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Health and Human Services

Texas Department of State Health Services

Physician Supply and Demand Projections 2021-2032

As Required by

Health and Safety Code

Section 105.009

Department of State Health Services
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Executive Summary

Texas Department of State Health Services (DSHS) conducts research to identify specialties and subspecialties within the field of medicine in Texas that are at critical shortage levels, the overall supply of physicians in Texas, and the ability of Texas's graduate medical education (GME) system to meet the current and future health care needs of Texas. This report is in fulfillment of the requirements found in Texas Health and Safety Code, Section 105.009 and examines medical education in Texas, including Texas' ability to produce the physicians needed according to the Texas Physicians Supply and Demand Projections, 2018 – 2032 report.

For this report, DSHS summarizes results on medical education in Texas and 35 physician specialties from 2021 through 2032. It places particular focus on primary care physician (PCP) specialties and psychiatry. These results are based on the Texas Physician Pipeline Model created by IHS Markit, a consulting firm that has previously conducted health care workforce modeling for the Health Resources and Services Administration, the Association of American Medical Colleges (AAMC), and DSHS.

To create the Texas Physician Pipeline Model tool, IHS Markit used national data from the American Medical Association Masterfile.

Key findings of the report include the following:

- 49.4 percent of Texas medical school graduates remained in Texas for their GME (2000-2019).
- 58.9 percent of physicians who completed their GME in Texas stayed in the state to practice after residency (2000-2019).
- All primary care specialties are projected to have shortages which, based on current models, will not be remedied through current medical education in Texas alone. Based on current rates of retention of medical students and their choices of specialties, GME would have to increase by the following number of residency slots per year over the prior year to meet the need for the following specialties:
  - Psychiatry would require an additional 31 residency slots each year.
  - Pediatrics would require an additional 55 residency slots each year.
  - Family medicine would require an additional 61 residency slots each year.

- Obstetrics and gynecology would require an additional 13 residency slots each year.
- General internal medicine would require an additional 61 residency slots each year.

The supply and demand models that underlie the Texas Physician Pipeline Model used for this report do not reflect the COVID-19 pandemic. While these numbers are not yet available, the impact of the COVID-19 on health practices, health providers, and the health system at large cannot be overstated.

In summary, there is a current shortage of physicians in Texas and this shortage will continue to increase through 2032. Current projections for medical education enrollment indicate that the state's medical education system will not create a supply of physicians that will meet projected demand.

1. Introduction

Senate Bill 18, 84th Legislature, Regular Session, 2015, added Texas Health and Safety Code, Section 105.009. This section requires the Health Professions Resource Center (HPRC) at the Texas Department of State Health Services (DSHS) conduct research identifying those specialties and subspecialties in the state that are at critical shortage levels, the overall supply of physicians in the state, and the ability of the state's GME system to meet the current and future health care needs of the state. By May 1 of even-numbered years, the Statewide Health Coordinating Council is required to report the results of research conducted by HPRC to the Legislative Budget Board, the Texas Higher Education Coordinating Board, the Office of the Governor, and the standing committees of each house of the legislature with primary jurisdiction over state finance or appropriations. This report is in fulfillment of the requirements in Section 105.009 and is an update to the Texas Physicians Supply and Demand Projections, 2018 – 2032 report for primary care physicians and psychiatrists. DSHS is submitting this report on behalf of the Statewide Health Coordinating Council.

This report assesses physician shortages in Texas by examining the number of medical education graduates by specialty for 2021 through 2032. The primary focus in this report is on primary care physicians (PCPs) and psychiatrists. These projections are based on health workforce modeling created by IHS Markit, a consulting firm that has previously generated workforce models for the U.S. Health

Resources and Services Administration,[1] the AAMC,[2] and DSHS.[3, 4, 5]

This report includes an overview of the methodology for the supply and demand models used for the projections in this report and discusses the strengths and limitations of these projections. The report also includes data on medical education graduates and 35 physician specialties statewide from 2000 through 2019 and provides projections to fulfill the estimated demand for physicians by 2032. These projections provide the number of either undergraduate medical education (UME) or graduate medical education slots (GME) that would need to be added year over year to meet the projected deficits for primary care and psychiatric specialties Appendix B provides tables on physicians' medical education and choice of specialties.

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[1] U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, National Center for Health Workforce Analysis. National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025. https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf. Published November 2016. Accessed January 28, 2022.

[2] Association of American Medical Colleges. 2019 Update: The Complexities of Physician Supply and Demand: Projections from 2017 to 2032. https://www.aamc.org/system/files/c/2/31-2019_update_-_the_complexities_of_physician_supply_and_demand_-_projections_from_2017-2032.pdf. Published April 2019. Accessed January 28, 2020.

[3] Texas Department of State Health Services. Texas Projections of Supply and Demand for Primary Care Physicians and Psychiatrists, 2017 - 2030. http://dshs.texas.gov/legislative/2018-Reports/SB-18-Physicians-Workforce-Report-Final.pdf. Published July 2018. Accessed January 28, 2020.

[4] Texas Department of State Health Services, Texas Center for Nursing Workforce Studies. Nurse Supply and Demand Projections, 2015-2030. https://www.dshs.texas.gov/chs/cnws/Workforce Reports/SupplyDemand.pdf. Published October 2016. Accessed January 28, 2020.

[5] Texas Department of State Health Services. Texas Supply and Demand Dental Projections, 2018 – 2030. https://www.dshs.texas.gov/chs/hprc/publications/DSHS_DentalProjections_092019.pdf. Published September 2019. Accessed January 28, 2020.

2. Background

Undergraduate and Graduate Medical Education

UME is a term that refers to the formal education an individual receives while in medical school. This stage in a physician's education typically lasts four years resulting in graduation from medical school. GME is used to describe formal education that occurs after an individual graduates from medical school. The Accreditation Council for GME is responsible for setting standards for GME (residency and fellowship) programs across the country.[6] During the 2020-2021 academic year, there were an estimated 12,420 residency and fellowship programs accredited by the Accreditation Council for GME in 182 specialties and subspecialties nationwide. Residency programs last between three and six years depending on the specialty, though some physicians may complete more than one residency for their specialization.[7] After completing their UME, individuals must complete a residency program in order to practice medicine.

According to the *2021 Report on Residents* by the AAMC, 11,113 of the 16,521 residents (67.3 percent) who completed residency training in Texas from 2011 through 2020 are currently practicing in the state.[8] Moreover, Texas ranked third among the states (behind California and Alaska) with the highest physician retention rate from residency training.

UME and GME Availability in Texas

Texas currently has 15 medical schools, including 12 medical schools that offer the Doctor of Medicine degree and three that offer the Doctor of Osteopathic Medicine

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[6] Accreditation Council for Graduate Medical Education. What We Do. https://www.acgme.org/what-we-do/overview/. Accessed November 15, 2021.
[7] Accreditation Council for Graduate Medical Education. About Us. https://www.acgme.org/about-us/overview/. Accessed November 15, 2021.
[8] Association of American Medical Colleges. 2021 Report on Residents: Table C6. Physician Retention in State of Residency Training, by State. https://www.aamc.org/data-reports/students-residents/interactive-data/report-residents/2021/table-c6-physician-retention-state-residency-training-state. Accessed November 15, 2021.

degree.[9] Of the 15 medical schools in the state, six were established in recent years, with their first year of enrollment ranging from 2016 to 2020. The number of students entering medical schools in Texas increased from 1,454 in 2006 to an estimated 2,223 in 2020. In addition, the number of medical school graduates in Texas increased from 1,314 in 2007 to 1,977 in 2021. Among the 10 most populous states in 2020, Texas and California were tied for second place in the highest number of medical schools (behind New York).

Overall, the number of residency and fellowship slots that were filled in Texas increased from 6,779 in 2011 to 8,685 in 2019.[10] During these years, the number of first-year residents increased from 1,494 to 1,950. Therefore, the percentage of residency and fellowship slots that were filled by first-year residents increased slightly from 2011 to 2019, from 22.0 percent to 22.5 percent.

In 2011, the Texas legislature codified the goal of achieving and maintaining a 1.1 to 1 ratio of first-year residency slots to medical school graduates in Texas.[11] Texas achieved the goal of a 1.1 to 1 ratio of first-year residency slots to medical school graduates in 2017 and 2019.

Physician Shortages

In 2018, the number of active physicians was 277.8 per 100,000 population nationwide, while the corresponding number of active physicians for Texas was 224.8 per 100,000 population.[12] Moreover, Texas ranked 41st among the 50 states in the number of active physicians per 100,000 population.

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[9] Texas Higher Education Coordinating Board. The Graduate Medical Education (GME) Report: An Assessment of Opportunities for Graduates of Texas Medical Schools to Enter Residency Programs in Texas. https://reportcenter.highered.texas.gov/reports/legislative/graduate-medical-education-report-an-assessment-of-opportunities-for-graduates-of-texas-medical-schools-to-enter-residency-programs-in-texas-fy2020/. Published October 2020. Accessed November 23, 2021.

[10] Texas Higher Education Coordinating Board. The Graduate Medical Education (GME) Report: An Assessment of Opportunities for Graduates of Texas Medical Schools to Enter Residency Programs in Texas. https://reportcenter.highered.texas.gov/reports/legislative/graduate-medical-education-report-an-assessment-of-opportunities-for-graduates-of-texas-medical-schools-to-enter-residency-programs-in-texas-fy2020/. Published October 2020. Accessed November 23, 2021.

[11] Chapter 61 of the Texas Education Code, Section 61.0661.

[12] Association of American Medical Colleges. 2019 State Physician Workforce Data Report. https://store.aamc.org/downloadable/download/sample/sample_id/305/. Published November 2019. Accessed November 22, 2021.

According to the Bureau of Labor Statistics, the projected job growth of physicians and surgeons nationwide from 2020 to 2030 is slower than average at 3 percent.[13] However, demand for physicians is projected to increase due to the aging and growing population.

In 2021, the AAMC issued a report projecting the supply and demand for physicians nationally from 2019 to 2034.[14] Results from this report indicate that there will be an estimated shortage of 37,800 to 124,000 physicians nationwide by 2034. This projected shortage includes 17,800 to 48,000 primary care physicians and 21,000 to 77,100 non-primary care specialty physicians.

DSHS issued a report in 2020 projecting the supply and demand for all physicians and 35 physician specialties in Texas from 2018 through 2032.[15] Projections on medical school enrollment and residency slots by the Texas Higher Education Coordinating Board were included in health workforce modeling used for the supply and demand projections in the report. Results indicate that the state's GME system will not create a supply of physicians that can meet projected demand. The shortage of all physicians statewide is projected to increase from 6,218 full-time equivalents (FTE) in 2018 to 10,330 FTEs in 2032.

Physician Retention

When considering both medical education and physician deficits in the state of Texas, a central topic of concern is retention of GME-trained physicians in the state where they trained.[16] From 2011-202020, 67.3 percent of those physicians who

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[13] U.S. Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook: Physicians and Surgeons: Job Outlook. https://www.bls.gov/ooh/healthcare/physicians-and-surgeons.htm#tab-6. Accessed November 22, 2021.
[14] Association of American Medical Colleges. The Complexities of Physician Supply and Demand: Projections From 2019 to 2034. https://www.aamc.org/media/54681/download. Published June 2021. Accessed November 22, 2021.
[15] Texas Department of State Health Services. Texas Physician Supply and Demand Projections, 2018 - 2032. https://dshs.texas.gov/legislative/2020-Reports/TexasPhysicianSupplyDemandProjections-2018-2032.pdf. Published May 2020. Accessed November 22, 2021.
[16] Utah Medical Education Council. Utah GME Retention Report: Academic Year 2019-2020. https://umec.utah.gov/wp-content/uploads/Retention.pdf. Published 2020. Accessed February 25, 2022.

completed their GME in Texas went on to practice in Texas.[17] This places Texas above the national average for 2011-2020, with a national rate of 57.1 percent of physicians going on to practice in the same state they completed their GME.[18] Furthermore, of those who completed both their UME and GME in Texas, 86.2 percent went on to practice in Texas. The state of Texas has one of the highest physician retention rates when medical school and residency training both occurred in Texas, ranking third (behind Hawaii and California).

Texas Physician Pipeline Model

All calculations in this report utilized the Texas Physician Pipeline Model. The Texas Physician Pipeline Model is a tool that was developed by IHS Markit. This tool builds upon the supply and demand models that were presented in the previous iteration of this required report published in 2020 on physician supply and demand projections. In developing this tool, IHS Markit used data gathered from the American Medical Association Masterfile and DSHS. When determining the impact of changes in the number of UME and GME spaces on the number of physicians practicing in Texas, the model considers the impact of choices of specialty and location of both UME and GME education. The model also relies on an assumption that all new UME and GME slots made available will be utilized.

Strengths and Limitations

Both the key strengths and the key limitations of the projections in this report lie in the ability of historical behaviors to predict future outcomes.

The main strength of the Texas Physician Pipeline Model lies in the use of state-level medical school graduation numbers which provide an accurate depiction of the production of new physicians over the last two decades in Texas. Likewise, the main strength of the supply side projections is the use of state-level physician licensure data. These data provide a timely and accurate count of the number of physicians

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[17] Association of American Medical Colleges. 2021 Report on Residents: Table C6. Physician Retention in State of Residency Training, by State. https://www.aamc.org/data-reports/students-residents/interactive-data/report-residents/2021/table-c6-physician-retention-state-residency-training-state. Accessed November 15, 2021.

[18] Association of American Colleges. 2021 Report on Residents: Physician Retention in State of Residency Training, by Last Completed GME Specialty. https://www.aamc.org/data-reports/students-residents/interactive-data/report-residents/2021/table-c4-physician-retention-state-residency-training-last-completed-gme. Published 2021. Accessed April 27, 2022.

practicing in Texas along with their demographics and practice specialties. The main strengths of the demand side projections are the use of state-level population numbers and demographics, which provide a sound starting point for estimating the population's demand for health care services.

As with any model, there are also limitations. The primary limitation of the Texas Physician Pipeline Model stems from using historical data to forecast future trends. It is possible that physicians in the future would be more likely or less likely to want to practice in Texas based on factors outside of those included in the model. Additionally, the more time passes, the less applicable findings based on 2000-2019 data will be.

There are also a number of limitations on the demand side of the model. The demand projections model the impact of changing demographics over time while health care use and delivery patterns remain the same. The baseline demand projections also assume that disease prevalence and health risk factors will remain consistent by demographic groups over time. The demand projections are also modeled on national health care use patterns rather than state-specific utilization patterns. Additionally, as access to care changes, models of care transform, and technology improves health practices and outcomes, it is difficult to predict how health care use and delivery patterns as well as disease prevalence and health risk factors will change demand over time.

Another limitation of this tool is that the supply and demand models were based on data from 2015-2018, and the educational pipeline models are based on historical data through 2019. The COVID-19 pandemic first appeared in Texas in March of 2020 and its impact on health practices, health providers, and the health system at large cannot be overstated. In future reports, DSHS may use data that reflects the impact of the COVID-19 on the education pipeline, as well as supply and demand trends.

State of UME, GME, and Practice, 2000-2019

The Texas Physician Pipeline Model uses several data sources to provide accurate projections. The data comes from the American Medical Association Masterfile and DSHS. The following tables (Tables 1-3) provide information on the location of Texas physicians' UME, GME and location of practice as well as a breakdown by specialty.

In Table 1, from 2000 to 2019, 50.6 percent of Texas UME graduates completed GME in another state, while 49.4 percent remained in Texas.

Table 1. State of Graduate Medical Education for Texas Medical School Graduates, 2000-2019

State of Graduate Medical Education	Graduates	Percentage
Other State	10,006	50.6%
Texas	9,752	49.4%
Total	**19,758**	**100.0%**

In Table 2, when comparing the GME and practice states among physicians who graduated from a Texas medical school between 2000 and 2019, those who completed their GME in Texas and then practiced in Texas (42.6 percent) were the most common finding. Results also indicate that 15.1 percent of Texas medical school graduates that completed GME in another state returned to Texas to practice.

Table 2. State of Graduate Medical Education and Practice for Texas Medical School Graduates, 2000-2019

State of Graduate Medical Education	State of Practice	Total	Percentage
Other State	Other State	7,018	35.5%
Other State	Texas	2,988	15.1%
Texas	Other State	1,341	6.8%
Texas	Texas	8,411	42.6%
Total		**19,758**	**100.0%**

In Table 3, among physicians who completed their GME in Texas between 2000 and 2019, there was a fairly even split between those who completed their UME in another state (40.8 percent) and those who completed their UME in Texas (40.1 percent); however, those who graduated from an international UME only made up 19.1 percent of those who completed their GME in Texas. Family medicine was the most common practice specialty for physicians who completed their UME in Texas. The least common practice specialty for those that completed their GME in Texas was colorectal surgery.

Table 3. Location of UME for Physicians Who Completed GME in Texas by Specialty, 2000-2019[19]

Specialty	International Medical School	Other State Medical School	Texas Medical School	Total
Allergy & Immunology	16.9%	54.3%	28.8%	431
Anesthesiology	13.3%	38.2%	48.5%	4,113
Cardiology	29.1%	46.3%	24.6%	2,298
Colorectal Surgery	21.9%	54.1%	24.0%	242
Critical Care Medicine	38.4%	37.7%	23.9%	297
Dermatology	3.1%	51.8%	45.1%	1,057
Emergency Medicine	6.5%	54.5%	39.0%	2,994
Endocrinology	39.7%	34.3%	26.1%	633
Family Medicine	24.8%	22.7%	52.5%	7,819
Gastroenterology	22.7%	47.3%	29.9%	1,236
General Internal Medicine	23.3%	30.6%	46.0%	4,702
General Surgery	10.1%	47.9%	41.9%	2,209
Hematology & Oncology	33.2%	43.8%	23.0%	1,684
Infectious Diseases	38.6%	39.4%	22.1%	775
Neonatology	28.2%	41.0%	30.8%	507
Nephrology	43.3%	32.2%	24.5%	995
Neurological Surgery	12.5%	49.3%	38.2%	353
Neurology	31.5%	35.9%	32.5%	1,027
Obstetrics & Gynecology	7.3%	41.5%	51.2%	4,024
Ophthalmology	6.6%	58.4%	35.0%	1,727
Orthopedic Surgery	4.3%	58.7%	37.0%	2,213
Other Specialties	18.6%	52.0%	29.5%	2,175
Otolaryngology	4.2%	54.2%	41.6%	882
Pathology	32.4%	39.0%	28.7%	2,453
Pediatrics	18.2%	34.6%	47.2%	4,537
Physical Medicine & Rehabilitation	19.8%	51.4%	28.8%	1,286
Plastic Surgery	8.4%	57.5%	34.1%	963
Psychiatry	27.6%	26.4%	46.0%	3,002
Pulmonology	32.9%	36.7%	30.4%	862
Radiation Oncology	16.0%	58.3%	25.7%	530
Radiology	9.0%	48.0%	42.9%	2,792
Rheumatology	34.9%	38.5%	26.6%	384
Thoracic Surgery	24.7%	54.1%	21.2%	567
Urology	6.0%	56.5%	37.5%	885
Vascular Surgery	23.7%	50.0%	26.3%	472
All Specialties	**19.1%**	**40.8%**	**40.1%**	**63,126**

From 2000 to 2019, 58.9 percent of physicians who completed GME in Texas ultimately stayed in the state to practice (see Appendix B.1. When considering the

[19] All percentages in this report are rounded to the tenths place. Subsequently, some calculations may not equal 100%.

specialty and medical school location of physicians, the three highest retention rates were for Texas medical school graduates with a specialty in family medicine (88.3 percent), allergy and immunology (86.9 percent), and general internal medicine (85.3 percent). The three lowest retention rates for Texas medical school graduates were specialties in neurological surgery (65.5 percent), thoracic surgery (67.9 percent), and radiation oncology (68.9 percent). Family medicine was the most common specialty among Texas medical school graduates who completed GME in Texas between 2000 and 2019 (14.5 percent), followed by pediatrics (9.7 percent) and general internal medicine (9.3 percent). Thoracic surgery was the least common specialty among Texas medical school graduates who completed GME in Texas between 2000-2019 (0.1 percent), followed by colorectal surgery (0.2 percent) and vascular surgery (0.3 percent).

3. Projection Results

Scenario Overview

Calculations were determined using the Texas Physician Pipeline Model tool. This section focuses on primary care specialties and psychiatry. It provides four different scenarios that consider the impact that changes in the number of UME and GME slots would have on the number physicians practicing within different specialties in Texas. For UME projections, the years used to determine the number of additional individuals that would need to graduate from Texas medical schools were 2026-2032. These years were used because UME takes four years, and therefore students who begin their UME in 2022 would graduate in 2026. For GME projections, the years used to determine the number of additional residency slots was 2023-2032. In each of the tables (Tables 4-7), the number of additional slots that are needed to close the projected deficit must be added year over year, cumulatively. Finally, the model and results from the model utilize data on UME and GME as of early 2020.

Undergraduate Medical Education Only

The Texas Physician Pipeline Model was used to estimate how many additional medical school graduates Texas would need to meet demand in 2032, if increasing Texas UME was the sole method of increasing physician supply. UME refers to the formal education an individual receives while in medical school. This stage in a physician's education typically lasts four years. In determining the number of additional UME graduates that are needed, the model factors in the likelihood that individuals will ultimately choose to practice in Texas after completing their GME. The projected demand considers the growing Texas population, but only at the rates of growth between 2016-2018 and not any impacts of change since that period. The final column in Table 4 presents the number of additional graduates each Texas medical school would need to produce every year between 2026 and 2032 to overcome the projected deficit.

Within the four specialties that comprise primary care physicians (family medicine, general internal medicine, pediatrics, and obstetrics/gynecology) and psychiatry, each specialty will face a deficit of over 10 percentage points in 2032.

In the first scenario (Table 4), if increasing Texas UME slots was the sole method of increasing physician supply, each of Texas' medical schools would need to have an additional 88 new graduates per year, for each year beginning in 2026, in order to meet the 2032 demand for primary care physicians specializing in family medicine. If no changes are made, the supply of family medicine specialists is projected to only meet 78.3 percent of demand by 2032. For general internal medicine physicians, each Texas medical school would need to increase the number of graduates by 149 students each year. Without these increases, Texas would only meet 74.8 percent of the projected demand by 2032. For obstetrics and gynecology, there would need to be an increase of 33 graduates each year in each of Texas' medical schools. Without these additional graduates, 89.8 percent of the need will be met in 2032. By 2032, Texas is expected to meet 71 percent of the demand for pediatrics specialists in 2032. To combat the need for physicians specializing in pediatrics, all Texas medical schools would need an additional 109 UME graduates each year.

For psychiatry, the percent of demand met will be 73.2 percent in 2032, if no additional graduate are added.; Adding 125 new graduates per year at each school would fulfill the demand for psychiatrists.

Table 4. Projected Supply and Demand and New Undergraduate Medical Education Graduates Needed to Meet 2032 Deficit for Primary Care Physicians and Psychiatrists

Specialty	2032 Supply (FTEs)	2032 Demand (FTEs)	2032 Deficit (FTEs)	2032 Percent Demand Met	Additional UME Graduates Each Year Over the Previous Year to Meet Demand (Per School)
Family Medicine	9,004	11,499	2,495	78.3%	88
General Internal Medicine	7,759	10,366	2,607	74.8%	149
Obstetrics & Gynecology	3,783	4,210	427	89.8%	33
Pediatrics	4,675	6,588	1,913	71.0%	109
Psychiatry	2,852	3,895	1,143	73.2%	125

Graduate Medical Education Only

While increasing the number of UME students in Texas can be used to help address physician shortages in Texas, increasing the number of GME residencies in certain specialties with greater demand may be more impactful. Specifically, the second scenario (Table 5) provides the number of additional spots that would need to be introduced in Texas year after year to meet the 2032 demand for PCPs and psychiatry if increasing GME spots was the only method used for increasing the number of physicians in the state. For those completing their residency in family medicine, GME slots in Texas would need to increase by a total of 61 residency slots per year, for each year beginning in 2023. For general internal medicine physicians, GME residency slots would need to add an additional 70 residents each year in the state. For obstetrics and gynecology, there would need to be an increase of 13 additional GME residency slots each year to meet projected demand in the state. Texas would also need to add an additional 55 pediatric GME residency slots each year to meet the projected demand for 2032. Finally, for psychiatry, there would need to be an increase of 31 GME residency slots each year to address the projected deficit.

Table 5. Projected Demand and New Graduate Medical Education Residents Needed to Meet 2032 Demand for Primary Care and Psychiatry Specialties

Specialty	2032 Supply (FTEs)	2032 Demand (FTEs)	2032 Deficit (FTEs)	2032 Percent Demand Met	Additional GME Residency Slots Each Year Over the Previous Year to Meet Demand
Family Medicine	9,004	11,499	2,495	78.3%	61
General Internal Medicine	7,759	10,366	2,607	74.8%	70
Obstetrics & Gynecology	3,783	4,210	427	89.8%	13
Pediatrics	4,675	6,588	1,913	71.0%	55
Psychiatry	2,852	3,895	1,143	73.2%	31

Alternative Scenarios – 10 Percent and 5 Percent Increases

Two other scenarios are also considered. One scenario (Table 6) considers the impact of a ten percent yearly increase in GME slots between 2023-2032, while the

other scenario (Table 7) considers the impact of a five percent increase in GME slots over that same period of time.

Table 6 demonstrates that for family medicine, a yearly ten percent increase in GME slots until 2032 would result in an additional 1,758 physicians practicing family medicine. This would fulfill over two-thirds of the current deficit predicted for 2032. For general internal medicine, a yearly ten percent increase in GME slots would result in an additional 3,022 physicians practicing general internal medicine in the state than are currently projected. This would create a surplus of general internal medicine physicians.[20, 21] For obstetrics and gynecology, a yearly ten percent increase in GME slots would result in an additional 516 physicians practicing obstetrics and gynecology. This would create a surplus of obstetrics and gynecology physicians. For pediatrics, a yearly ten percent increase in GME slots would result in an additional 951 physicians practicing pediatrics. This would fulfill approximately half of the current deficit predicted for 2032. For psychiatry, a yearly ten percent increase in GME slots would result in an additional 671 physicians practicing psychiatry. This would fulfill almost three-fifths of the current deficit predicted for 2032.

[20] When considering potential changes in GME, it is important to note that some of the specialties included under Primary Care, particularly General Internal Medicine residents, are a first step to becoming a specialist in a non-Primary Care specialty. According to Long et. al. (2016), approximately four-fifths of internal medicine residents and nearly two-thirds of primary care internal medicine residents do not plan to have a career in primary care or general internal medicine. Therefore, only a fraction of the increase in General Internal Medicine GME residencies would help to alleviate shortages in Primary Care in Texas.

[21] Long, Theodore, MD MHS; Krisda Chaiyachati, MD MPH; Olatunde Bosu, MD; Sohini Sircar; Bradley Richards, MD; Megha Garg, MD; Kelly McGarry, MD; Sonja Solomon, MD; Rebecca Berman, MD; Leslie Curry, PhD MPH; John Moriarty, MD; and Stephen Huot, MD PhD. Why Aren't More Primary Care Residents Going into Primary Care? A Qualitative Study. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5130953/#:~:text=BACKGROUND,care%20or%20general%20internal%20medicine. Published December 2016. Accessed February 22, 2022.

Table 6. Projected Impact of 10 Percent Increase of Graduate Medical Education Residents for Primary Care and Psychiatry Specialties

Specialty	2032 Supply (FTEs)	2032 Demand (FTEs)	2032 Deficit (FTEs)	10 Percent Increase Per Year GME Resident Yield	Percent of Deficit Met By 10 Percent Increase
Family Medicine	9,004	11,499	2,495	1,758	70.4%
General Internal Medicine	7,759	10,366	2,607	3,022	115.9%
Obstetrics and Gynecology	3,783	4,210	427	516	120.8%
Pediatrics	4,675	6,588	1,913	951	49.7%
Psychiatry	2,852	3,895	1,143	671	58.7%

The results in Table 7 show that for family medicine, a yearly five percent increase in GME slots would result in an additional 749 physicians practicing family medicine. This would fulfill approximately a third of the current deficit projected for 2032. For general internal medicine, a yearly five percent increase in GME slots would result in an additional 1,286 physicians practicing general internal medicine. This would fulfill approximately half of the current deficit projected for 2032. For obstetrics and gynecology, a yearly five percent increase in GME slots would result in an additional 220 physicians practicing obstetrics and gynecology. This would fulfill approximately half of the current deficit projected for 2032. For pediatrics, a yearly five percent increase in GME slots would result in an additional 405 physicians practicing pediatrics. This would fulfill over a fifth of the current deficit projected for 2032. For psychiatry, a yearly five percent increase in GME slots would result in an additional 285 physicians practicing psychiatry. This would fulfill one fourth of the current deficit projected for 2032.

Table 7. Projected Impact of Five Percent Increase of Graduate Medical Education Residents for Primary Care and Psychiatry Specialties

Specialty	2032 Supply (FTEs)	2032 Demand (FTEs)	2032 Deficit (FTEs)	5 Percent Increase Per Year GME Resident Yield	Percent of Deficit Met By 5 Percent Increase
Family Medicine	9,004	11,499	2,495	749	30.0%
General Internal Medicine	7,759	10,366	2,607	1,286	49.3%
Obstetrics and Gynecology	3,783	4,210	427	220	51.5%
Pediatrics	4,675	6,588	1,913	405	21.2%
Psychiatry	2,852	3,895	1,143	285	25.0%

Scenario Results Observations

Collectively, a combination of increases in UME and GME can help to address physician shortages in Texas. Increases in UME slots at medical schools create a larger supply of physicians in the state overall, while increases in GME residency slots provides residency opportunities in Texas which may increase the likelihood of physicians to remain and practice in Texas.

Without any action to increase physicians in Texas, the gaps between supply and demand will widen between 2022 and 2032.

4. Conclusion

This report presents information on the medical education pipeline in the state of Texas. This report also identifies the potential impact that changes in the medical education system would have on the supply of physicians in primary care and psychiatry specialties in the state.

Projected deficits vary greatly based on specialty, meaning the number of additional medical education slots needed to meet projected needs vary, as well. For example, based on the medical education pipeline as it currently stands, the GME slots would have to increase for all primary care physician specialties. Whereas obstetrics and gynecology would require a yearly increase of 13 additional new resident slots, general internal medicine would require a yearly increase of 70 additional new resident slots to overcome the projected deficit. Meanwhile, to overcome the projected deficit in psychiatry, the specialty would require a yearly increase of 31 additional new resident slots.

Current Texas Higher Education Coordinating Board projections in medical school enrollment and resident slots indicate the state's GME system will not create a supply of physicians that can meet projected demand. The different scenarios demonstrate a need to increase both UME and GME enrollment, as well as a need for physician recruitment strategies beyond the medical education system in Texas. Such strategies may include approaches to incentivize physicians moving to Texas to practice, and they may also specifically target those specialties with the largest projected deficits.

Unless corrective measures are taken, the shortage of physicians in Texas will persist beyond 2032. As the legislature continues to analyze the shortage of physicians in the state, DSHS will continue to work with stakeholders to ensure accurate and consistent understanding of the shortages facing Texas today and in the future.

Appendix A. List of Acronyms

Acronym	Full Name
AAMC	American Association of Medical Colleges
DSHS	Texas Department of State Health Services
FTE	Full-time Equivalent
GME	Graduate Medical Education
HPRC	Health Professions Resource Center
PCP	Primary Care Physician
UME	Undergraduate Medical Education

Appendix B. Physician Specialties and Education

Table B.1 Probability that Texas GME Residents Practice in Texas by Specialty and UME Location

Specialty	International	Other State	Texas
Allergy & Immunology	55.9%	32.5%	86.9%
Anesthesiology	59.2%	35.9%	82.6%
Cardiology	55.8%	32.3%	79.8%
Colorectal Surgery	38.6%	21.2%	76.4%
Critical Care Medicine	47.4%	37.4%	83.3%
Dermatology	59.3%	30.9%	75.6%
Emergency Medicine	61.1%	43.7%	84.6%
Endocrinology	64.2%	46.4%	76.6%
Family Medicine	68.8%	48.1%	88.3%
Gastroenterology	52.4%	35.0%	82.0%
General Internal Medicine	61.8%	44.5%	85.3%
General Surgery	50.0%	36.8%	77.8%
Hematology & Oncology	50.9%	36.5%	77.9%
Infectious Diseases	58.8%	32.9%	77.9%
Neonatology	61.7%	46.4%	74.0%
Nephrology	62.1%	36.4%	78.3%
Neurological Surgery	50.0%	32.4%	65.5%
Neurology	52.4%	33.8%	71.7%

Specialty	International	Other State	Texas
Obstetrics & Gynecology	55.1%	36.5%	81.0%
Ophthalmology	52.2%	25.7%	75.4%
Orthopedic Surgery	60.9%	24.9%	76.8%
Other Specialties	58.3%	34.0%	77.8%
Otolaryngology	50.0%	26.0%	76.9%
Pathology	50.9%	33.5%	74.8%
Pediatrics	62.1%	37.9%	82.1%
Physical Medicine & Rehabilitation	51.9%	36.8%	78.0%
Plastic Surgery	44.1%	30.0%	72.7%
Psychiatry	60.8%	50.7%	81.0%
Pulmonology	61.4%	41.0%	81.7%
Radiation Oncology	57.4%	31.2%	68.9%
Radiology	61.7%	36.5%	81.6%
Rheumatology	57.5%	32.5%	73.3%
Thoracic Surgery	37.6%	22.1%	67.9%
Urology	42.1%	25.7%	75.0%
Vascular Surgery	37.0%	22.9%	76.6%

Table B.2. Specialty Distribution of Texas Medical School Graduates Who Completed Graduate Medical Education in Texas, 2000-2019

Specialty	Total
Allergy & Immunology	41
Anesthesiology	787
Cardiology	211
Colorectal Surgery	18
Critical Care Medicine	46
Dermatology	248
Emergency Medicine	548
Endocrinology	92
Family Medicine	1,417
Gastroenterology	176
General Internal Medicine	903
General Surgery	367
Hematology & Oncology	174
Infectious Diseases	52
Neonatology	77
Nephrology	106
Neurological Surgery	60
Neurology	130
Obstetrics & Gynecology	701
Ophthalmology	205

Specialty	Total
Orthopedic Surgery	282
Other Specialties	192
Otolaryngology	102
Pathology	209
Pediatrics	942
Physical Medicine & Rehabilitation	205
Plastic Surgery	118
Psychiatry	497
Pulmonology	129
Radiation Oncology	70
Radiology	447
Rheumatology	53
Thoracic Surgery	14
Urology	102
Vascular Surgery	31
Total	9,752