

State-Level Projections of Supply and Demand for Primary Care Practitioners: 2013-2025

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Contents

Overview.....	4
Key Findings.....	5
Primary Care Physicians.....	5
Primary Care Nurse Practitioners.....	6
Primary Care Physician Assistants.....	6
Background.....	7
Trends in Primary Care Physician Supply and Demand:.....	9
Exhibit 1: Supply Baseline and Projected Primary Care Physician Supply and Demand, by State, 2013 and 2025.....	11
Exhibit 2: Primary Care Physician Supply versus Demand, by State, 2025.....	13
Trends in Primary Care Nurse Practitioner (NP) Supply and Demand.....	14
Exhibit 3: Baseline and Projected Primary Care Nurse Practitioner Supply and Demand, by State, 2013 and 2025.....	15
Trends in Primary Care Physician Assistant (PA) Supply and Demand:.....	17
Exhibit 4: Baseline and Projected Primary Care Physician Assistant Supply and Demand, by State, 2013 and 2025.....	18
Exhibit 5: Primary Care Physician Assistant Supply versus Demand, by State, 2025.....	20
Exhibit 6: Primary Care Physician Adequacy, by State, 2025.....	21
Exhibit 7: Primary Care Nurse Practitioner Adequacy, by State, 2025.....	22
Exhibit 8: Primary Care Physician Assistant Adequacy, by State, 2025.....	23
Provider Summaries.....	24
Exhibit 9: Supply – Demand Differences and Supply Adequacy, by State and Provider Type, 2025.....	25
Strengths and Limitations.....	27
Conclusions.....	28
Appendix A: Provider Overview.....	32
Physicians.....	32
Nurse Practitioners.....	32

Physician Assistants..... 34

Appendix B: Summary of Scope of practice (SOP) for Nurse Practitioners and Physician Assistants..... 35

 Exhibit B-1: State level summary of scope of practice (SOP) at the state level for nurse practitioners (NPs) and physician assistants (PA). 35

About the Health Workforce Simulation Model..... 37

State-Level Projections of Supply and Demand for Primary Care Practitioners: 2013-2025

Overview

This report presents state-level projections of U.S. supply and demand for primary care practitioners in 2025, with 2013 data serving as baseline. These projections supplement the estimates presented in “National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025,” prepared by the Health Resources and Services Administration (HRSA).¹ State-level projections were developed using the same Health Workforce Simulation Model (HWSM) used to produce HRSA’s national and regional projections. Primary care practitioners considered in these state-level estimates include physicians, nurse practitioners (NPs), and physician assistants (PAs).

HRSA’s HWSM is an integrated microsimulation model that estimates current and future supply and demand for health workers in multiple professions and care settings. The state provider supplies were projected by simulating each state by estimating where the providers will practice given existing shortage/surplus, as well as hours worked based on current patterns of work by demographic groups. The demand estimates were derived by pro-rating the national demand for health care services based on the population characteristics of the states (e.g., age, sex, household income, insurance status, health status, etc.). The 2013 state demand estimates also reflect allocation of the approximately 8,200 primary care physicians needed to de-designate health professions shortage areas. All supply and demand projections are reported as full time

¹ U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. 2015. National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2015. Rockville, MD. Available from: <http://bhpr.hrsa.gov/healthworkforce/>.

equivalents (FTEs). A detailed description of the HWSM can be found in the accompanying technical document available at <http://bhwh.hrsa.gov/healthworkforce/index.html>.

All projection models are sensitive to assumptions and the findings must be interpreted in light of those assumptions. An underlying model assumption in HWSM is that health care delivery in the future (projected until 2025) will not change substantially from the way care was delivered in the base year (2013); and current rates of workforce participation and retirement will continue similarly into the future. Changes in any of these factors may significantly impact both the supply and demand projections for all three types of primary care providers included in this report. Thus, it is important to note that the numbers presented here represent a planning tool for workforce development and should not be looked upon as exact numbers.

Key Findings

Primary Care Physicians

There is substantial state-level variation between projected supply and demand for primary care physicians in 2013 and 2025.

- Looking at each state's 2013 primary care physician supply minus its 2013 demand reveals both shortages and surpluses at the state level. The greatest shortage is seen in Texas, where the undersupply is estimated to be 2,840 FTE primary care physicians. The largest surplus is seen in Massachusetts, with an estimated oversupply of 1,230 FTE physicians. A total of 29 states had an estimated shortage of primary care physicians in 2013, with 2 states having shortages of more than 1,000 FTE physicians (Florida, Texas). Only Massachusetts had a surplus of more than 1,000 FTE primary care physicians.
- Projected differences between each state's 2025 supply and its 2025 demand range from a shortage of 3,060 FTE primary care physicians in Florida to a surplus of 890 FTE physicians in Massachusetts. Thirty-seven states are projected to have a shortage of primary care physicians in 2025, with 12 of these states having a deficit of 1,000 or more FTEs.

Primary Care Nurse Practitioners

Projected differences between supply and demand for primary care NPs vary across states.

- Looking at each state's 2013 primary care NP supply minus its 2013 NP demand again reveals both shortages and surpluses.² These range from an estimated shortage of 1,900 FTE primary care NPs in California to an estimated surplus of 1,090 FTE NPs in Tennessee. Twenty-three states had an estimated shortage of primary care NPs in 2013, but only California had a deficit of more than 1,000 FTE NPs. Only Tennessee had a surplus of more than 1,000 FTE primary care NPs.
- In 2025, no state is projected to have a shortage of primary care NPs. Projected surpluses range from less than 100 FTE NPs (4 states and the District of Columbia) to 5,350 FTE NPs (Texas). Thirteen states are projected to have a primary care NP surplus in excess of 1,000 FTEs in 2025.

Primary Care Physician Assistants

Projected differences between supply and demand for primary care PAs vary across states.

- Differences between each state's 2013 primary care PA supply and its 2013 PA demand range from an estimated shortage of 840 FTE primary care PAs in Ohio to an estimated surplus of 870 FTE PAs in North Carolina.³ Twenty-two states had an estimated shortage of primary care PAs in 2013. None of the estimated 2013 shortages or surpluses exceeded 1,000 FTE primary care PAs.

² At the national level, baseline primary care NP supply is assumed to be equal to baseline primary care NP demand. However, at the state level, baseline supply reflects labor market differences, local economic differences, and provider demographics, while baseline demand captures the state population's demographics, health status, health care use, and insurance status. As a result, both baseline shortages and baseline surpluses are observed at the state level. For additional information, please see "About the Model" on the last page of this report, as well as the HWSM technical documentation available at <http://bhw.hrsa.gov/healthworkforce/index.html>.

³ At the national level, baseline primary care PA supply is assumed to be equal to baseline primary care PA demand. However, at the state level, baseline supply reflects labor market differences, local economic differences, and provider demographics, while baseline demand captures the state population's demographics, health status, health care use, and insurance status. As a result, both baseline shortages and baseline surpluses are observed at the state level. For additional information, please see "About the Model" on the last page of this report, as well as the HWSM technical documentation available at <http://bhw.hrsa.gov/healthworkforce/index.html>.

- Differences between each state’s 2025 primary care PA supply and its 2025 PA demand range from a projected shortage of 560 FTE primary care PAs in Ohio to a projected surplus of 2,260 FTE PAs in California. A total of nine states are projected to have a primary care PA shortage in 2025, while five states are projected to have a surplus in excess of 1,000 FTEs.

Background

The Institute of Medicine’s Committee on the Future of Primary Care defined primary care as:

[T]he provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.⁴

Medical disciplines that meet the criteria for a primary care practitioner include general and family medicine, general internal medicine, geriatrics, and general pediatrics. While the majority of the nation’s hospitalists – practitioners who mainly provide care to hospitalized patients – are trained in primary care specialties, they are excluded from physician counts in this study because they are not engaged in activities that meet the above definition of primary care. Other specialists (e.g., cardiologists, endocrinologists, obstetricians/gynecologists) are also excluded from this study, even though these practitioners may serve as sources of primary health care for some individuals.

This report uses a more narrow definition of primary care services as those provided by practitioners in general and family medicine, general internal medicine, geriatrics, and general pediatrics and excludes practitioners in these fields who provide these services only in hospitals. While this definition may underestimate aggregate primary care capacity, the definition is

⁴ Institute of Medicine, Division of Health Care Services, Committee on the Future of Primary Care. 1996. Donaldson, M. S., Yordy, K. D., Lohr, K. N., & Vanselow, N. A. (Eds.). Primary care: America’s health in a new era. Washington, DC: National Academy Press. Accessed 10/01/2015: www.nap.edu/catalog.php?record_id=5152.

consistent with the generalist medical disciplines targeted by certain federal policies. The National Center is also preparing reports on selected disciplines, where specialists' roles in providing primary care will be discussed.

Providers generally included in the definition of primary care practitioners include physicians, NPs, and PAs who trained and practice in primary care disciplines (i.e., general and family medicine, general internal medicine, geriatrics, and general pediatrics). Training and licensing requirements for each of these groups are briefly described in Appendix A.

Results

Future supply and demand for primary care practitioners will be affected by a host of factors, including population growth, the aging of the nation's population, overall economic conditions, expanded health insurance coverage, changes in health care reimbursement, geographic location, and health workforce availability. The HWSM is an integrated microsimulation model that estimates supply and demand for health workers in multiple professions and care settings, and accounts for these factors when adequate data are available to estimate their impact.⁵

In developing the projections presented here, baseline demand for primary care physicians was assumed to be equal to the 2013 primary care physician supply plus the approximately 8,200 FTE physicians required to eliminate shortages in the HRSA-designated HPSAs.⁶ Baseline demands for NPs and PAs were assumed to be equal to 2013 supplies at the national level, consistent with standard workforce research methodology for analyses like these where there are no consistent data sources available to estimate base year shortages/surpluses. At the state level, baseline supplies were estimated directly from provider databases, while baseline demands were estimated from the state population demographics, health status, health care use,

⁵ For additional information about the HWSM, please see "About the Model" on the last page of this report.

⁶ U.S. Department of Health and Human Services, Health Resources and Services Administration. 2015. Shortage Designation: Health Professional Shortage Areas & Medically Underserved Areas/Populations. Accessed 10/1/2015: <http://www.hrsa.gov/shortage/index.html>.

and insurance status, using state population characteristics to prorate baseline demand for health care providers including the number of physicians that would be required to de-designate HPSA areas.⁷ Thus, baseline provider supply and demand are not in equilibrium at the state level.

Trending forward, supply projections reflect the estimated number of new entrants to each profession who choose to practice in the state, and the number of practitioners lost due to retirement and mortality, as well as changes in the average number of hours worked based on provider demographics. Demand projections reflect impacts associated with both changes in population demographics and projected changes in insurance coverage under the Affordable Care Act, but do not account for potential changes in how health care is delivered. All supply and demand projections are reported as FTEs.

In spite of the rigorous methodology followed to develop these projections, it is important to note that, the estimates in this report are derived from a statistical process that is based on probabilistic methods. Some amount of uncertainty is therefore, inherent in these estimates. Furthermore, as in all projection models, the numbers presented here are sensitive to baseline assumptions, and the findings must be interpreted in light of those assumptions. Given this characteristic feature of projection methodologies, the numbers presented in this report should be interpreted in relative terms and used as planning tools for workforce development.

Trends in Primary Care Physician Supply and Demand: Nationally, approximately 216,580 primary care physicians⁸ were in active practice in the U.S. workforce in 2013. Trending forward to 2025, a net growth of 22,880 FTE primary care physicians will result in a national workforce of 239,460 FTE primary care physicians by 2025. In contrast, the national demand for primary care physicians is projected to reach 263,100 FTEs in 2025, largely resulting from the aging and growth of the U.S. population. The greater increase in demand compared

⁷ For additional information, please see “About the Model” on the last page of this report, as well as the HWSM technical documentation available at <http://bhw.hrsa.gov/healthworkforce/index.html>.

⁸ This estimate reflects primary care physicians below the age of 75 who have completed their graduate medical education.

with supply will result in a projected deficit of 23,640 FTE primary care physicians nationally by 2025. This finding is consistent with recent projections developed by the Association of American Medical Colleges (AAMC), which suggest that primary care shortfalls may range from 14,900 to 35,600 physicians by 2025.⁹ Methodological differences do not allow for the comparison of these estimates with other physician projection models.¹⁰ However, to the extent possible, the results presented in this report are consistent with state level projections developed by the Robert Graham Center.¹¹

National estimates mask considerable regional and state-level variation. At the regional level, the projected unmet demand in 2025 is estimated to be highest in the South region, with demand exceeding supply by approximately 13,860 FTE primary care physicians and lowest in the Northeast with projected demand exceeding supply by 810 physician FTEs. Looking at each state's 2013 primary care physician supply minus their 2013 demand reveals both state-level shortages and surpluses. The most severe shortage is seen in Texas, where the undersupply is estimated to be 2,840 FTE primary care physicians, while the largest surplus is seen in Massachusetts, with an estimated oversupply of 1,230 FTE physicians. Two states had estimated 2013 shortages of more than 1,000 FTE primary care physicians (Florida, Texas), while only Massachusetts had a surplus of more than 1,000 FTE physicians. Trending forward to 2025 37 states are projected to have an undersupply of primary care physicians. Twelve of these 37 states are expected to have a deficit of 1,000 or more FTEs, with the greatest shortages projected for Florida (3,060 FTEs) and Texas (1,760 FTEs). Thirteen states and the District of Columbia are projected to have an oversupply of primary care physicians in 2025 (Exhibit 1).

⁹ IHS Inc. 2016. The Complexities of Physician Supply and Demand: Projections from 2014 to 2025. Prepared for the Association of American Medical Colleges, Washington, DC. Accessed 4/5/2016: https://www.aamc.org/download/458082/data/2016_complexities_of_supply_and_demand_projections.pdf.

¹⁰ The Graham Center based their shortage projection on increased demand for services and did not examine future changes in physician supply available at <http://www.graham-center.org/rgc/publications-reports/browse-by-topic/workforce.html>

¹¹ Available at <http://www.graham-center.org/rgc/publications-reports/browse-by-topic/workforce.html> .

Exhibit 1: Supply Baseline and Projected Primary Care Physician Supply and Demand, by State, 2013 and 2025 (in tens)

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
<i>Northeast</i>							
Connecticut	2,690	2,710	-20	2,860	3,000	-140	-4.7%
Maine	1,320	990	330	1,270	1,050	220	21.0%
Massachusetts	6,420	5,190	1,230	6,470	5,580	890	15.9%
New Hampshire	1,110	950	160	1,150	1,100	50	4.5%
New Jersey	6,050	6,590	-540	6,470	7,530	-1,060	-14.1%
New York	15,160	14,200	960	15,310	15,190	120	0.8%
Pennsylvania	9,480	9,740	-260	9,140	10,140	-1,000	-9.9%
Rhode Island	870	800	70	840	850	-10	-1.2%
Vermont	630	450	180	600	480	120	25.0%
<i>Midwest</i>							
Illinois	9,440	9,190	250	9,620	10,020	-400	-4.0%
Indiana	4,040	4,810	-770	3,920	5,100	-1,180	-23.1%
Iowa	2,140	2,240	-100	2,020	2,220	-200	-9.0%
Kansas	1,970	2,090	-120	1,930	2,220	-290	-13.1%
Michigan	7,140	7,480	-340	6,940	7,900	-960	-12.2%
Minnesota	4,580	3,850	730	4,590	4,290	300	7.0%
Missouri	3,950	4,480	-530	3,930	5,150	-1,220	-23.7%
Nebraska	1,310	1,280	30	1,330	1,360	-30	-2.2%
North Dakota	530	490	40	520	480	40	8.3%
Ohio	8,170	8,660	-490	7,990	9,190	-1,200	-13.1%
South Dakota	610	590	20	600	610	-10	-1.6%
Wisconsin	4,340	4,120	220	4,260	4,420	-160	-3.6%
<i>South</i>							
Alabama	2,720	3,540	-820	2,680	3,870	-1,190	-30.7%
Arkansas	1,810	2,160	-350	1,820	2,410	-590	-24.5%
Delaware	670	680	-10	710	820	-110	-13.4%
District of Columbia	1,090	420	670	1,070	400	670	167.5%
Florida	12,250	14,160	-1,910	14,620	17,680	-3,060	-17.3%
Georgia	5,930	6,690	-760	7,000	8,310	-1,310	-15.8%
Kentucky	2,660	3,330	-670	2,560	3,520	-960	-27.3%

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
Louisiana	2,770	3,220	-450	2,830	3,500	-670	-19.1%
Maryland	4,810	4,280	530	5,300	5,060	240	4.7%
Mississippi	1,470	2,010	-540	1,490	2,220	-730	-32.9%
North Carolina	6,480	6,960	-480	7,620	8,640	-1,020	-11.8%
Oklahoma	2,290	2,830	-540	2,320	3,150	-830	-26.3%
South Carolina	2,910	3,340	-430	3,220	3,940	-720	-18.3%
Tennessee	4,220	4,780	-560	4,410	5,460	-1,050	-19.2%
Texas	14,490	17,330	-2,840	19,390	21,150	-1,760	-8.3%
Virginia	5,670	5,800	-130	6,350	6,970	-620	-8.9%
West Virginia	1,340	1,480	-140	1,280	1,460	-180	-12.3%
<i>West</i>							
Alaska	600	470	130	660	580	80	13.8%
Arizona	4,030	4,740	-710	6,050	7,040	-990	-14.1%
California	26,120	25,900	220	32,470	34,020	-1,550	-4.6%
Colorado	3,950	3,510	440	4,800	4,640	160	3.4%
Hawaii	1,140	960	180	1,210	1,130	80	7.1%
Idaho	960	1,110	-150	1,100	1,350	-250	-18.5%
Montana	700	690	10	700	750	-50	-6.7%
Nevada	1,460	1,850	-390	2,270	2,780	-510	-18.3%
New Mexico	1,440	1,400	40	1,660	1,780	-120	-6.7%
Oregon	3,350	2,900	450	3,650	3,520	130	3.7%
Utah	1,520	1,970	-450	1,770	2,370	-600	-25.3%
Washington	5,430	5,020	410	6,310	6,290	20	0.3%
Wyoming	350	390	-40	340	400	-60	-15.0%

Notes: Numbers may not sum to totals due to rounding. Baseline supply and demand are not in equilibrium in the states because state demands were estimated by pro-rating the national physician demand for health care services based on the population characteristics of the states (e.g., age, sex, household income, insurance status, health status, etc.). The 2013 state demand estimates also reflect allocation of the approximately 8,200 primary care physicians needed to de-designate health professions shortage areas. The 2025 projections assume expanded health insurance coverage associated with Medicaid expansion and Affordable Care Act marketplaces, together with year 2013 health care use and delivery patterns.

^a Difference = (supply minus demand); a negative difference reflects a shortage (i.e., supply is less than demand), while a positive difference indicates a surplus (i.e., supply is greater than demand).

^b Adequacy = 100 * (projected supply – projected demand)/(projected demand); a negative adequacy indicates a shortage (i.e., supply is less than demand) while a positive adequacy indicates a surplus (i.e., supply is greater than demand); adequacies associated with 2025 projected shortages are highlighted in blue.

In addition to presenting primary care physician shortages and surpluses by state, Exhibit 1 shows measures of adequacy (last column). For the purpose of this report, adequacy is defined as the projected 2025 state-level provider shortage or surplus expressed as a percentage of that state's 2025 provider demand. Adequacy is interpreted as follows:

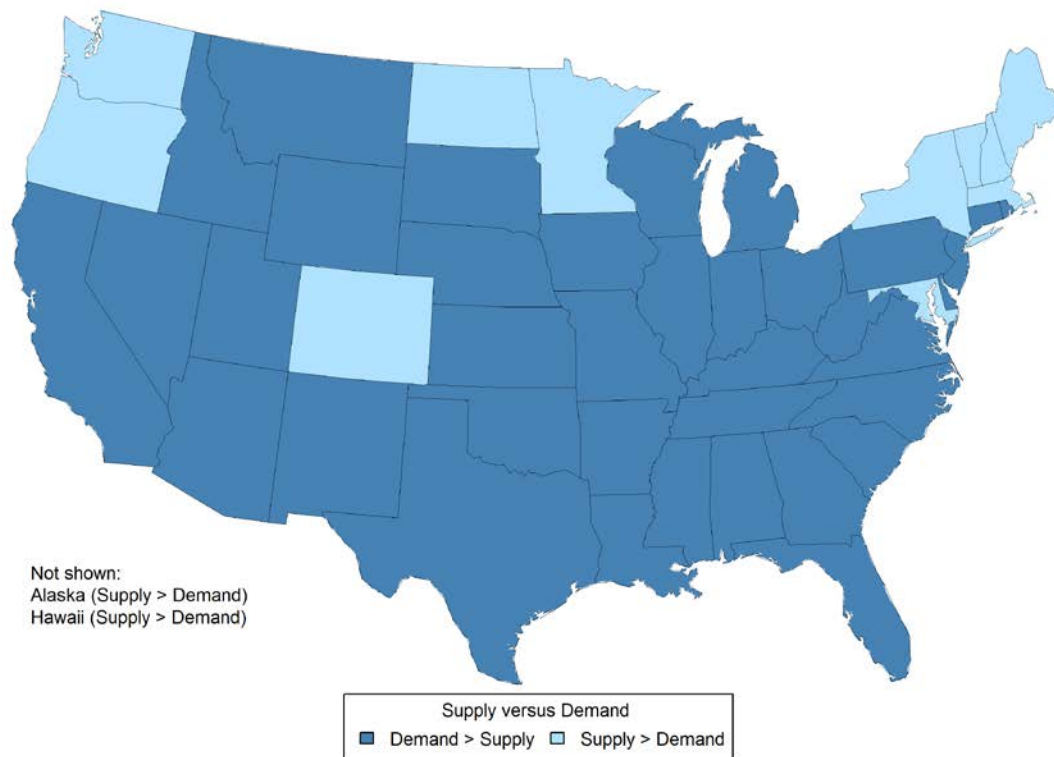
- A negative adequacy indicates a 2025 shortage and reflects the percentage of 2025 demand that is unmet.
- A positive adequacy indicates a 2025 surplus and reflects the size of the projected surplus relative to the projected demand.

Expressing each 2025 state-level shortage or surplus as a percentage of the state's 2025 demand helps to inform comparisons of differences between supply and demand across states by considering how the size of each state's surplus or shortage relates to that state's underlying provider demand.

Based on the adequacies shown on Exhibit 1, the unmet 2025 demand for primary care physicians is greatest in Mississippi, where the projected physician shortage is 33 percent of projected demand. The unmet 2025 physician demand is lowest in Rhode Island, where the projected shortage is about 1 percent of projected demand. As noted above, 2025 primary care physician supply exceeds demand in 13 states and the District of Columbia, with excess supply ranging from 0.3 percent of physician demand in Washington to 168 percent of demand in the District of Columbia.

Mapping the 37 states with unmet demand in 2025 illustrates the geographic extent of primary care physician shortages projected across the United States (Exhibit 2).

Exhibit 2: Primary Care Physician Supply versus Demand, by State, 2025



Trends in Primary Care Nurse Practitioner (NP) Supply and Demand: Approximately 57,330 primary care NPs were active in the U.S. workforce in 2013. Trending forward to 2025, a net growth of 53,210 FTE NPs is projected to result in a national workforce of 110,540 FTE primary care NPs by 2025. The projected increase in primary care NP supply exceeds the increase in demand, producing an estimated national surplus of 42,500 FTE primary care NPs in 2025.

Again, national estimates obscure regional and state-level variation. The oversupply of primary care NPs is projected to range from 18,070 FTEs in the South to 4,140 FTE in the Northeast region in 2025. This regional variation is also reflected in the states. Differences between each state's 2013 primary care NP supply and their 2013 NP demand range from an undersupply of 1,900 FTE primary care NPs in California to an oversupply of 1,090 FTE NPs in Tennessee.

With the exception of these two states, no other state had either a 2013 shortage or oversupply of primary care NPs greater than 1,000 FTEs.

By 2025, all states and the District of Columbia are projected to have a surplus of primary care NPs, with 13 states having an oversupply of more than 1,000 FTE NPs (Exhibit 3).

Exhibit 3: Baseline and Projected Primary Care Nurse Practitioner Supply and Demand, by State, 2013 and 2025 (in Tens)

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
<i>Northeast</i>							
Connecticut	980	690	290	1,190	770	420	54.5%
Maine	510	250	260	640	270	370	137.0%
Massachusetts	2,280	1,330	950	2,420	1,430	990	69.2%
New Hampshire	460	240	220	730	280	450	160.7%
New Jersey	1,020	1,690	-670	1,950	1,940	10	0.5%
New York	3,210	3,630	-420	4,550	3,890	660	17.0%
Pennsylvania	2,100	2,490	-390	3,700	2,600	1,100	42.3%
Rhode Island	170	200	-30	220	210	10	4.8%
Vermont	220	120	100	390	130	260	200.0%
<i>Midwest</i>							
Illinois	1,700	2,340	-640	3,290	2,560	730	28.5%
Indiana	1,380	1,220	160	2,240	1,300	940	72.3%
Iowa	420	570	-150	1,000	570	430	75.4%
Kansas	730	530	200	1,140	560	580	103.6%
Michigan	1,240	1,910	-670	2,870	2,030	840	41.40%
Minnesota	1,090	980	110	2,360	1,100	1,260	114.5%
Missouri	1,270	1,140	130	1,890	1,310	580	44.3%
Nebraska	300	320	-20	740	340	400	117.6%
North Dakota	250	120	130	290	120	170	141.7%
Ohio	1,960	2,210	-250	3,470	2,350	1,120	47.7%
South Dakota	180	150	30	390	160	230	143.8%
Wisconsin	1,170	1,050	120	1,900	1,130	770	68.1%
<i>South</i>							

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
Alabama	770	900	-130	1,080	980	100	10.2%
Arkansas	610	550	60	1,210	620	590	95.2%
Delaware	160	170	-10	290	210	80	38.1%
District of Columbia	230	110	120	180	100	80	80.0%
Florida	3,670	3,610	60	7,640	4,520	3,120	69.0%
Georgia	1,570	1,700	-130	3,230	2,120	1,110	52.4%
Kentucky	930	850	80	1,300	900	400	44.4%
Louisiana	730	820	-90	1,180	900	280	31.1%
Maryland	860	1,100	-240	1,600	1,300	300	23.1%
Mississippi	1,080	510	570	1,210	570	640	112.3%
North Carolina	1,610	1,770	-160	3,550	2,200	1,350	61.4%
Oklahoma	560	720	-160	1,200	800	400	50.0%
South Carolina	870	850	20	1,700	1,010	690	68.3%
Tennessee	2,310	1,220	1,090	3,100	1,400	1,700	121.4%
Texas	4,220	4,400	-180	10,730	5,380	5,350	99.4%
Virginia	1,980	1,480	500	3,620	1,780	1,840	103.4%
West Virginia	340	380	-40	720	380	340	89.5%
<i>West</i>							
Alaska	330	120	210	530	150	380	253.3%
Arizona	1,300	1,210	90	3,450	1,800	1,650	91.7%
California	4,700	6,600	-1,900	13,620	8,700	4,920	56.6%
Colorado	1,100	890	210	2,300	1,180	1,120	94.9%
Hawaii	230	250	-20	410	290	120	41.4%
Idaho	240	280	-40	630	340	290	85.3%
Montana	320	170	150	380	190	190	100.0%
Nevada	320	470	-150	1,190	710	480	67.6%
New Mexico	530	350	180	1,050	450	600	133.3%
Oregon	920	740	180	1,690	900	790	87.8%
Utah	410	500	-90	980	610	370	60.7%
Washington	1,630	1,280	350	3,240	1,610	1,630	101.2%
Wyoming	160	100	60	160	100	60	60.0%

Notes: Numbers may not sum to totals due to rounding. Baseline supply and demand are not in equilibrium in the states because state demands were estimated by pro-rating the national NP demand for health care services based on the population

characteristics of the states (e.g., age, sex, household income, insurance status, health status, etc.). The 2025 projections assume expanded health insurance coverage associated with Medicaid expansion and Affordable Care Act marketplaces, together with year 2013 health care use and delivery patterns.

^a Difference = (supply – demand); a negative difference reflects a shortage (i.e., supply is less than demand), while a positive difference indicates a surplus (i.e., supply is greater than demand).

^b Adequacy = $100 * (\text{projected supply} - \text{projected demand}) / (\text{projected demand})$; a negative adequacy indicates a shortage (i.e., supply is less than demand) while a positive adequacy indicates a surplus (i.e., supply is greater than demand).

As shown in Exhibit 3, 2025 adequacy for primary care NPs ranges from less than 1 percent of 2025 demand in New Jersey to more than 250 percent of 2025 demand in Alaska. Because all states are projected a surplus of primary care NPs in 2025, a map of NP supply versus demand is not presented.

Trends in Primary Care Physician Assistant (PA) Supply and Demand: Approximately 33,390 primary care PAs were active in the U.S. workforce in 2013. Trending forward to 2025 and using current supply determinants, there is a projected net growth of 25,380 FTE PAs, yielding a national workforce of 58,770 FTE primary care PAs by 2025. The demand for PAs is projected to be 39,060 FTEs by 2025, an increase of 5,670 FTEs. The increase in primary care PA supply is expected to exceed the increase in demand, resulting in a national surplus of 19,710 FTE primary care PAs by 2025. All four U.S. Census Bureau regions are expected to see primary care PA supply exceed demand in 2025, with the projected oversupply of primary care PAs being the highest in the West region (8,340 FTEs), and lowest in the Midwest region (2,090 FTEs).

Differences between each state's 2013 primary care PA supply and their 2013 PA demand range from an estimated undersupply of 840 FTE primary care PAs in Ohio to an estimated oversupply of 870 FTE PAs in North Carolina. In 2025, shortages of primary care PAs are projected for 9 states, with the highest deficits projected to occur in New Jersey (430 FTEs) and Ohio (560 FTEs). Forty-one states and the District of Columbia are projected to have a surplus of primary care PAs in 2025, with 5 states having projected oversupplies of more than 1,000 FTE primary care PAs (Exhibit 4).

Exhibit 4: Baseline and Projected Primary Care Physician Assistant Supply and Demand, by State, 2013 and 2025 (in Tens)

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
<i>Northeast</i>							
Connecticut	420	400	20	710	440	270	61.4%
Maine	240	150	90	410	150	260	173.3%
Massachusetts	580	770	-190	880	820	60	7.3%
New Hampshire	180	140	40	260	160	100	62.5%
New Jersey	340	980	-640	670	1100	-430	-39.1%
New York	2,580	2,110	470	3,890	2,220	1,670	75.2%
Pennsylvania	1,790	1,450	340	2,290	1,480	810	54.7%
Rhode Island	80	120	-40	150	130	20	15.4%
Vermont	100	70	30	190	70	120	171.4%
<i>Midwest</i>							
Illinois	880	1,370	-490	1,380	1,500	-120	-8.0%
Indiana	230	710	-480	360	760	-400	-52.6%
Iowa	490	330	160	710	330	380	115.2%
Kansas	500	310	190	700	330	370	112.1%
Michigan	1,360	1,110	250	1,940	1,180	760	64.4%
Minnesota	820	570	250	1,310	640	670	104.7%
Missouri	220	660	-440	530	770	-240	-31.2%
Nebraska	480	190	290	700	200	500	250.0%
North Dakota	160	70	90	260	70	190	271.4%
Ohio	450	1,290	-840	810	1,370	-560	-40.9%
South Dakota	280	90	190	400	90	310	344.4%
Wisconsin	640	610	30	900	660	240	36.4%
<i>South</i>							
Alabama	130	530	-400	260	580	-320	-55.2%
Arkansas	110	320	-210	160	360	-200	-55.6%
Delaware	90	100	-10	170	120	50	41.7%
District of Columbia	100	60	40	120	60	60	100.0%
Florida	1,680	2,110	-430	3,530	2,650	880	33.2%
Georgia	950	990	-40	1,880	1,240	640	51.6%
Kentucky	480	490	-10	640	520	120	23.1%

Region/State	2013 Estimates			2025 Projections			
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a	Adequacy ^b
Louisiana	240	480	-240	420	520	-100	-19.2%
Maryland	540	640	-100	1,050	760	290	38.2%
Mississippi	30	300	-270	70	330	-260	-78.8%
North Carolina	1,900	1,030	870	3,180	1,290	1,890	146.5%
Oklahoma	530	420	110	830	470	360	76.6%
South Carolina	360	500	-140	640	590	50	8.5%
Tennessee	520	710	-190	940	820	120	14.6%
Texas	2,960	2,560	400	5,250	3,150	2,100	66.7%
Virginia	700	860	-160	1,520	1,040	480	46.2%
West Virginia	390	220	170	480	220	260	118.2%
<i>West</i>							
Alaska	340	70	270	510	90	420	466.7%
Arizona	850	700	150	1,990	1,040	950	91.3%
California	3,120	3,870	-750	7,290	5,030	2,260	44.9%
Colorado	1,290	520	770	2,150	680	1,470	216.2%
Hawaii	120	140	-20	210	170	40	23.5%
Idaho	380	160	220	610	200	410	205.0%
Montana	220	100	120	330	110	220	200.0%
Nevada	240	270	-30	710	410	300	73.2%
New Mexico	320	210	110	610	260	350	134.6%
Oregon	520	430	90	870	520	350	67.3%
Utah	360	290	70	790	350	440	125.7%
Washington	960	750	210	1,830	930	900	96.8%
Wyoming	140	60	80	280	60	220	366.7%

Notes: Numbers may not sum to totals due to rounding. Baseline supply and demand are not in equilibrium in the states because state demands were estimated by pro-rating the national NP demand for health care services based on the population characteristics of the states (e.g., age, sex, household income, insurance status, health status, etc.). The 2025 projections assume expanded health insurance coverage associated with Medicaid expansion and Affordable Care Act marketplaces, together with year 2013 health care use and delivery patterns.

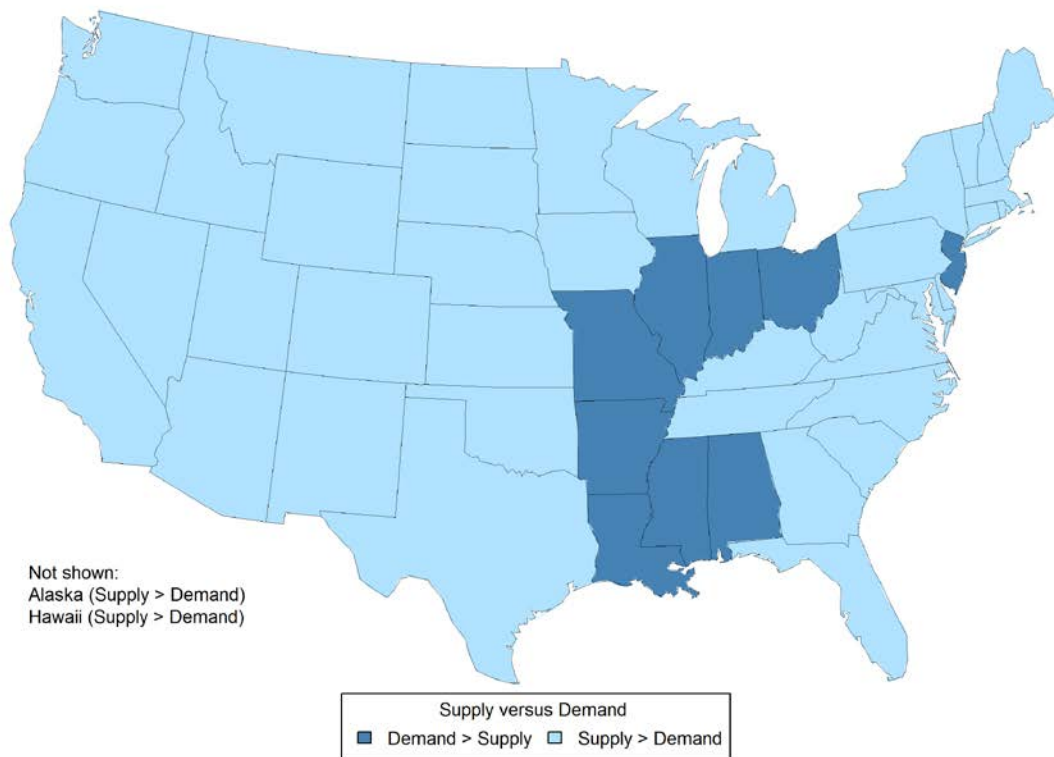
^a Difference = (supply – demand); a negative difference reflects a shortage (i.e., supply is less than demand), while a positive difference indicates a surplus (i.e., supply is greater than demand).

^b Adequacy = 100 * (projected supply – projected demand)/(projected demand); a negative adequacy indicates a shortage (i.e., supply is less than demand) while a positive adequacy indicates a surplus (i.e., supply is greater than demand); adequacies associated with 2025 projected shortages are highlighted in blue.

Looking more closely at the nine states where there is a projected 2025 shortage of primary care PAs, unmet demand, as indicated by a negative adequacy, ranges from 8 percent of demand in Illinois to 79 percent of demand in Mississippi. Where 2025 supply is projected to exceed demand, the excess supply ranges from 7 percent of demand in Massachusetts to more than 450 percent of demand in Alaska.

Exhibit 5 maps the nine states with projected unmet primary care PA demand in 2025.

Exhibit 5: Primary Care Physician Assistant Supply versus Demand, by State, 2025



The maps shown on Exhibits 6 through 8 further explore primary care provider projections by illustrating the estimated 2025 adequacies for each provider type. Appendix B presents the 2025 supply and demand differences and the 2025 adequacy measures in a single table.

As previously noted, 37 states are projected to have primary care physician shortages in 2025 (Exhibit 2; Exhibit 6; Appendix B). Twelve of these 37 states are projected to have modest primary care NP oversupplies of 50 percent of 2025 demand or less (Exhibit 3; Exhibit 7; Appendix B), while 9 of these 37 states have modest primary care PA oversupplies (50 percent of 2025 demand or less; Exhibit 4; Exhibit 8; Appendix B).

Nine states are projected to have 2025 shortages of both primary care physicians and PAs: Alabama, Arkansas, Indiana, Illinois, Louisiana, Mississippi, Missouri, New Jersey, and Ohio. Of these, Alabama and New Jersey also have only small primary care NP oversupplies that are 10 percent or less of their 2025 primary care NP demand (Appendix B).

Exhibit 6: Primary Care Physician Adequacy, by State, 2025

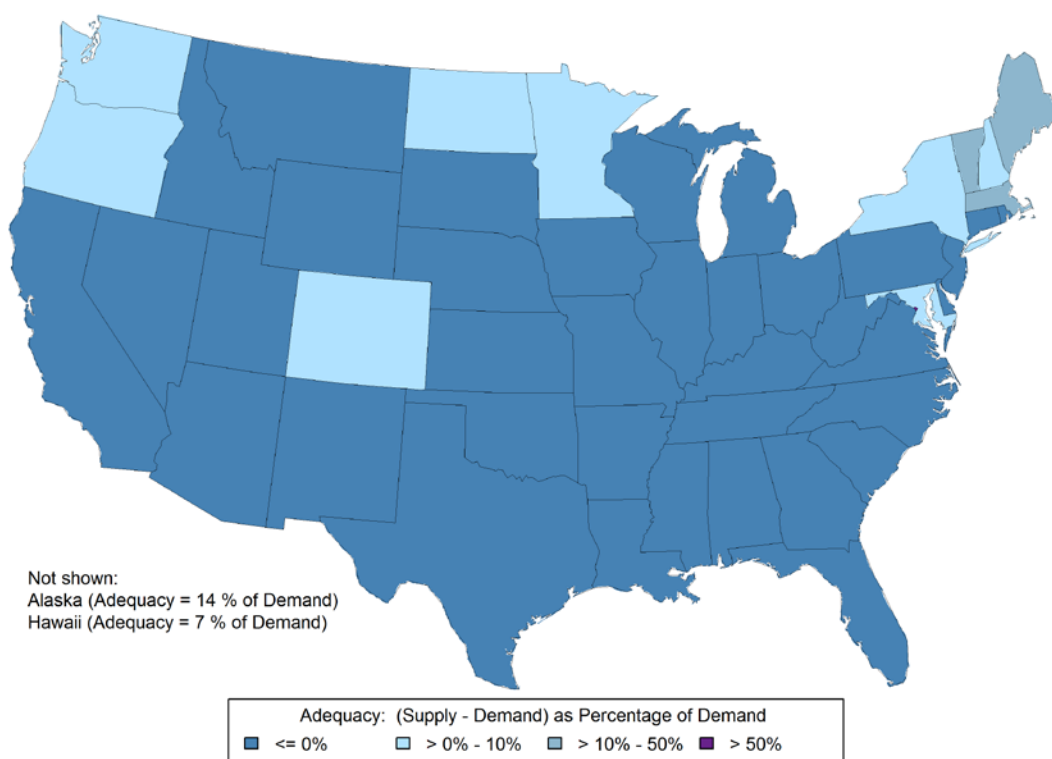


Exhibit 7: Primary Care Nurse Practitioner Adequacy, by State, 2025

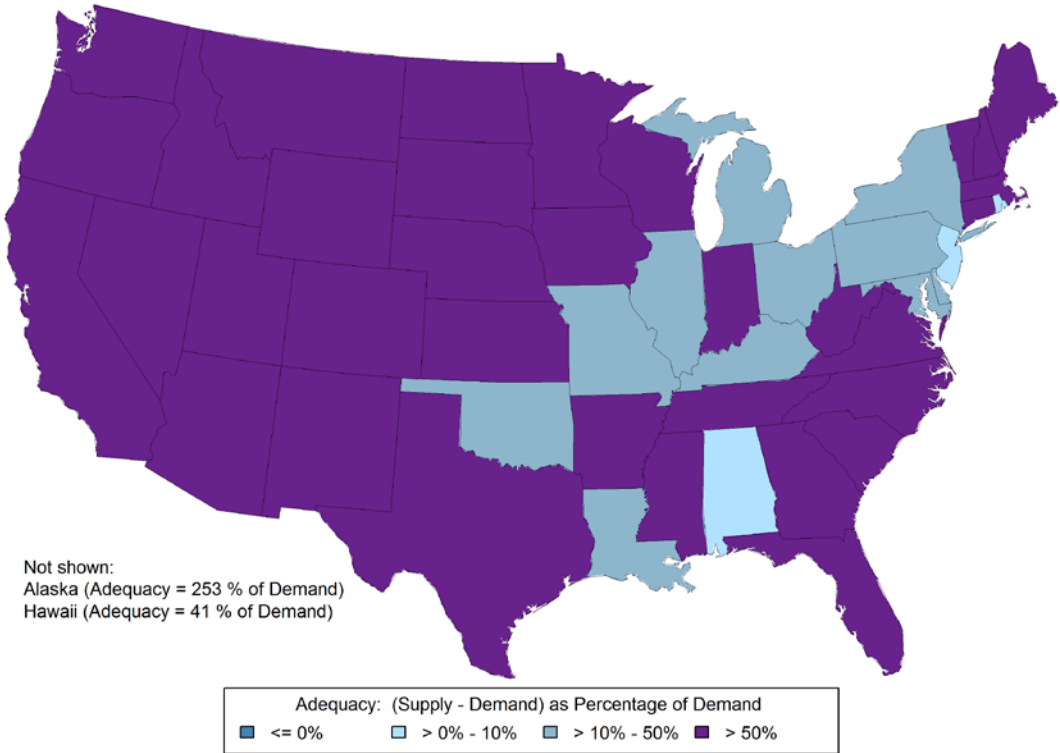
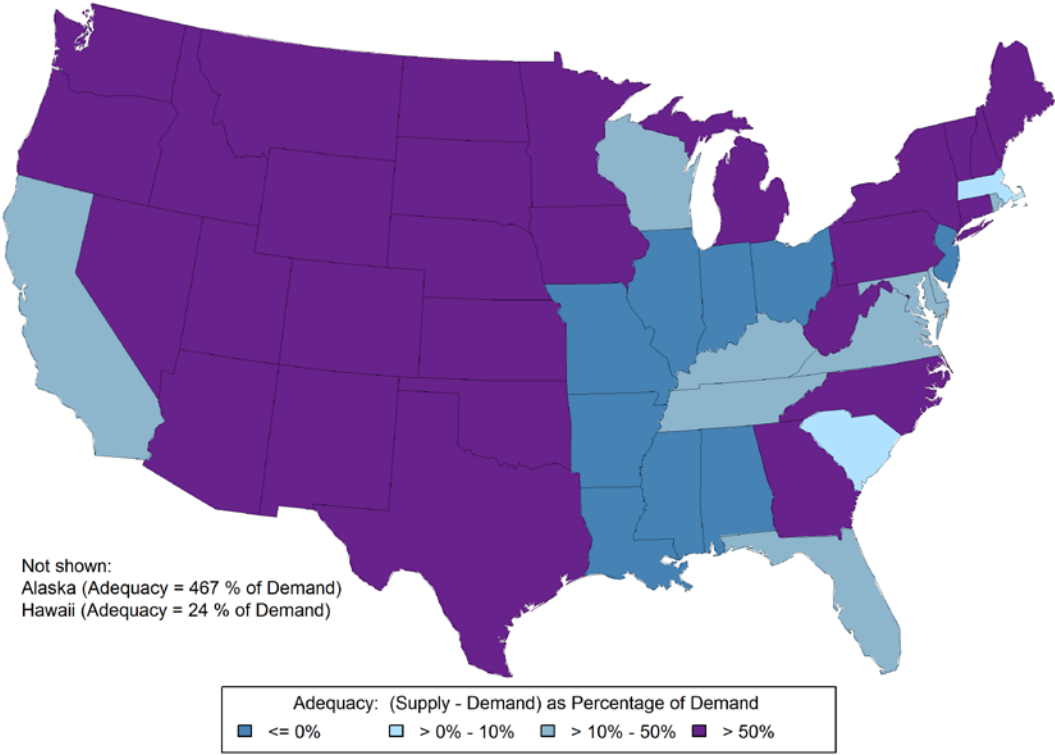


Exhibit 8: Primary Care Physician Assistant Adequacy, by State, 2025



Provider Summaries

Exhibit 9 looks across states to present 2025 projected supply-demand differences and adequacies for primary care physicians, primary care nurse practitioners (NPs), and primary care physician assistants (PAs). Consistent with the body of the report, the calculated measures of 2025 adequacy reflect projected differences as percentages of projected 2025 demands.

Exhibit 9: Supply – Demand Differences and Supply Adequacy, by State and Provider Type, 2025 (in Tens)

	Primary Care Physicians	Primary Care NPs	Primary Care PAs		Primary Care Physicians	Primary Care NPs	Primary Care PAs
State	2025 Supply - 2025 Demand	2025 Supply - 2025 Demand	2025 Supply - 2025 Demand		2025 Adequacy ^b	2025 Adequacy ^b	2025 Adequacy ^b
<i>Northeast</i>							
Connecticut	-140	420	270		-4.7%	54.5%	61.4%
Maine	220	370	260		21.0%	137.0%	173.3%
Massachusetts	890	990	60		15.9%	69.2%	7.3%
New Hampshire	50	450	100		4.5%	160.7%	62.5%
New Jersey	-1,060	10	-430		-14.1%	0.5%	-39.1%
New York	120	660	1,670		0.8%	17.0%	75.2%
Pennsylvania	-1,000	1,100	810		-9.9%	42.3%	54.7%
Rhode Island	-10	10	20		-1.2%	4.8%	15.4%
Vermont	120	260	120		25.0%	200.0%	171.4%
<i>Midwest</i>							
Illinois	-400	730	-120		-4.0%	28.5%	-8.0%
Indiana	-1,180	940	-400		-23.1%	72.3%	-52.6%
Iowa	-200	430	380		-9.0%	75.4%	115.2%
Kansas	-290	580	370		-13.1%	103.6%	112.1%
Michigan	-960	840	760		-12.2%	41.4%	64.4%
Minnesota	300	1,260	670		7.0%	114.5%	104.7%
Missouri	-1,220	580	-240		-23.7%	44.3%	-31.2%
Nebraska	-30	400	500		-2.2%	117.6%	250.0%
North Dakota	40	170	190		8.3%	141.7%	271.4%
Ohio	-1,200	1,120	-560		-13.1%	47.7%	-40.9%
South Dakota	-10	230	310		-1.6%	143.8%	344.4%
Wisconsin	-160	770	240		-3.6%	68.1%	36.4%
<i>South</i>							
Alabama	-1,190	100	-320		-30.7%	10.2%	-55.2%
Arkansas	-590	590	-200		-24.5%	95.2%	-55.6%
Delaware	-110	80	50		-13.4%	38.1%	41.7%
District of Columbia	670	80	60		167.5%	80.0%	100.0%

	Primary	Primary	Primary		Primary	Primary	Primary
State	2025 Supply - 2025 Demand	2025 Supply - 2025 Demand	2025 Supply - 2025 Demand		2025 Adequacy ^b	2025 Adequacy ^b	2025 Adequacy ^b
Florida	-3,060	3,120	880		-17.3%	69.00%	33.2%
Georgia	-1,310	1,110	640		-15.8%	52.4%	51.6%
Kentucky	-960	400	120		-27.3%	44.4%	23.1%
Louisiana	-670	280	-100		-19.1%	31.1%	-19.2%
Maryland	240	300	290		4.7%	23.1%	38.2%
Mississippi	-730	640	-260		-32.9%	112.3%	-78.8%
North Carolina	-1,020	1,350	1,890		-11.8%	61.4%	146.5%
Oklahoma	-830	400	360		-26.3%	50.0%	76.6%
South Carolina	-720	690	50		-18.3%	68.3%	8.5%
Tennessee	-1,050	1,700	120		-19.2%	121.4%	14.6%
Texas	-1,760	5,350	2,100		-8.3%	99.4%	66.7%
Virginia	-620	1,840	480		-8.9%	103.4%	46.2%
West Virginia	-180	340	260		-12.3%	89.5%	118.2%
West							
Alaska	80	380	420		13.8%	253.3%	466.7%
Arizona	-990	1,650	950		-14.1%	91.7%	91.3%
California	-1,550	4,920	2,260		-4.6%	56.6%	44.9%
Colorado	160	1,120	1,470		3.4%	94.9%	216.2%
Hawaii	80	120	40		7.1%	41.4%	23.5%
Idaho	-250	290	410		-18.5%	85.3%	205.0%
Montana	-50	190	220		-6.7%	100.0%	200.0%
Nevada	-510	480	300		-18.3%	67.6%	73.2%
New Mexico	-120	600	350		-6.7%	133.3%	134.6%
Oregon	130	790	350		3.7%	87.8%	67.3%
Utah	-600	370	440		-25.3%	60.7%	125.7%
Washington	20	1,630	900		0.3%	101.2%	96.8%
Wyoming	-60	60	220		-15.0%	60.0%	366.7%

Notes: Baseline supply and demand are not in equilibrium in the states because state demands were estimated by prorating the national NP demand for health care services based on the population characteristics of the states (e.g., age, sex, household income, insurance status, health status, etc.). The 2025 projections assume expanded health insurance coverage associated with Medicaid expansion and Affordable Care Act marketplaces, together with year 2013 health care use and delivery patterns.

^a 2025 projected shortages (i.e., where supply is less than demand) are highlighted in blue.

^b Adequacy = 100 * (projected 2025 supply – projected 2025 demand)/(projected 2025 demand); 2025 projected shortages are highlighted in blue.

Strengths and Limitations

The HWSM used to develop the supply and demand projections presented in this report relies on a microsimulation approach that replaces the cohort-based workforce models used historically by HRSA and others.¹² A microsimulation approach was chosen for the HWSM because of the flexibility and granularity that this approach will provide to simulate potential changes in health care delivery patterns in the future when data are available to estimate the impacts of delivery system changes on staffing patterns.

Major strengths of the current HWSM include:

- Application of a consistent approach to analyzing supply and demand across practitioner type, primary care discipline, and U.S. state.
- Incorporation of current demographic and health data of sufficient size and representativeness to provide reliable estimates of key population characteristics.
- Consideration not only of population growth and changing demographics across the United States, but also of the effects of expanded health insurance coverage.

A limitation of the HWSM involves imputing state-level estimates, recognizing that national estimates may not be easily decomposed into more granular measures and also that there may be considerable within-state variation. Development of state-level estimates is especially challenging for projections of demand. Nationally, demand at baseline may be estimated broadly, but allocating demand across states is more difficult, given demand's many complex

¹² Historically, supply has been modeled using a cohort approach with each cohort typically defined by age, sex, and occupation/specialty. Demand has historically been modeled by deriving provider-to-population ratios based on historical care use and delivery patterns, and then applying these ratios to subsets of the population defined by age group, sex, insurance status, and sometimes race and ethnicity.

drivers. These include population age and population health status, as well as access to health care, available treatment options, and the overall health literacy of the population.¹³

A related overall limitation of these projections is that data gaps and uncertainties exist regarding how health care use and delivery patterns will evolve over time. As additional data become available, it will be possible to improve the microsimulation model by incorporating these data into the model.

Finally, it should be reiterated that these projections reflect the HWSM's underlying assumptions about national levels of baseline supply and demand,¹⁴ and the findings must be interpreted in the context of those assumptions. For example, the projected surplus of NPs across all states reflects the assumption that current national supply is equal to current national demand. However, if the baseline national supply of NPs is less than the baseline national demand, then the projected growth in the number of NPs may, in fact, be balanced by projected demands, leading to possible equilibrium between future NP supply and demand at both national and state levels.

Conclusions

Improving quality of care, increasing access to care, and controlling health care costs are dependent on the robust availability of primary care providers.¹⁵ The projections presented here suggest that the U.S. supply of primary care physicians will grow more slowly than demand for

¹³ Koh, H., D.M. Berwick, C.M. Clancy, et al. 2012. New Federal Policy Initiatives to Boost Health Literacy Can Help the Nation Move Beyond the Cycle of Costly 'Crisis Care.' *Health Affairs*. 31: 2(434-443). Accessed 10/1/2015: <http://content.healthaffairs.org/content/31/2/434.abstract?sid=172a2ffa-806a-4909-8ce2-d2f1dbfc1eb5>.

¹⁴ At the national level, baseline primary care physician demand is assumed to exceed baseline supply by the approximately 8,200 physicians needed to de-designate the HPSAs, and these shortages are considered to be equally represented among family physicians and internal medicine physicians. For NPs and PAs, national baseline supply and demand are assumed to be in equilibrium.

¹⁵ The Commonwealth Fund. 2011. Realizing Health Reform's Potential: How the Affordable Care Act Will Strengthen Primary Care and Benefit Patients, Providers, and Payers. Accessed 10/1/2015: http://www.commonwealthfund.org/~media/Files/Publications/Issue%20Brief/2011/Jan/1466_Abrams_how_ACA_will_strengthen_primary_care_reform_brief_v3.pdf

primary care physician services. In contrast, primary care NP and PA supplies are projected to outpace demand for services nationally.

At the state level, the picture becomes more complicated. The projected national 2025 primary care physician shortage is less than 9 percent of the projected 2025 demand,¹⁶ and it masks both projected oversupplies of primary care physicians in some states and large variations in undersupply in other states. Similarly, national estimates of 2025 primary care NP and PA oversupply obscure the considerable spread in state estimates and the shortages of primary care PAs that are projected for nine states.

Based on analyses presented in this report, 37 states are projected to have a shortage of primary care physicians in 2025. Nine of these physician-shortage states also have projected shortages of primary care PAs in 2025. These findings underscore the potential complexity of ensuring adequate primary care provider supply across the United States.

A number of factors could act to increase or decrease state-level variation in the supply, demand, and adequacy of primary care providers. For example, differential state adoption rates of new health care delivery and payment models under the Affordable Care Act could lead to changes in the provider mix in some states, while keeping the provider mix static in others.¹⁷ This, in turn, could alleviate projected physician shortages and excess NP and PA supplies in those states which see advantageous changes in their primary care provider mix. Similarly, greater adoption of electronic health records combined with telehealth by some states could reduce state differences in provider availability by allowing providers to treat and monitor patients across state boundaries, and, at the same time, reduce state-level differences in demand for services through improved access. Changes in state Medicaid provider payment rates and varying

¹⁶ As discussed on page 7, at the national level, the 2025 primary care physician shortage is projected to be 23,640 FTE physicians and the 2025 primary care physician demand is projected to be 263,100 FTE physicians.

¹⁷ Friedberg, Mark W., Peggy G. Chen, Chapin White, Olivia Jung, Laura Raaen, Samuel Hirshman, Emily Hoch, Clare Stevens, Paul B. Ginsburg, Lawrence P. Casalino, Michael Tutty, Carol Vargo and Lisa Lipinski. *Effects of Health Care Payment Models on Physician Practice in the United States*. Santa Monica, CA: RAND Corporation, 2015. Accessed 10/1/2015: http://www.rand.org/pubs/research_reports/RR869.

acceptance rates of new Medicaid patients by primary care providers could also exacerbate some shortages while alleviating others.¹⁸ In addition, decreasing or removing federal subsidies to states under the Affordable Care Act may lead to greater variations in provider supply, demand, and adequacy at the state level.^{19,20} As discussed in a recent Institute of Medicine report, provider supply and demand are inherently fluid, and thus require not only well-targeted planning but also continued monitoring in order to address and prevent major imbalances.²¹

A growing portion of primary care could potentially be provided by NPs and PAs. While there is limited published information on the degree to which a surplus of primary care NPs and PAs may offset a projected physician shortage, various estimates suggest that additional NPs and PAs may help alleviate the projected shortage of physicians in 2025. However, such an offset assumes a reorganization of primary care and a redesign of service delivery in physician practices where NPs and PAs could deliver a greater proportion of the services than they do now, to complement the services provided by physicians. In addition, it may be necessary to address state licensure and scope of practice laws relating to NPs and PAs that currently limit the services these practitioners can deliver.

A related issue involves distribution of the workforce in the projected state-level surpluses of NPs and PAs by 2025. Even in states with estimated surpluses, localized shortages in primary care providers may exist, especially for rural and underserved communities, due to locational

¹⁸ U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services. 2015. Access to Care Issues among Quality Medicare Beneficiaries. Accessed 10/1/2015: https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/Access_to_Care_Issues_Among_Qualified_Medicare_Beneficiaries.pdf.

¹⁹ Blumberg, L.J. and J. Holahan. 2015. *After King v. Burwell: Next Steps for the Affordable Care Act*. Urban Institute: Washington, DC. Accessed 10/1/2015: <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000328-After-King-v.-Burwell-Next-Steps-for-the-Affordable-Care-Act.pdf#pdfjs.action=download>.

²⁰ Holahan, J. 2014. 2014. *The Launch of the Affordable Care Act in Selected States: The Financial Impact*. Urban Institute: Washington, DC. Accessed 10/1/2015: <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/413037-The-Launch-of-the-Affordable-Care-Act-in-Selected-States-The-Financial-Impact-on-States-from-the-Affordable-Care-Act.PDF>.

²¹ IOM (Institute of Medicine). 2015. *Transforming health care scheduling and access: Getting to now*. Washington, DC: The National Academies Press. Accessed 10/1/2015: <http://iom.nationalacademies.org/Reports/2015/Transforming-Health-Care-Scheduling-and-Access.aspx>.

preferences of these providers driven by local economies and other factors. These were not accounted for in the HWSM.

Finally, growing emphasis on care coordination, preventive services, and chronic disease management may lead to new and different roles for all primary care practitioners and to expanded roles for NPs and PAs. These factors underscore the need for continued training across all provider types to ensure an agile and responsive primary care workforce.

Appendix A: Provider Overview

This section provides brief information on the training and licensure of physicians, nurse practitioners, and physician assistants.

Physicians

In order to become a physician licensed to practice medicine in the United States, accredited graduate medical education is required. Physicians obtain graduate medical education through residencies and fellowships²² completed following graduation from a U.S. school of allopathic medicine (i.e., U.S.-trained Medical Doctors), graduation from a U.S. school of osteopathic medicine (i.e., U.S.-trained Doctors of Osteopathic Medicine), or graduation from an international medical school (i.e., International Medical Graduates).

According to a recent report published by the AAMC, approximately 29,000 physicians completed their graduate medical education in 2013.²³ Using data compiled from various sources, the 2015 AAMC study estimates that approximately 8,500 new physicians (29 percent) enter primary care annually.

Nurse Practitioners

The Bureau of Labor Statistics' (BLS) 2010 Standard Occupational Classification (SOC) system describes the duties and requirements for NPs as follows:²⁴

²² Institute of Medicine. 2014. Graduate medical education that meets the nation's health needs. Washington, DC: The National Academies Press. Accessed 10/1/2015: http://iom.nationalacademies.org/Reports/2014/Graduate-Medical-Education-That-Meets-the-Nations-Health-Needs.aspx?utm_source=Hootsuite&utm_medium=Dashboard&utm_campaign=SentviaHootsuite.

²³ IHS Inc. 2015. The Complexities of Physician Supply and Demand: Projections from 2013 to 2025. Prepared for the Association of American Medical Colleges, Washington, DC: Association of American Medical Colleges. Accessed 10/1/2015: https://www.aamc.org/download/426242/data/ihsreportdownload.pdf?cm_mmc=AAMC--ScientificAffairs--PDF--ihsreport.

²⁴ U.S. Department of Labor/Bureau of Labor Statistics. 2010 Standard Occupational Classification: 29-1171 – Nurse Practitioners. Accessed 10/1/2015: <http://www.bls.gov/soc/2010/soc291171.htm>.

- Diagnose and treat acute, episodic, or chronic illness, independently or as part of a health care team.
- May focus on health promotion and disease prevention.
- May order, perform, or interpret diagnostic tests such as lab work and x-rays.
- May prescribe medication.
- Must be registered nurses (RNs) who have specialized graduate education.

To become an NP, a graduate degree is required (e.g., a Master of Science in Nursing or a Doctor of Nursing Practice). NPs must also obtain clinical training beyond the preparation they receive as part of their RN training. This intensive study through both didactic and clinical forums gives NPs the skills and competencies necessary to practice in a range of settings and disciplines, including primary care.²⁵

After earning a degree, NPs typically take an exam to become certified in a particular practice area. Credentialing examinations are offered by various organizations, including the American Academy of Nurse Practitioners Certification Program, the American Nurses Credentialing Center, and the Pediatric Nursing Certification Board.

Most NPs must also be licensed by the state in which she or he practices. All states and the District of Columbia issue licenses to NPs, and NPs practice under the rules and regulations of the state in which they are licensed. Laws governing NP licensure and scope of practice vary by state, and range from allowing NPs complete clinical and business autonomy to requiring that NPs work closely with a physician in performing certain work duties (e.g., prescribing medication).²⁶

²⁵ American Association of Nurse Practitioners (AANP). What's an NP? Accessed 10/1/2015: <http://www.aanp.org/all-about-nps/what-is-an-np>.

²⁶ U.S. National Library of Medicine. MedlinePlus: Nurse Practitioner. Accessed 10/1/2015: <http://www.nlm.nih.gov/medlineplus/ency/article/001934.htm>.

Physician Assistants

PAs practice medicine on a team under the supervision of physicians and/or surgeons. They are formally educated to examine patients, diagnose injuries and illnesses, and provide treatment.²⁷ The BLS 2010 SOC system describes the responsibilities and training of PAs as follows:²⁸

- Provide health care services typically performed by a physician, under the supervision of a physician.
- Conduct complete physicals, provide treatment, and counsel patients.
- May prescribe medication.
- Must graduate from an accredited educational program for physician assistants.

Like NPs, PAs are state licensed and nationally certified. PAs are required to be licensed by the state in which they practice. All 50 states and the District of Columbia issue PA licenses and allow PAs to prescribe at least some medications.²⁹ PA certification requires that, following completion of an accredited training program, PAs pass the Physician Assistant National Certifying Examination (PANCE). PANCE, administered by the National Commission on Certification of Physician Assistants, evaluates fundamental medical and surgical comprehension.³⁰ Candidates who pass the PANCE may use the Physician Assistant-Certified designation.³¹

²⁷ U.S. Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook, 2014-2015 Edition: Physician Assistants. Accessed 10/1/2015: <http://www.bls.gov/ooh/healthcare/physician-assistants.htm>.

²⁸ U.S. Department of Labor, Bureau of Labor Statistics. 2010 Standard Occupational Classification: 29-1071 – Physician Assistants. Accessed 10/1/2015: <http://www.bls.gov/soc/2010/soc291071.htm>.

²⁹ American Academy of Physician Assistants. 2015. PA Prescribing Authority, by State. Accessed 10/1/2015: <https://www.aapa.org/WorkArea/DownloadAsset.aspx?id=2453>.

³⁰ National Commission on Certification of Physician Assistants. Becoming Certified. Accessed 10/1/2015: <http://www.nccpa.net/BecomingCertified>.

³¹ American Academy of Physician Assistants. Become a PA. Accessed 10/1/2015: <https://www.aapa.org/become-a-pa/>.

Appendix B: Summary of Scope of practice (SOP) for Nurse Practitioners and Physician Assistants

To provide a better background and facilitate the interpretation of the results, Exhibit B-1 looks across states to present state-level variation in practice environments for NPs and PAs focusing on practice and prescriptive authority.

Exhibit B-1: State level summary of scope of practice (SOP) at the state level for nurse practitioners (NPs) and physician assistants (PA).

State Practice Environments Practice and Prescriptive Authorities				
Nurse Practitioners ^{32,33,34}		State	Physician Assistants ^{35,36}	
<i>Practice</i>	<i>Prescriptive</i>		<i>Practice</i>	<i>Prescriptive</i>
Reduced	Reduced	Alabama	Reduced	Full
Full	Full	Alaska	Full	Full
Full	Full	Arizona	Full	Full
Reduced	Reduced	Arkansas	Full	Full
Restricted	Reduced	California	Full	Full
Full	Full	Colorado	Full	Full
Full	Full	Connecticut	Full	Full
Full	Full	Delaware	Full	Full
Full	Full	District of Columbia	Full	Full
Restricted	Reduced	Florida	Restricted	Reduced
Restricted	Reduced	Georgia	Reduced	Reduced
Full	Full	Hawaii	Full	Full
Full	Full	Idaho	Full	Full
Reduced	Reduced	Illinois	Full	Full
Reduced	Reduced	Indiana	Full	Full
Full	Full	Iowa	Reduced	Reduced
Reduced	Reduced	Kansas	Full	Full
Reduced	Reduced	Kentucky	Reduced	Reduced
Reduced	Reduced	Louisiana	Full	Full
Full	Full	Maine	Full	Reduced
Full	Full	Maryland	Reduced	Full
Restricted	Reduced	Massachusetts	Full	Full

³² American Association of Nurse Practitioners. State Practice Environment. Acquired April 20, 2015 at: <http://www.aanp.org/legislation-regulation/state-legislation-regulation/state-practice-environment/66-legislation-regulation/state-practice-environment/1380-state-practice-by-type>.

³³ Phillips SJ. 27th Annual APRN legislative update: advancements continue for APRN practice. *Nurse Practitioner*. 2015 Jan 16. 40(1):16-42.

³⁴ Interactive Physician Assistant (PA) Scope of Practice Law Guide. Barton Associates. Acquired December 9, 2015 at: <http://www.bartonassociates.com/nurse-practitioners/physician-assistant-scope-of-practice-laws/>.

³⁵ U.S. Department of Justice Drug Enforcement Administration, Office of Diversion Control, Mid-Level Practitioners Authorization by State Table, Created 10 February 2011. Acquired May 21, 2015 from: http://www.deadiversion.usdoj.gov/drugreg/practitioners/mlp_by_state.pdf.

³⁶ American Academy of Physician Assistants. Professional issues: Scope of practice. 7 November 2013. Acquired May 21, 2015 from: <http://www.aapa.org/workarea/downloadasset.aspx?id=583>.

State Practice Environments				
<i>Practice and Prescriptive Authorities</i>				
Nurse Practitioners^{32,33,34}		State	Physician Assistants^{35,36}	
<i>Practice</i>	<i>Prescriptive</i>		<i>Practice</i>	<i>Prescriptive</i>
Restricted	Reduced	Michigan	Full	Full
Full	Full	Minnesota	Full	Full
Reduced	Reduced	Mississippi	Restricted	Reduced
Restricted	Reduced	Missouri	Reduced	Reduced
Full	Full	Montana	Full	Full
Full	Full	Nebraska	Full	Full
Full	Full	Nevada	Full	Full
Full	Full	New Hampshire	Full	Full
Reduced	Reduced	New Jersey	Restricted	Full
Full	Full	New Mexico	Reduced	Full
Reduced	Full	New York	Full	Full
Restricted	Reduced	North Carolina	Full	Full
Full	Full	North Dakota	Full	Full
Reduced	Reduced	Ohio	Full	Full
Restricted	Reduced	Oklahoma	Full	Reduced
Full	Full	Oregon	Full	Full
Reduced	Reduced	Pennsylvania	Reduced	Reduced
Full	Full	Rhode Island	Full	Full
Restricted	Reduced	South Carolina	Reduced	Full
Reduced	Reduced	South Dakota	Full	Full
Restricted	Reduced	Tennessee	Full	Full
Restricted	Reduced	Texas	Full	Full
Reduced	Reduced	Utah	Full	Full
Full	Full	Vermont	Full	Full
Restricted	Reduced	Virginia	Restricted	Full
Full	Full	Washington	Reduced	Full
Reduced	Reduced	West Virginia	Reduced	Reduced
Reduced	Reduced	Wisconsin	Reduced	Full
Full	Full	Wyoming	Full	Full

About the Health Workforce Simulation Model

The results in this report come from HRSA's Health Workforce Simulation Model (HWSM), an integrated health professions projection model that estimates current and future supply and demand for health care providers.

The supply component of the HWSM simulates workforce decisions for each provider type based on his or her demographics and profession, along with the characteristics of the local or national economy and the labor market. The starting supply plus new additions to the workforce minus attrition provide an end-of-year supply projection, which then becomes the starting supply estimate for the subsequent year. This cycle is repeated through 2025. The basic files that support the supply analyses contain records of primary care physicians, nurse practitioners, and physician assistants in the workforce come from the American Medical Association Physician Masterfile, the National Plan and Provider Enumeration System (NPPES) and the National Commission on Certification of Physician Assistants (NCCPA) Professional Profile Survey.

Demand projections for health care services in different care settings are produced by applying regression equations for individuals' current health care use on the projected population using estimates from the Medical Expenditure Panel Survey. The current staffing patterns by care setting are then applied to forecast the future demand for primary care practitioners. The population database used to estimate demand consists of records of individual characteristics of a representative sample of the entire U.S. population derived from the ACS, the National Nursing Home Survey, and the Behavioral Risk Factor Surveillance System. Using the Census Bureau's projected population and the Urban Institute's state-level estimates of the impact of the Affordable Care Act on insurance coverage,^{1,2} the HWSM simulates future populations with expected demographic, socioeconomic, health status, health risk and insurance status.

The HWSM makes projections at the state level which are then aggregated to regional and national levels. A detailed description of the HWSM can be found in the accompanying technical documentation available at <http://bhw.hrsa.gov/healthworkforce/index.html>.

¹ Holahan, J. & Blumberg, L. 2010. How would states be affected by health reform? Timely analysis of immediate health policy issues. Accessed 10/1/2015: http://www.urban.org/UploadedPDF/412015_affected_by_health_reform.pdf.

² Holahan, J. 2014. The launch of the Affordable Care Act in selected states: Coverage expansion and uninsurance. Washington, DC: The Urban Institute. Accessed 10/1/2015: <http://www.urban.org/uploadedPDF/413036-the-launch-of-the-Affordable-Care-Act-in-selected-states-coverage-expansion-and-uninsurance.pdf>.