
The Rise of Female International Medical Graduates and their Contribution to Physician Supply in the United States

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ABSTRACT: The rise of female physicians has provided care to the growing and evolving United States population. According to the 2014 FSMB Census of Licensed Physicians, 32% of actively licensed physicians are female. Less attention, however, has been given to the location of medical school graduation and its association with the growing population of female physicians. This study examines physicians who were issued their first license in the United States by gender and by where they graduated from medical school. Using data from the Federation of State Medical Boards' (FSMB) Physician Data Center, the authors measured the percentage of first-time licenses issued between 1990 and 2014 to females and by where they graduated from medical school—that is, either a United States medical graduate (USMG) or an international medical graduate (IMG). Key findings indicate that between 1990 and 2014, first-time licenses issued to IMG females have increased from 25% to 45% (31% to 47% for USMG females). Furthermore, the percentage of first-time licenses issued to female IMGs increased among international regions with the highest number of licensed physicians in the U.S. The findings support that a greater percentage of first-time licenses issued to IMGs have been to females over the past two and half decades. Analyzing the trend of first-time licenses issued to physicians by gender and location of medical school graduation adds to better understanding the physician pipeline and physicians' transition from medical school to the practicing medical community in the United States.

Introduction

Ensuring an adequate supply of physicians is a top concern of health care policy workers in the United States. Physicians' gender is an important component in analyzing how male and female physicians are contributing to the health care supply. To date, however, little attention has been given to how the international medical graduate (IMG) community, and more specifically the IMG female community, has grown and helped provide a supply

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of physicians in the United States. Yet, both the female and IMG population contribute substantially to the U.S. physician supply. According to the *2014 FSMB Census of Licensed Physicians*, 32% of actively licensed physicians are female and 23% are IMGs.¹ The goal of this research is to analyze the growth of first-time licenses issued to female

physicians in the United States, with a particular focus on IMG females. Using data from the FSMB's Physician Data Center (PDC), we analyzed the percentage of physicians who received their first license between 1990 and 2014 by gender and where they graduated from medical school. Furthermore, we examined the percentage of first-time licenses issued to females who graduated from international regions with the largest populations of licensed physicians in the United States (India, the Caribbean, the Philippines, Pakistan, Mexico and all other international countries). Tracking the percentage of first-time licensed physicians by gender and where they graduated from medical school provides valuable information on how these physicians contribute to the physician pipeline.

Background

Over the past few decades, there has been a distinct increase in the number of female physicians providing care in the United States. This trend has been recorded in various ways, such as capturing the percentage of U.S. medical school graduates² and the percentage of active physicians who are female.^{1,3} For example, females were awarded 27% of Doctor of Medicine degrees in 1983, compared to 48%

by 2011.² The rise of women in medicine parallels the rise of women in other professional fields. An examination of selected professional fields, including dentistry, optometry, pharmacy, podiatry, veterinary medicine, chiropractic, law, theology, medicine and osteopathic medicine, shows that 49% of graduates from institutions granting these professional degrees in 2011 were females.⁴

Just as female physicians from U.S. medical schools fill the need for physicians in the United States, the growth of IMG physicians has also helped with increasing health care demands. In 2014, IMGs constituted approximately a quarter of all licensed physicians in the U.S.¹ According to the American Medical Association (AMA), between 1970 and 1994 the overall physician population increased by more than 105%; the USMG population grew by 91% and the IMG population grew at almost twice the rate (170%).⁵ The female population among IMG physicians providing patient care grew from 17% in 1981 to 26% in 2001.⁶ While research has shown growth in the IMG female population, less is known about trends in the percentage of females from the IMG population who have been issued their first license in the United States.

Growth among IMG physicians can encourage better care among certain areas and populations in the U.S. First, IMGs may be able to help alleviate the maldistribution of primary care physicians in rural and underserved areas.^{7, 8} According to the 2002 AMA physician data, IMG primary care physicians were more likely to practice in rural areas than USMGs in 18 states, while USMG primary care physicians were more likely to practice in rural areas in 16 states.⁸ Second, IMGs are more likely to be sensitive to cross-cultural issues as they relate to the medical field.⁹ In summary, an appropriate

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distribution of male and female physicians from U.S. and international medical schools helps ensure a physician population that can better respond to health care demands and preferences in countries as diverse as the United States.

Method

Data used for this analysis were from the FSMB's PDC, including license data provided by the U.S. and District of Columbia state medical boards that regulate allopathic and osteopathic physicians. Physician records are created in the PDC when U.S. medical school students or IMGs register for the United States Medical Licensing Examination (USMLE). For physicians who do not take the USMLE, the PDC uses license files from state boards to create an initial physician record. Physician records in the PDC are updated on a regular basis, including all medical licenses issued by state boards.¹

Over their career, physicians are often issued several licenses, either from renewing their license in the same state or applying for licenses in multiple states. Each physician's licenses were ordered by their issue date to identify the earliest and first

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license issued. If physicians had licenses with missing issue dates, we were unable to accurately determine the first license and therefore excluded these physicians from our analysis. With these criteria, a total of 605,424 physicians were issued their first license between 1990 and 2014. With the assumptions that most physicians receive their first license within five years after graduating medical school, we estimated the number of missing physicians who may have been issued their first license between 1990 and 2014. It is estimated that 6% or less of physicians who were issued their first license were missing from our study population.

Location of where physicians graduated from medical school was divided into two categories of either USMGs or IMGs. USMGs included physicians who graduated from medical schools in the United States or Canada. Physicians who graduated from medical schools outside of the United States and Canada were categorized as IMGs.

First-time licenses issued by gender were also analyzed by international countries or regions with the highest number of graduates with licenses in the United States, according to the 2014 FSMB

census.¹ In 2014, there were 48,377 actively licensed physicians who graduated from medical schools in India, 30,895 physicians from the Caribbean, 14,211 physicians from the Philippines, 11,651 physicians from Pakistan, 10,213 physicians from Mexico and 92,493 physicians who graduated from other international countries. The exact numbers of graduates by country of medical school graduation may be slightly under-represented due to 2% of the 2014 actively licensed physicians in the United States who had an unknown location for their medical school.¹

Among the 605,424 physicians who were issued their first license between 1990 and 2014, 593,035 physicians had a recorded gender (corresponds to Figure 1). When including where physicians graduated from medical school, 584,291 first-time licensed physicians were known to be either USMGs or IMGs (corresponds to Figure 2). This represents our study population, which includes physicians with valid first-time license issue dates, a recorded gender, and where applicable, location of medical school graduation.

Results

Between 1990 and 2014, 347,146 male and 245,889 female physicians were issued their first

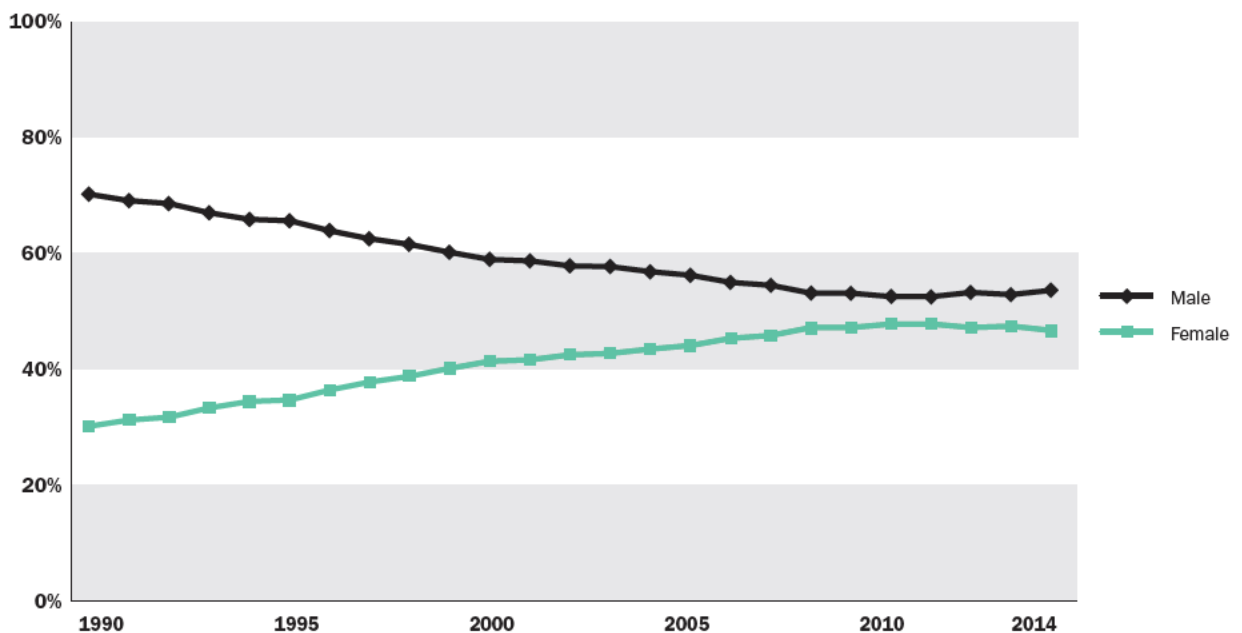
license to practice medicine, accounting for 59% and 41% of first-time licenses issued, respectively. The percentage of first-time licensed physicians who were females increased from 30% in 1990 to slightly under half (47%) in 2014 (see Figure 1). Using a simple linear regression analysis to investigate the change each year from 1990 to 2014 in the percentage of first-time licenses to female physicians,

THE PERCENTAGE OF FIRST-TIME LICENSED PHYSICIANS WHO WERE FEMALES INCREASED FROM 30% IN 1990 TO SLIGHTLY UNDER HALF (47%) IN 2014.

we found that the rise in the percentage of first-time licenses to female physicians was statistically significant ($p < 0.001$) and increased by an average of 0.773% for each year.

The gender of first-time licensed physicians was also segmented by whether they were USMGs or IMGs. From the 431,470 first-time licenses issued to USMGs between 1990 and 2014, 58% of these licenses were issued to males and 42% to females. Among IMGs during this time period ($n = 152,821$),

Figure 1
Percentage of First Licenses Issued to Physicians by Year and Gender



61% of licenses were issued to males, compared to 39% of licenses issued to females.

When looking at the trend of licenses issued by year, 31% of first-time licenses to USMGs were issued to females in 1990. The percentage grew to 47% by 2014 (see Figure 2). A linear regression analysis confirmed that the rise in the percentage

OVERALL, A GREATER PROPORTION OF FIRST-TIME LICENSES ISSUED TO USMGs WERE FEMALES, COMPARED TO IMG FEMALES BETWEEN 1990 AND 2014.

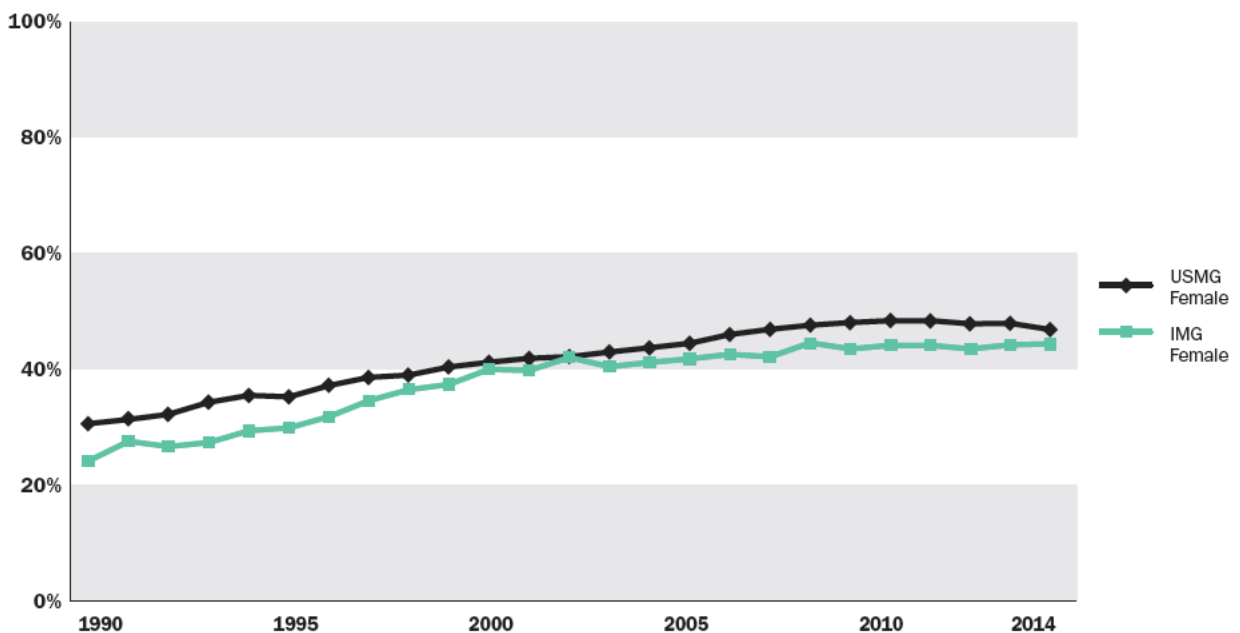
of first-time licenses to USMG female physicians was statistically significant ($p < 0.001$) and increased by an average of 0.769% for each year.

Similarly, females represented 25% of first-time licenses issued to IMGs in 1990 and the percentage grew to 45% by 2014 (see Figure 2). A linear regression analysis confirmed that the rise in the percentage of first-time licenses to IMG female physicians was statistically significant ($p < 0.001$) and increased by an average of 0.856% for each year.

Overall, a greater proportion of first-time licenses issued to USMGs were females, compared to IMG females between 1990 and 2014. There has been, however, a greater percentage increase of first-time licenses issued to female IMGs (82%), compared to 53% for USMG females.

Lastly, we looked at the gender composition by international regions with the highest number of medical graduates with active U.S. medical licenses in 2014. The total number of first-time licenses issued between 1990 and 2014 to physicians by their country of medical school graduation were as follows: 34,004 first-time licenses were issued to graduates from India, 27,794 to graduates from the Caribbean, 10,082 to graduates from Pakistan, 7,479 to graduates from the Philippines, 4,016 to graduates from Mexico and 69,446 first-time licenses were issued to graduates from all other international schools. While an increasingly greater percentage of first-time licenses were issued to female physicians between 1990 and 2014 based on the location of their international medical graduation, the increase varied by region (see Figure 3). Physicians who graduated from the Philippines had the highest percentage of first-time licenses issued to females (39% in 1990 and 59% in 2014). Comparatively, physicians who graduated

Figure 2
Percentage of First Licenses Issued to Females by Year and Medical School Location



from Mexico had the lowest percentage of first-time licenses issued to females (17% in 1990 and 41% in 2014). The percentage of first-time licenses issued in 2014 to females who graduated from Mexico and other international counties were relatively close by comparison; 49%, 48%, 44% and 43% of first-time licenses issued to graduates from Pakistan, India, the Caribbean and other international countries were, respectively, female.

Discussion

Defining trends for first-time licensed physicians by gender and where they graduated from medical school adds an important piece in measuring the physician pipeline and physicians' transition from medical school training to being part of the established U.S. medical community. Based on our analysis, first-time licenses are being issued in an increasingly more equal distribution for male and female physicians who graduated from U.S. and international medical schools. In 1990, USMG and IMG female physicians constituted 31% and 25%, respectively, of first-time licenses issued. Comparatively, USMG and IMG female physicians represented 47% and 45%, respectively, of first-time licenses issued in 2014. While a smaller proportion of first-time licenses were issued to IMG females

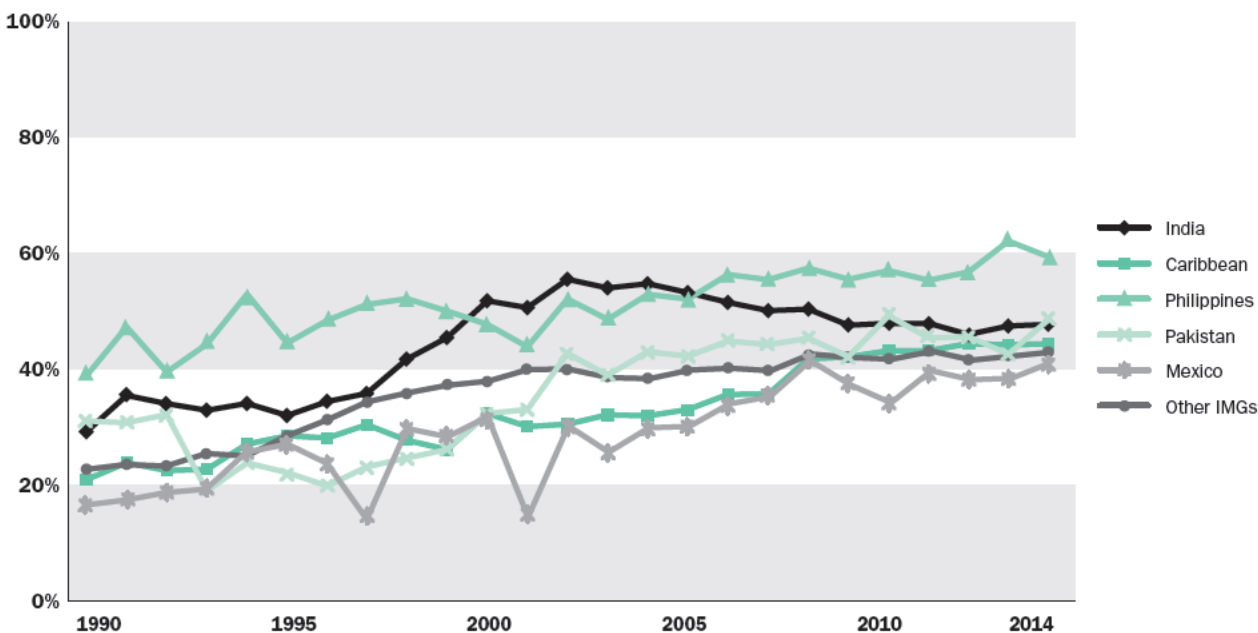
compared to USMG females between 1990 and 2014, there was a greater increase in the percentage of first-time licenses issued to IMG females than

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USMG females during this time period. Furthermore, an analysis looking at medical school graduates from India, the Caribbean, the Philippines, Pakistan, Mexico and all other international countries also confirmed that the percentage of first-time licenses issued to females has increased since 1990 to 2014, although to varying degrees.

Our analysis summarizing physician characteristics based on gender and location of medical school graduation helps provide a link between the physician population and research looking at quality of care provided based upon physician demographics. International medical graduates tend to serve patients in traditionally underserved areas.^{7,8}

Figure 3
Percentage of First Licenses Issued to IMG Females by Year and Region



International medical graduates are also likely to be more culturally sensitive when communicating with their patients.⁹

When analyzing physician contributions by gender, male and female physicians also tend to contribute to the medical profession in different ways. For example, when comparing patient-physician encounters by gender, male physicians tend to report more patient encounters and write out more prescriptions compared to female physicians.^{10, 11} Female primary care physicians, however, tend to engage in more patient-centered communication, spend a longer time and address a greater number of patient issues per visit compared to their male primary care counterparts.^{10, 12}

Availability of both male and female physicians also helps address patients' preferences for a particular physician gender. For example, female patients tend to prefer female obstetricians and gynecologists.^{13, 14} It should be noted, however, that preference for physician experience, communication, quality of care and competency tends to be stronger than the preference for female obstetricians or gynecologists.¹³⁻¹⁵

Regarding workforce capacity, male physicians tend to work more hours each week, and male and female physicians tend to be more active in their careers at different ages.^{11, 16} Using the U.S. Census Bureau Current Population Survey data from 1979 to 2008, Staiger, Auerbach and Buerhaus examined physician work activity across ages and by gender. Both males and females peak work years are between 45 to 54 years. Relative to their own peak activity, females tend to be less active than males between ages 25 to 34 years. Females, however,

OUR ANALYSIS...HELPS PROVIDE A LINK BETWEEN THE PHYSICIAN POPULATION AND RESEARCH LOOKING AT QUALITY OF CARE PROVIDED BASED UPON PHYSICIAN DEMOGRAPHICS.

are 98% as active relative to their peak work years when they are 55 to 64 years while male physicians at this age are 83% as active relative to their peak work years.¹⁶

While male and female physicians both contribute to the medical field in their respective ways, evidence remains that females tend to hold less visible and lower compensated roles than males. For example,

even though females are more likely to have roles in science and medical research experiments, males are more likely to be published authors.¹⁷ Similarly, male physicians tend to have higher incomes than females even after accounting for several characteristics, including specialty, hours worked and geographical location.¹⁸ The persistence of gender biases calls for further research to study the role of male and female physicians in the workforce.

In addition to our analysis, which helps link the rise of first-time licensed females and IMG physicians with established literature stating this same population can provide increased quality care to certain patients' preferences, our study also helps link health workforce studies in understanding the gender and age distribution in the physician pipeline.

FEMALE PRIMARY CARE PHYSICIANS...TEND TO ENGAGE IN MORE PATIENT-CENTERED COMMUNICATION, SPEND A LONGER TIME AND ADDRESS A GREATER NUMBER OF PATIENT ISSUES PER VISIT COMPARED TO THEIR MALE PRIMARY CARE COUNTERPARTS.

For example, there was a greater percentage of actively licensed female physicians who were 39 years and younger in 2014 compared with male physicians (30% vs. 16%),¹ which can be explained by the greater increase in the percentage of first-time licenses issued to females over past decades.

While our analysis establishes a distinct trend in the rise of IMG female physicians from 1990 to 2014, a limitation of our analysis is that it does not provide a direct link as to why the trend exists. There are many reasons why IMGs want to practice in the United States, including the prestige of practicing abroad, working in technologically-advanced environments, having a higher standard of living, personal freedom and living in the environment of a stable government.¹⁹ Even though IMGs may help alleviate physician shortages in the United States, some question the ethics of relying on IMGs in the U.S. health care workforce, because it decreases the supply of physicians in their native countries.²⁰ Future research is needed to explore how the increase in IMGs, particularly female IMGs, in the United States influences physician workforce patterns worldwide. Further research should also examine the intersections of gender, country of medical school graduation and other physician

attributes, such as specialty certification, and their relationship to how the health workforce responds to U.S. health care demands and preferences.

In summary, while a great deal of attention has been given to the increase in female medical school acceptance rates, medical school graduation rates and actively practicing physicians,¹⁻³ less attention has been given to how female IMGs have contributed to the physician supply in U.S. health care. This analysis affirms the growth in the percentage of first-time licenses issued to IMG females and their sizeable contribution to health care in the United States. ■

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Ethical approval

This study was determined to be exempt from further human subjects review by The American Institutes for Research on September 13, 2016, reference number EX00404.

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