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Ten Year Projections for US Residency Positions: Will There be Enough Positions to Accommodate the Growing Number of U.S. Medical School Graduates?

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OBJECTIVE: Recently, a multitude of new U.S. medical schools have been established and existing medical schools have expanded their enrollments. The National Residency Match Program (NRMP) reports that in 2016 there were 23,339 categorical residency positions offered in the match and 26,836 overall applicants with 17,789 (66.29%) of the total candidates being U.S. allopathic graduates. In view of the rapid growth of medical school graduates, the aim of this study is to determine if current trends suggest a shortage of residency positions within the next ten years.

DESIGN: The total number of graduates from U.S. medical schools was obtained from the Association of American Medical Colleges (AAMC) for 2005-2014 academic years and was trended linearly for a 10-year prediction for the number of graduates. The yearly number of categorical positions filled by U.S. graduates for calendar years 2006-2015 was obtained from the NRMP and was trended longitudinally 10 years into the future. Analysis of subspecialty data focused on the comparison of differences in growth rates and potential foreseeable deficits in available categorical positions in U.S. residency programs.

RESULTS: According to trended data from AAMC, the total number of graduates from U.S. medical schools has increased 1.52 percent annually (15,927 in 2005 to 18,705 in 2014); with a forecast of 22,280 U.S. medical school graduates in 2026. The growth rate of all categorical positions available in U.S. residency programs was 2.55 percent annually, predicting 29,880 positions available in 2026. In view of these results, an analysis of specific residencies was done to determine potential shortages in specific residencies. With 17.4 percent of all U.S. graduates matching into internal medicine and a 3.17 percent growth rate in residency positions, in 2026 the number of internal medicine residency positions will be 9,026 with 3,874 U.S. graduates predicted to match into these positions. In general surgery, residency positions note a growth rate of 1.55 percent. Of all U.S. graduates, 5.6 percent match into general surgery. Overall this projects 1,445 general surgery residency positions in 2026 with 1,257 U.S. graduates matching. In orthopedics with a growth rate of 1.35 percent and a match rate of 3.75 percent, there are projected to be 827 positions available with 836 U.S. graduates projected to match.

CONCLUSIONS: Despite the increasing number of medical school graduates, our model suggests the rate of growth of residency positions continues to be higher than the rate of growth of U.S. medical school graduates. While there is no apparent shortage of categorical positions overall, highly competitive subspecialties like orthopedics may develop a shortage within the next ten years. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Published by Elsevier Inc. on behalf of the Association of Program Directors in Surgery)

KEY WORDS: physician shortage, medical school, residency, medical education

COMPETENCIES: Systems-Based Practice, Interpersonal and Communication Skills, Professionalism

INTRODUCTION

Predicting the number of physicians that will be needed in the future to care for the growing and aging U.S. population has been an area of great debate among the medical

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community for several decades. In 1976, a physician surplus of 145,000 physicians in the year 2000 was predicted by the Graduate Medical Education National Advisory Committee.[1] Ultimately, this prediction lead the medical community to voluntarily restrict the number of U.S. medical school positions.[1-3] The Balanced Budget Act of 1997 froze the amount of Medicare funding for U.S. allopathic residency positions.[2-4] Following this, no significant growth was seen in the number of U.S. allopathic medical school positions or residency positions through the year 2002.[1-3,5,6]

The projections switched from physician surplus to severe physician shortages around the turn of the 21st century.[5,7] The Association of American Medical Colleges (AAMCs) recommended a 15% increase in the number of U.S. medical school positions in 2005, by 2006 their new recommendation was an increase of 30%.[1,6] The Resident Physician Shortage Reduction Act of 2009 was proposed and aimed to similarly increase the number of federally supported residency positions but ultimately the bill was not passed.[3]

At the current time, there is a consensus that the United States is facing a physician shortage and that this shortage is predicted to get worse.[5-8] The process to produce a physician involves 2 separate but related levels of education. Medical schools have responded to the AAMC's call for rapid expansion and new medical colleges are being created and established colleges have expanded their enrollments.[9] At the residency level, there has been no similar formal expansion of positions.[10-12] In view of the absence of a formal plan to expand residency positions and concerns about funding of graduate medical education, the aim of this study was to investigate the possibility of a mismatch between the number of matriculated medical students and the number of residency positions over the next 10 years.

MATERIALS AND METHODS

The total number of graduates from U.S. medical schools was obtained from the AAMC for 2005 to 2014 academic years. The number of U.S. medical school graduates was then trended linearly to create a 10-year prediction for the number of graduates. The yearly number of categorical positions filled by U.S. graduates for calendar years 2006 to 2015 was obtained from the National Residency Match Program (NRMP). This was trended longitudinally for 10 years into the future. An analysis of subspecialty date was then completed. Subspecialty analysis focused on the comparison of differences in growth rates as well as potential foreseeable deficits in available categorical positions in U.S. residency programs.

RESULTS

The AAMC database was queried for the academic years of 2005 to 2014. In 2005 the number of total graduates from allopathic U.S. medical colleges was 15,927. In 2014 this number had grown to 18,705 graduates resulting in a 1.52% annual increase in the number of U.S. medical school graduates annually. This was noted to be a linear relationship with an R^2 value of 0.9618. Assuming a continued linear relationship, this predicts 22,280 graduates in the year 2026.

The NRMP database was queried for the academic years of 2006 to 2015. In 2006, there were 17,465 categorical allopathic residency positions offered in The Match. In 2015 there were 23,170 categorical allopathic positions offered in The Match resulting in an annual growth rate of 2.55%. This was noted to be a linear relationship with an R^2 value of 0.9408. Assuming a continued linear relationship, this predicts 29,880 positions offered in The Match in the year 2026 (Fig. 1).

The NRMP was then queried for the academic years of 2006 to 2015 for the number of filled allopathic categorical residency positions. In 2006, 11,698 of the available 17,465 positions (66.97%) were filled by U.S. allopathic graduates. In 2015, 14,952 of the 23,170 available positions (64.53%) were filled by U.S. allopathic graduates. The growth rate was calculated to be 2.2% and was noted to be linear with an R^2 of 0.9156.

A subanalysis was done on internal medicine, orthopedics, and general surgery residency positions. In 2006, 17.22% of all U.S. allopathic graduates matched into internal medicine. There were 4735 categorical internal medicine residency positions offered and 2743 of those offered positions (57.93%) were filled by a U.S. allopathic medical school graduate. In 2015, 18.27% of all U.S. allopathic graduates matched into internal medicine. There were 6770 categorical internal medicine residency positions offered and 3418 of those offered positions (50.49%) were filled by a U.S. allopathic medical school graduate (Fig. 2).

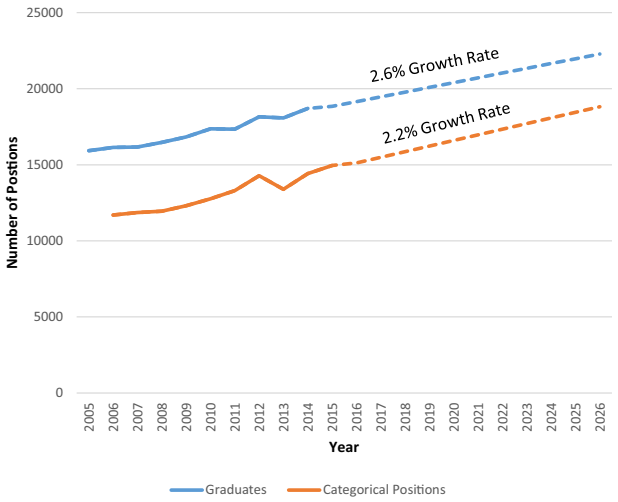

FIGURE 1. Current and projected trends of available categorical allopathic residency positions and total number of U.S. allopathic medical graduates.