

The Future of the Nursing Workforce: National- and State-Level Projections, 2012-2025

December 2014

**U.S. Department of Health and Human Services
Health Resources and Services Administration
Bureau of Health Workforce
National Center for Health Workforce Analysis**



About the National Center for Health Workforce Analysis

The National Center for Health Workforce Analysis informs public and private-sector decision-making on the U.S. health workforce by expanding and improving health workforce data and its dissemination to the public, and improving and updating projections of the supply of and demand for health workers. For more information about the National Center, please visit our website at <http://bhw.hrsa.gov/healthworkforce/index.html>.

Suggested citation:

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. The Future of the Nursing Workforce: National- and State-Level Projections, 2012-2025. Rockville, Maryland, 2014.

Copyright information:

All material appearing in this documentation is in the public domain and may be reproduced or copied without permission. Citation of the source, however, is appreciated.

The Future of the Nursing Workforce: National- and State-Level Projections, 2012-2025

Using baseline data from 2012 and the Health Resources and Services Administration's (HRSA) Health Workforce Simulation Model, this brief presents national- and state-level projections on the supply of and demand for registered nurses (RNs) and licensed practical/vocational nurses (LPNs) for the entire U.S. in 2025. State-level differences in demographics and the labor market will result in considerable variation in the size and adequacy of the nursing workforce across the country.

Key Findings

Nationally, the change in RN supply between 2012 and 2025 is projected to outpace demand.

- Approximately 2.9 million RNs were active in the workforce in 2012. Consistent with standard workforce research methodology, the Health Workforce Simulation Model assumes that the RN demand in 2012 equals the RN supply.
- Assuming RNs continue to train at the current levels and accounting for new entrants and attrition, the RN supply is expected to grow by 952,000 full-time equivalents (FTEs) – from 2,897,000 FTEs in 2012 to 3,849,000 FTEs in 2025 – a 33 percent increase nationally.
- The nationwide demand for RNs, however, is projected to grow by only 612,000 FTEs – from 2,897,000 FTEs in 2012 to 3,509,000 FTEs in 2025 – a 21 percent increase.
- The number of new graduates that entered the workforce has substantially increased from approximately 68,000 individuals in 2001 to more than 150,000 in 2012 and in 2013.
- While not considered in this study, emerging care delivery models, with a focus on managing health status and preventing acute health issues, will likely contribute to new growth in demand for nurses, e.g., nurses taking on new and/or expanded roles in preventive care and care coordination.

Substantial variation at the state level is observed for RN supply and demand.

- Projections at the national level mask a distributional imbalance of RNs at the state level.

- Sixteen states are projected to experience a smaller growth in RN supply relative to their state-specific demand, resulting in a shortage of RNs by 2025; ten of these states are in the West, four are in the South, and two are in the Northeast region.
- States projected to experience the greatest shortfalls in the number of RNs by 2025 are Arizona (with 28,100 fewer RNs than needed) followed by Colorado and North Carolina (each with 12,900 fewer RNs than needed).
- Growth in supply is expected to exceed demand growth in the remaining 34 states, including all of the Midwestern states.

The LPN supply is also projected to outpace demand at the national level.

- Approximately 730,000 LPNs were active in the workforce in 2012. Consistent with standard workforce research methodology, the Health Workforce Simulation Model assumes that the LPN demand in 2012 equals the LPN supply.
- Assuming LPNs continue to train at the current levels and accounting for new entrants and attrition, the LPN supply is expected to grow by 260,900 FTEs – from 730,000 FTEs in 2012 to 990,900 FTEs in 2025 – a 36 percent increase nationally.
- Using current health care utilization patterns, the demand for LPNs is projected to grow by only 28 percent by 2025. The demand for LPNs is projected to grow by 201,000 FTEs – from 730,000 FTEs in 2012 to 931,000 FTEs.
- Similar to the RNs, emerging care delivery models will likely contribute to new growth and demand for LPNs. Since it is too early to determine the impact, this report reflects the demand for the traditional role of the LPNs.

Projected changes in supply and demand for LPNs between 2012 and 2025 vary substantially by state.

- Projections at the national level mask a distributional imbalance of LPNs at the state level.
- Twenty-two states are projected to experience a smaller growth in the supply of LPNs relative to their state-specific demand for LPN services resulting in a shortage of LPNs by 2025. Ten of these states are in the West, five are in the South, five are in the Northeast, and two are in the Midwest.

- Maryland, North Carolina, and Georgia are each expected to fall short by between 7,000 to 8,000 LPNs of their respective 2025 projected demands, whereas Ohio and California each are projected to have an excess of between 20,000 to 25,000 LPNs.

The Evolving Role of the Nursing Workforce

- The rapidly changing health care delivery system is redefining how care is delivered and the role of the nursing workforce.
- Supply and demand will continue to be affected by numerous factors including population growth and the aging of the nation's population, overall economic conditions, aging of the nursing workforce, and changes in health care reimbursement.
- Research to model the demand implications of trends in care delivery is ongoing and health workforce projection models will be updated as needed.

Background

Nurses make up the single largest health profession in the U.S.¹ They perform a variety of patient care duties and are critical to the delivery of health care services across a wide array of settings, including ambulatory care clinics, hospitals, nursing homes, public health facilities, hospice programs, and home health agencies. Distinctions are made among different types of nurses according to their education, role, and the level of autonomy in practice. Licensed Practical/Vocational Nurses (LPNs) typically receive training for a year beyond high school and, after passing the national NCLEX-PN exam, become licensed to work in patient care. LPNs provide a variety of direct care services including administration of medication, taking medical histories, recording symptoms and vital signs, and other tasks as delegated by registered nurses (RNs), physicians, and other health care providers. RNs usually have a bachelor's degree in nursing, a two year associate's degree in nursing, or a diploma from an approved nursing program. They must also pass a national exam, the NCLEX-RN, before they are licensed to practice. The scope of RN responsibilities is more complex and analytical than that of LPNs. RNs provide a wide array of direct care services, such as administering treatments, care coordination, disease prevention, patient education, and health promotion for individuals, families, and communities. RNs may choose to obtain advanced clinical education and training to become Advanced Practice Nurses (APN). APNs usually have a master's degree, although some complete doctoral-level training, and often focus in a clinical specialty area.

This brief presents national- and state-level projections of the supply of and demand for RNs and LPNs in 2025. Advance practice nurses are not addressed in this nursing-focused report.

Results

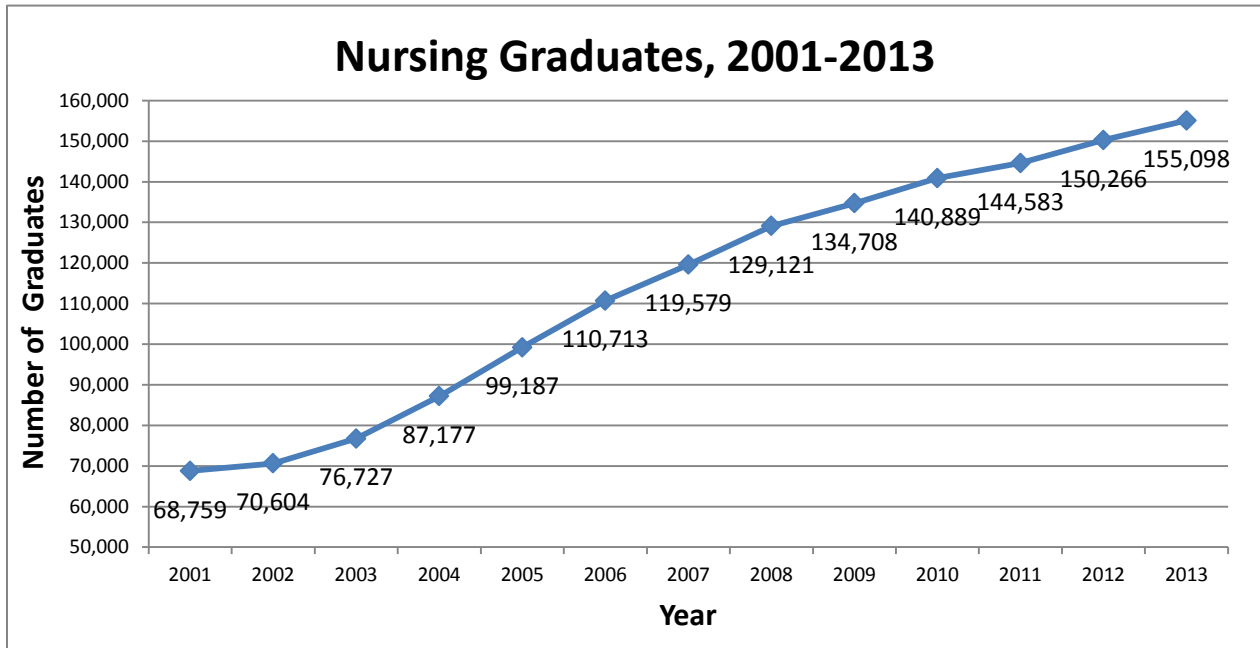
Nursing Graduation Rates: The number of new graduates who entered the workforce has substantially increased from approximately 68,000 individuals in 2001 to more than 150,000 in 2012 and in 2013. In 2004, HRSA released projections of RN supply and demand that suggested virtually no growth in supply between 2000 and 2020, with the number of new nurse graduates offsetting the expected number of nurses retiring.² At the time, the nation was educating

¹ U.S. Department of Labor, Bureau of Labor Statistics. (2012). *Occupational Outlook Handbook, 2012-13 Edition*. Washington, D.C.: GPO, U.S. Bureau of Labor Statistics. Retrieved from <http://www.bls.gov/ooh/healthcare/registered-nurses.htm>; <http://www.bls.gov/ooh/healthcare/licensed-practical-and-licensed-vocational-nurses.htm>

² U.S. Department of Health and Human Services, Health Resources and Services Administration. (2004). *What Is Behind HRSA's Projected Supply, Demand, and Shortage of Registered Nurses?* Washington, D.C.: USDHHS, HRSA.

approximately 68,000 nurses annually. The report stated that the U.S. was on a path where demand for RNs would exceed supply in 2020. The recommendation was to increase the number of new graduates to approximately 130,000 annually. Over the next several years, educational capacity was expanded and enrollments were increased in nursing programs (Exhibit 1).

Exhibit 1: Number of Nursing Graduates 2001-2013^a



Notes: ^a Data Source: HRSA compilation of data from the National Council of State Boards of Nursing, Exam Statistics and Publications, 2001 to 2013. <https://www.ncsbn.org/1232.htm>

National Trends in RN Supply and Demand: Approximately 2.9 million RNs were active in the U.S. workforce in 2012. Trending forward to 2025, close to 2 million new RNs will enter the workforce (assuming new RNs are produced at the current rate) and an estimated 1 million RNs will leave the workforce. This net growth of 952,000 new nurses will result in a national workforce of 3,849,000 RNs by 2025. (Exhibit 2)

Based on 2012 health care delivery and staffing patterns and assuming the current RN demand equals the current RN supply of approximately 2.9 million, the demand for RNs is projected to reach 3.5 million in 2025, an increase of 612,000 RNs. A growth in disease burden attributable to changing patient demographics contributes to an increased demand of 584,000 RNs, and expanded insurance coverage under the Affordable Care Act accounts for a demand of an additional 28,000 RNs.

The greater growth rate of supply (33 percent) over that of demand (21 percent) will result in an excess of 340,000 RNs by 2025.

Exhibit 2: Projected National Supply of and Demand for Registered Nurses

	Registered Nurses
Supply	
Estimated supply, 2012	2,897,000
Estimated supply growth, 2012-2025	952,000
<i>New entrants</i>	<i>1,950,000</i>
<i>Attrition^a</i>	<i>(998,800)</i>
<i>Change in average work hours^b</i>	<i>800</i>
Projected supply, 2025	3,849,000
Demand^c	
Estimated demand, 2012	2,897,000
Estimated demand growth, 2012-2025	612,000
<i>Changing demographics</i>	<i>584,000</i>
<i>ACA-related increase in the number of insured</i>	<i>28,000</i>
Projected demand, 2025	3,509,000
Supply in Excess of Demand, 2025	340,000

Notes: ^a Includes RNs who exit to become APNs; ^b This represents the change in nurse 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 demand and supply are equal in 2012.

State Trends in RN Supply and Demand: There is substantial state variation in the projected supply and demand for the RN workforce in 2025. Despite projections of an excess of RNs at the national level, 16 states are expected to see their supply of RNs outpaced by increases in demand, resulting in shortages. Ten of these states are in the West, four are in the South, and two are in the Northeast U.S. Census Bureau Regions. Midwestern states, on the other hand, are expected to improve the adequacy of their RN supply in 2025. (Exhibit 3)

Arizona is projected to have the largest state-level shortfall of over 28,100 RNs in 2025, followed by Colorado and North Carolina each with 12,900 fewer RNs than will be needed. Maryland and Nevada are also expected to see large declines in the adequacy of their RN workforce. On the other hand, states that currently have some of the largest numbers of RNs

(New York, Pennsylvania, Ohio, and Illinois) are projected to experience further improvements in the adequacy of their RN supply relative to 2012.

Exhibit 3: Baseline and Projected Supply of and Demand for Registered Nurse Workforce 2012-2025

Region/State	2012	2025 Projected		
	Supply & Demand ^a	Demand	Supply	Difference ^b
<i>Northeast</i>				
Connecticut	37,100	41,500	45,200	+3,700
Maine	16,200	17,500	15,800	-1,700
Massachusetts	78,800	85,500	85,900	+400
New Hampshire	15,700	18,000	18,500	+500
New Jersey	84,600	98,500	119,400	+20,900
New York	191,200	212,400	235,800	+23,400
Pennsylvania	145,000	152,600	178,400	+25,800
Rhode Island	12,900	14,000	11,900	-2,100
Vermont	7,400	8,100	8,800	+700
<i>Northeast subtotal</i>	<i>588,900</i>	<i>648,100</i>	<i>719,700</i>	<i>+71,600</i>
<i>Midwest</i>				
Illinois	126,900	140,100	149,800	+9,700
Indiana	66,400	71,400	91,600	+20,200
Iowa	34,600	35,300	56,600	+21,300
Kansas	30,300	32,800	47,600	+14,800
Michigan	96,300	104,600	116,000	+11,400
Minnesota	59,300	66,500	84,900	+18,400
Missouri	61,600	67,700	85,000	+17,300
Nebraska	20,900	21,900	22,100	+200
North Dakota	7,400	7,600	10,400	+2,800
Ohio	130,600	137,400	212,800	+75,400
South Dakota	10,000	10,600	14,500	+3,900
Wisconsin	63,300	68,800	78,100	+9,300
<i>Midwest subtotal</i>	<i>707,600</i>	<i>764,700</i>	<i>969,400</i>	<i>+204,700</i>
<i>South</i>				
Alabama	50,200	55,700	70,100	+14,400
Arkansas	27,600	31,800	47,700	+15,900
Delaware	10,600	12,500	16,200	+3,700
Florida	171,600	225,500	229,700	+4,200

Region/State	2012	2025 Projected		
	Supply & Demand ^a	Demand	Supply	Difference ^b
Georgia	77,300	101,400	94,700	-6,700
Kentucky	47,300	51,000	67,500	+16,500
Louisiana	41,300	46,500	64,700	+18,200
Maryland	60,600	72,000	59,900	-12,100
Mississippi	32,200	35,800	47,000	+11,200
North Carolina	95,800	120,000	107,100	-12,900
Oklahoma	32,200	37,300	55,000	+17,700
South Carolina	44,600	54,600	54,000	-600
Tennessee	65,000	76,100	92,200	+16,100
Texas	192,000	278,300	284,400	+6,100
Virginia	69,900	87,300	106,700	+19,400
West Virginia	20,600	21,100	29,000	+7,900
South subtotal	1,038,800	1,306,900	1,425,900	+119,000
West				
Alaska	5,600	7,300	4,600	-2,700
Arizona	53,000	87,200	59,100	-28,100
California	277,000	393,600	389,900	-3,700
Colorado	42,900	59,000	46,100	-12,900
Hawaii	10,700	13,400	13,200	-200
Idaho	11,700	15,400	16,100	+700
Montana	10,700	12,100	11,300	-800
Nevada	19,400	32,400	24,600	-7,800
New Mexico	15,900	22,100	18,700	-3,400
Oregon	31,300	40,100	34,100	-6,000
Utah	19,700	25,400	31,200	+5,800
Washington	57,800	75,100	68,100	-7,000
Wyoming	4,300	4,900	6,800	+1,900
West subtotal	560,000	788,000	723,800	-64,200
US^c	2,897,000	3,509,000	3,849,000	+340,000

Notes: ^a Projections assume demand and supply are equal in 2012 and nurses remain in their state of training.

^b Difference = 2025 projected supply – demand. ^c Includes Washington, D.C.; data for D.C. are not presented separately because the small sample size in American Community Survey (ACS) generated unstable supply estimates.

National Trends in LPN Supply and Demand: Approximately 730,000 LPNs were active in the U.S. workforce in 2012. Trending forward to 2025 using current supply determinants (such as rates of entry, or attrition from the profession) there will be 832,000 new LPNs in the workforce and 571,000 LPNs will leave the workforce. This net growth of 260,900 new nurses will result in a national workforce of 990,900 LPNs by 2025. (Exhibit 4)

Assuming the current LPN demand equals the current LPN supply of 730,000, the demand for LPNs is projected to reach 931,000 by 2025, an increase of 201,000. This growth in demand is driven primarily by an aging population, resulting in increased health service needs. The impact of expanded insurance coverage under the Affordable Care Act is relatively small.

Exhibit 4: Projected National Supply and Demand of Licensed Practical Nurses

	Licensed Practical Nurses
Supply	
Estimated supply, 2012	730,000
Estimated supply growth, 2012-2025	260,900
<i>New entrants</i>	832,000
<i>Attrition^a</i>	(571,000)
<i>Change in average work hours^b</i>	100
Projected supply, 2025	990,900
Demand^c	
Estimated demand, 2012	730,000
Estimated demand growth, 2012-2025	201,000
<i>Changing demographics</i>	195,000
<i>ACA-related increases in the number of insured</i>	6,000
Projected demand, 2025	931,000
Supply in Excess of Demand, 2025	59,000

Notes: ^a Includes LPNs who exit to become RNs; ^b This represents the change in nurse 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 demand and supply are equal in 2012.

State Trends in LPN Supply and Demand: Assuming LPNs remain in the state where they receive their training, 22 states are projected to see that their LPN supply will be outpaced by demand by 2025 – including 10 states in the West, 5 each in the South and Northeast, and 2 in the Midwest. Arizona, with a projected deficit of 9,590 LPNs, will have the largest shortage. Other states with relatively large projected shortfalls are all in the South: Maryland with an expected shortfall of 7,880 LPNs; North Carolina with a shortfall of 7,760 LPNs; and Georgia with 7,100 fewer LPNs than needed. States currently with a larger LPN workforce (New York, Ohio, Florida, Texas and California) trend towards higher LPN supply relative to demand, with Ohio exhibiting the greatest projected excess supply of 25,240 LPNs by 2025. (Exhibit 5)

Exhibit 5: Baseline and Projected Supply of and Demand for the Licensed Practical Nurse Workforce 2012-2025

State/Region	2012	2025 Projected		
	Supply & Demand ^a	Demand	Supply	Difference ^b
<i>Northeast</i>				
Connecticut	8,300	9,810	11,540	+1,730
Maine	2,150	2,840	1,750	-1,090
Massachusetts	14,020	16,690	14,380	-2,310
New Hampshire	3,930	4,820	4,390	-430
New Jersey	18,500	23,260	36,220	+12,960
New York	45,380	53,470	55,050	+1,580
Pennsylvania	41,380	44,990	42,680	-2,310
Rhode Island	1,640	2,050	930	-1,120
Vermont	1,410	1,800	2,340	+540
<i>Northeast subtotal</i>	136,710	159,730	169,280	+9,550
<i>Midwest</i>				
Illinois	22,390	27,220	29,360	+2,140
Indiana	18,130	20,230	22,200	+1,970
Iowa	7,980	8,560	16,880	+8,320
Kansas	7,360	8,380	13,460	+5,080
Michigan	20,460	24,100	23,270	-830
Minnesota	15,880	18,630	24,030	+5,400
Missouri	19,430	21,850	23,560	+1,710
Nebraska	5,600	5,800	3,120	-2,680
North Dakota	2,660	2,800	2,950	+150
Ohio	39,340	41,650	66,890	+25,240

State/Region	2012	2025 Projected		
	Supply & Demand ^a	Demand	Supply	Difference ^b
South Dakota	1,840	2,090	2,750	+660
Wisconsin	12,120	14,490	15,650	+1,160
Midwest subtotal	173,190	195,800	244,120	+48,320
South				
Alabama	13,930	16,110	15,410	-700
Arkansas	12,750	14,250	17,410	+3,160
Delaware	1,940	2,600	4,380	+1,780
Florida	47,270	63,910	65,430	+1,520
Georgia	25,910	33,260	26,160	-7,100
Kentucky	12,110	13,720	17,350	+3,630
Louisiana	15,890	17,900	20,400	+2,500
Maryland	13,150	16,960	9,080	-7,880
Mississippi	11,210	12,550	13,260	+710
North Carolina	20,650	28,180	20,420	-7,760
Oklahoma	15,440	17,180	19,720	+2,540
South Carolina	11,990	15,540	11,630	-3,910
Tennessee	23,330	27,200	27,580	+380
Texas	60,730	85,090	86,230	+1,140
Virginia	23,630	29,630	34,470	+4,840
West Virginia	7,350	7,830	8,380	+550
South subtotal	317,280	401,910	397,310	-4,600
West				
Alaska	910	1,480	590	-890
Arizona	8,940	19,090	9,500	-9,590
California	56,100	91,540	112,140	+20,600
Colorado	6,190	11,360	7,230	-4,130
Hawaii	1,590	2,610	2,310	-300
Idaho	3,090	4,320	4,270	-50
Montana	1,800	2,420	2,060	-360
Nevada	3,260	6,950	5,750	-1,200
New Mexico	3,060	5,210	3,160	-2,050
Oregon	3,500	6,490	6,100	-390
Utah	2,660	4,400	6,510	+2,110
Washington	9,800	15,490	14,290	-1,200
Wyoming	940	1,250	1,540	+290

State/Region	2012	2025 Projected		
	Supply & Demand ^a	Demand	Supply	Difference ^b
<i>West subtotal</i>	<i>101,840</i>	<i>172,610</i>	<i>175,450</i>	<i>2,840</i>
US^c	730,000	931,000	990,900	59,900

Notes: ^a Projections assume demand and supply are equal in 2012 and nurses remain in their state of training.

^b Difference = 2025 projected supply – demand. ^c Includes Washington, D.C.; data for D.C. are not presented separately because the small sample size in ACS generated unstable supply estimates.

Alternative Scenarios

Several alternative scenarios that utilize different assumptions were examined in the preparation of this report. For example, if the demand for RNs returns to pre-recession levels (prior to 2007), then excess capacity is projected to decline from 340,000 to approximately 236,000 RNs by 2025. Adjusting the number of new graduates to approximately 126,000 to 133,000 per year should align supply with the projected demand for services if care delivery patterns were to remain unchanged.

However, since the 1980s, the annual number of nurse graduates has been cyclical and characterized by high growth followed by declines of up to 25%. In an alternative supply and demand scenario if nurses begin retiring two years earlier than pre-recession levels and there is a 10% drop in new graduates, future supply would fall below projected demand resulting in a shortfall of 86,000 RNs in 2025.

Alternatively, if the number of new LPNs educated each year were to decline by 10% relative to current numbers, then projected supply and demand would be in equilibrium in 2025. In another alternative supply and demand scenario if LPNs begin retiring two years earlier than pre-recession levels and there is a 10% drop in new graduates, future supply would fall below projected demand resulting in a shortfall of 19,000 LPNs in 2025.

Therefore, while the evidence in this report points towards the U.S. currently educating slightly more nurses than required to meet future demand, a reduction in people choosing nursing as a career or a combination of factors such as early retirement or increased demand, could be sufficient to erase projected surpluses for RNs and LPNs.

Limitations

HRSA's Health Workforce Simulation Model operates under several assumptions regarding the current status and future trends in health care utilization and workforce supply. The HRSA Model, like most other health workforce projection models, assumes that the labor market for nurses is currently in balance (i.e., supply and demand in the base year are equal).^{3,4} Therefore, the results in this brief reflect changes in the nursing workforce over time relative to a balanced 2012 baseline. The HRSA Model also assumes that the future production of nurses will remain consistent with the current rate. However, there have historically been large swings in enrollment and the resulting labor supply, which, if repeated in the future, would affect the results reported here.

State-level projections require assumptions about the geographic mobility of nurses. Results presented here assume that nurses will practice in states where they have been trained. As a result, many states are projected to have nursing shortages in 2025 despite the fact that, on a national level, there is projected to be an excess of both RNs and LPNs. If, on the other hand, migration were optimal (i.e., nurses were able and willing to migrate to states where the in-state supply did not meet demand), then every state would show a relative surplus of RNs and LPNs in 2025. This accentuates the fact that nursing shortages currently (and in 2025) represent a problem with workforce distribution rather than magnitude. Although there is evidence that some very specialized settings may be facing nurse shortages,⁵ this report looks at the nursing profession as a whole and does not look at individual nursing specialty areas (e.g., public health, home health care, etc.) or sites of practice (e.g., nursing homes, ambulatory settings, etc.).

³ Ono, T., Lafortune, G., Schoenstein, M. (2013). Health workforce planning in OECD countries: a review of 26 projection models from 18 countries. *OECD Health Working Papers, No. 62*. France: OECD Publishing; 2013:8-11.

⁴ Yang, W., Williams, J.H., Hogan, P.F., Bruinooge, S.S., Rodriguez, G.I., Kosty, M.P., Bajorin, D.F., Hanley, A., Muchow, A., McMillan, N., Goldstein, M. (2014). Projected supply of and demand for oncologists and radiation oncologists through 2025: an aging, better-insured population will result in shortage. *J Oncol Pract.*, 10(1):39-45.

⁵ American Association of Colleges of Nursing. (2014, April 24). *Nursing shortage fact sheet*. Retrieved August 21, 2014, from <http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-shortage>.

This brief's projections do account for increased utilization of health care services due to expanded insurance coverage under the Affordable Care Act. However, because of the uncertainties in its effects on staffing patterns and the evolving roles of different health professionals on care teams, changes in health care service delivery are not incorporated into the model. If the growing emphasis on care coordination, preventive services, and chronic disease management in care delivery models leads to a greater need for nurses, this brief may underestimate the projected nurse demand.

Conclusions

Using the most recently available data on nurse education, labor supply, and retirement patterns, HRSA's Health Workforce Simulation Model projects that by 2025 the supply of RNs and LPNs will grow more than the demand at the national level and for most states. Since 2000, the U.S. has more than doubled the number of RNs educated annually. The current high level of nurse training will add about 2 million new RNs and 800,000 new LPNs into the workforce by 2025, resulting in a national excess of 340,000 RNs and 59,900 LPNs, as compared to 2012. However, distributional patterns for the profession indicate that shortages exist and may persist or worsen in a number of states.

While these projections are consistent with findings in recent studies on RN supply,^{6, 7} historical experience demonstrates how sensitive enrollment in training programs and the resulting labor supply of nurses are to the job market and economic conditions.^{8, 9} For example, the growth of new entrants into the RN workforce is susceptible to the fragile supply of nurse educators.¹⁰

The HRSA Model estimated a growth in the demand for RNs by 21 percent and LPNs by 28 percent between 2012 and 2025. This growth is comparable to the U.S. Bureau of Labor

⁶ Auerbach, D. I., Buerhaus, P. I. & Staiger, D. O. (2014). Registered nurses are delaying retirement, a shift that has contributed to recent growth in the nurse workforce. *Health Affairs*, 33(8):1474-1480.

⁷ Auerbach, D. I., Buerhaus, P. I. & Staiger, D. O. (2011) Registered nurse supply grows faster than projected amid surge in new entrants ages 23-26 *Health Affairs*, 30(12):2286-2292.

⁸ Buerhaus, P.I., Auerbach, D.I., & Staiger, D.O. (2009). The recent surge in nurse employment: causes and implications. *Health Affairs*, 28(4): w657-w668.

⁹ Staiger, D. O., Auerbach, D. I., & Buerhaus, P. I. (2012). Registered nurse labor supply and the recession —are we in a bubble? *NEJM*, 366(16):1463-1465.

¹⁰ American Association of Colleges of Nursing (2014). Nursing faculty shortage fact sheet. Retrieved September 30, 2014 from <http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-faculty-shortage>.

Statistic's job growth estimate of 19 percent for RNs and 25 percent for LPNs between 2012 and 2022.¹¹ The state-level estimates derived from the Model are in agreement with recent data^{12,13} on RNs which have identified the South and West regions of the country as most vulnerable to RN shortages. Some of the projected declines in nurse supply in these states could be compensated for if nurses from states with an excess of RNs migrate to states with a deficit. However, given the nature of the nurse labor market and state regulatory environment, relying on migration of nurses may not be adequate. An effort to increase the capacity for states facing potential shortfalls to expand educational opportunities might be one effective strategy to mitigate the geographic variation in nurse supply.

Looking to the future, many factors will continue to affect the demand and supply of the nurse workforce including population growth and the aging of the nation's population, overall economic conditions, aging of the nursing workforce, new care delivery models and demand for health services broadly and within specific health care settings, and changes in health care reimbursement.¹⁴ The Affordable Care Act (ACA) is designed to expand the number of people with health insurance coverage and to encourage new value-based models of care. With an emphasis on maintaining health status and preventing acute health crises, these models are providing new opportunities and roles for nurses within the health care delivery system.¹⁵ It is too early to tell whether emerging care delivery models will contribute to a new growth in demand for nurses—e.g., with nurses taking on new and increased roles in prevention and care coordination. Additionally, emerging care delivery models such as Accountable Care Organizations could change the way the LPNs are employed, but there is currently insufficient information to project the extent to which these new delivery models will materially affect the demand for LPNs. Research to model the demand implications of trends in care delivery is ongoing.

¹¹ U.S. Department of Labor, Bureau of Labor Statistics. (2013, December 19). Occupations with the largest projected number of job openings due to growth and replacement needs, 2012 and projected 2022. *Economic News Release* Table 8. Retrieved August 19, 2014 from <http://www.bls.gov/news.release/ecopro.t08.htm>.

¹² Juraschek, S.P., Zhang, X., Ranganathan, V., & Lin, V.W. (2012). United States Registered Nurse Workforce Report Card and Shortage Forecast. *American Journal of Medical Quality*, 27(3): 241-249.

¹³ Buerhaus, P.I., Auerbach, D.I., Staiger, D. O., & Muench, U. (2013). Projections of the long-term growth of the registered nurse workforce: a regional analysis. *Nursing Economics*, 31(1):13-17.

¹⁴ Institute of Medicine. (2008). *Retooling for an aging America, building the health care workforce*. Washington (DC): National Academies Press.

¹⁵ Rother, J., & Lavizzo-Mourey, R. (2009). Addressing the nursing workforce: A critical element for health reform. *Health Affairs*, 28(4), w620-w624.

The supply and demand projections presented assume that care use and delivery patterns will remain unchanged. However, the health care system continues to evolve in response to changing technology, shifting financial incentives and economic pressures, and efforts to improve care access and quality. The net effects of these and other factors on supply and demand projections will continue to be researched. HRSA will update supply and demand projections as changes emerge in staff utilization patterns, reimbursement policies, health care coverage, scope of practice, health care delivery models, and other labor and economic factors.

About the Model

The results reported in this brief come from HRSA's new Health Workforce Simulation Model, which is an integrated health professions projection model that estimates the current and future supply of and demand for health care providers.

The supply component of the Model simulates workforce decisions for each provider 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 provides an end of year supply projection, which becomes the starting supply for the subsequent year. This cycle is repeated through 2025. The basic file that underlies the supply analysis contains individual records of the RNs and LPNs in the workforce from the American Community Survey (ACS).

Demand projections for health care services in different care settings are produced by applying regression equations for individuals' health care use on the projected population. The current nurse staffing patterns by care setting are then applied to forecast the future demand for nurses. 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, 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 Model simulates future populations with expected demographic, socioeconomic, health status, health risk and insurance status.

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

¹ Holahan, J. & Blumberg, L. (2010 January). *How would states be affected by health reform? Timely analysis of immediate health policy issues*. Retrieved August 2013 from http://www.urban.org/UploadedPDF/412015_affected_by_health_reform.pdf.

² Holahan, J. (2014 March) *The launch of the Affordable Care Act in selected states: coverage expansion and uninsurance*. Retrieved August 2013 from <http://www.urban.org/uploadedPDF/413036-the-launch-of-the-Affordable-Care-Act-in-selected-states-coverage-expansion-and-uninsurance.pdf>. Washington D.C., The Urban Institute.