



Center for
Rural Health

University of North Dakota
School of Medicine & Health Sciences

North Dakota Nursing Supply and Demand Projections

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*Connecting resources and knowledge to strengthen
the health of people in rural communities.*

NORTH DAKOTA NURSING NEEDS STUDY INTRODUCTION

Health personnel shortages can negatively impact health care quality, through reduced health care access, increased stress on providers, and the use of under-qualified personnel. Also, shortages can contribute to higher costs by raising compensation levels to attract and retain personnel and by increasing the use of overtime pay and expensive temporary personnel. Workforce shortages, while a problem for the entire health care system, are likely to be most severe for rural/frontier regions and medically needy population groups such as the elderly. North Dakota has 41 designated medically underserved areas, and 81 percent of North Dakota's 53 counties are designated as partial or whole county health professional shortage areas. North Dakota also has the highest proportion of residents aged 85 and older, the age group with the greatest need for healthcare services. In North Dakota, this cohort is predicted to double in size by 2020.

Nurses are an integral part of the health care system providing nursing services to patients requiring assistance in recovering or maintaining their physical and/or mental health (North Dakota Healthcare Association, 2002). In the United States, nurses comprise the largest group of health care providers. They practice in settings ranging from public health to long-term care. The ability to provide accessible, high quality care depends on the availability of a nursing workforce with the requisite skills and knowledge. Over the past few years, research studies have identified clear relationships between nurse staffing and patient outcomes. For example, lower nurse staffing in hospitals has been linked to longer hospital stays for patients, as well as a number of complications such as pneumonia (e.g., Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). Directly challenging the health care system's ability to provide quality patient care is a growing national and international disparity in nursing workforce supply and demand. North Dakota is not immune to this problem.

The Nursing Needs Study was recommended, in 2001, by the North Dakota State Legislature (NDCC Nurse Practices Act 43-12.1-08.2) to address potential shortages in nursing supply. Specifically, the North Dakota Board of Nursing was directed to address issues of supply and demand for nurses, including issues of recruitment, retention, and utilization of nurses. To respond to this request, the North Dakota Board of Nursing contracted with the Center for Rural Health at the University of North Dakota School of Medicine and Health Sciences.

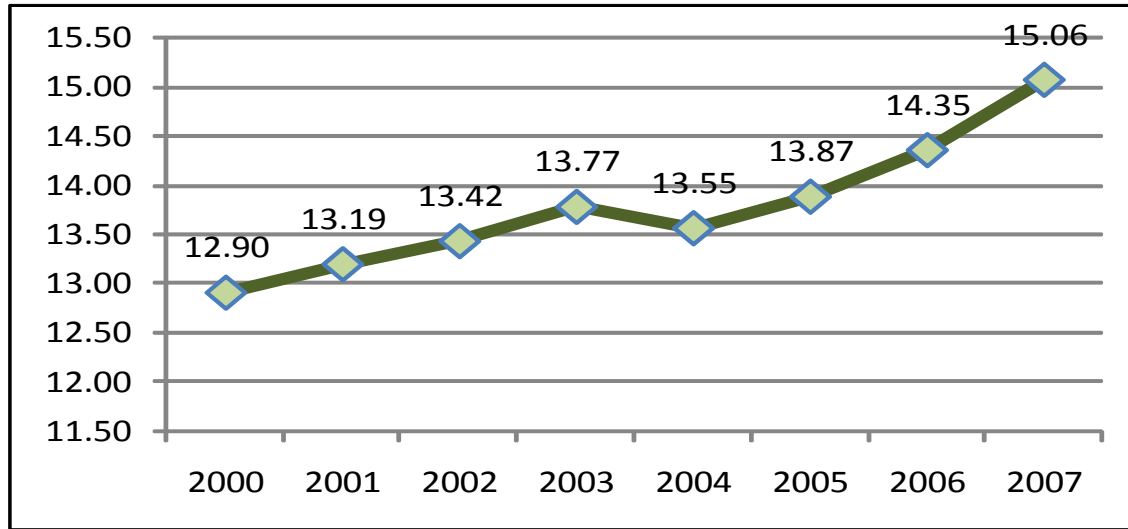
This study, initiated in 2002, was designed to obtain an accurate and complete picture of nurses in rural and urban areas of North Dakota, compare North Dakota's trends to national trends, and inform institutional and public policy. The study, currently in its sixth year, is approved to continue until 2012 by the Board of Nursing. This study will continue to provide valuable information about the nursing workforce through a 10-year period of time.

In this report, results from a study of current and forecasted nurse supply and demand characteristics are presented.

RN Supply

The number of licensed RNs per population has increased during the last several years and in 2007 was 15.06 RNs per 1,000 people (see Figure 1) which is greater than the national average of 8.48 per 1,000¹.

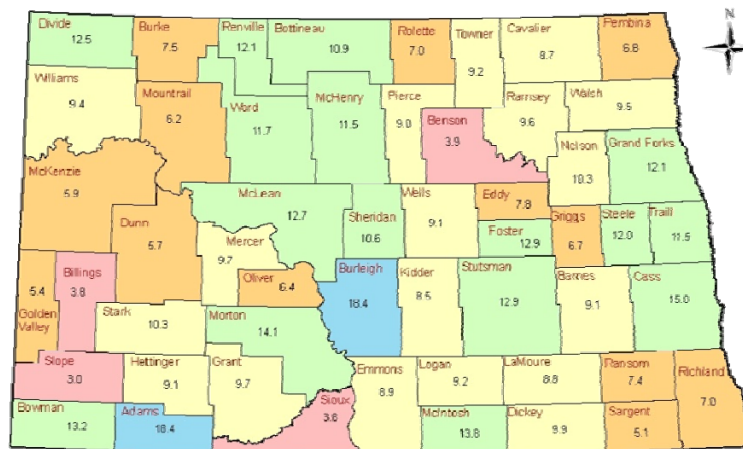
Figure 1. Number of Licensed RNs per 1,000 People



Sources: ND Board of Nursing Annual Reports and US Census Population Estimates.

However, maldistribution of RN supply remains a concern with 17 of 53 counties having less than the national average of RNs per 1,000 people (see Figure 2).

Figure 2: North Dakota RNs per 1,000 Population

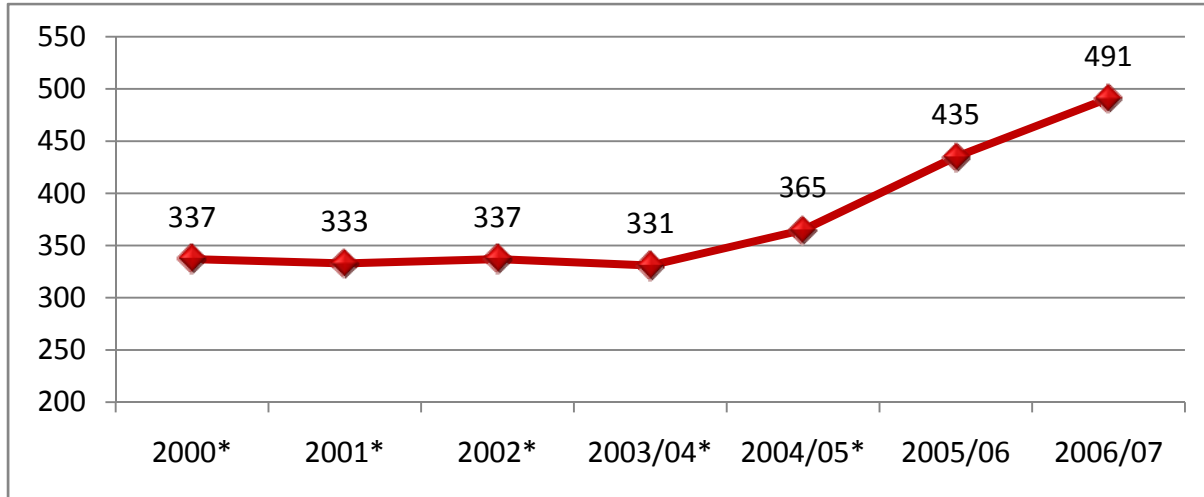


0.0 - 5.0 RNs/1,000 pop
 5.1 - 8.4 RNs/1,000 pop
 8.5 - 10.5 RNs/1,000 pop
 10.6 - 10.9 RNs/1,000 pop
 10.1 - 20.0 RNs/1,000 pop

Database on 2007 Population Estimates and 2008 North Dakota Board of Nursing Licensure Data, 7/08

All RN nursing education programs increased their enrollments in the last three years and this has resulted in an increase in the number of RN graduates statewide (see Figure 3).

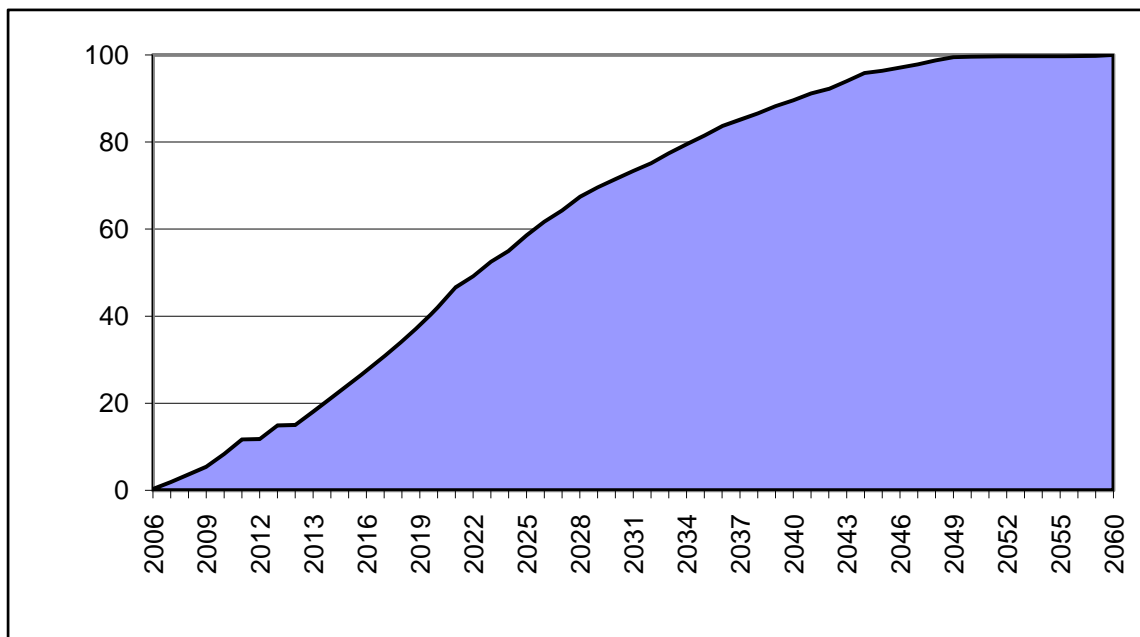
Figure 3: North Dakota Nursing Education Graduates: RNs



Source: North Dakota Board of Nursing Annual Education Reports. Note. The 2000-2005 graduate numbers also include graduates from Concordia College as a part of the Tri-College Program.

The North Dakota average age of RNs has decreased to 44 years. This is below the national average of 47 years¹. Twenty-five percent of North Dakota RNs plan to retire by 2016 (see Figure 4).

Figure 4: RN Retirement Plans

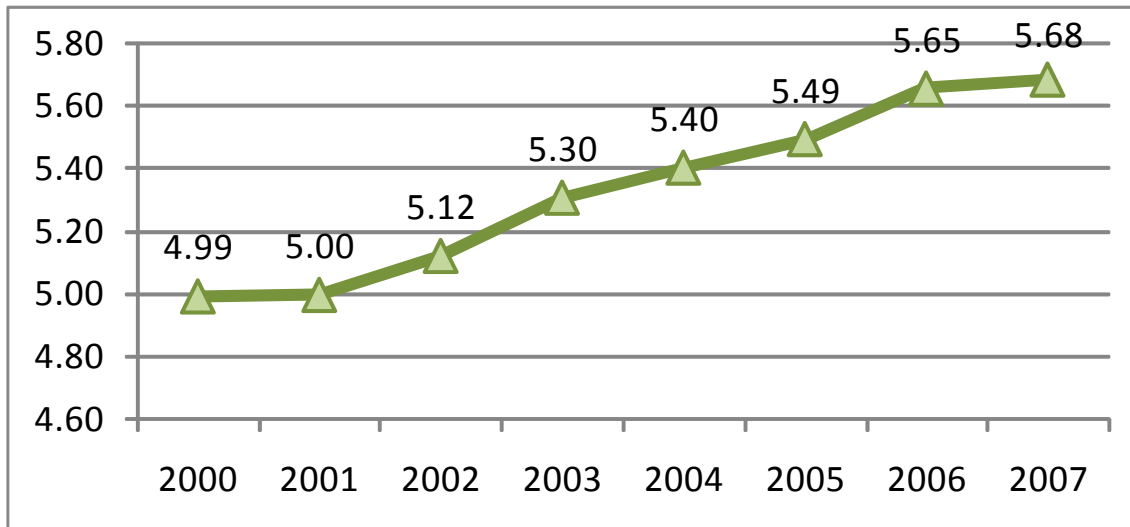


Source. Marino, J. & Moulton, P. (2007). Five-year comparison of North Dakota Nurses: Results and Implications. North Dakota Nursing Needs Study.

LPN Supply

The number of LPNs per 1,000 people has increased slightly over the last six years to 5.68 LPNs per 1,000 people and is consistently above the national average of 2.4 LPNs per 1,000 (see Figure 5)².

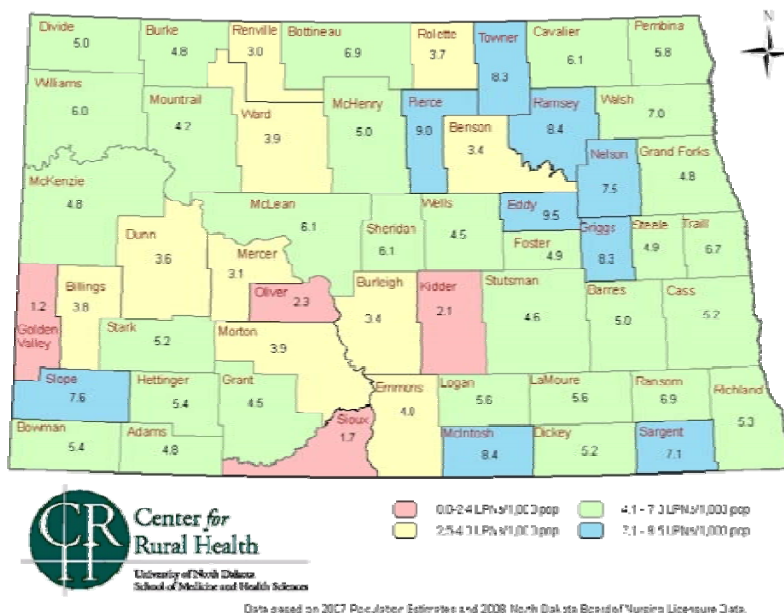
Figure 5. Number of Licensed LPNs per 1,000 People



Sources: ND Board of Nursing Annual Reports and US Census Population Estimates.

However, distribution of LPNs varies widely across the state with four counties having less LPNs than the national average (see Figure 6).

Figure 6: North Dakota LPNs per 1,000 Population

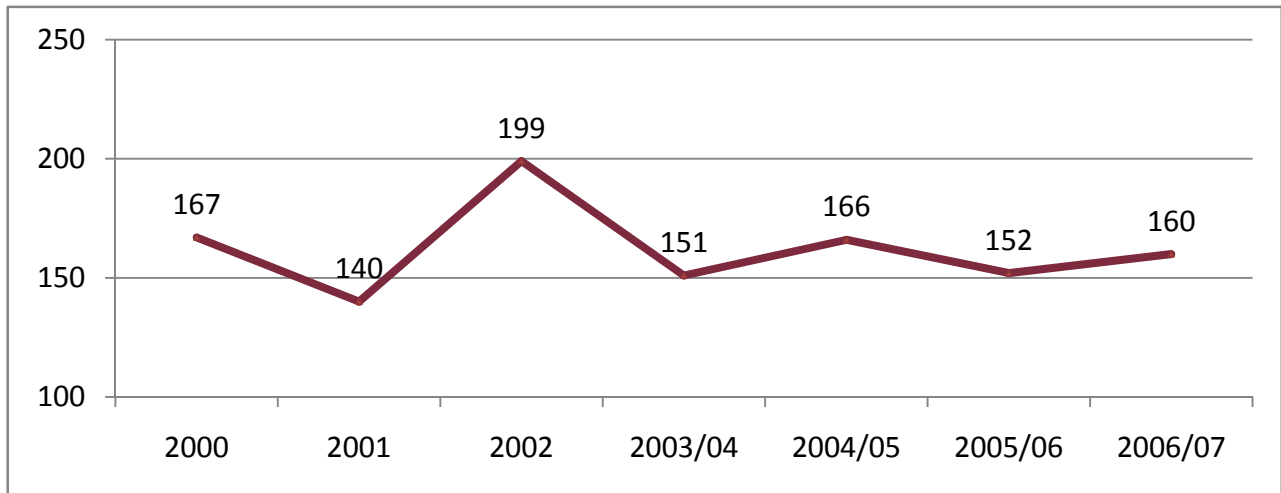


Data based on 2007 Population Estimates and 2008 North Dakota Board of Nursing Licensure Data.

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The number of LPN graduates has decreased slightly from 2000 to 2007 (see Figure 7).

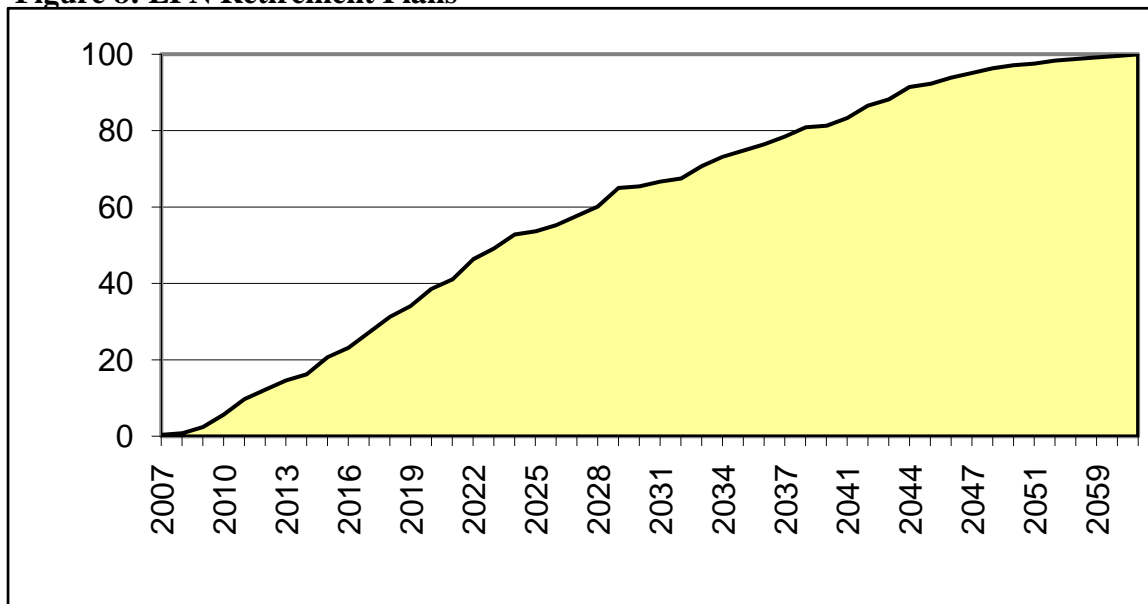
Figure 7: North Dakota Nursing Education Graduates: LPNs



Source: North Dakota Board of Nursing Annual Education Reports

The average age of LPNs in North Dakota is 42 years. This is lower than the national average of 43 years³. Twenty-five percent of LPNs plan to retire by 2017 (see Figure 8).

Figure 8: LPN Retirement Plans

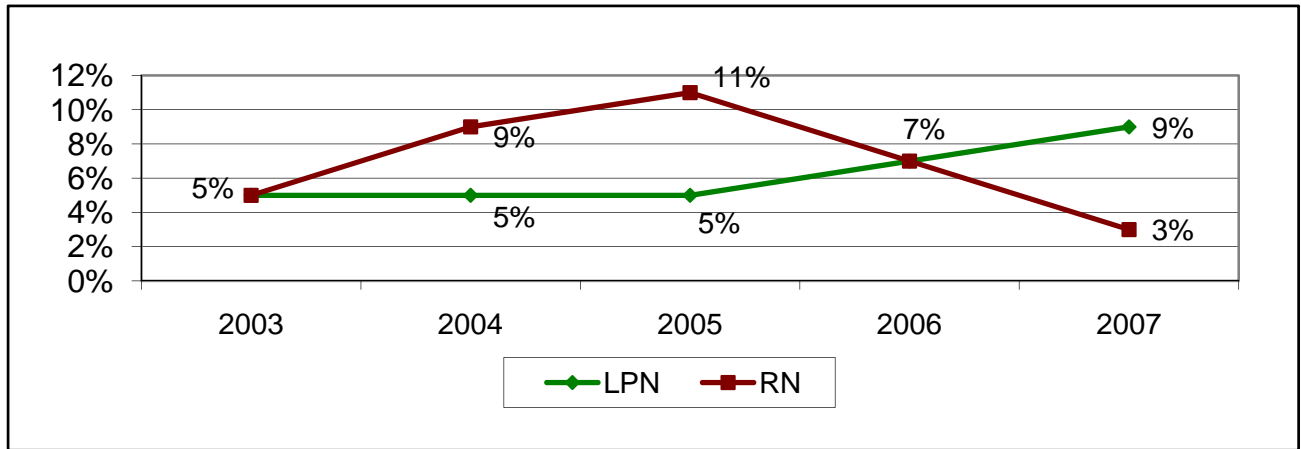


Source. Marino, J. & Moulton, P. (2007). Five-year comparison of North Dakota Nurses: Results and Implications. North Dakota Nursing Needs Study.

LPN and RN Demand

According to economists, a full workforce in most industries exists when vacancy rates are below five to six percent ⁴. A shortage is considered to be present at a sustained vacancy rate above this level. North Dakota RN vacancy rates have decreased over the last three years to 3% in 2007 (see Figure 9). The North Dakota hospital RN vacancy rate is 3% which is less than the national average of 8%.⁵ It is important to note that while RN vacancy rates have been decreasing, LPN vacancy rates have increased over the last three years.

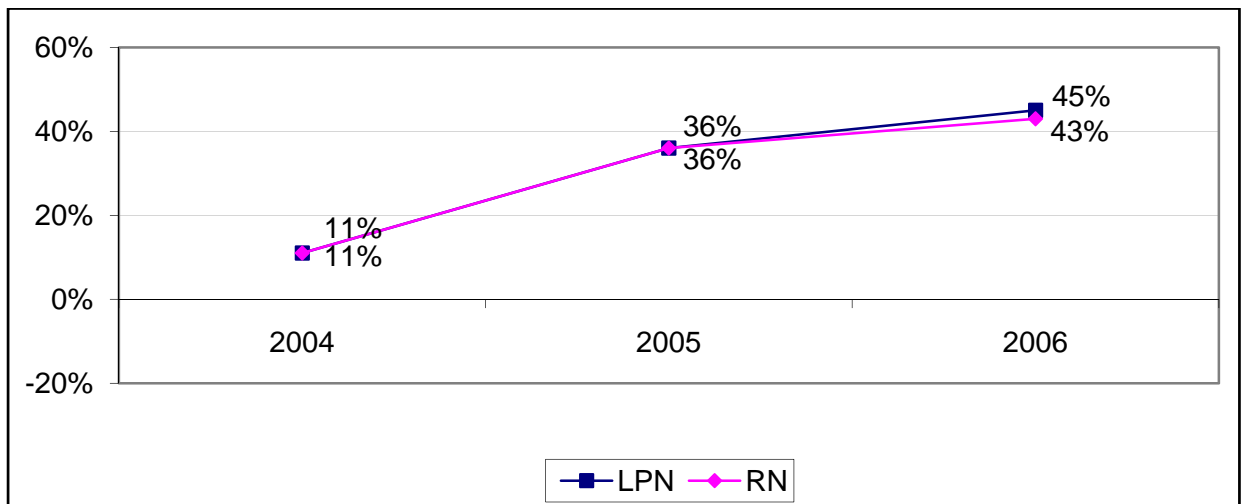
Figure 9: North Dakota Statewide Vacancy Rates



Source. Marino, J. & Moulton, P. (2007). North Dakota Nursing Needs Study: Year Five Facility Survey Results.

The percentage of RNs working full-time (36-40 hours/week) has increased from 11% in 2004 to 43% in 2007. LPNs have had a similar increase from 11% to 49% (see Figure 10).

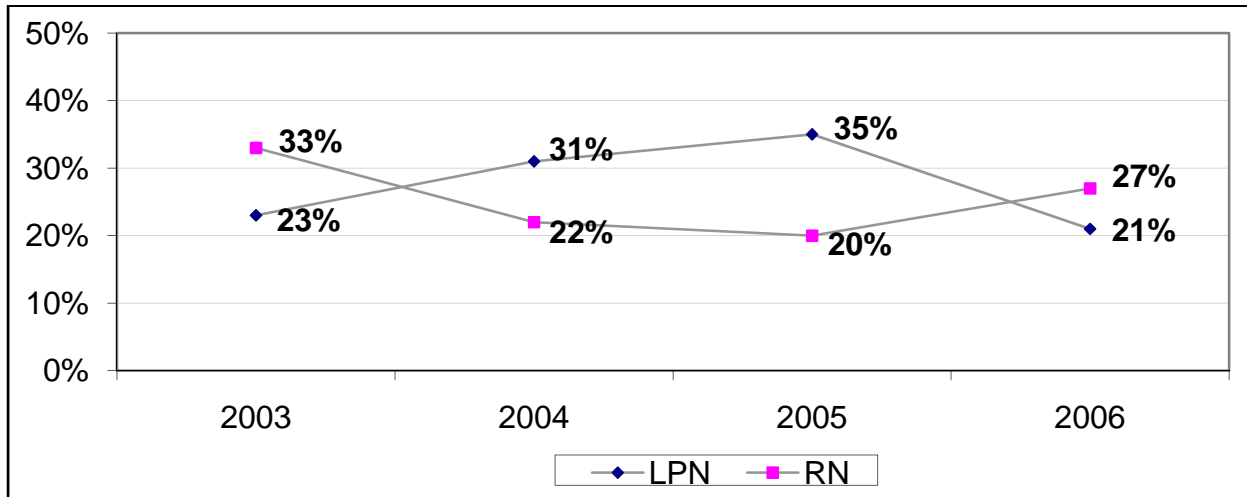
Figure 10: Percentage of Nurses Working 36-40 Hours per Week



Source. Marino, J. & Moulton, P. (2007). Five-year comparison of North Dakota Nurses: Results and Implications. North Dakota Nursing Needs Study.

The percentage of RNs with a second job has also declined from 33% in 2003 to 16% in 2007 with LPNs having the same pattern from 23% in 2003 to 14% in 2007 (see Figure 11). This indicates that more nurses are increasing their hours at one job and working at less facilities.

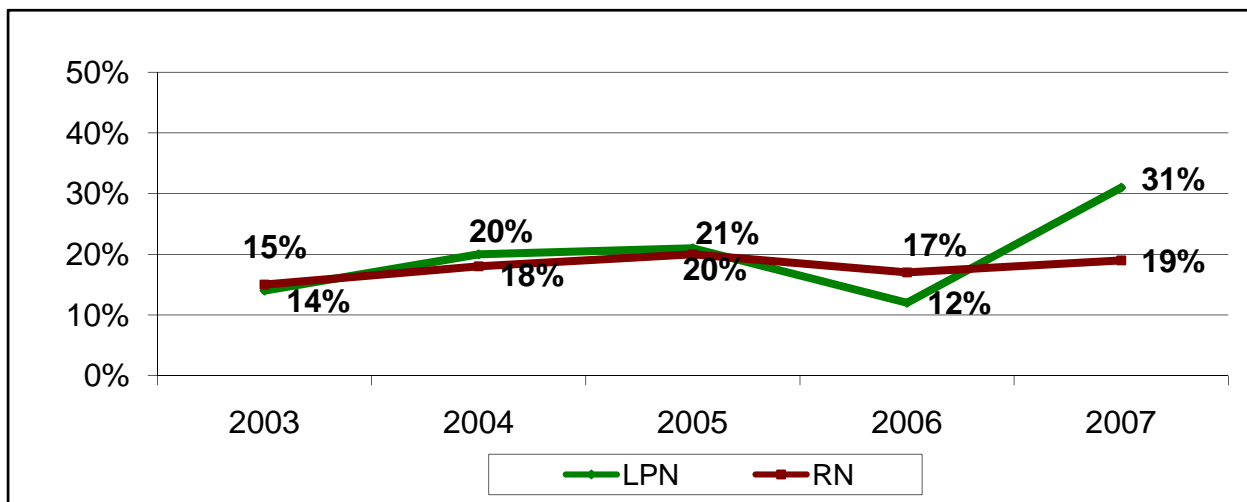
Figure 11: Percentage of Nurses with a Secondary Nursing Job



Source. Marino, J. & Moulton, P. (2007). Five-year comparison of North Dakota Nurses: Results and Implications. North Dakota Nursing Needs Study.

Turnover rates reflect fluctuation in staffing in healthcare facilities. The statewide turnover rate for RNs was 19 percent. It is important to note that the statewide turnover rate for LPNs was 31% in 2007. This is higher than the statewide turnover rate in previous years (see Figure 12). The turnover rate for RNs and LPNs working in North Dakota hospitals was 20% and 25% which is greater than the national average nurse turnover rate in hospitals which is 8.4%.⁶

Figure 12: North Dakota Statewide Turnover Rates

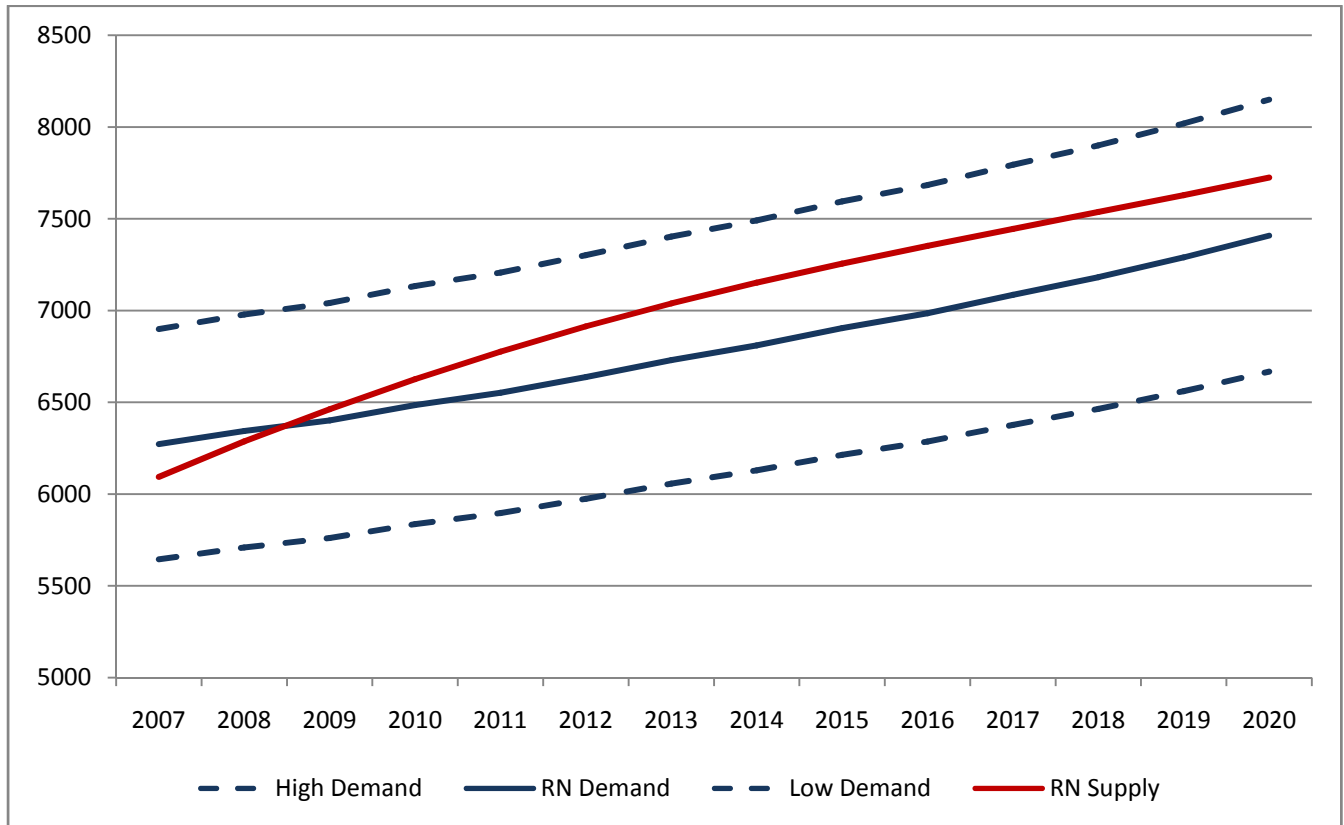


Source. Marino, J. & Moulton, P. (2007). North Dakota Nursing Needs Study: Year Five Facility Survey Results.

Supply and Demand Projections

Currently we have a small shortage of RNs. Looking ahead in the near future it is projected that the state will have an adequate supply of RNs as compared to demand (see Figure 13). These projections may be influenced by a number of factors such as maintaining similar RN graduation rates, financial status of health care facilities, variation in the strength of the economy and recruitment from border states. The projection model that we are using is utilized at the federal level. This model likely underestimates demand. It is important for you to note that the use of this model likely underestimates demand in states with large rural populations and those states with large elderly populations such as North Dakota. Because of the variation associated with the model, we are presenting the demand estimate as a range from low to high demand⁷. In addition, as with all projection models, estimates become less precise in the later years of the projection.

Figure 13: North Dakota Registered Nurse FTE Supply and Demand Projections



The estimate of supply and demand utilized the USDHHS Health Resources and Services Administration National Center for Health Workforce Analysis Nursing Supply and Demand software. Please see the methods section for more detail.

Conclusions

- ❖ Continued support of North Dakota's nursing education programs in particularly support for the recent expansion of class size will play an important role in ensuring an adequate supply of nurses in the future.
- ❖ The distribution of an inadequate number of nurses across rural areas of the state remains a concern.
- ❖ There is some indication of a worsening LPN shortage. This should be closely monitored.
- ❖ Increased turnover rates of nurses in health care facilities indicate a need to improve the work environment and maximize retention of nurses.
- ❖ Given the number of factors that can impact supply and demand, it is important to collect data and track changes over time.

Methodology

The supply and demand projections were determined using the Nursing Supply Model (NSM) and Nursing Demand Model (NDM) both of which were developed for the National Center for Health Workforce Analysis, Bureau of Health Professions, Health Resources and Services Administration. The Lewin Group and Klemm Analysis Group updated and developed the software under Contract No. HHS-250-01-0001. The Lewin Group and SAG Corporation updated and developed the NDM under Contract No. HHS-100-97-0016.

Demand projections are based on selected national and state factors along with historical trends. Direct care supply projections are based on historical trends and estimates of when nurses will leave direct care nursing. These estimates may be influenced by a variety of factors, for example; a change in licensure laws, an aging population and variation in strength of the economy. The impact of all potentially influential factors on these estimates is not incorporated in these projections. Also, projections are statewide estimates and may not reflect city or county level shortages.

The original HRSA projections were modified using North Dakota specific information. These adjustments included:

Demand Projections

- State Population was modified using “Interim State Projections of Population by Single Year of Age and Sex: July 1, 2004 to 2030” Source: U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.

Supply Projections

- Adjusted Base Year to 2007
- Adjusted “Base year Education Upgrade” from ND Board of Nursing Annual Report
- Adjusted “Base year Graduation Totals” from ND Board of Nursing Annual Report- All Grads included all Graduates from North Dakota Board of Nursing minus Concordia which is an approved College located in Minnesota
- Adjusted “Base year Nurse Population” from ND Board of Nursing Data

Key Assumptions

- The number of new RN graduates will remain constant over time at the 2007 numbers
- The number of nurses upgrading their education in future years are based on recent estimates extrapolated forward.
- The age distribution of nursing upgrading their education level is assumed to be the same across states and constant over time.
- RNs licensed in ND have labor force participation rates that are the same as RNs of similar age and education level across the nation.
- Attrition rates were constructed to model permanent departure of nurses from the licensed nurse workforce due to retirement, mortality, disability, and other factors. Attrition rates, adjusting for age and education level, remain constant over time.

References

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