Nebraska's Multi-Regional Nursing Workforce Model

Main Findings

2017-2025

NEBRASKA

Good Life. Great Mission.

DEPT. OF HEALTH AND HUMAN SERVICES

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MAJOR FINDINGS

REGISTERED NURSES (RNS)

- 58 percent of RNs are employed in Nebraska hospitals.
- 2 percent of RNs in Nebraska are unemployed.
- A **statewide shortage** for RNs is expected to continue from 2017 through 2025.
- 2017 shows a shortage of full-time equivalent (FTE) RNs (20,739 supply) compared to demand (23,531) in all regions.
- **Expected RN shortage in 2025: 3,238 (FTEs)**

ADVANCED PRACTICE REGISTERED NURSES (APRNS)

- 49 percent of APRNs are employed in Nebraska hospitals.
- 30 percent of APNRs are employed in Ambulatory Care.
- The demand for APRNs (FTEs) in 2017 was estimated at 1,876, with a supply of 1,498, leaving a gap of 378 FTEs.
- A **statewide shortage** for APRNs is expected to continue from 2017 through 2025.
- The most severe APRN shortages will be experienced in the following regions: Central, Northeast, Omaha, and Lincoln.
- **Expected APRN shortage in 2025: 592 (FTEs)**

LICENSED PRACTICAL NURSES (LPNS)

- 44 percent of LPNs are employed in long-term care facilities.
- The LPN ratio of nurses to patients is much higher in Sandhills and Southeast regions than in other economic regions of the State.
- There will be a **shortage of LPNs through 2025** in all Nebraska economic regions.
- **Expected LPN shortage in 2025: 1,606 (FTEs)**

☞ By 2025, a nursing shortage of **5,436 FTE** nurses is expected.

The Nebraska Multi-regional Nursing Workforce Model is a policy tool that forecast the supply and demand for **registered nurses** (RNs), **advanced practice registered nurses** (APRNs), and **licensed practical nurses** (LPNs), through the year 2025, both at the state level, and at the regional level. Nebraska's nine economic development regions developed by the Nebraska Department of Labor were used for forecasting at the regional level. Nursing shortages and surpluses are identified from 2017 through 2025 for each type of nurse and by region using the following formula:

Shortage or Surplus of Nurses = Demand for Nurses – Supply of Nurses

Changes in health care policy/health care reform, patient care delivery, nurse intensity, technological advances, or population change will affect demand for RNs, APRNs, and LPNs. As the population projections from 2017 to 2025 are based on the 2010 U.S. Census, it is expected that baseline data from the 2020 Census will provide even better estimates of the supply and demand of nurses in each of the nine economic regions. As the nursing model is dynamic in essence, some of these demographic changes can already be simulated through changes in nursing utilization intensity and graduation rates.

REGIONAL DEFINITIONS

The nine regions that have been selected for analyzing nursing in the state are the same regions that the Nebraska Department of Labor has defined for their economic regions. This is helpful because it allows data in the model to be compared with Department of Labor data for the same geographic markets. There are three regions that contain Metropolitan Statistical Areas and each has one county that is considered "urban": Omaha (Douglas County), Lincoln (Lancaster County), and Grand Island (Hall County). The population groupings by age and gender are broken out separately for them for each of these urban

counties. This is because healthcare follows a different pattern in urban areas. Residents are more likely to seek care at an emergency room or urgent care center and often do not have a regular primary care physician. In suburban and rural areas, residents are more likely to see the same doctor who is more familiar with their medical history. This results in early diagnosis and fewer hospitalizations. Thus a lower demand for nurses than in urban communities. A map and definition of each region based on counties is shown below.

**Nine Regions for the Nursing Workforce Model – State of Nebraska:**
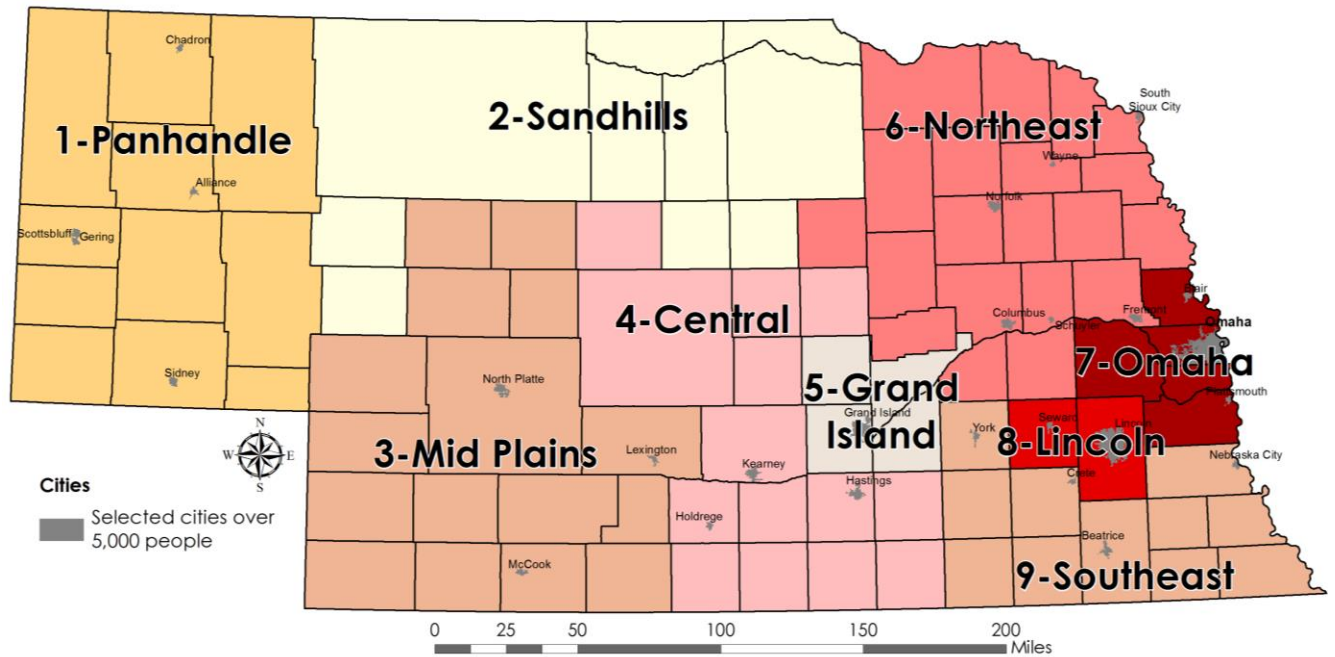
Region	Counties
1. Panhandle	Banner, Box Butte, Cheyenne, Dawes, Deuel, Garden, Kimball, Morrill, Scotts Bluff, Sheridan, Sioux
2. Sandhills	Arthur, Boyd, Brown, Cherry, Garfield, Grant, Holt, Keya Paha, Loup, Rock
3. Mid Plains	Chase, Dawson, Dundy, Frontier, Furnas, Gosper, Hayes, Hitchcock, Hooker, Keith, Lincoln, Logan, McPherson, Perkins, Red Willow, Thomas
4. Central	Adams, Blaine, Buffalo, Clay, Custer, Franklin, Greeley, Harlan, Kearney, Nuckolls, Phelps, Sherman, Valley, Webster
5. Grand Island	Hall, Hamilton, Howard, Merrick
6. Northeast	Antelope, Boone, Burt, Butler, Cedar, Colfax, Cuming, Dakota, Dixon, Dodge, Knox, Madison, Nance, Pierce, Platte, Polk, Stanton, Thurston, Wayne, Wheeler
7. Omaha	Cass, Douglas, Sarpy, Saunders, Washington
8. Lincoln	Lancaster, Seward
9. Southeast	Fillmore, Gage, Jefferson, Johnson, Nemaha, Otoe, Pawnee, Richardson, Saline, Thayer, York

THE DEMAND OF NURSES

Estimating the demand for nurses starts with demographic analysis. The data used are the official population figures published by the state government based on data from the U.S. decennial census. The population forecasts for each county are broken down into groups by age, gender and whether the county is urban or rural. Each of these population clusters has a demand factor based on studies done by various national healthcare organizations. Actuarial data shows that the older one gets, the more healthcare they likely need and the pattern of demand for males and females vary during most of their lives because of child bearing and other factors. This is evident from the following graph showing the inpatient days by age and gender for urban and non-urban communities.

Inpatient Days, By Age and Gender, Urban/Non-Urban Population
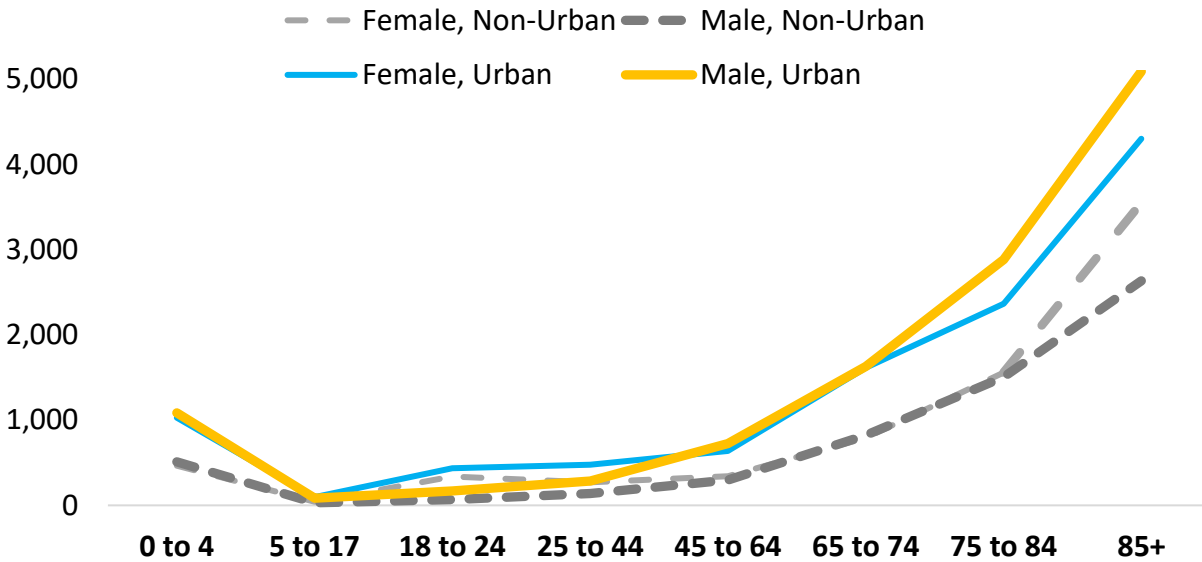
Each of the three models associates the demand for nurses with each population group based on **age**, **gender**, and degree of **urbanization** in each region to a set of healthcare settings where nurses are employed.

HEALTHCARE SETTINGS

Healthcare settings breakdown the employment of nurses by where they work. The demand for each type of nurse is estimated in each of the following healthcare settings. A brief description and the units used to measure demand are shown below:

Setting	Description	Units Used
Inpatient Care	Hospitals where acute care is provided.	Patient days
Ambulatory Care	Clinics, urgent care, doctors' offices	Visits per day
Nursing Facilities	Both long-term and sub-acute care	Resident days
Home Health	In home care by any nurse	Visits per day
Public Health	Public Health and Community Health	Nurses per 10,000
Nursing Education	Nurses teaching in schools of nursing	Nurses per 10,000
Other	Nurses working in public schools, prisons, insurance companies, etc.	Nurses per 10,000

Each model forecasts the demand for nurses that will be needed in each of these settings by each population cluster. These estimates are then added together to determine the total demand for that type of nurse in each future year in each region. The regional demand is also aggregated to the state level by healthcare setting. The flowchart below shows the elements used in estimating the demand for nurses.
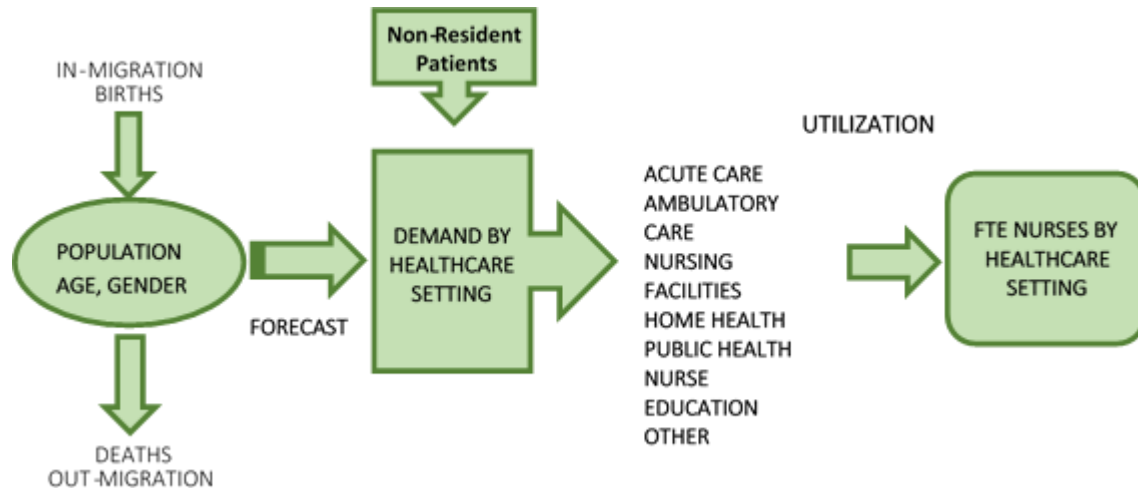
Another factor that is considered is the care of patients who come from outside the region. These are designated as non-resident patients (exports) because the payment for their care comes from outside the region's economy. In some regions this is not a factor, but in several regions, it is a major factor that must be accounted for because it has a significant impact on the demand for nurses.

THE SUPPLY OF NURSES

The supply of nurses can be thought of as a stock and flow model. There is a current stock of nurses working in each region across the major healthcare settings. Based on their age, the number of nurses is converted to FTE nursing units. Each year some nurses retire or reduce their hours of work as they age. This causes an outflow of FTEs from the stock of nurses available in the region's workforce. But, there is also a new crop of nurses joining the workforce each year. This is an inflow of FTEs to the stock of nurses. Most of these are newly licensed nurses who are recent graduates of nursing programs. There are, however, some nurses who move in or out of a region for personal reasons or are recruited that have to be considered.

ESTIMATING THE SUPPLY OF NURSING

The first step in estimating the future supply of nursing resources in any region is to examine the licensure data. The key variables are the age of each nurse and the average number of hours they work each week. The average number of

hours worked each week for each age group in single years in divided by 40 hours per week. This results in a percent of full-time nursing that is multiplied times the number of nurses in that age group to estimate how many FTEs are available. Prior to age 60 there isn't much of a decrease in average hours worked, but in later years this figure drops.

CRITICAL ACCESS HOSPITALS

Nebraska has many regions with very low population density. The number of people who need healthcare is not large enough to sustain the demand for all types of care and so medical personnel in these regions must be prepared for a wide variety of medical emergencies, illnesses, and treatments. In effect, acting as an urgent care center for part of the region. Demand can fluctuate greatly. Meeting this challenge, is a network of Critical Access Hospitals throughout the state. They are smaller in size and operate differently than other hospitals because they are the first place patients come for care and the treatment they need is unpredictable. When the service area of a hospital has a larger number of patients, it can anticipate the pattern of treatment that can be expected. Nurses can be on one service and specialize and staffing patterns are relatively stable. But in the Critical Access Hospital, a nurse deals with every type of care and treatment as well as some clerical tasks such as patient registration. Patients are often stabilized and transported to larger regional medical centers. These same patients may be returned for sub-acute care or therapy following their acute care at a regional medical center.

As a result, Critical Access Hospitals must always have a minimum staff on hand to be prepared for variations in demand. The nurses working there need a wider variety of skills. The demand for nursing is not as sensitive to demographics in the region. The age and gender groups in these rural areas are not large enough, given the size of the total population, to provide a stable picture of demand.

This can be seen when a comparison is made between the national benchmarks for inpatient care and ambulatory care and the actual utilization of nurses in these facilities. The number of nurses per patient is much greater because minimum staffing is necessary. The silver lining to this is that patients get high quality care and more attention than in a larger facility. The downside is

that it costs more to maintain this system, but there is no effective alternative if patients are going to have access to healthcare in rural areas.

What this means for the models of the nurse workforce is that the utilization factors are much greater than normal. Part of this is due to Critical Access Hospitals being engaged in ambulatory care and sub-acute care that in a larger setting would be done in a rehabilitation facility or nursing home. The hours are not separated out at this point. The models provide an accurate picture of the demand across the entire region, but the breakdown of the need for nurses in each healthcare setting is less accurate because Critical Access Hospitals provide such a broad range of services.

NURSING WORKFORCE DIALOGUES

Ann Oertwich, Executive Director of the Board of Nursing, Lisa Walters, President of the Nebraska Center for Nursing, Dr. Craig Moore, consultant, a national expert on nursing workforce models and the author of the Nebraska Multiregional Nursing Workforce Model, and Juan-Paulo Ramírez, independent consultant with the Nebraska Center for Nursing, traveled the State of Nebraska during the month of July 2018, to present and discuss the nursing supply and demand projections by economic regions. Cities visited included: Scottsbluff (Panhandle Economic Region), North Platte (Mid Plains Economic Region), Kearney (Central Economic Region), Lincoln (Lincoln MSA Economic Region), Norfolk (Northeast Economic Region), and Omaha (Omaha Consortium Region). The map below shows the location of each site visited. More than 150 participants attended these nursing workforce dialogues.

Cities and Economic Regions visited during the Nursing Workforce Dialogues:
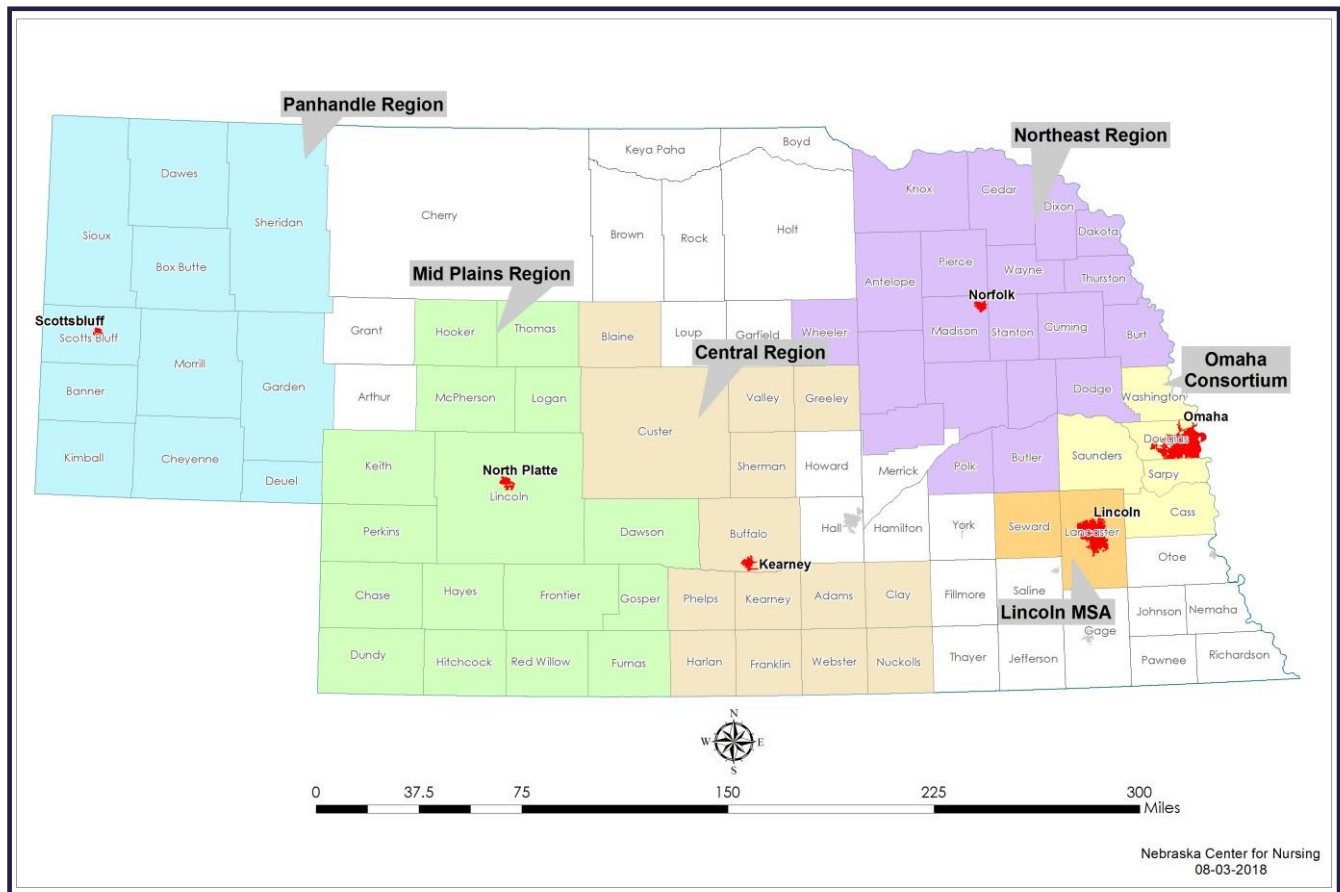
Throughout these dialogues, nurses, CEO/administrators, CNO/DON, CFO, health educators, public officials (or elected officials) were informed of the expected nursing supply and demand, the nursing workforce gap for RNs, APRNs, and LPNs projected to the year 2025, and visualized results of a simulation ("what if" scenario) for each economic region. After the presentations, attendants were asked to participate in a focus group addressing three key questions:

1. **What do you know? Does this data match with what you are seeing?**

2. **What have you done? What efforts have you made to help**

alleviate the shortage in your area?

3. **What can Nebraska Center for Nursing do to help or partner?**

The dialogues validated results of the models with the current nursing workforce needs present at each site, and informed about the main strategies used to alleviate the nursing shortage. The next figure shows participants and speakers in each of the sites.

Speakers and attendees of the Nursing Workforce Dialogues - July 23-26, 2018:

From right to left: Ann Oertwich, Dr. Moore, and attendees in Scottsbluff (Regional West Services; Panhandle Economic Region).

Dr. Moore, Ann Oertwich, and Lisa Walters in the background in North Platte (Great Plains Health; Mid Plains Economic Region).

Dr. Moore giving a presentation in Kearney. Ann Oertwich is portrayed in the background (Younes Center; Central Economic Region).

Attendees at the Lincoln MSA Economic Region Nursing Workforce Dialogue (Bryan Health Plaza, Lincoln).

Lisa Walters conducting a focus groups with attendees at Faith Regional Health Center (Norfolk; Northeast Economic Region).
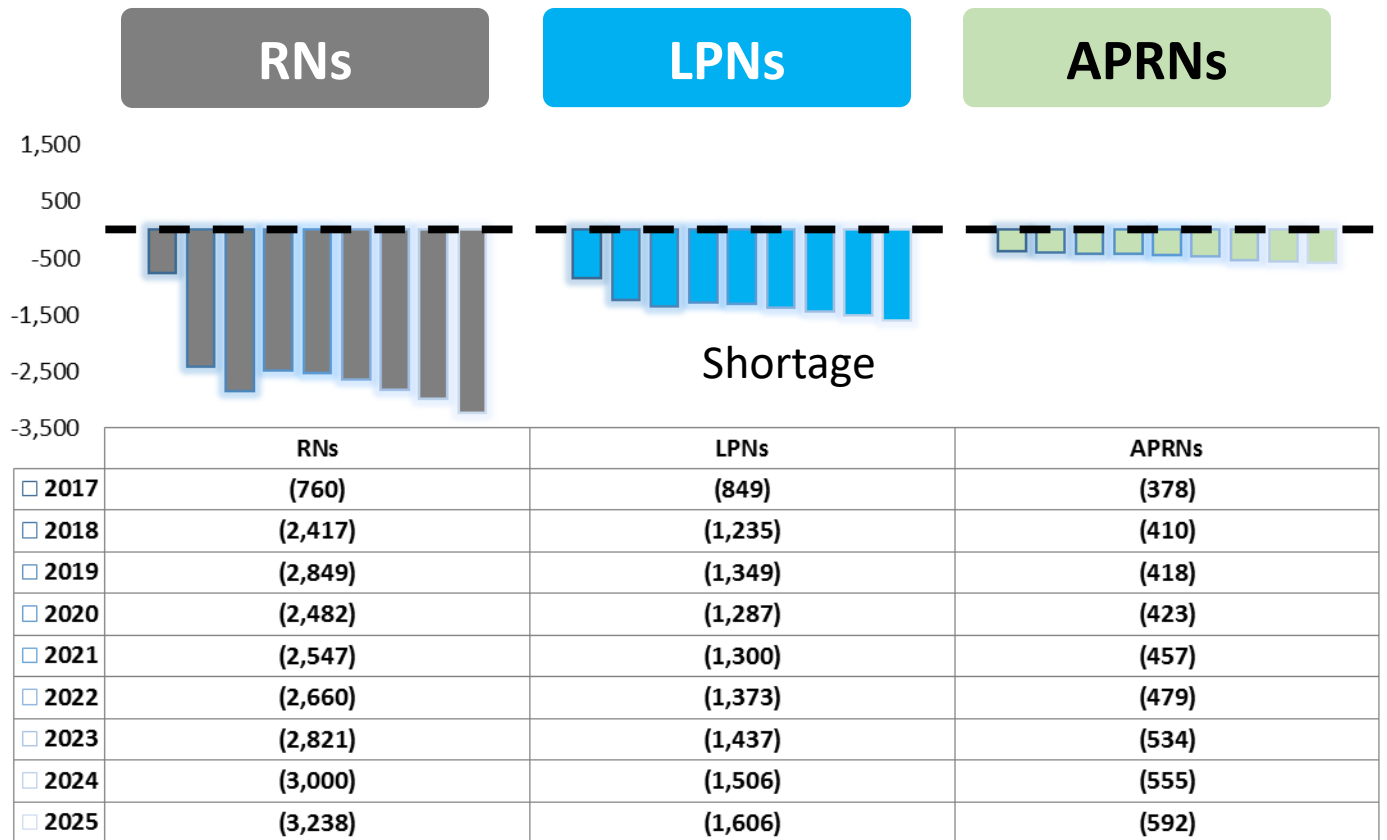

Dr. Moore, State Senators, and general public attending the Nursing Workforce Dialogue (Thompson Center at UNO. Omaha Consortium Economic Region).

NEBRASKA NURSING SUPPLY & DEMAND FORECAST

☞ The nursing shortage will deepen from 2017 through 2025 for all type of nurses:

RNs	LPNs	APRNs

Shortage

	RNs	LPNs	APRNs
☐ 2017	(760)	(849)	(378)
☐ 2018	(2,417)	(1,235)	(410)
☐ 2019	(2,849)	(1,349)	(418)
☐ 2020	(2,482)	(1,287)	(423)
☐ 2021	(2,547)	(1,300)	(457)
☐ 2022	(2,660)	(1,373)	(479)
☐ 2023	(2,821)	(1,437)	(534)
☐ 2024	(3,000)	(1,506)	(555)
☐ 2025	(3,238)	(1,606)	(592)

☞ All nursing types are experiencing shortages that will be increased over the following years.

☞ By 2025, a nursing shortage of **5,436** FTE nurses is expected.

	2017	2018	2019	2020	2021	2022	2023	2024	2025
RNs	-760	-2,417	-2,849	-2,482	-2,547	-2,660	-2,821	-3,000	-3,238
APRNs	-849	-410	-1,349	-1,287	-1,300	-1,373	-1,437	-1,506	-1,606
LPNs	-378	-1,235	-418	-423	-457	-479	-534	-555	-592
Total Nursing Shortage	**-1,986**	**-4,062**	**-4,616**	**-4,191**	**-4,304**	**-4,511**	**-4,792**	**-5,062**	**-5,436**

☞ 2018 shows a significant shortage ("gap") of nurses statewide:
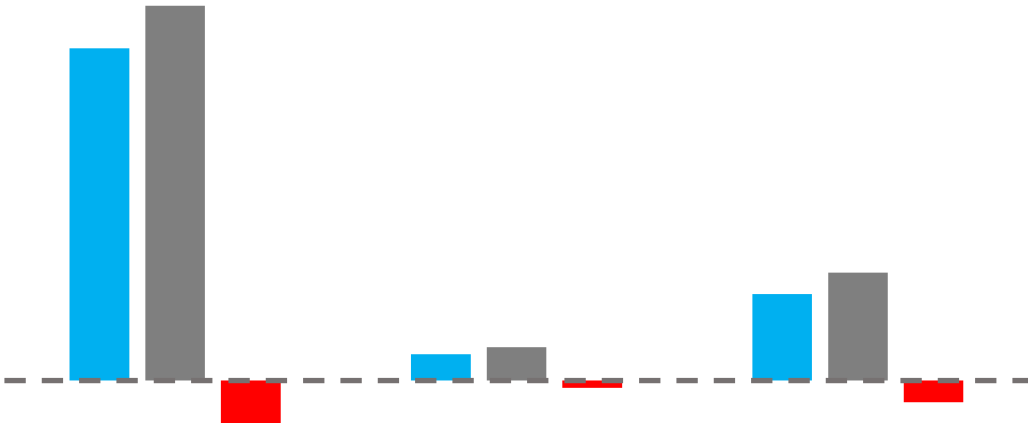
	RNs	APRNs	LPNs
■ **Supply**	18,901	1,490	4,913
■ **Demand**	21,318	1,900	6,147
■ **GAP**	(2,417)	(410)	(1,235)

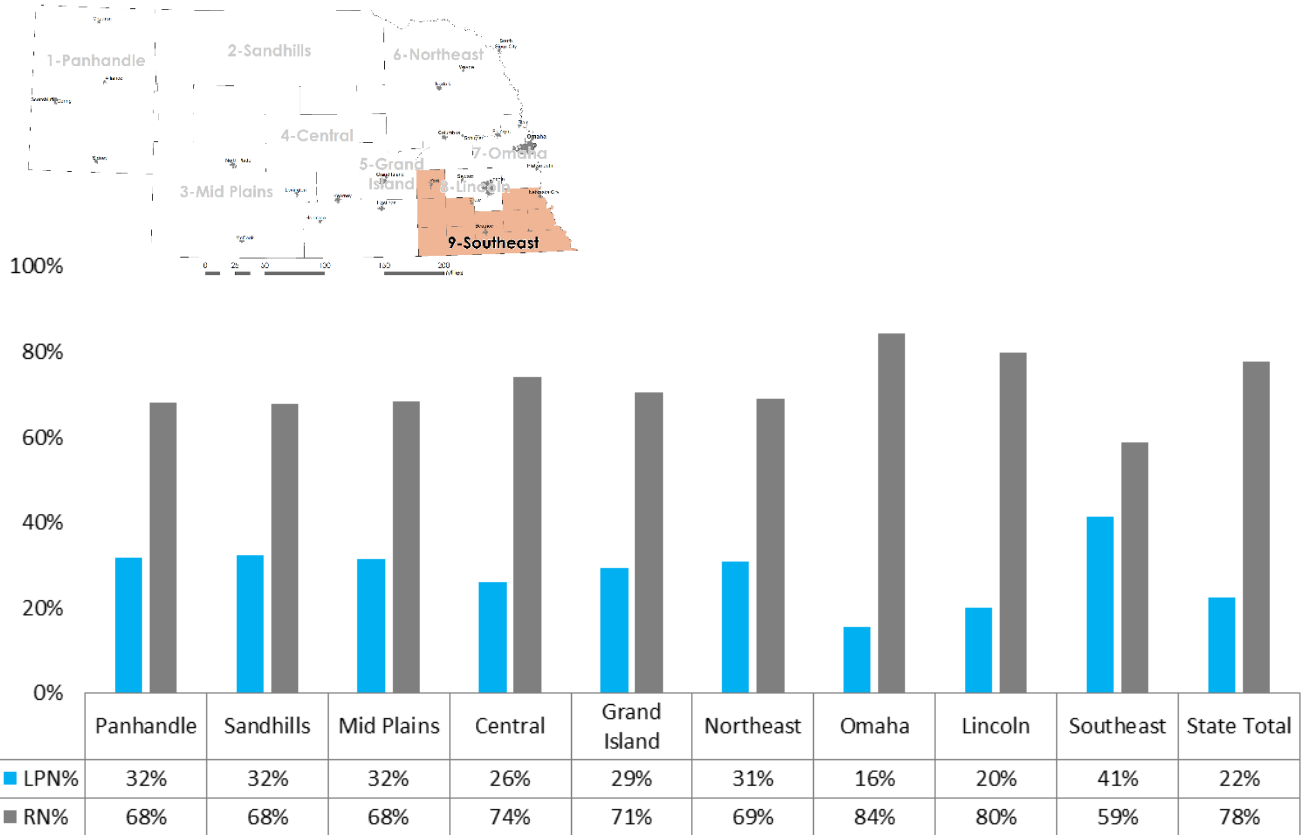## RN WORKFORCE 2018 BY REGION (FTES)

☞ The Panhandle and Sandhills Regions have the highest proportion of unmet demand for RNs.
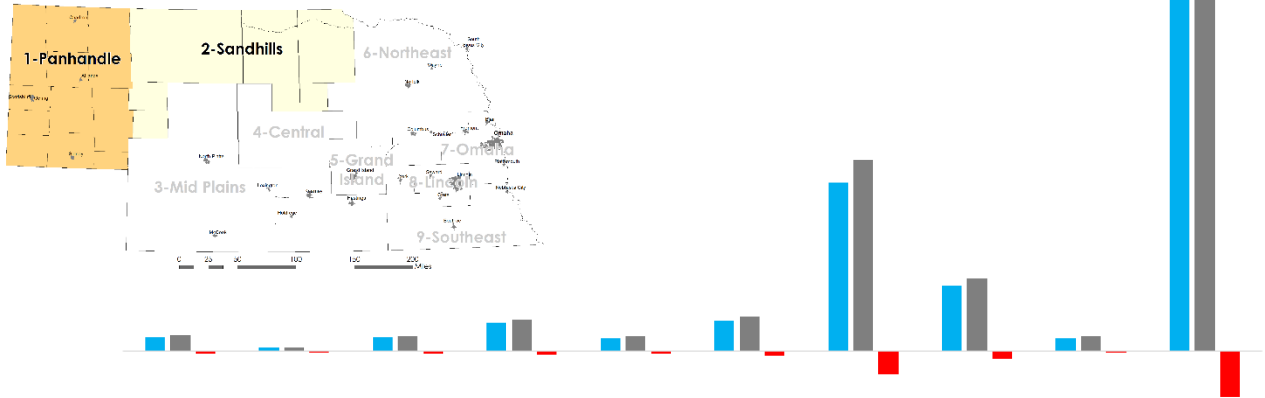
	Panhandle	Sandhills	Mid Plains	Central	Grand Island	Northeast	Omaha	Lincoln	Southeast	State Total
■ Supply	747	201	748	1,532	695	1,672	9,048	3,530	727	18,901
■ Demand	871	232	847	1,698	800	1,878	10,245	3,940	807	21,318
■ GAP	(124)	(31)	(99)	(166)	(104)	(206)	(1,197)	(409)	(80)	(2,417)

LPN Workforce 2018 by Region (FTEs)

☞ The Omaha Region has the highest proportion of unmet demand for LPNs.
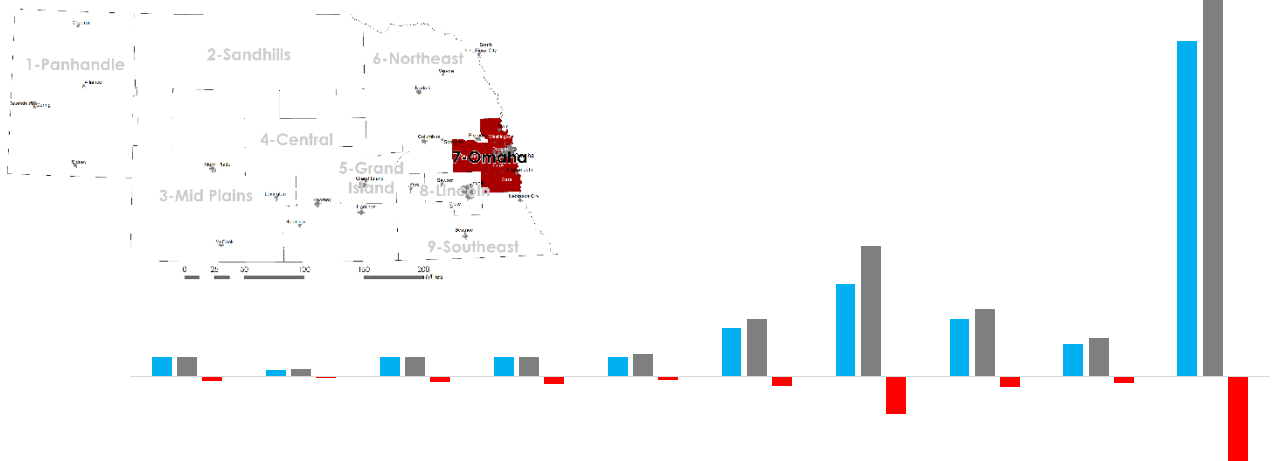
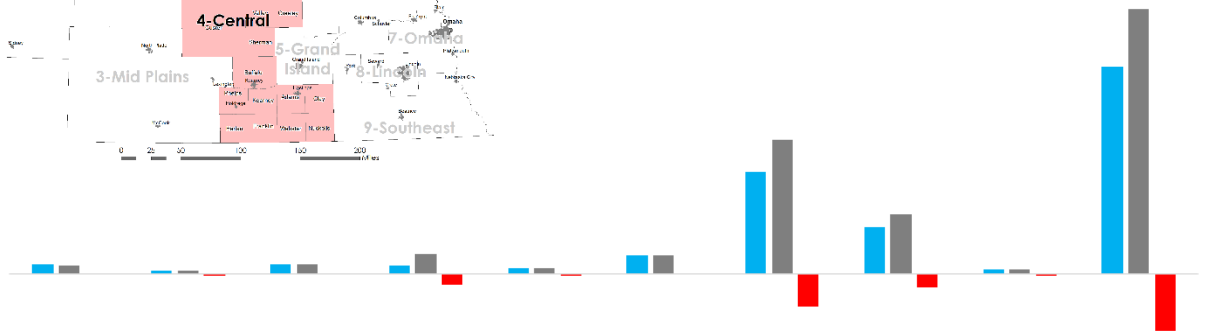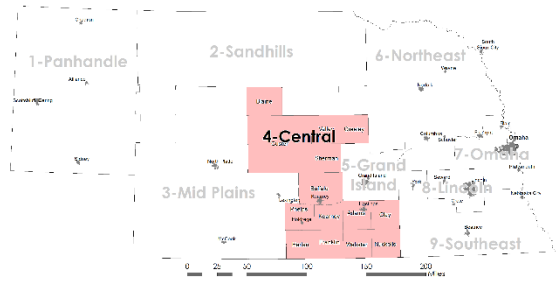|	Panhandle	Sandhills	Mid Plains	Central	Grand Island	Northeast	Omaha	Lincoln	Southeast	State Total
■ Supply	344	92	316	487	280	711	1362	843	477	4913
■ Demand	406	111	390	595	332	843	1906	995	568	6147
■ GAP	-62	-19	-74	-108	-52	-132	-544	-152	-92	-1235

NEBRASKA STATEWIDE NURSE WORKFORCE (FTES). DEMAND PROPORTION FOR RNS AND LPNS BY REGION

☞ There is a higher demand for LPNs in proportion to the demand for RNs in the Southeast Region.

	Panhandle	Sandhills	Mid Plains	Central	Grand Island	Northeast	Omaha	Lincoln	Southeast	State Total
LPN%	32%	32%	32%	26%	29%	31%	16%	20%	41%	22%
RN%	68%	68%	68%	74%	71%	69%	84%	80%	59%	78%

APRN WORKFORCE 2018 BY REGION (FTES)

The Central Region has the highest proportion of unmet demand for APRNs.

	Panhandle	Sandhills	Mid Plains	Central	Grand Island	Northeast	Omaha	Lincoln	Southeast	State Total
■ Supply	65	19	67	62	45	137	728	332	36	1,490
■ Demand	62	21	67	144	46	136	962	425	37	1,900
■ GAP	2	(2)	0	(82)	(1)	1	(234)	(93)	(1)	(410)

☞ By 2025, all economic regions will still be experiencing nursing shortages:
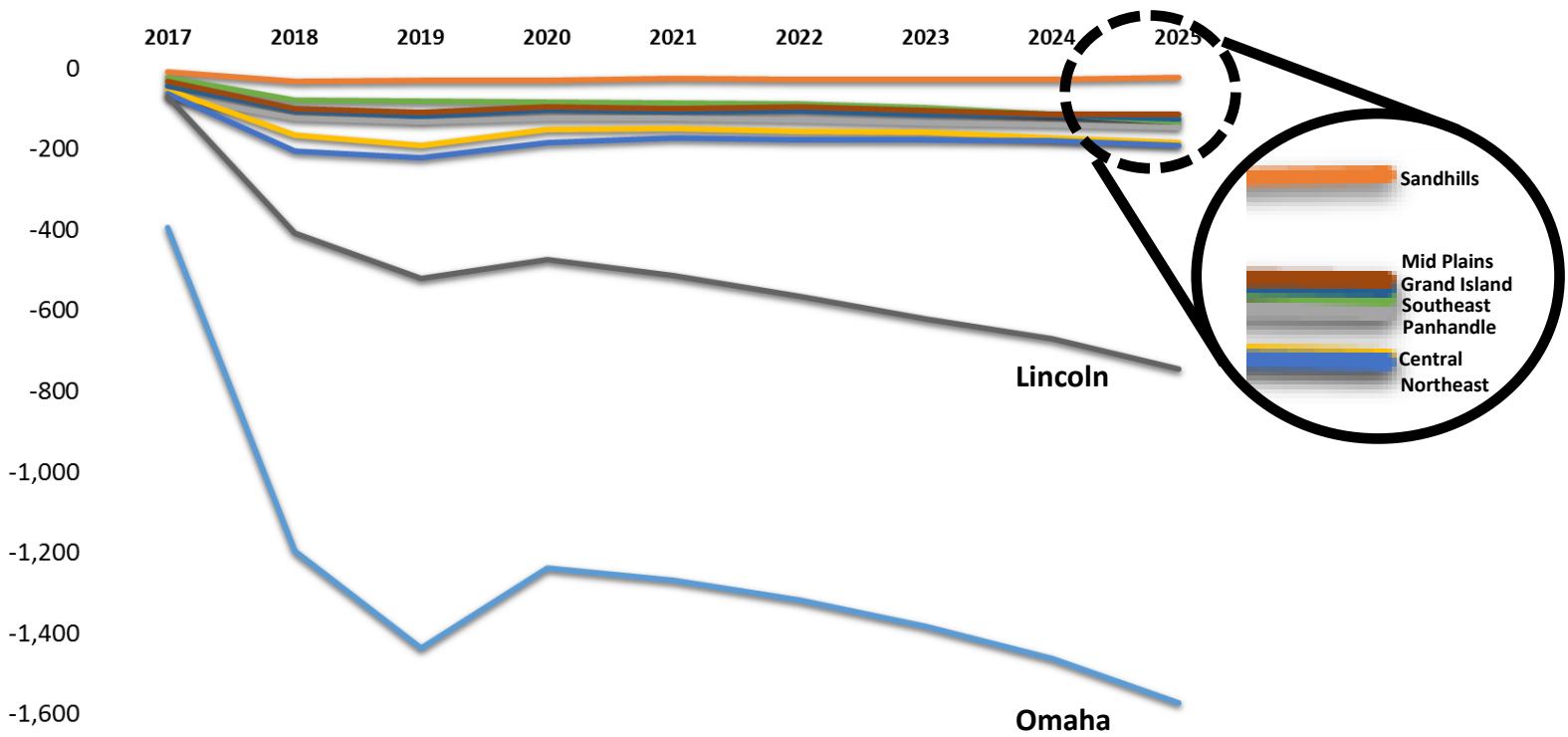
PROJECTED NURSING SHORTAGES (ALL TYPE OF NURSES) BY REGION IN 2025
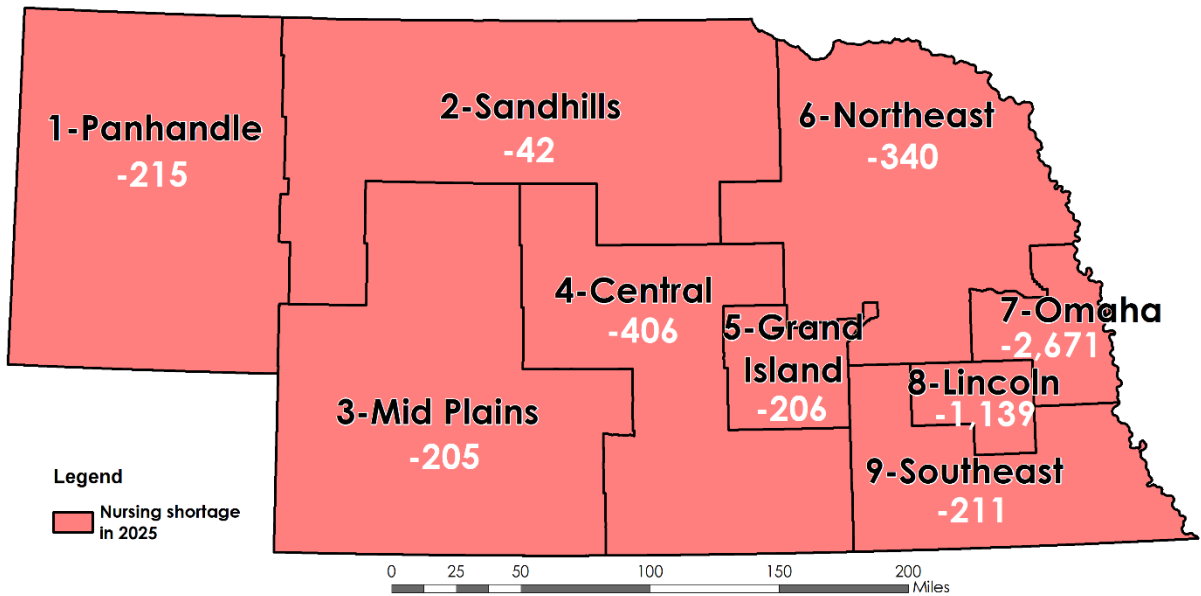
2018 DEMAND FOR NURSES – STATEWIDE VARIES BY SETTING

☞ RNs and APRNs are highly demanded in Hospital inpatient facilities, while LPNs are highly demanded in Nursing Facilities.

	Hospital Inpatient	Ambulatory Visits	Nursing Facilities	Home Health Visits	Public Health	Nursing Education	Other
APRNs%	48%	28%	2%	1%	4%	4%	7%
LPNs%	11%	9%	35%	13%	7%	0%	24%
RNs%	53%	13%	9%	5%	3%	1%	8%
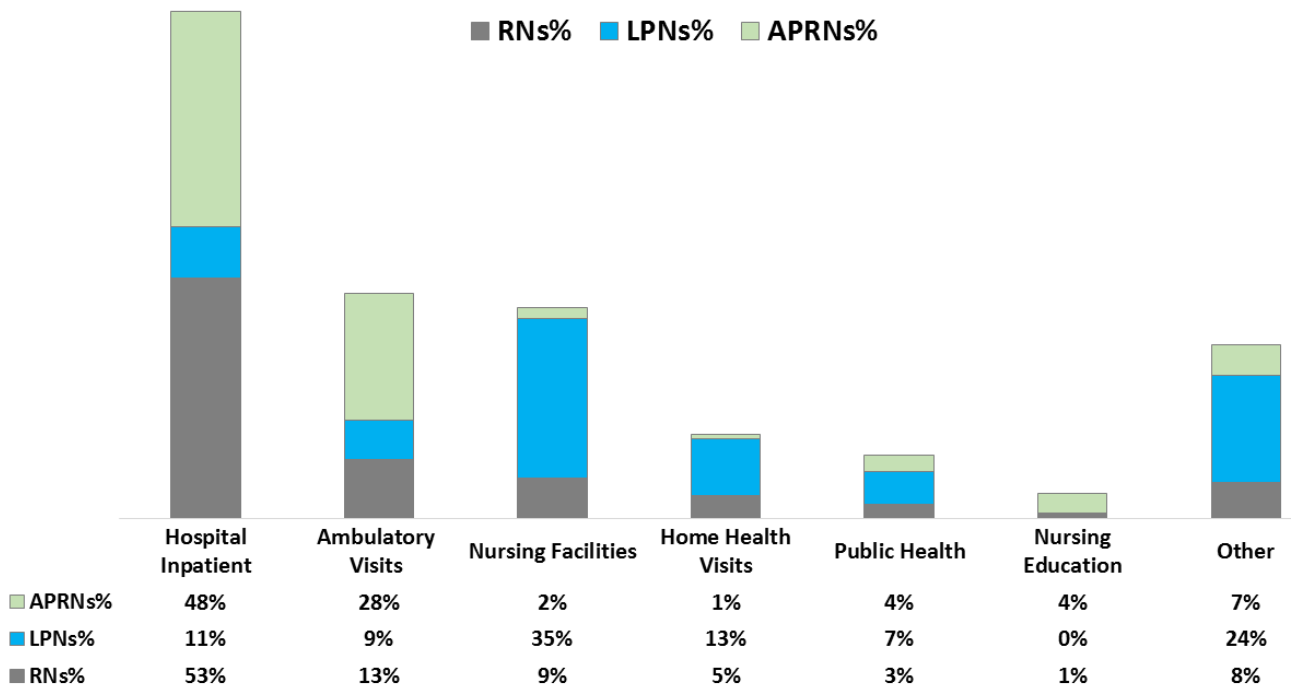
Forecasts by Economic Development Regions:

REGION 1- PANHANDLE
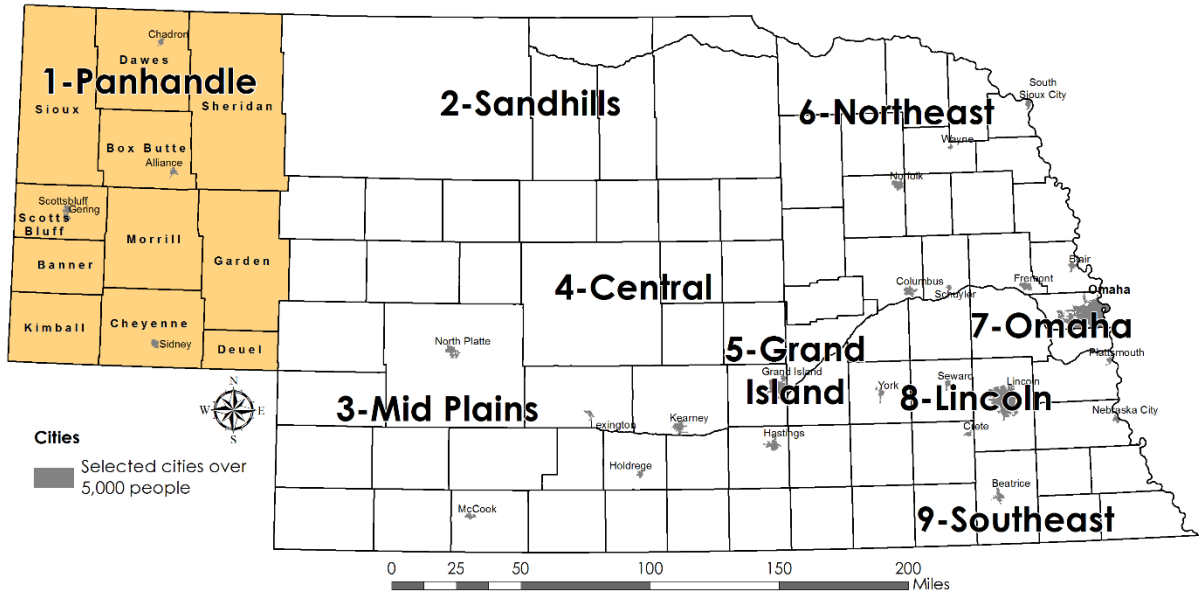
PANHANDLE Forecast:

RNs: There will be a demand for RNs through 2025. An RN shortage of 146 FTEs by 2025 is projected.

APRNs: An APRN shortage of 4 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 64 FTEs by 2025 is projected.
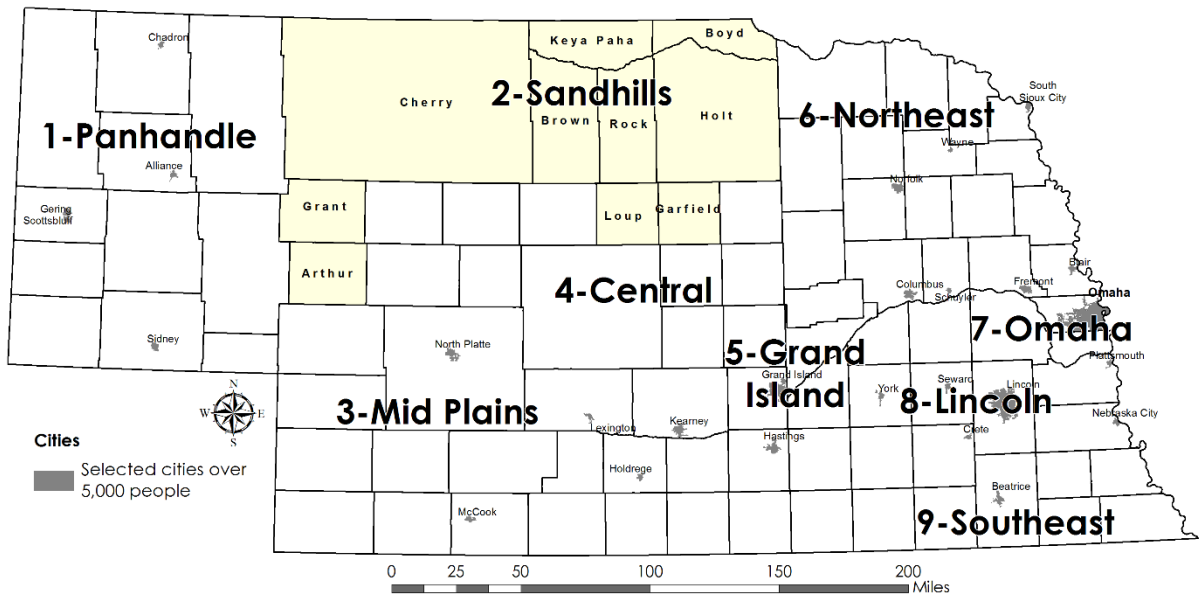
Total nursing shortage by 2025: 215 FTEs

PANHANDLE - Nursing Shortage/Surplus by Type of Nurse:

Panhandle

	RNs	LPNs	APRNs	Total Nursing Shortage/Surplus
Years	2017 2018 2019 2020 2021 2022 2023 2024 2025	2017 2018 2019 2020 2021 2022 2023 2024 2025	2017 2018 2019 2020 2021 2022 2023 2024 2025	2017 2018 2019 2020 2021 2022 2023 2024 2025

(Chart y-axis: 50, 0, -50, -100, -150, -200, -250)

REGION 2- SANDHILLS

Nebraska regions map:
- 1-Panhandle (Chadron, Alliance, Gering, Scottsbluff, Sidney)
- 2-Sandhills (Cherry, Keya Paha, Boyd, Brown, Rock, Holt, Grant, Loup, Garfield, Arthur)
- 3-Mid Plains (North Platte, McCook)
- 4-Central (Kearney, Hastings, Holdrege, Lexington)
- 5-Grand Island (Grand Island)
- 6-Northeast (South Sioux City, Wayne, Norfolk)
- 7-Omaha (Columbus, Schuyler, Fremont, Blair, Omaha, Plattsmouth)
- 8-Lincoln (York, Seward, Lincoln, Crete, Nebraska City)
- 9-Southeast (Beatrice)

Cities
Selected cities over 5,000 people
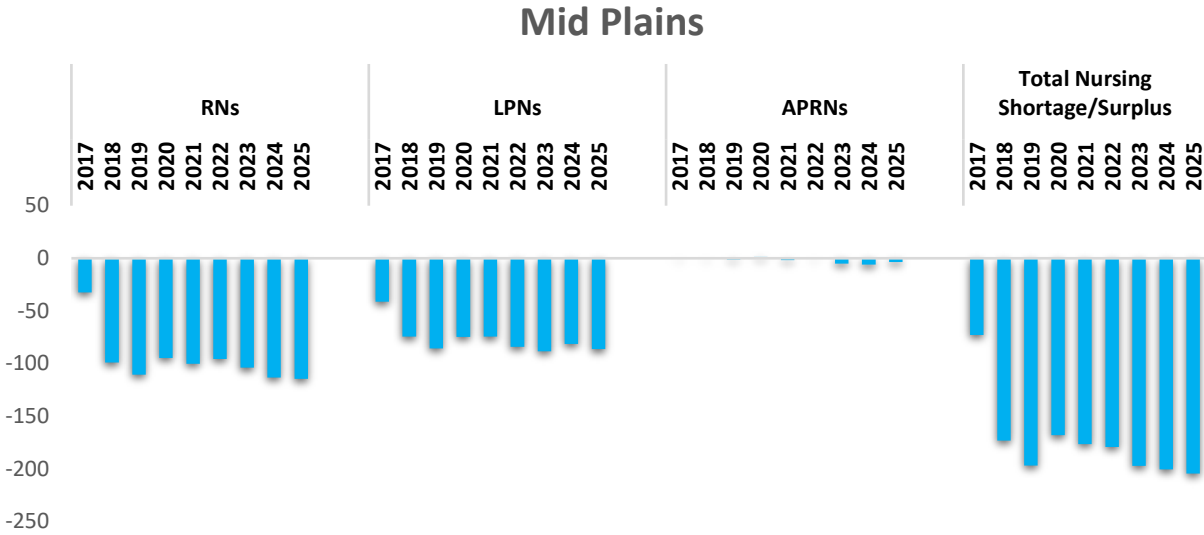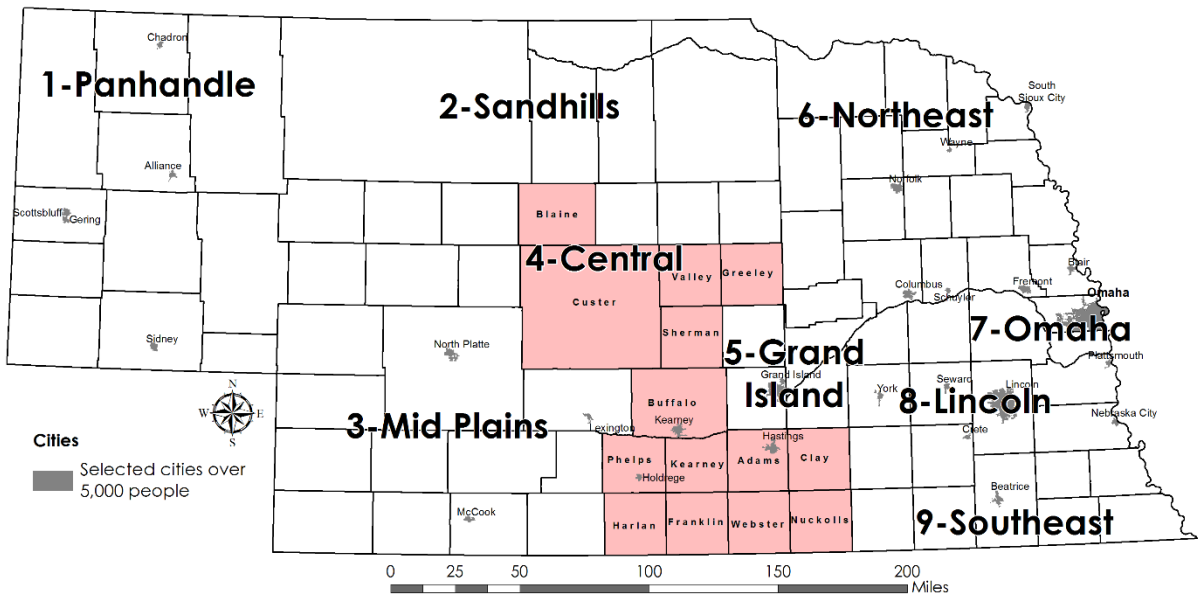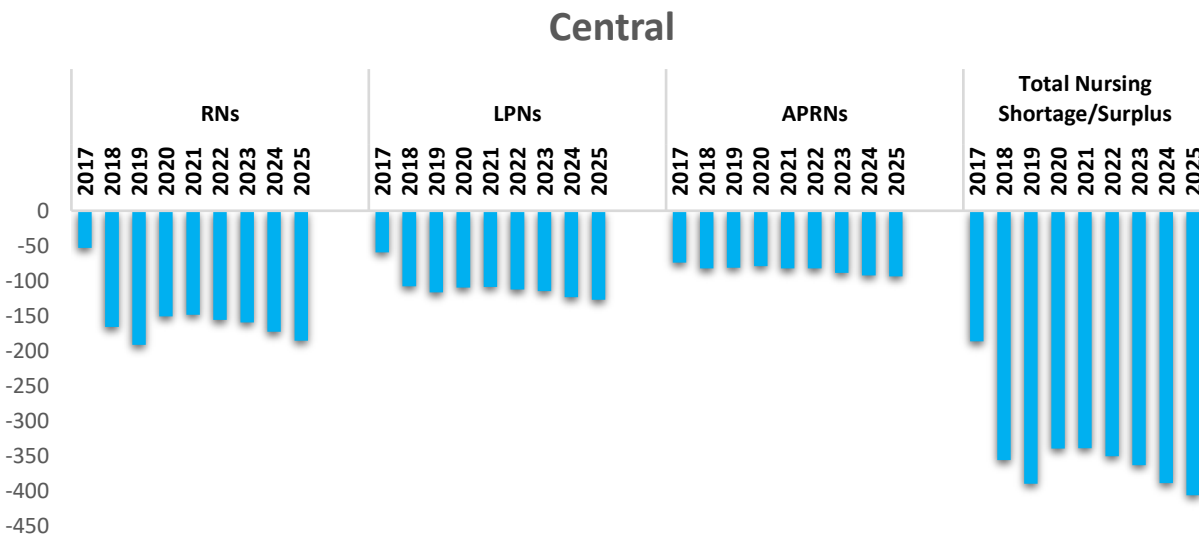
0 25 50 100 150 200 Miles

SANDHILLS Forecast:

RNs: There will be a demand for RNs through 2025. An RN shortage of 23 FTEs by 2025 is projected.

APRNs: There will be a demand for APNRs through 2025. An APRN shortage of 1 FTE by 2025 is projected.

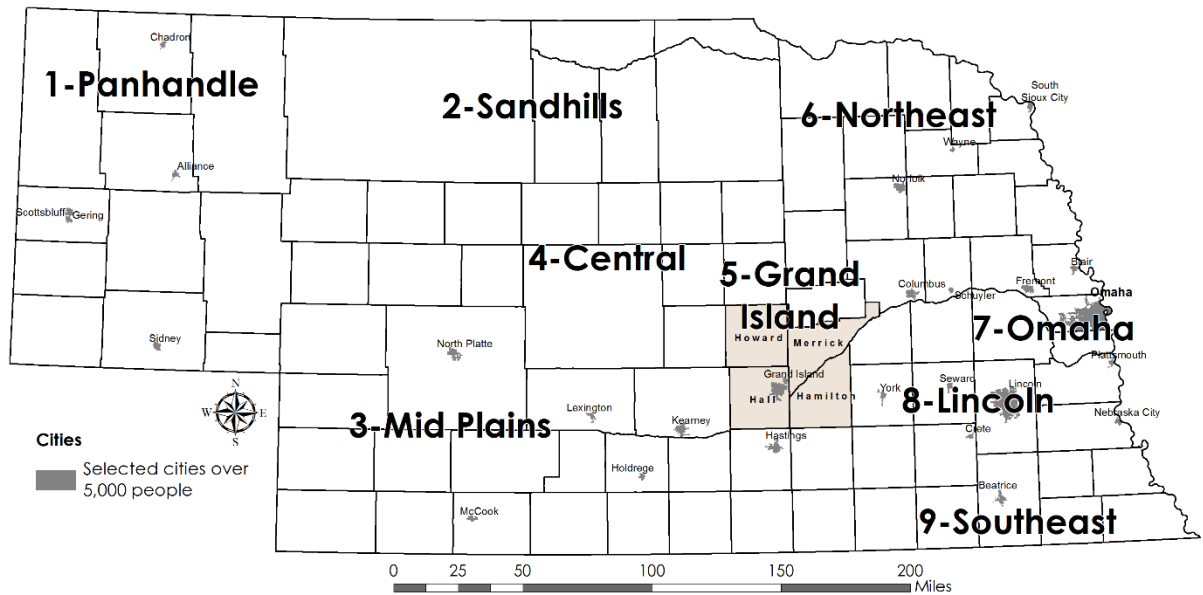**LPNs**: There will be a demand for LPNs through 2025. An LPN shortage of 18 FTEs by 2025 is projected.

Total nursing shortage by 2025: 42 FTEs

SANDHILLS - Nursing Shortage/Surplus by Type of Nurse:
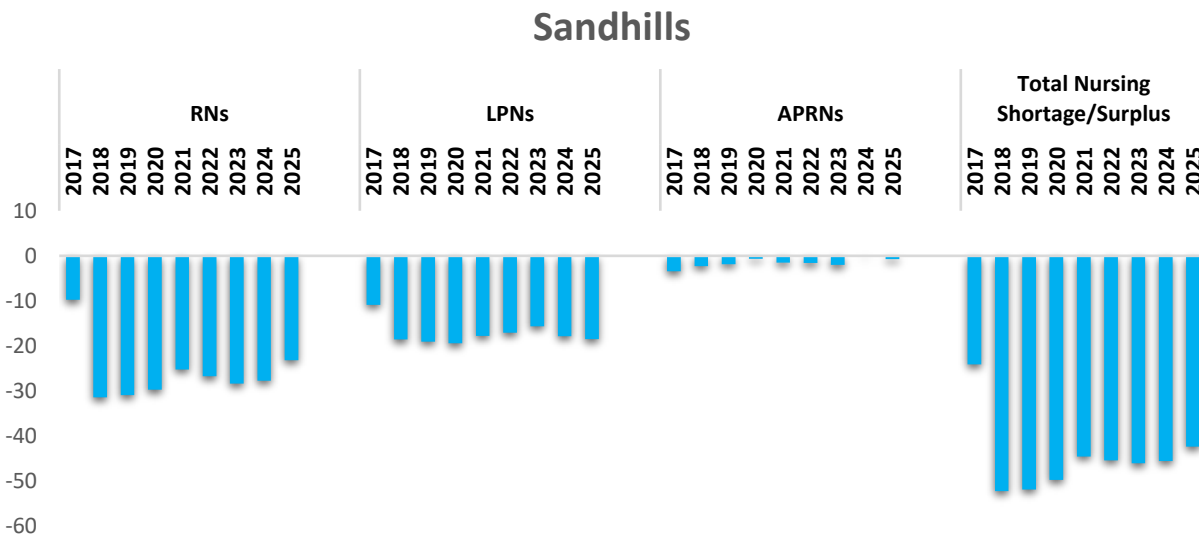
Sandhills
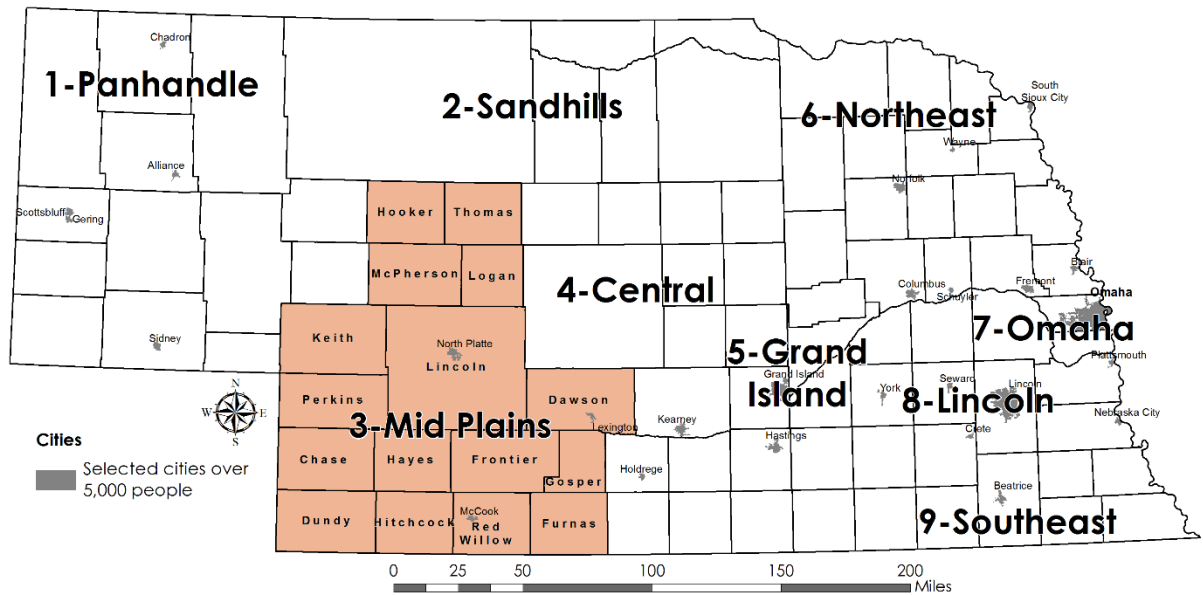
MID PLAINS Forecast:

RNs: There will be a demand for RNs through 2025. An RN shortage of 115 FTEs by 2025 is projected.
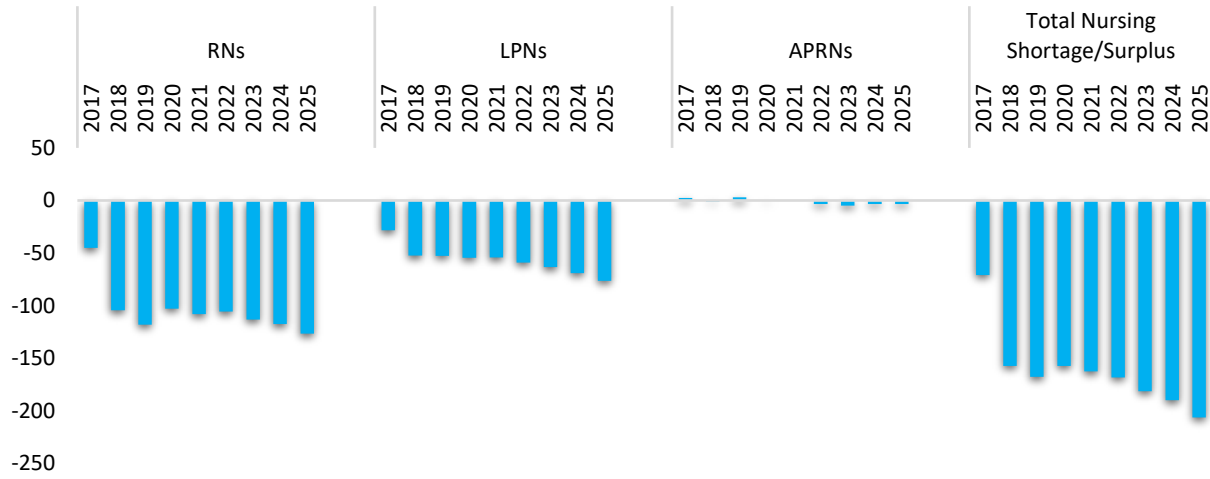
APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 4 FTEs by 2025 is projected.

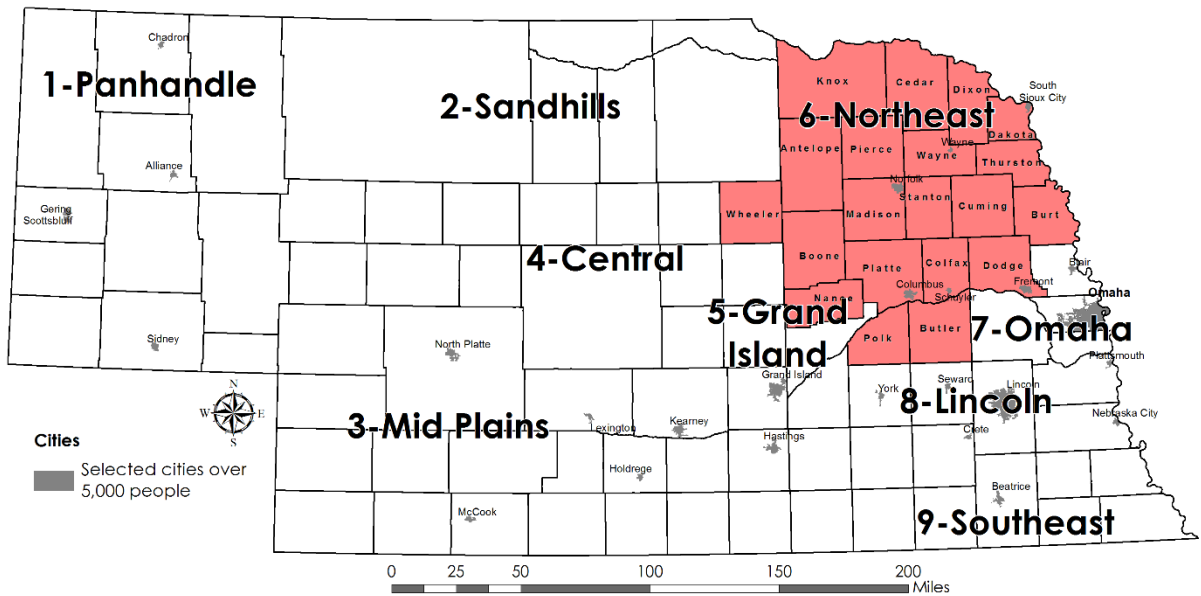**LPNs**: There will be a demand for LPNs through 2025. An LPN shortage of 86 FTEs by 2025 is projected.

Total nursing shortage by 2025: 205 FTEs

MID PLAINS - Nursing Shortage/Surplus by Type of Nurse:

Mid Plains

REGION 4- CENTRAL
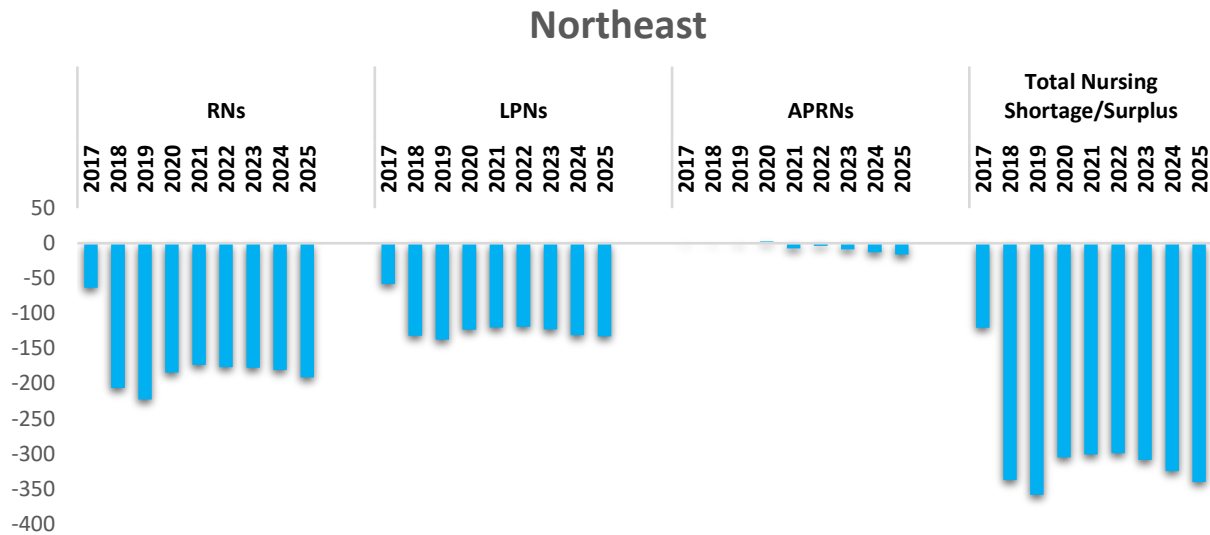
CENTRAL Forecast:

RNs: There will be a demand for RNs through 2025. An RN shortage of 185 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 93 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 127 FTEs by 2025 is projected.

Total nursing shortage by 2025: 405 FTEs

CENTRAL - Nursing Shortage/Surplus by Type of Nurse:

RNs: There will be a demand for RNs through 2025. An RN shortage of 127 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 3 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 76 FTEs by 2025 is projected.
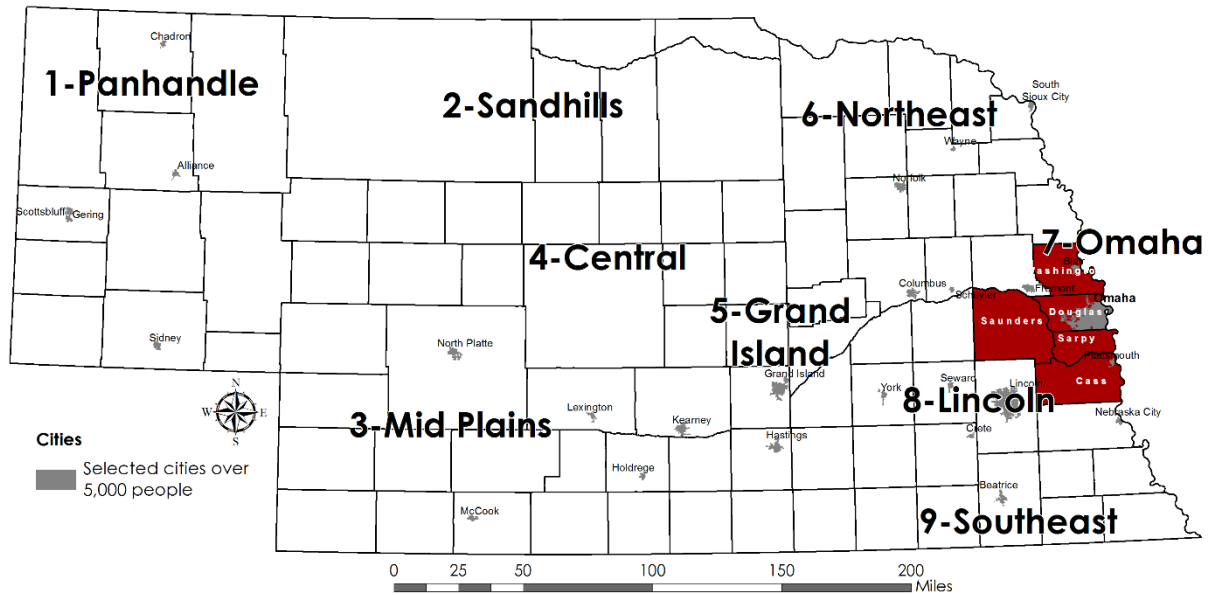
Total nursing shortage by 2025: 206 FTEs

GRAND ISLAND - Nursing Shortage/Surplus by Type of Nurse:
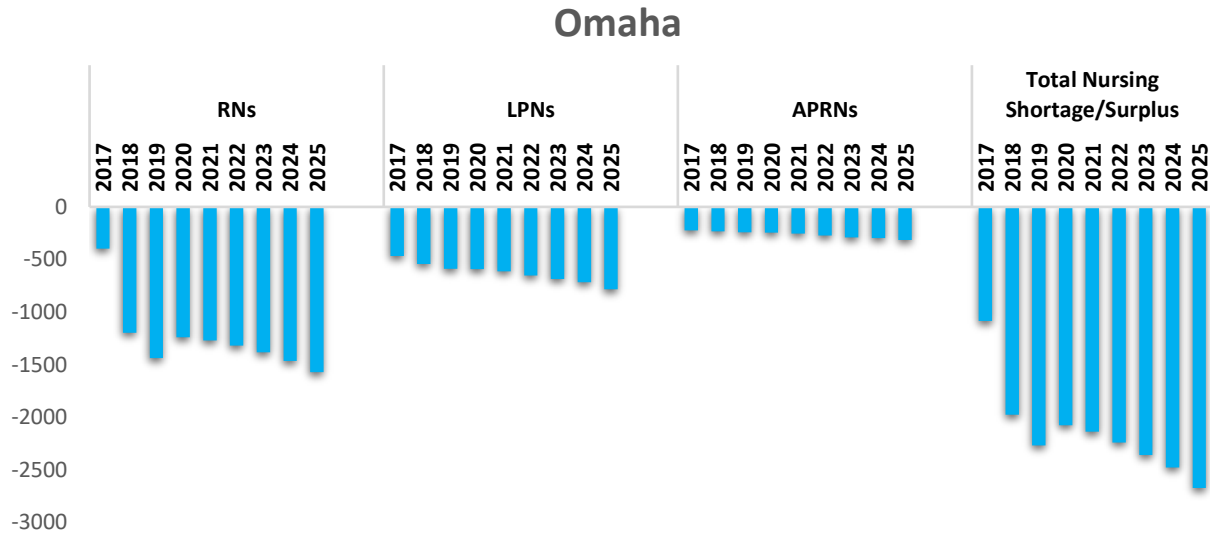
Grand Island

REGION 6- NORTHEAST

RNs: There will be a demand for RNs through 2025. An RN shortage of 191 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 16 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 133 FTEs by 2025 is projected.

Total nursing shortage by 2025: 340 FTEs

NORTHEAST - Nursing Shortage/Surplus by Type of Nurse:

Northeast

RNs: There will be a demand for RNs through 2025. An RN shortage of 1,572 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 316 FTEs by 2025 is projected.
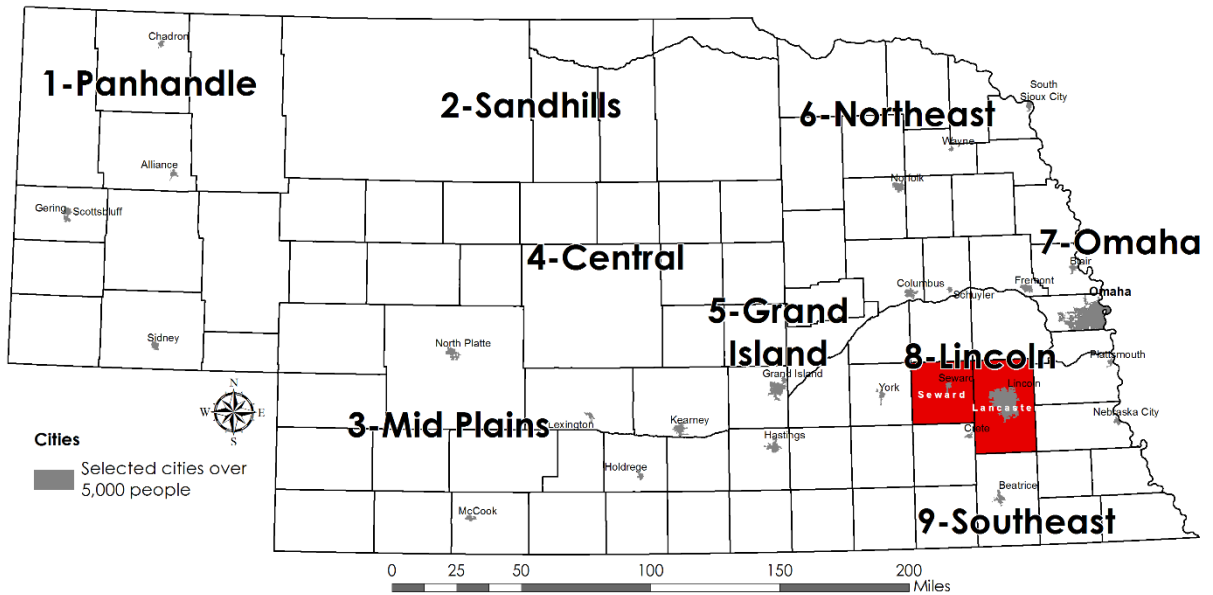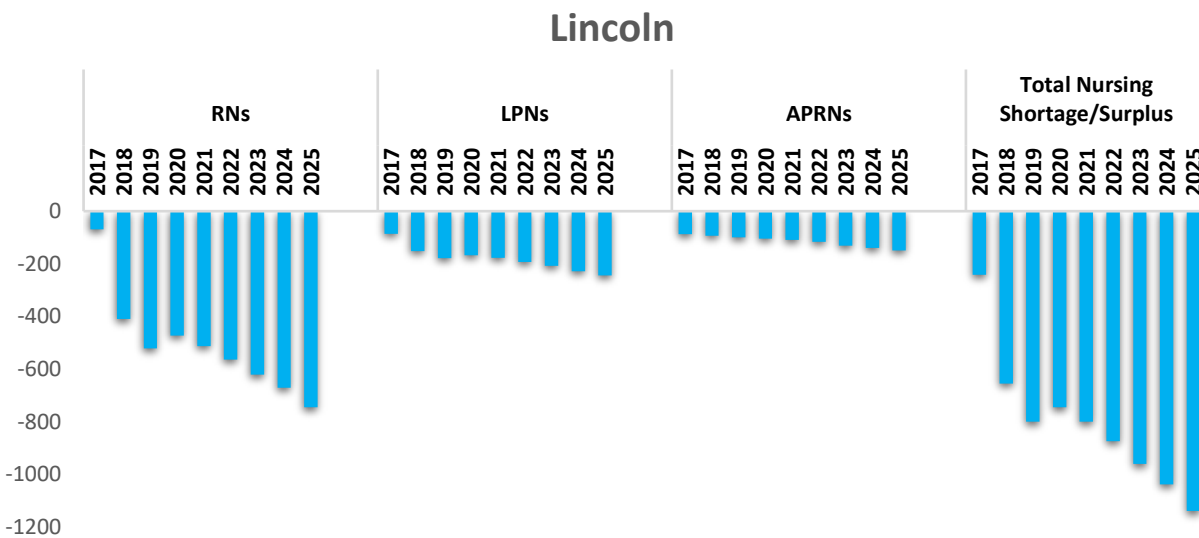
LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 783 FTEs by 2025 is projected.

Total nursing shortage by 2025: 2,671 FTEs

OMAHA CONSORTIUM - Nursing Shortage/Surplus by Type of Nurse:

Omaha

REGION 8 – LINCOLN

RNs: There will be a demand for RNs through 2025. An RN shortage of 745 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 150 FTEs by 2025 is projected.

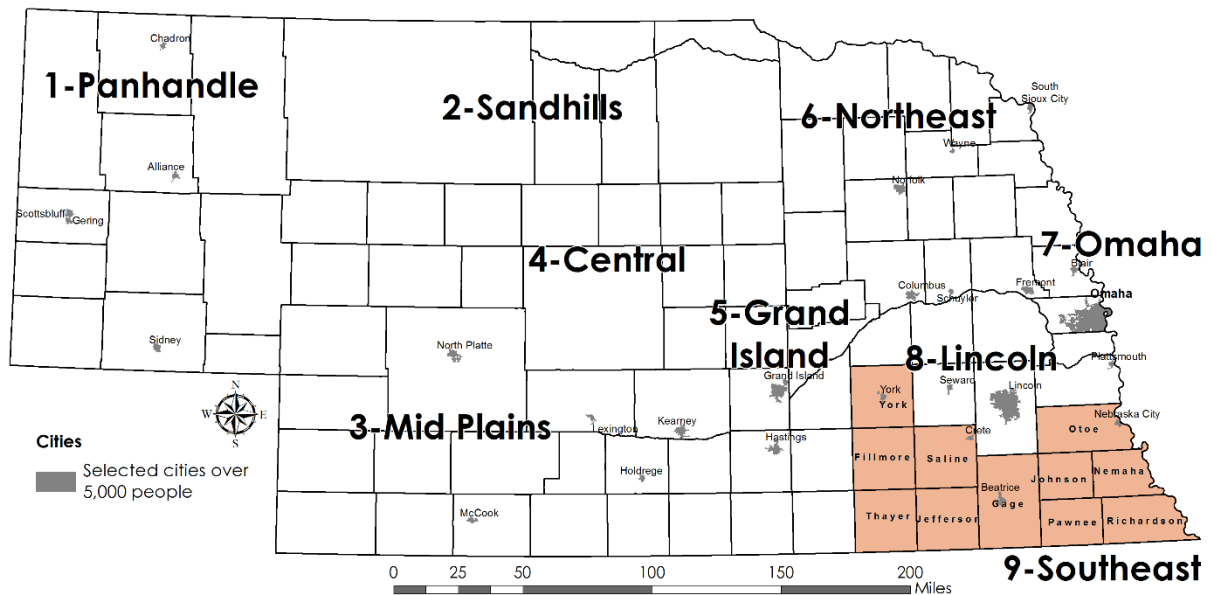**LPNs**: There will be a demand for LPNs through 2025. An LPN shortage of 244 FTEs by 2025 is projected.

Total nursing shortage by 2025: 1,139 FTEs

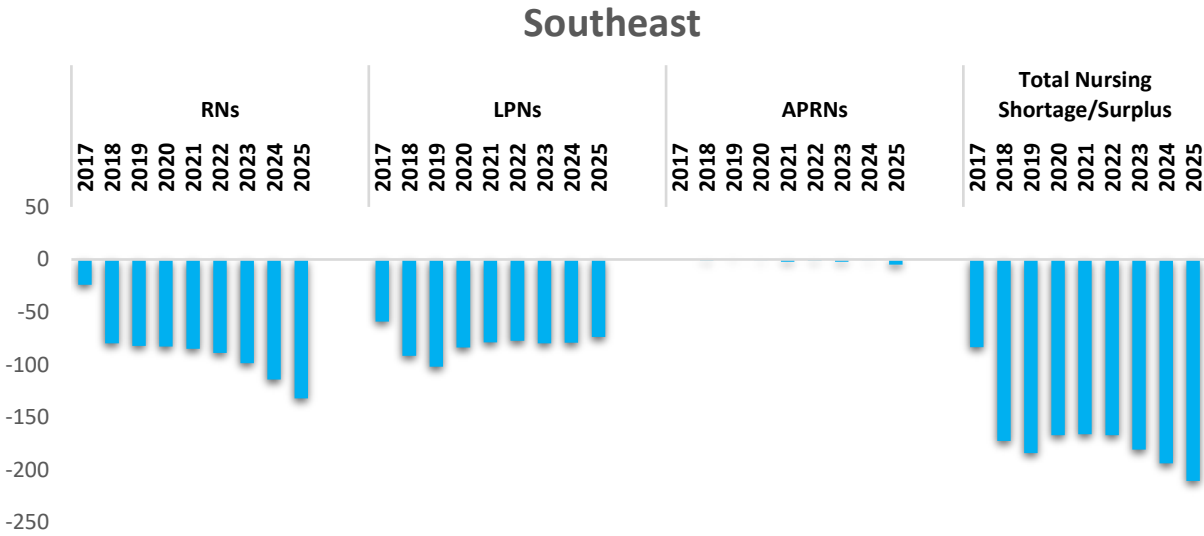**LINCOLN** - Nursing Shortage/Surplus by Type of Nurse:

RNs: There will be a demand for RNs through 2025. An RN shortage of 132 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 5 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 74 FTEs by 2025 is projected.

Total nursing shortage by 2025: 211 FTEs

SOUTHEAST - Nursing Shortage/Surplus by Type of Nurse:

Southeast

STATE OF NEBRASKA

RNs: There will be a demand for RNs through 2025. An RN shortage of 3,238 FTEs by 2025 is projected.

APRNs: There will be a demand for APRNs through 2025. An APRN shortage of 592 FTEs by 2025 is projected.

LPNs: There will be a demand for LPNs through 2025. An LPN shortage of 1,606 FTEs by 2025 is projected.

Total nursing shortage by 2025: 5,435 FTEs

State of Nebraska - Nursing Shortage/Surplus by Type of Nurse:

State of Nebraska
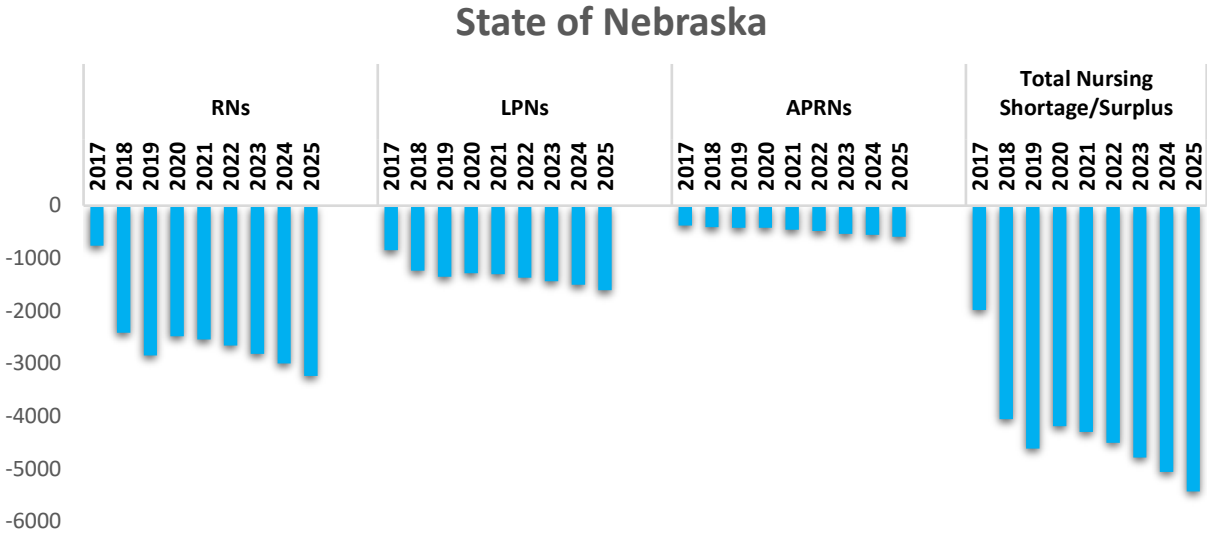
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Organizations:

Nebraska Center for Nursing and its Board of Directors

Nebraska Board of Nursing

Nebraska Hospital Association

Nebraska Healthcare Association

Nebraska Organization of Nurse Leaders

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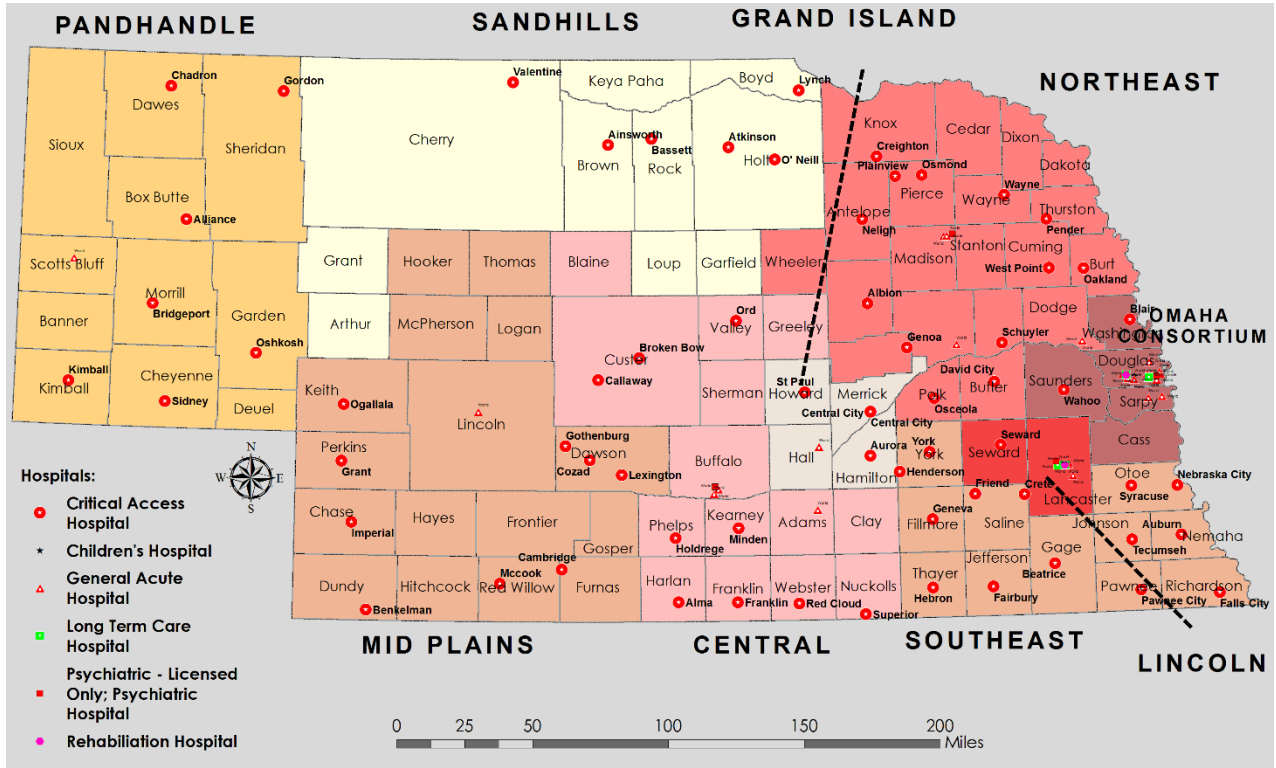
David Drozd, Nebraska State Data Center, University of Nebraska at Omaha

Jodie Meyer, Nebraska Department of Labor

The staff of the Nebraska Center for Nursing for their support

MAP 1: HOSPITALS & ECONOMIC REGIONS

MAP 2: MEDICALLY UNDERSERVED AREAS (MUAS) IN NEBRASKA