-being-thankful.

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