# International Medical Graduates in the US Physician Workforce and Graduate Medical Education: Current and Historical Trends

Awad A. Ahmed, MD
Wei-Ting Hwang, PhD
Charles R. Thomas Jr, MD
Curtiland Deville Jr, MD

## ABSTRACT

**Background** Data show that international medical graduates (IMGs), both US and foreign born, are more likely to enter primary care specialties and practice in underserved areas. Comprehensive assessments of representation trends for IMGs in the US physician workforce are limited.

**Objective** We reported current and historical representation trends for IMGs in the graduate medical education (GME) training pool and US practicing physician workforce.

**Methods** We compared representation for the total GME and active practicing physician pools with the 20 largest residency specialties. A 2-sided test was used for comparison, with $P < .001$ considered significant. To assess significant increases in IMG GME trainee representation for the total pool and each of the specialties from 1990–2015, the slope was estimated using simple linear regression.

**Results** IMGs showed significantly greater representation among active practicing physicians in 4 specialties: internal medicine (39%), neurology (31%), psychiatry (30%), and pediatrics (25%). IMGs in GME showed significantly greater representation in 5 specialties: pathology (39%), internal medicine (39%), neurology (36%), family medicine (32%), and psychiatry (31%; all $P < .001$). Over the past quarter century, IMG representation in GME has increased by 0.2% per year in the total GME pool, and 1.1% per year for family medicine, 0.5% for obstetrics and gynecology and general surgery, and 0.3% for internal medicine.

**Conclusions** IMGs make up nearly a quarter of the total GME pool and practicing physician workforce, with a disproportionate share, and larger increases over our study period in certain specialties.

## Introduction

With the recent shift in US policy toward efforts to restrict immigration, there has been increased discussion regarding the role of international medical graduates (IMGs), defined as clinicians who graduated from a medical school outside the United States and Canada, in medicine.[1–4] This includes both US citizens and permanent residents who complete medical school outside of the United States and Canada and foreign nationals who enter the United States for GME training. IMGs go through careful and critical scrutiny by the Educational Commission on Foreign Medical Graduates.[1] IMGs have important roles in delivering health care in the United States,[1–5] and approximately 80% of IMGs are born in a foreign country.[6] US physician organizations have a significant interest in immigration policy.[7–9]

While trends in the pool of IMGs have been examined,[10–14] comprehensive understanding and assessment of recent representation trends for IMGs in the US physician workforce are limited. This report quantifies the current and historical representation trends for IMGs in the graduate medical education (GME) training pool and US practicing physician workforce for each of the 20 largest residency specialties.

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## Methods

Our study used publicly reported data from 2015 to assess the representation of IMGs in the total US active practicing physician[15] and GME trainee[16] workforces. Representation for the total GME and active practicing physician pools were respectively compared with the 20 largest residency specialties, including internal medicine, family medicine, pediatrics, surgery–general, anesthesiology, emergency medicine, obstetrics and gynecology, psychiatry, diagnostic radiology, orthopedic surgery, pathology–anatomic and clinical, neurology, otolaryngology, internal medicine/pediatrics, ophthalmology, physical medicine and rehabilitation, dermatology, neurological surgery, and urology, and excluding transitional year. A 2-sided test was used for comparison, with $P < .001$ considered statistically significant, adjusting

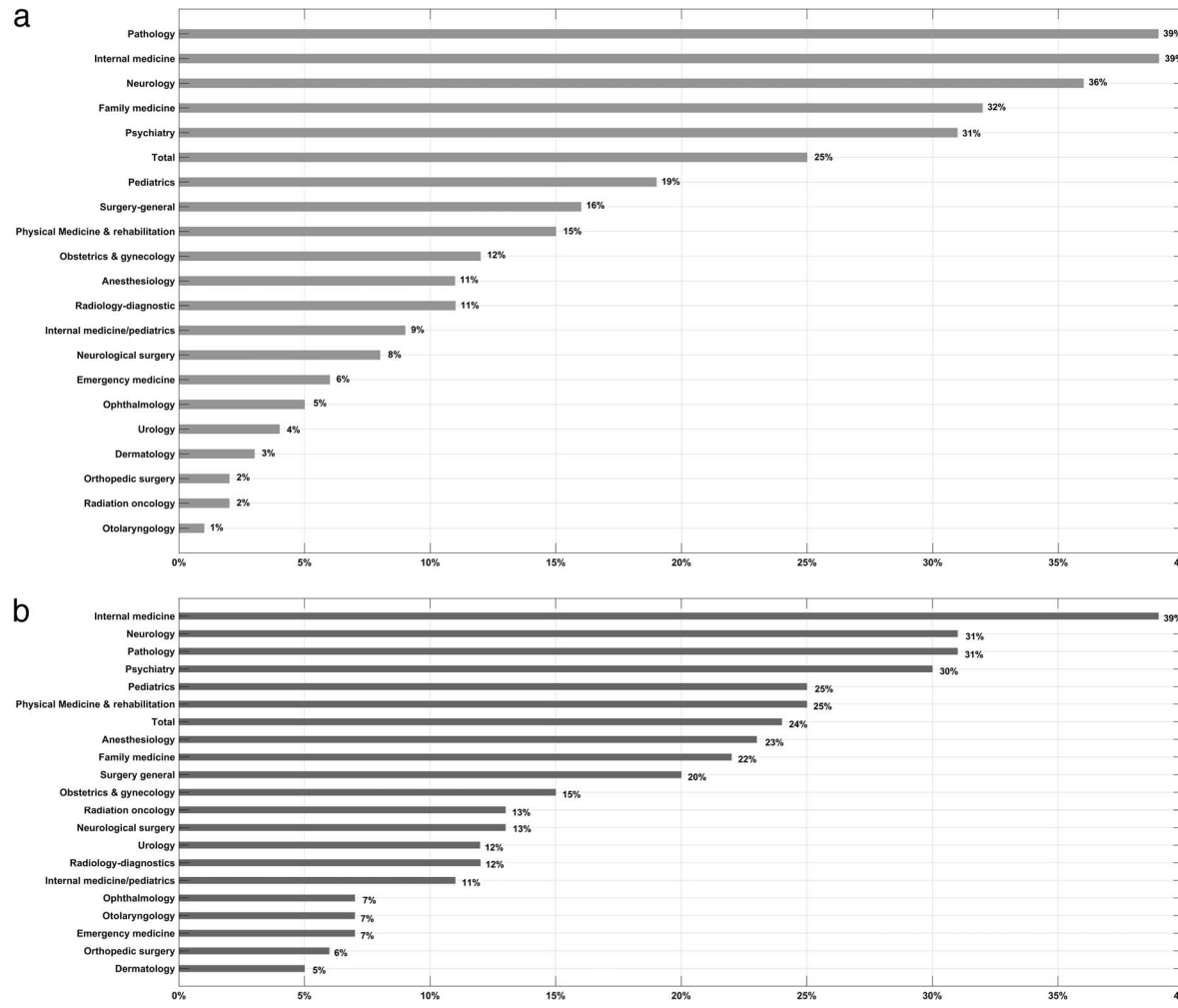


**FIGURE 1A**
International Medical Graduate GME Representation
Abbreviation: GME, graduate medical education.

**FIGURE 1B**
International Medical Graduate Active Practicing Physician Representation

for multiple comparisons. *JAMA* publications were used to obtain data on GME training program IMG composition from 1990–2015.[17,18] To assess historical increases in IMG GME trainee representation for the total pool and each of the 20 training specialties, we modeled the slope and associated 95% confidence intervals for each group, with year treated as an independent variable, and the proportion of GME trainees included as the dependent variable.

This study used publicly available data, and did not require Institutional Review Board review.

## Results

In 2015, there were 860 917 active practicing physicians and 120 598 trainees in the total GME pool, of which 24% (209 367 of 860 917)[15] and 25% (29 654 of 120 598),[16] respectively, were IMGs. As shown in FIGURE 1A, for trainees, when compared to the total GME pool, IMGs showed significantly greater representation in 5 of the 20 largest GME specialties: pathology (39%, 882 of 2245), internal medicine (39%, 9270 of 23 664), neurology (36%, 830 of 2305), family medicine (32%, 3319 of 10 359), and psychiatry (31%, 1622 of 5153). IMG GME representation was lowest for otolaryngology (1%, 15 of 1501) and radiation oncology (2%, 12 of 714). Among active practicing physicians, IMGs showed significantly greater representation in 4 of the 20 specialties examined (FIGURE 1B): internal medicine (39%, 44 030 of 114 087), neurology (31%, 4151 of 13 392), psychiatry (30%, 11 404 of 37 736), and pediatrics (25%, 14 623 of 57 542).

**TABLE**
Residency Training Specialties Significantly Increasing in International Medical Graduate Representation (1990–2015)

| Specialty | Slope (%/y) | *P* Value | 95% CI |
|---|---|---|---|
| Family medicine | 1.133 | < .001 | 0.807–1.458 |
| Obstetrics and gynecology | 0.496 | < .001 | 0.281–0.710 |
| General surgery | 0.456 | < .001 | 0.298–0.615 |
| Internal medicine | 0.290 | .002 | 0.117–0.463 |
| Emergency medicine | 0.221 | < .001 | 0.147–0.294 |
| Total | 0.202 | < .001 | 0.110–0.294 |
| Neurological surgery | 0.139 | < .001 | 0.079–0.200 |
| Orthopedic surgery | 0.055 | < .001 | 0.032–0.078 |

Abbreviation: CI, confidence interval.

IMG representation was lowest for dermatology (5%, 575 of 11 706) and orthopedic surgery (6%, 1051 of 19 145). As shown in the TABLE, when assessing significant changes over the past 25 academic years, representation of IMG trainees was increasing at 0.2% per year overall, and increased at a higher rate for family medicine (1.1%), obstetrics and gynecology (0.5%), general surgery (0.5%), and internal medicine (0.3%).

## Discussion

Nearly a quarter of the total GME training pool and active practicing physician workforce are made up of IMGs. However, representation of US medical graduates is disparate across medical specialties, with IMGs currently making up approximately one-third or more of active practicing physicians and GME trainees in internal medicine, psychiatry, neurology, and pathology. Over the past quarter century, the greatest historical increases in IMGs occurred in family medicine, obstetrics and gynecology, general surgery, and internal medicine.

Both US and foreign-born IMGs play an important role in promoting access to medical care, as they are more likely to practice in lower-income rural and urban communities that are underserved by US medical graduates.[19] IMGs also make significant contributions to diversity,[1] medical research,[20] dissemination of ideas through conferences,[4] and medical education. A majority of IMGs are not US citizens or permanent residents; 2017 National Residency Matching data show 2777 US IMGs and 3814 foreign-born IMGs matched to first-year positions, and a little more than 100 in each group obtained positions through the Supplemental Offer and Acceptance Program (SOAP).[19] India (11.8%), Canada (7.9%), Pakistan (7.1%), Egypt (2.1%), and Iran (2.4%) are among the top countries of origin for foreign-born IMGs.[21] IMGs pursuing GME training in the United States who are not US citizens or permanent residents most commonly do so through the J-1 visa.[1] Upon completion of training in the United States, J-1 visa holders are required to return to their country of citizenship for 2 years. Avenues exist for staying in the United States after training. One pathway consists of practicing in an underserved community, which provides the trainee an opportunity to remain in the United States after completing residency as part of a federal program known as the Conrad 30 program, which stipulates that the IMG may remain in the United States after training if they commit to 3 years of work in a medically underserved community.[22] Federal efforts to restrict immigration, coupled with predicted shortages of US physicians, may affect IMG physicians, their patients, and the medical community,[3] particularly in specialties with disproportionate representation of IMGs. In three-quarters of the largest training specialties, at least 10% of active practicing physicians are made up of IMGs (FIGURE 1A); and among trainees, IMGs make up at least 10% of the workforce in more than half of large training specialties (FIGURE 1B).

This study has limitations. The major limitation is that the Association of American Medical Colleges and *JAMA* GME data used in this study do not distinguish between IMGs that are US citizens or permanent residents and foreign nationals who enter the United States for GME training. Notably, at least 59% (7284 of 12 353) of IMGs participating in the main residency match were foreign-born,[23] and prior studies examining historical trends place the proportion of IMGs made up of foreign-born physicians at 73% to 95.2%.[5]

The potential ramifications of the recent shifts in immigration policies on communities should be further examined, with a particular focus toward specialties and geographic locations of practice that improve access for medically underserved populations. These populations may have greater difficulty finding access to appropriate medical care, and restriction in immigration could affect access to care in areas and specialties where IMGs, specifically

foreign-born IMGs, make up a significant proportion of the total number of practitioners, which may further exacerbate documented health disparities.[24–26]

## Conclusion

International medical graduates make up nearly one-quarter of the total GME pool and practicing physician workforce, with disproportionate supply and growth in certain specialties, including primary care specialties.

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**Awad A. Ahmed, MD,** is a Resident Physician, University of Miami and Jackson Memorial Hospital; **Wei-Ting Hwang, PhD,** is Associate Professor, Department of Biostatistics and Epidemiology, Hospital of the University of Pennsylvania; **Charles R. Thomas Jr, MD,** is Professor and Chair, Department of Radiation Medicine, Knight Cancer Institute, Oregon Health & Science University; and **Curtiland Deville Jr, MD,** is Associate Professor, Department of Radiation Oncology and Molecular Radiation Sciences, Johns Hopkins University School of Medicine.

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Corresponding author: Curtiland Deville Jr, MD, Johns Hopkins University School of Medicine, Department of Radiation Oncology and Molecular Radiation Sciences, Weinberg Suite 1440, 401 N Broadway, Baltimore, MD 21231, 202.537.4788, fax 202.537.4964, cdeville@jhmi.edu

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