

National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025

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National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025

Overview

This report presents national and regional projections of U.S. supply and demand for primary care practitioners in 2025, with 2013 data serving as baseline. Projections were developed using the Health Resources and Services Administration's (HRSA) Health Workforce Simulation Model (HWSM). Primary care practitioners considered in these estimates include physicians, nurse practitioners, and physician assistants.

The HWSM is an integrated microsimulation model that estimates current and future supply and demand for health workers in multiple professions and care settings. In developing the projections presented here, the baseline primary care physician demand was assumed to exceed 2013 supply by the approximately 8,200 physicians needed to de-designate the Health Professional Shortage Areas (HPSAs). Baseline demand for other practitioners was assumed to be equal to 2013 supply, consistent with standard workforce research methodology for analyses like these where there are no consistent national/regional data sources available to estimate base year shortages/surpluses. All supply and demand projections are reported as full time equivalents (FTEs). A detailed description of the HWSM can be found in the accompanying technical document available at <http://bhw.hrsa.gov/healthworkforce/index.html>.

Important limitations for these workforce projections include: an underlying model assumption 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, as well as current patterns of health care utilization. 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.

Key Findings

Primary Care Physicians

Under current workforce utilization and care delivery patterns, the 2025 demand for primary care physicians is projected to exceed supply at the national level.

- Approximately 216,580 primary care physicians were active in the U.S. workforce in 2013. Assuming workforce participation rates remain unchanged, the supply of primary care physicians is expected to grow by 22,880 FTEs – from 216,580 FTEs in 2013 to 239,460 FTEs in 2025 – an 11 percent increase.
- The national demand for primary care physicians is projected to increase by 38,320 FTEs – from 224,780 FTEs in 2013 to 263,100 FTEs in 2025 – a 17 percent increase.
- *With delivery system changes and full utilization of NP and PA services, the projected shortage of 23,640 FTEs can be effectively mitigated.*

Aging and population growth account for most of the increased demand for primary care physicians, but its impact varies by discipline.

- Because of current utilization patterns by age, the increased demand in primary care is seen most prominently among general/family medicine, and general internal medicine practitioners.
- The small (890 FTE) projected surplus of geriatricians suggests significant underutilization of geriatricians by older Americans.
- Small projected growth in the child population is expected to generate a surplus of general pediatricians (1,530 FTEs) in 2025.

There is substantial regional variation in the estimates of both supply and demand for primary care physicians in 2025.

- Projected changes in supply and demand for primary care physicians differ by region; when combined with baseline differences, these projected changes result in considerable variation in the extent of 2025 shortages across regions.
- Although all regions are projected to have a deficit of primary care physicians, the U.S. Census Bureau's South region is projected to experience the greatest shortfall (about 13,860 FTEs) in the supply of primary care physicians needed to meet 2025 demand.
- More effective incorporation of NP and PA services in care delivery could mitigate regional disparities and improve access to primary care services.

Primary Care Nurse Practitioners (NPs)

The primary care NP supply is projected to outpace demand at the national level if NPs are utilized in the same way in the future.

- Approximately 57,330 primary care NPs were active in the U.S. workforce in 2013. Assuming continuation of current training levels and workforce participation patterns, the supply of NPs is expected to grow by 53,210 FTEs – from 57,330 FTEs in 2013 to 110,540 FTEs in 2025 – a 93 percent increase.
- The national demand for primary care NPs is projected to grow by 10,710 FTEs – from 57,330 FTEs in 2013 to 68,040 FTEs in 2025 – a 19 percent increase.

Projected changes in supply and demand for primary care NPs vary by region.

- Distributional imbalances in primary care NP supply and demand are projected at the regional level.
- While primary care NP supply is expected to exceed demand in all U.S. Census Bureau regions, the 2025 oversupply is expected to be greatest in the South region (18,070 FTEs).

Primary Care Physician Assistants (PAs)

Under current workforce utilization and care delivery patterns, the projected 2025 supply of primary care PAs is expected to exceed their demand.

- Approximately 33,390 primary care PAs were active in the U.S. workforce in 2013. Assuming continuation of current training levels and workforce participation patterns, the supply of PAs is expected to grow by 25,380 FTEs – from 33,390 FTEs in 2013 to 58,770 FTEs in 2025 – a 76 percent increase.
- The national demand for primary care PAs is projected to grow by 5,670 FTEs – from 33,390 FTEs in 2013 to 39,060 FTEs in 2025 – a 17 percent increase.

Projected changes in supply and demand for primary care PAs vary by region.

- Like primary care NPs, distributional imbalances in primary care PA supply and demand are projected at the regional level.
- Oversupply of primary care PAs is greatest in the South (6,420 FTEs) and West (8,340 FTEs) regions.

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.¹

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 services 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. While this definition may underestimate aggregate primary care capacity, the definition is 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.

¹ 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 10/1/2015: www.nap.edu/catalog.php?record_id=5152.

Results

Future supply and demand for primary care practitioners will be affected by a host of factors, including population growth, aging of the nation's population, overall economic conditions, expanded health insurance coverage, changes in health care reimbursement, and the availability of the health workforce. The HWSM is an integrated microsimulation model that estimates future 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.²

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 8,200 FTE physicians required to eliminate shortages in the HRSA-designated primary care Health Professional Shortage Areas (HPSAs).³ Baseline demands for NPs and PAs were assumed to be equal to 2013 supplies, consistent with standard workforce research methodology for analyses like these where there are no consistent national/regional data sources available to estimate base year shortages/surpluses. Trending forward, supply projections reflect the estimated number of new entrants to each profession 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 are based on current utilization patterns and reflect impacts associated with both changes in population demographics and changes in insurance coverage, but do not account for potential changes in provider utilization or health care delivery in the future. All supply and demand projections are reported as FTEs.

In spite of the rigorous methodology followed when developing 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

² For additional information about the HWSM, please see "About the Model" on the last page of this report.

³ 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>.

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.

National Trends in Primary Care Physician Supply and Demand: Approximately 216,580 primary care physicians⁴ were in active practice in the U.S. workforce in 2013. Trending forward to 2025, approximately 91,510 FTE primary care physicians will enter the workforce (assuming new physicians continue to be trained at the current rate), and an estimated 66,560 FTE physicians will leave the workforce. A net growth of 22,880 FTE (11 percent) primary care physicians will result in a national workforce of 239,460 FTE primary care physicians by 2025 (Exhibit 1).

Based on 2013 health care delivery and staffing patterns and assuming a current, unmet demand equal to the approximately 8,200 FTE physicians needed to de-designate the federal primary care HPSAs, the demand for primary care physicians is projected to reach 263,100 FTEs in 2025. Of this total 38,320 FTE increase, the aging and growth of the population contribute to an increased demand of 33,660 (88 percent) FTE primary care physicians, and expanded health insurance coverage increases demand by an additional 4,660 FTE (12 percent) primary care physicians.

The greater increase in demand (17 percent) compared with the increase in supply (11 percent) will result in a projected deficit of 23,640 FTE (9 percent of 2025 demand) primary care physicians 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 2025.⁵

The HWSM-projected 2025 deficit of 23,640 FTE primary care physicians reflects shortages of general and family medicine physicians (13,100 FTEs) and general internal medicine physicians (12,960 FTEs). Two primary care disciplines are projected to experience small surpluses – geriatrics (890 FTEs) and general pediatrics (1,530 FTEs) although for different reasons. Shifting population demographics, including the growth and aging of the U.S. population, account for

⁴ This estimate reflects primary care physicians below the age of 75 who have completed their graduate medical education and excludes hospitalists.

⁵ 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

most of the projected increases in provider demand, and this demand is seen most prominently among general and family medicine, and general internal medicine practitioners. Slower growth in the demand for general pediatric providers appears consistent with the aging of the population, while the small projected surplus in geriatricians may largely reflect low current use patterns. The vast majority of physicians, who care for older adults, are internists or family physicians. This pattern of provider utilization by older adults may be due to lack of access to geriatricians or the fact that older adults tend to remain with their primary care provider versus utilizing the services of a geriatrician. It is expected that as the availability of geriatricians grow, older adults will increasingly use their services. Recently many general and family physicians, as well as internists, have been receiving additional training in caring for geriatric patients to expand and enhance the care they provide to older Americans. However, these physicians are not categorized as geriatricians because they did not identify geriatrics as their primary specialty. Moreover, despite the expanding expertise the projected shortage of general and family medicine and general internal medicine physicians, coupled with growth in the need for services by older Americans, suggest that the nation can likely use additional geriatricians. Due to the complexity of determining the health care needs of older Americans, the National Center is preparing a report specifically to examine the supply of and demand for geriatricians.

Exhibit 1: Baseline and Projected National Supply and Demand, Primary Care Physicians, 2013 and 2025

	General & Family Medicine ^d	General Internal Medicine ^d	Geriatrics ^d	General Pediatrics ^d	All Primary Care
Supply					
Estimated supply, 2013	90,320	78,100	3,090	45,070	216,580
Estimated supply growth, 2013-2025	6,270	10,260	2,270	4,080	22,880
<i>New entrants</i>	<i>37,400</i>	<i>33,070</i>	<i>2,880</i>	<i>18,160</i>	<i>91,510</i>
<i>Attrition^a</i>	<i>-30,010</i>	<i>-22,090</i>	<i>-590</i>	<i>-13,870</i>	<i>-66,560</i>
<i>Change in average work hours^b</i>	<i>-1,120</i>	<i>-720</i>	<i>-20</i>	<i>-210</i>	<i>-2,070</i>
Projected supply, 2025	96,590	88,360	5,360	49,150	239,460
Demand					
Estimated demand, 2013 ^c	94,420	82,200	3,090	45,070	224,780
Estimated demand growth, 2013-2025	15,270	19,120	1,380	2,550	38,320
<i>Changing demographics impact</i>	<i>12,820</i>	<i>16,910</i>	<i>1,380</i>	<i>2,550</i>	<i>33,660</i>
<i>Insurance coverage impact^e</i>	<i>2,450</i>	<i>2,210</i>	<i>0</i>	<i>0</i>	<i>4,660</i>
Projected demand, 2025	109,690	101,320	4,470	47,620	263,100

	General & Family Medicine ^d	General Internal Medicine ^d	Geriatrics ^d	General Pediatrics ^d	All Primary Care
Projected Difference, 2025^f	-13,100	-12,960	890	1,530	-23,640

Notes: Numbers may not sum to totals due to rounding.

^a Includes retirement and mortality.

^b This represents the change in physician full time equivalents resulting from a change in the demographic composition of the future workforce and the associated effect on average number of hours worked.

^c 2013 supply is assumed to fall short of demand by the approximately 8,200 primary care physicians needed to de-designate the primary care Health Professional Shortage Areas (HPSAs). It is also assumed that the HPSA shortages are equally represented among general and family physicians and general internal medicine physicians.

^d Disciplines reflect the physicians' primary reported specialty.

^e Insurance coverage impact measures growth in demand associated with Medicaid expansion and Affordable Care Act marketplaces from expanded insurance coverage due to the Affordable Care Act.

^f 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).

Regional Trends in Primary Care Physician Supply and Demand: Regional trends in primary care physician supply and demand were assessed using the U.S. Census Bureau definitions for the Northeast, Midwest, South, and West regions (Appendix B, Exhibit B-1). All four U.S. regions have a projected undersupply of primary care physicians in 2025. However, there is substantial regional variation in 2025, just as in 2013. The projected unmet demand in 2025 is estimated to be highest in the South region, where demand is expected to exceed supply by approximately 13,860 FTE primary care physicians (Exhibit 2).

Exhibit 2: Baseline and Projected Primary Care Physician Supply and Demand, by Region, 2013 and 2025

Region	2013 Estimates			2025 Projections		
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a
<i>Northeast</i>						
General & Family Medicine	12,950	16,870	-3,920	12,900	18,000	-5,100
General Internal Medicine	19,310	16,180	3,130	19,540	18,200	1,340
General Pediatrics	10,560	7,890	2,670	10,390	7,870	2,520
Geriatrics	900	660	240	1,280	850	430
All Primary Care	43,720	41,600	2,120	44,110	44,920	-810
<i>Midwest</i>						
General & Family Medicine	23,440	21,080	2,360	22,350	22,430	-80
General Internal Medicine	15,700	17,960	-2,260	15,910	20,300	-4,390
General Pediatrics	8,530	9,570	-1,040	8,500	9,370	-870
Geriatrics	560	660	-100	890	870	20
All Primary Care	48,230	49,270	-1,040	47,650	52,970	-5,320
<i>South</i>						
General & Family Medicine	31,370	35,400	-4,030	34,850	41,750	-6,900
General Internal Medicine	25,380	29,990	-4,610	30,230	37,710	-7,480
General Pediatrics	15,830	16,540	-710	17,760	17,480	280
Geriatrics	990	1,080	-90	1,850	1,610	240
All Primary Care	73,570	83,010	-9,440	84,690	98,550	-13,860
<i>West</i>						
General & Family Medicine	22,560	21,060	1,500	26,490	27,510	-1,020
General Internal Medicine	17,720	18,070	-350	22,680	25,110	-2,430
General Pediatrics	10,160	11,070	-910	12,500	12,910	-410
Geriatrics	640	680	-40	1,320	1,130	190
All Primary Care	51,080	50,880	200	62,990	66,660	-3,670

Notes: Regional numbers may not sum to regional totals due to rounding. Similarly, regional totals may not sum to national totals due to rounding. Baseline supply and demand are not in equilibrium in the regions because regional demands were estimated by pro-rating the national physician demand for health care services based on regional population characteristics (e.g., age, sex, household income, insurance status, health status, etc.). The primary care disciplines (i.e., general and family medicine, general internal medicine, general pediatrics, and geriatrics) reflect the physicians' primary reported discipline. The 2013 regional demand estimates also reflect regional 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 – 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).

National 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 and using current supply determinants (e.g., entry and attrition rates), approximately 72,960 FTE primary care NPs will enter the workforce and 19,540 FTE NPs will leave the workforce. A net growth of 53,210 FTE NPs (93 percent) will result in a projected national workforce of 110,540 FTE primary care NPs by 2025 (Exhibit 3).

Assuming the current national NP demand equals the current NP supply of 57,330, the demand for NPs is projected to reach 68,040 FTEs by 2025, an increase of 10,710 FTEs (19 percent). This growth in demand is driven primarily by an aging population with commensurate increased health service needs (90 percent). Expanded health insurance coverage exerts a relatively small (10 percent) impact on 2025 primary care NP demand.

Exhibit 3: Baseline and Projected National Supply and Demand, Primary Care Nurse Practitioners, 2013 and 2025

	General & Family Medicine	General Internal Medicine	Geriatrics	General Pediatrics	All Primary Care
Supply					
Estimated supply, 2013	32,130	10,490	5,650	9,060	57,330
Estimated supply growth, 2013-2025	28,970	10,280	6,820	7,140	53,210
<i>New entrants</i>	<i>40,040</i>	<i>13,890</i>	<i>8,770</i>	<i>10,260</i>	<i>72,960</i>
<i>Attrition^a</i>	<i>-10,950</i>	<i>-3,570</i>	<i>-1,930</i>	<i>-3,090</i>	<i>-19,540</i>
<i>Change in average work hours^b</i>	<i>-120</i>	<i>-40</i>	<i>-20</i>	<i>-30</i>	<i>-210</i>
Projected supply, 2025	61,100	20,770	12,470	16,200	110,540
Demand					
Estimated demand, 2013 ^c	32,130	10,490	5,650	9,060	57,330
Estimated demand growth, 2013-2025	5,210	2,460	2,530	510	10,710
<i>Changing demographics impact</i>	<i>4,370</i>	<i>2,180</i>	<i>2,530</i>	<i>510</i>	<i>9,590</i>
<i>Insurance coverage impact^d</i>	<i>840</i>	<i>280</i>	<i>0</i>	<i>0</i>	<i>1,120</i>
Projected demand, 2025	37,340	12,950	8,180	9,570	68,040
Projected Difference, 2025^e	23,760	7,820	4,290	6,630	42,500

Notes: Numbers may not sum to totals due to rounding.

^a Includes retirements and mortality.

^b This represents the change in nurse practitioner full time equivalents resulting from a change in the demographic composition of the future workforce and the associated effect on average number of hours worked.

^c The model assumes that national supply and demand are in equilibrium in 2013.

^d Insurance coverage impact measures growth in demand associated with Medicaid expansion and Affordable Care Act marketplaces from expanded insurance coverage due to the Affordable Care Act

^e 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).

The projected increase in primary care NP supply (93 percent) exceeds the increase in demand (19 percent) by 42,500 FTE (62 percent of 2025 demand) primary care NPs in 2025.

Regional Trends in Primary Care Nurse Practitioner (NP) Supply and Demand: All four U.S. Census Bureau regions are expected to see primary care NP supply exceed demand in 2025. The oversupply of primary care NPs is projected to be highest in the South (18,070 FTEs) and West regions (12,410 FTEs), and lowest in the Northeast region (4,140 FTEs) (Exhibit 4).

Exhibit 4: Baseline and Projected Primary Care Nurse Practitioner Supply and Demand, by Region, 2013 and 2025

Region	2013 Estimates			2025 Projections		
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a
<i>Northeast</i>						
General & Family Medicine	4,260	5,770	-1,510	5,580	6,180	-600
General Internal Medicine	3,070	2,070	1,000	4,470	2,330	2,410
General Pediatrics	1,990	1,590	400	2,700	1,580	1,120
Geriatrics	1,630	1,210	420	2,770	1,560	1,210
All Primary Care	10,950	10,640	310	15,790	11,650	4,140
<i>Midwest</i>						
General & Family Medicine	7,180	7,140	40	12,840	7,630	5,210
General Internal Medicine	1,930	2,290	-360	3,810	2,590	1,220
General Pediatrics	1,590	1,920	-330	2,750	1,880	870
Geriatrics	1,000	1,210	-210	2,170	1,590	580
All Primary Care	11,700	12,560	-860	21,570	13,690	7,880
<i>South</i>						
General & Family Medicine	12,800	12,010	790	24,020	14,190	9,830
General Internal Medicine	3,940	3,830	110	8,170	4,820	3,350
General Pediatrics	3,810	3,330	480	6,930	3,510	3,420
Geriatrics	1,940	1,990	-50	4,420	2,950	1,470
All Primary Care	22,490	21,160	1,330	43,540	25,470	18,070
<i>West</i>						
General & Family Medicine	7,880	7,200	680	18,660	9,340	9,320
General Internal Medicine	1,550	2,300	-750	4,040	3,210	830
General Pediatrics	1,670	2,220	-550	3,820	2,600	1,220
Geriatrics	1,090	1,250	-160	3,120	2,080	1,040

Region	2013 Estimates			2025 Projections		
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a
All Primary Care	12,190	12,970	-780	29,640	17,230	12,410

Notes: Regional numbers may not sum to regional totals due to rounding. Similarly, regional totals may not sum to national totals due to rounding. Baseline supply and demand are not in equilibrium in the regions because regional demands were estimated by pro-rating the national nurse practitioner demand for health care services based on regional population characteristics (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).

National 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, approximately 30,840 FTE primary care PAs will enter the workforce and 5,170 FTE PAs will leave the workforce. A net growth of 25,380 FTE PAs (76 percent) will result in a projected national workforce of 58,770 FTE primary care PAs by 2025 (Exhibit 5).

Assuming the current national primary care PA demand equals the current PA supply of 33,390, the demand for PAs is projected to be 39,060 FTEs by 2025, an increase of 5,670 FTEs (17 percent). Eighty-six percent of this growth in demand is driven by an aging population and 14 percent is due to the expansion of insurance coverage.

The increase in primary care PA supply (76 percent) is expected to exceed the increase in demand (17 percent) by 19,710 FTE (50 percent of 2025 demand) primary care PAs by 2025.

Exhibit 5: Baseline and Projected National Supply and Demand, Primary Care Physician Assistants, 2013 and 2025

	General & Family Medicine	General Internal Medicine	Geriatrics	General Pediatrics	All Primary Care
Supply					
Estimated supply, 2013	22,070	7,630	370	3,320	33,390
Estimated supply growth, 2013-2025	17,320	5,140	170	2,750	25,380
<i>New entrants</i>	20,590	6,760	250	3,240	30,840
<i>Attrition^a</i>	-3,140	-1,550	-70	-410	-5,170
<i>Change in average work hours^b</i>	-130	-70	-10	-80	-290
Projected supply, 2025	39,390	12,770	540	6,070	58,770
Demand					
Estimated demand, 2013 ^c	22,070	7,630	370	3,320	33,390
Estimated demand growth, 2013-2025	3,580	1,770	130	190	5,670
<i>Changing demographics impact</i>	3,010	1,560	130	190	4,890
<i>Insurance coverage impact^d</i>	570	210	0	0	780
Projected demand, 2025	25,650	9,400	500	3,510	39,060
Projected Difference, 2025^e	13,740	3,370	40	2,560	19,710

Notes: Numbers may not sum to totals due to rounding.

^a Includes retirement and mortality.

^b This represents the change in physician assistant full time equivalents resulting from a change in the demographic composition of the future workforce and the associated effect on average number of hours worked.

^c The model assumes that national supply and demand are in equilibrium in 2013.

^d Insurance coverage impact measures growth in demand associated with Medicaid expansion and Affordable Care Act marketplaces from expanded insurance coverage due to the Affordable Care Act

^e 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).

Regional Trends in Primary Care Physician Assistant (PA) Supply and Demand: All four U.S. Census Bureau regions are expected to see primary care PA supply exceed demand in 2025. Oversupply of primary care PAs is projected to be highest in the South (6,420 FTEs) and West regions (8,340 FTEs), and lowest in the Midwest region (2,090 FTEs) (Exhibit 6).

Exhibit 6: Baseline and Projected Primary Care Physician Assistant Supply and Demand, by Region, 2013 and 2025

Region	2013 Estimates			2025 Projections		
	Supply	Demand	Difference ^a	Supply	Demand	Difference ^a
<i>Northeast</i>						
General & Family Medicine	3,180	3,940	-760	4,970	4,210	760
General Internal Medicine	2,130	1,500	630	2,910	1,690	1,220
General Pediatrics	890	580	310	1,430	580	850
Geriatrics	100	80	20	140	100	40
All Primary Care	6,300	6,100	200	9,450	6,580	2,870
<i>Midwest</i>						
General & Family Medicine	4,710	4,930	-220	7,270	5,240	2,030
General Internal Medicine	1,340	1,660	-320	2,100	1,880	220
General Pediatrics	380	710	-330	540	690	-150
Geriatrics	70	80	-10	90	100	-10
All Primary Care	6,500	7,380	-880	10,000	7,910	2,090
<i>South</i>						
General & Family Medicine	7,640	8,280	-640	14,220	9,770	4,450
General Internal Medicine	2,640	2,780	-140	4,610	3,500	1,110
General Pediatrics	1,320	1,220	100	2,130	1,290	840
Geriatrics	110	120	-10	190	170	20
All Primary Care	11,710	12,400	-690	21,150	14,730	6,420
<i>West</i>						
General & Family Medicine	6,540	4,920	1,620	12,920	6,430	6,490
General Internal Medicine	1,510	1,680	-170	3,160	2,330	830
General Pediatrics	740	820	-80	1,970	950	1,020
Geriatrics	80	80	0	130	130	0
All Primary Care	8,870	7,500	1,370	18,180	9,840	8,340

Notes: Numbers may not sum to totals due to rounding. Baseline supply and demand are not in equilibrium in the regions because regional demands were estimated by pro-rating the national physician assistant demand for health care services based on regional population characteristics (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).

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.⁶ 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. region.
- 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 U.S., but also of the effects of expanded health insurance coverage.

It should be reiterated that these projections reflect the HWSM's underlying assumptions about baseline supply and demand,⁷ and the findings must be interpreted in the context of those assumptions. One assumption is that the current patterns of provider utilization will continue in to the future and the baseline shortage is determined by HPSA designation. In the case of geriatricians, the projected surplus of geriatricians reflects the assumption that current supply is equal to current demand (see Exhibit 1), due the absence of data to document a shortage or surplus in 2013, and that the current utilization of geriatricians by older adults will continue in the future. However, if the baseline supply of geriatricians is less than baseline demand or if the current utilization patterns change, then the projected growth in the number of geriatricians may, in fact, be offset by the projected demand, leading to a possible equilibrium or shortage in future geriatrician supply. Similarly, the HWSM assumes equilibrium at baseline between supply and demand for both NPs and PAs. However, if baseline supply for these providers is less than

⁶ 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.

⁷ 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 general and family physicians and general internal medicine physicians. For NPs and PAs, national baseline supply and demand are assumed to be in equilibrium.

baseline demand, then the projected NP and PA supplies may be closer to equilibrium with projected demands.

An 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. For example, an assumption included in the 2013 Primary Care Report was that *all* states plus the District of Columbia will adopt Medicaid expansion.⁸ For this Report, actual Medicaid expansion data were available (i.e., only 30 states and the District of Columbia had adopted Medicaid expansion as of July 2015) and therefore incorporated into the model.

Conclusions

Achieving the vision of better care, smarter spending, and healthier people is dependent on the robust availability of primary care providers.⁹ The projections presented here suggest the U.S. supply of primary care physicians will grow more slowly than demand for primary care physician services. In contrast, primary care NP and PA supplies are projected to outpace demand for services. Although NPs and PAs do not replace physicians, studies have shown that NPs and PA practitioners can augment and expand physician capacity in many care settings.^{10,11} Studies show that NPs can manage 80 to 90 percent of care provided by primary care physicians¹² such as, take medical histories, conduct exams, order and interpret tests, develop treatment plans, and provide preventive care. Published estimates from various studies suggest

⁸ U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. 2013. Projecting the Supply and Demand for Primary Care Practitioners Through 2020. Rockville, Maryland: U.S. Department of Health and Human Services.

⁹ 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

¹⁰ Rohrer, J. E., K. B. Angstman, G. M. Garrison, J. L. Pecina, J. A. Maxson. 2013. Nurse Practitioners and Physician Assistants Are Complements to Family Medicine Physicians. *Population Health Management* 16(4):242-45,

¹¹ Horrocks, S., E. Anderson, and C. Salisbury. 2002. "Systematic Review of Whether Nurse Practitioners Working in Primary Care Can Provide Equivalent Care to Doctors." *British Medical Journal* 324:819-823 [accessed 5/11/2016]. Available from: <http://www.bmj.com/content/324/7341/819>

¹² Munding, M. 1994. "Advanced-Practice Nursing -- Good Medicine for Physicians?" *New England Journal of Medicine* 330(3): 211-214 [accessed 5/10/2016]. Available from: <http://www.nejm.org/doi/full/10.1056/NEJM199401203300314>.

that with delivery system changes additional NPs and PAs providers can be used to help alleviate the projected shortage of physicians in 2025.^{13,14,15}

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 number of factors could increase or decrease the adequacy of primary care providers. For example the Affordable Care Act is designed to encourage new models of care with an emphasis on maintaining health status and preventing acute health crises. While this may increase the demand for primary care providers, the long run impact would be improvement in population health and reduced need for care providers.

Advances in medicine and technology also play an important role in projecting future workforce supply and demand. While improved treatments and technology could reduce demand for health care services by improving patient health, such advances may concurrently lead to increased demand for services by creating more treatment options. For example, electronic health record systems combined with telehealth could improve access to care and overall patient health by allowing providers to treat and monitor patients independent of geographic location. Such advances may alleviate the need for providers to be geographically co-located with their patients, but, at the same time, may increase overall demand for care.

¹³ Riley, L., T. Litsch, and M. L. Cook. 2016. Preparing the Next Generation of Health Care Providers: A Description and Comparison of Nurse Practitioner and Medical Student Tuition in 2015. *Journal of the American Association of Nurse Practitioners* 28(2016):6-10.

¹⁴ AANP. <https://www.aanp.org/aanpqa2/images/documents/publications/costeffectiveness.pdf>

¹⁵ Association of American Medical Colleges, 2015. The Complexities of Physical Supply and Demand: Projections for 2013 to 2025. Final Report, submitted by IHC Inc, downloaded from https://www.aamc.org/download/426242/data/ihsreportdownload.pdf?cm_mmc=AAMC--ScientificAffairs--PDF--ihsreport

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 fellowships¹⁶ 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 2013.¹⁷ 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:¹⁸

- 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.

¹⁶ 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.

¹⁷ 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.

¹⁸ 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>.

- 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.¹⁹

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).²⁰

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.²¹ The BLS 2010 SOC system describes the responsibilities and training of PAs as follows:²²

- Provide health care services typically performed by a physician, under the supervision of a physician.

¹⁹ 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>.

²⁰ U.S. National Library of Medicine. MedlinePlus: Nurse Practitioner. Accessed 10/1/2015: <http://www.nlm.nih.gov/medlineplus/ency/article/001934.htm>.

²¹ 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>.

²² 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>.

- 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.²³ 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.²⁴ Candidates who pass the PANCE may use the Physician Assistant-Certified designation.²⁵

²³ American Academy of Physician Assistants. 2015. PA Prescribing Authority, by State. Accessed 10/1/2015: <https://www.aapa.org/WorkArea/DownloadAsset.aspx?id=2453>.

²⁴ National Commission on Certification of Physician Assistants. Becoming Certified. Accessed 10/1/2015: <http://www.nccpa.net/BecomingCertified>.

²⁵ American Academy of Physician Assistants. Become a PA. Accessed 10/1/2015: <https://www.aapa.org/become-a-pa/>.

Appendix B: U.S. Census Bureau Regions

Exhibit B-1 lists the states associated with each of the U.S. Census Bureau regions. This categorization was used in the regional projections of primary care practitioner supply and demand presented in this report.

Exhibit B-1: U.S. Census Bureau Regions and Associated States

NORTHEAST	MIDWEST	SOUTH	WEST
Connecticut	Illinois	Alabama	Alaska
Maine	Indiana	Arkansas	Arizona
Massachusetts	Iowa	Delaware	California
New Hampshire	Kansas	District of Columbia	Colorado
New Jersey	Michigan	Florida	Hawaii
New York	Minnesota	Georgia	Idaho
Pennsylvania	Missouri	Kentucky	Montana
Rhode Island	Nebraska	Louisiana	Nevada
Vermont	North Dakota	Maryland	New Mexico
	Ohio	Mississippi	Oregon
	South Dakota	Oklahoma	Utah
	Wisconsin	North Carolina	Washington
		South Carolina	Wyoming
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

Source: U.S. Census Bureau. 2015. Geographic Terms and Concepts: Census Divisions and Census Regions. Accessed 10/1/2015: https://www.census.gov/geo/reference/gtc/gtc_census_divreg.html.

About the 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 from the American Physician Masterfile, National Plan and provider Enumeration System, and the National Commission on Certification of Physician Assistants.

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 American Community Survey, 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 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 the 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>.