

**Nebraska  
Center  
for  
Rural  
Health  
Research**

**“A CRITICAL MATCH”  
Nebraska’s Health Workforce Planning Project  
FINAL REPORT  
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## **EXECUTIVE SUMMARY**

In September 2007, with funding from the University of Nebraska Foundation Larson Medical Research Fund, staff of the Nebraska Center for Rural Health Research undertook a health workforce planning project for Nebraska. The purpose of this project was to develop a strategy for meeting the health care workforce needs of Nebraska. This project was completed in four phases over two years.

### **Phase 1**

As a first step, in February 2008, a statewide stakeholder meeting was held at Mahoney State Park. Representatives of trade and professional associations and educational institutions were invited to this meeting to provide their input early in the planning process. The research team sought feedback from the stakeholders on the priorities for assessment and analysis, the data sources available, and health workforce planning activities currently ongoing in the state.

Chapter I of this report provides a snapshot of the current supply and composition of the health professional workforce in the state of Nebraska. The professionals included in this report are physicians, nurses, dental professionals, pharmacists, allied health professionals, public health professionals, non-physician clinicians, auxiliary health professionals, primary care providers, and mental health professionals.

### **Key Findings of Phase 1**

#### ***Age Distribution***

- Over a third (37.3%) of all physicians in Nebraska (including MDs and DOs) were older than 50 years.
- About a third (33.6%) of actively practicing registered nurses (RNs) in Nebraska, were older than 50 years.
- Approximately half of actively practicing dentists in Nebraska were older than 50 years.
- About a third (34%) of actively practicing pharmacists in Nebraska, were older than 50 years.
- Over a third (35.1%) of actively practicing psychiatrists in Nebraska, were older than 55 years.
- About 40% of nurse practitioners and physician assistants specialized in psychiatry were older than 55 years.
- Approximately 40% of behavioral health professionals (including psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors) were older than 55 years.



### ***Gender Distribution***

- Women accounted for only 26% of Nebraska's physician workforce.
- Women accounted for only 16.9% of the dentists practicing in the state.
- Male nurses represented 4.8% of Nebraska's RN workforce.
- About a third (35.1%) of actively practicing psychiatrists in Nebraska were women.

### ***Racial and Ethnic Distribution***

- About 1% of physicians were African American and less than 2% were of Hispanic origin.
- Ethnic minorities comprised about 3% of the RN workforce.
- African Americans, Native Americans, and Hispanics were underrepresented among dentists.
- The available data show that racial/ethnic minorities were underrepresented in the pharmacist workforce, and this is similar to the national pharmacist workforce profile.
- African American, Hispanic, and Native Americans made up only 1.6% of the pharmacist workforce.
- African Americans and Hispanics were underrepresented among psychiatrists, making up only 1.4% of psychiatrists.
- About 2% of behavioral health professionals in 2008 identified themselves as African American and 1.5% as Hispanic.

## **Phase 2**

In the second phase of the project, we assessed the current needs for health professionals in Nebraska. The findings of this phase of the project are presented in Chapter II of this report. The key questions we sought to answer at this stage of the project were, How many health professionals practice in the state? Where do they practice? and How does the current supply of health professionals compare to benchmark ratios used for federal and state shortage area designations and national average ratios of health care providers to population?

For a predominantly rural state like Nebraska, we are concerned with the rural/urban distribution of health care providers. Whereas the overall statewide ratios compare favorably with national average provider-to-population ratios, the rural/urban distribution of providers is not uniform.

### **Key Findings of Phase 2**

#### ***Rural/ Urban Distribution***

- In terms of statewide ratios, for most of the health professions, Nebraska compares favorably to the rest of the nation.
- For physicians, nurse practitioners, nurse anesthetists, certified nurse midwives, chiropractors, and podiatrists, the state's ratio of health care providers to population in 2004, was below the national average.

- Forty-two percent of Nebraska's population lives in rural (non-metro) areas. However, only 27.8% of MDs, 33.6% of DOs, 38% of physician assistants, 34.6% of RNs, 32.6% of nurse practitioners, 35.6% of dentists, 32.5% of dental hygienists, 37.3% of pharmacists, 37.4% of primary care MDs, 18.7% of psychiatrists, and 24.8% of psychologists practice in rural Nebraska.
- Fifteen of the 38 frontier counties in Nebraska have no health care providers for almost all categories of health professionals.
- Only three counties in Nebraska (Douglas, Lancaster, and Scotts Bluff) have a health professional-to-population ratio above the national average for all categories of health professionals.

### ***Health Professional Shortage Areas Within Nebraska***

- Fifty-one of Nebraska's 93 counties are currently federally designated primary care Health Professional Shortage Areas (HPSAs). Of these, 24 are designated single-county HPSAs.
- Forty-five of Nebraska's 93 counties have some level of RN shortage.
- Twenty-five of Nebraska's counties are currently federally designated dental HPSAs.
- All of Nebraska's counties, with the exception of Mental Health Catchment Area 6 (Cass, Dodge, Douglas, Sarpy, and Washington counties), are federally designated mental health HPSAs.

## **Phase 3**

In Phase 3 of the project, we assessed the future need for health professionals in Nebraska by projecting the future supply and demand for health professionals using the available data. The findings of Phase 3 are presented in Chapter III of the report.

### **Key Findings of Phase 3**

#### ***Nebraska's Future Health Professional Shortages***

- Nebraska will face future shortages of nurses, physicians, and dentists.
- The supply of pharmacists is keeping pace with the growth in Nebraska's population.

#### ***Proportion of Health Professionals in the Pre-retirement Age Group***

- About a third or more of Nebraska's physicians (29.9%), dentists (39.3%), psychiatrists (36.7%), nurse practitioners specialized in psychiatry (42.9%), physician assistants specialized in psychiatry (33.3%), psychologists (45.2%), and other behavioral health professionals (40.7%), including licensed mental health practitioners, licensed alcohol and drug counselors, certified compulsive gambling counselors, and master social workers, are in the pre-retirement age group (55 years or older).
- In rural Nebraska, about a third or more of physicians (32.3%) and pharmacists (32.2%), 44.4% of dentists, 42.9% of psychiatrists, and 50% of nurse practitioners specialized in psychiatry are in the pre-retirement age group (55 years or older).

## **Phase 4**

A strategic plan to address Nebraska's future health workforce needs was developed in the fourth and final phase of the project. Chapter IV describes current workforce development activities in Nebraska, including training, pipeline, and recruitment and retention programs in the state and best practices based on the evidence from other states. Chapter V describes the strategic plan and recommendations for Nebraska.

A second statewide meeting of stakeholders was convened in June 2009 and the findings of the study were presented. The stakeholder group was charged with discussing barriers and opportunities to workforce development and developing priorities and recommendations for the state's workforce development efforts. The input from the state stakeholder group was incorporated in the final recommendations of the project.

**Nebraska should act now on current health care workforce needs and on future projections, particularly because of the mal-distribution of the workforce and expected growth of the elderly population and coverage of the uninsured.**

### **Final Recommendations**

- *Create a state health workforce center.*
- *Support targeted ongoing data collection to monitor the health workforce and future requirements.*
- *Support an enhanced focus on interdisciplinary, team-based approaches aimed at both education and the provision of services.*
- *Proactively address health provider shortages and mal-distribution at the state level through the development of comprehensive health workforce criteria and shortage designations.*
- *Expand the role of pipeline programs aimed at provider shortage areas, and primary care.*
- *Increase funding for current debt relief programs aimed at recruitment and retention of health care professionals.*
- *Establish new, and streamline existing, community partnerships aimed at health workforce development.*

## CHAPTER I

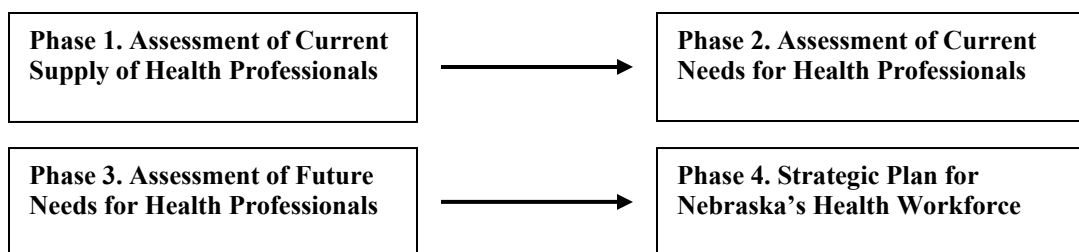
### CURRENT SUPPLY OF HEALTH PROFESSIONALS IN NEBRASKA, 2007–2008

Nebraska is ahead of most states in training a health care workforce to meet state needs. With a single state-supported health sciences university (the University of Nebraska Medical Center [UNMC]), Nebraska has the benefit of a campus focused on the state's needs that attracts and trains most Nebraskans interested in the health professions. In addition, the training and research programs of UNMC's health professions colleges reach all corners of the state despite the principal campuses being located in Omaha and Lincoln. Finally, as evident in recent developments in Norfolk, where UNMC's College of Nursing partnered with Northeast Community College and Faith Regional Health Services to establish a new College of Nursing division, UNMC colleges can develop working relationships with training programs based in other educational institutions in the state.

So what is missing? Nebraska has not developed a comprehensive plan to predict the need for health care professionals, stay abreast of innovations in training, and develop programs to meet future needs for professionals who practice effectively in health care teams (Moskowitz, 2004).

In September 2007, with funding from the University of Nebraska Foundation, Larson Medical Research Fund, staff of the Nebraska Center for Rural Health Research undertook a health workforce planning project for Nebraska. The purpose of this project was to develop a strategy for meeting the health care workforce needs of Nebraska. This project was completed in four phases over two years. As a first step, in February 2008, a statewide stakeholder meeting was held at Mahoney State Park. Representatives of trade and professional associations and educational institutions were invited to this meeting to provide their input early in the planning process. The research team sought feedback from the stakeholders on the priorities for assessment and analysis, the data sources available, and health workforce planning activities currently ongoing in the state.

**Figure 1. “A Critical Match”: Nebraska's Health Workforce Planning Project Phases**



The specific objectives in Phase 1 of the project were to estimate the current supply of health care professionals in Nebraska and to describe the age, gender, and racial/ethnic characteristics of the health workforce in Nebraska.

This chapter provides a snapshot of the current supply and composition of the health workforce in the state of Nebraska. The professionals included in this report are physicians, nurses, dental professionals, pharmacists, allied health professionals, public health professionals, auxiliary health professionals, non-physician clinicians, primary care providers, and mental health professionals. (See Appendix 1 for the inclusion criteria and Appendix 2 for the complete list of professions and the data sources for this report.)

The data for Phase 1 of the project were obtained from various data sources, including the Health Professions Tracking Service (HPTS), a unit of the College of Public Health at UNMC; the Nebraska Department of Health and Human Services' (NDHHS') Licensure Unit; the Nebraska Center for Nursing; and state and local public health departments. HPTS collects data on actively practicing physicians, physician assistants, nurse practitioners, dentists, registered pharmacists and mental health professionals. For the professions not tracked by HPTS (except for registered nurses and licensed practical nurses), data on actively licensed health professionals were obtained from the NDHHS' Licensure Unit. Using licensure data to enumerate health professionals has drawbacks. Actively licensed professionals may not be actively practicing, which may result in overestimating the supply of health professionals in the state. In addition, the address field in the licensure database does not always reflect the primary practice location of the health professionals, which can be a problem when assessing the regional needs for health professionals. The Nebraska Center for Nursing completed a comprehensive analysis of Nebraska's nursing workforce in 2007. The complete report is available at the center's Web site (Kelly, Ramirez, Walburn, Exstrom, Bowen & Drozda, 2007). The data on registered nurses (RNs) and licensed practical nurses (LPNs) in this report were obtained from the Nebraska Center for Nursing surveys of RNs (2009) and LPNs (2008).

## **Physicians and Physician Assistants**

HPTS estimates that 3,402 allopathic physicians (MDs) and 123 osteopathic physicians (DOs) were actively practicing in Nebraska in 2007. The ratio of physicians (MDs and DOs) to 100,000 population in Nebraska was 198.6 in 2007 (Table 1). The ratio of physicians to 100,000 population in the United States was 214.09 in 2004 (The United States Health Workforce Profile, 2006). Over a third (37.3%) of all physicians in Nebraska for whom age data were available (including MDs, DOs, residents, and house officers) were older than 50 years and were likely to retire in the next 10 to 15 years (Figure 2). Women accounted for only 26% of Nebraska's physician workforce in 2007 (Figure 3). Nationally, women accounted for 26% of the total physician workforce in 2004 (The United States Health Workforce Profile, 2006). Although data on race/ethnicity are not available for a quarter of Nebraska's physician workforce, the available data show that the diversity of physicians does not reflect the diversity of Nebraska's population. Among physicians with race/ethnicity data available, 1.2% of physicians identified themselves as African American, and less than 2% were of Hispanic origin (Figure 4). In 2007, 4.4% of Nebraska's population was African American and 7.4% was of Hispanic origin.<sup>1</sup>

There were 598 physician assistants (PAs) actively practicing in Nebraska in 2008 (Table 1). The cohort of physician assistants is younger than that of physicians, with 22.2% of PAs in Nebraska older than 50 years (Figure 5). The majority of PAs (61%) were women (Figure 6). Only 0.4% of

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<sup>1</sup>Data on Nebraska's 2007 population was obtained from the US Census Bureau 2007 population estimates.

PAs who reported race/ethnicity identified themselves as African American and 0.8% as Hispanic. Approximately 17% of physician assistants did not report their race/ethnicity (Figure 7).

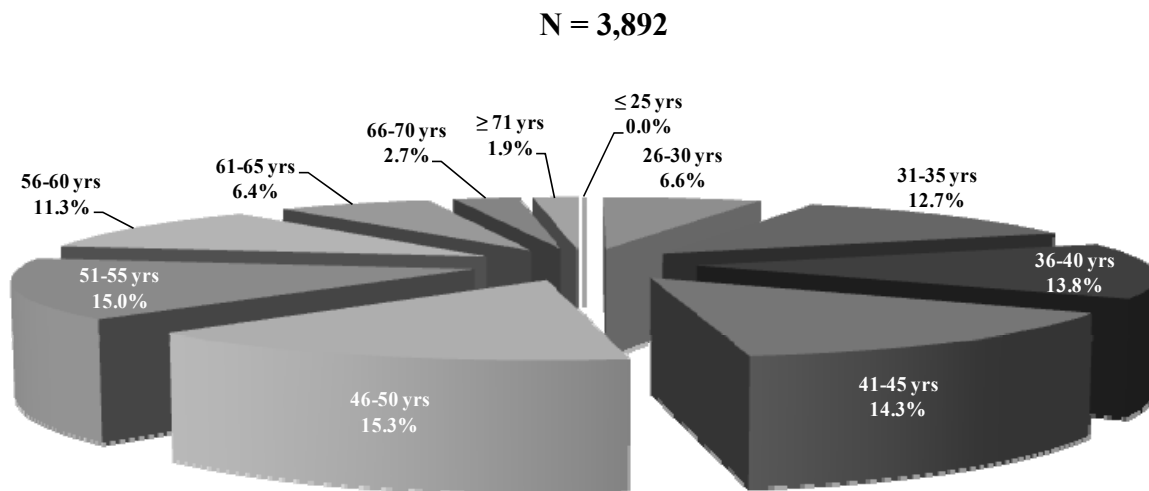
**Table 1. Actively Practicing Physicians and Physician Assistants in Nebraska, 2007**

Physician Type	Number of Physicians	Ratio of Providers/100,000 Population
Allopathic Physician (MD)	3,402	191.7
Osteopathic Physician (DO)	123	6.9
Resident and House Officer	531	29.9
Physician Assistant (PA)*	598	33.5
Total	4,654	262.0

Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

\*Data updated as of 2008.

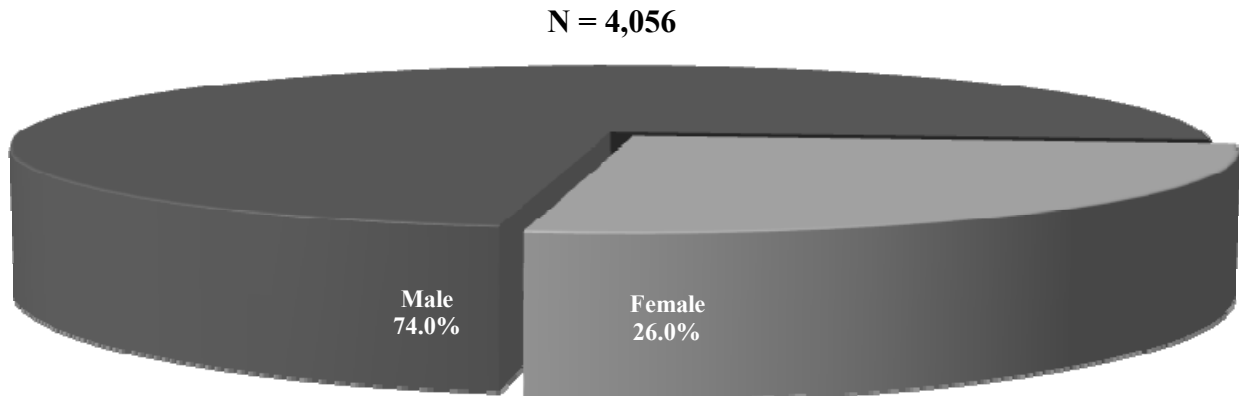
**Figure 2. Age Distribution of Actively Practicing Physicians, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Includes allopathic physicians, osteopathic physicians, residents, and house officers. Physician data had 164 records with missing/unknown age data.

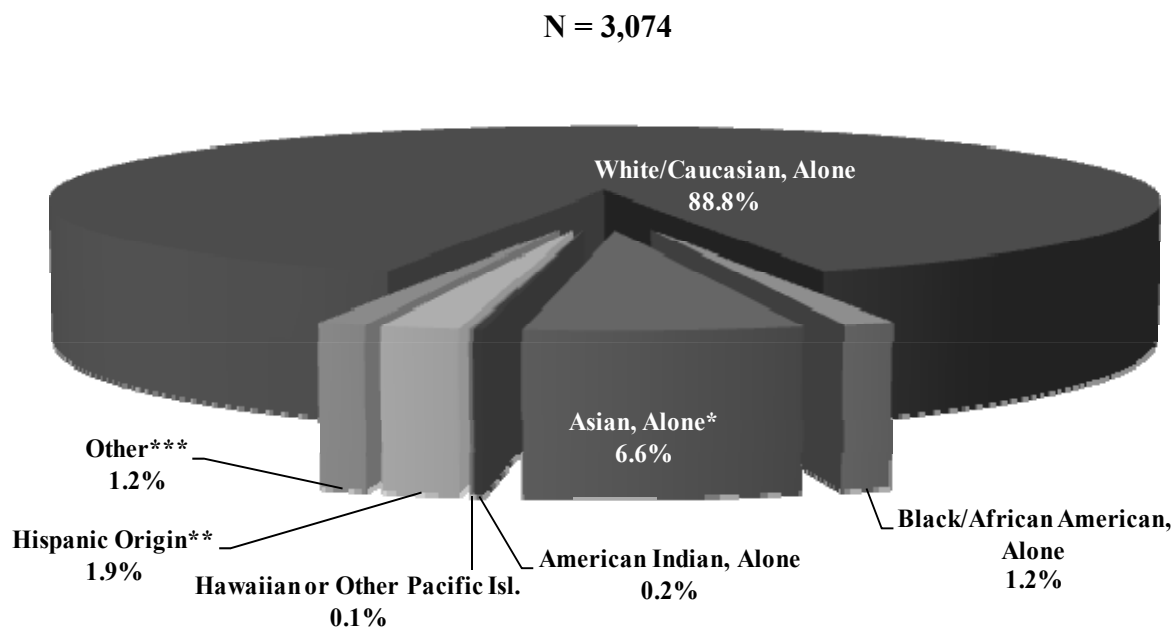
**Figure 3. Gender Distribution of Actively Practicing Physicians, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Includes allopathic physicians, osteopathic physicians, residents, and house officers.

**Figure 4. Race and Ethnicity of Actively Practicing Physicians, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Includes allopathic physicians, osteopathic physicians, residents, and house officers. Physician data had 982 records with missing/unknown race/ethnicity data.

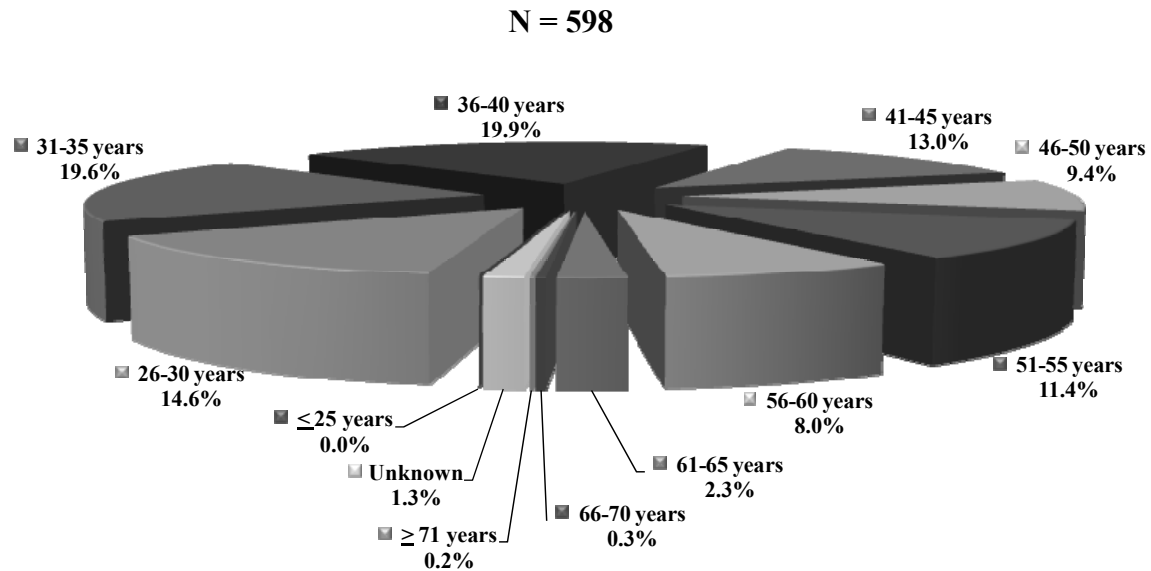
\* "Asian, Alone" category includes Asian Indian, Other Asian, Vietnamese, SE Asian not Vietnam, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\* "Hispanic Origin" category includes Hispanic/Other, Puerto Rican, and Mexican American/Chicano.

\*\*\* "Other" category includes Foreign and Other.

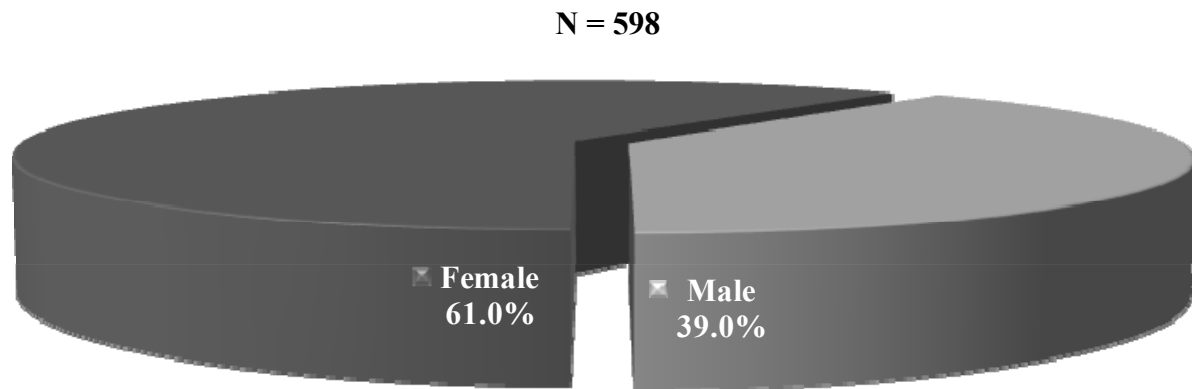
\*\*\*\* "No Response" includes No Response and Unknown.

**Figure 5. Age Distribution of Actively Practicing Physician Assistants, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

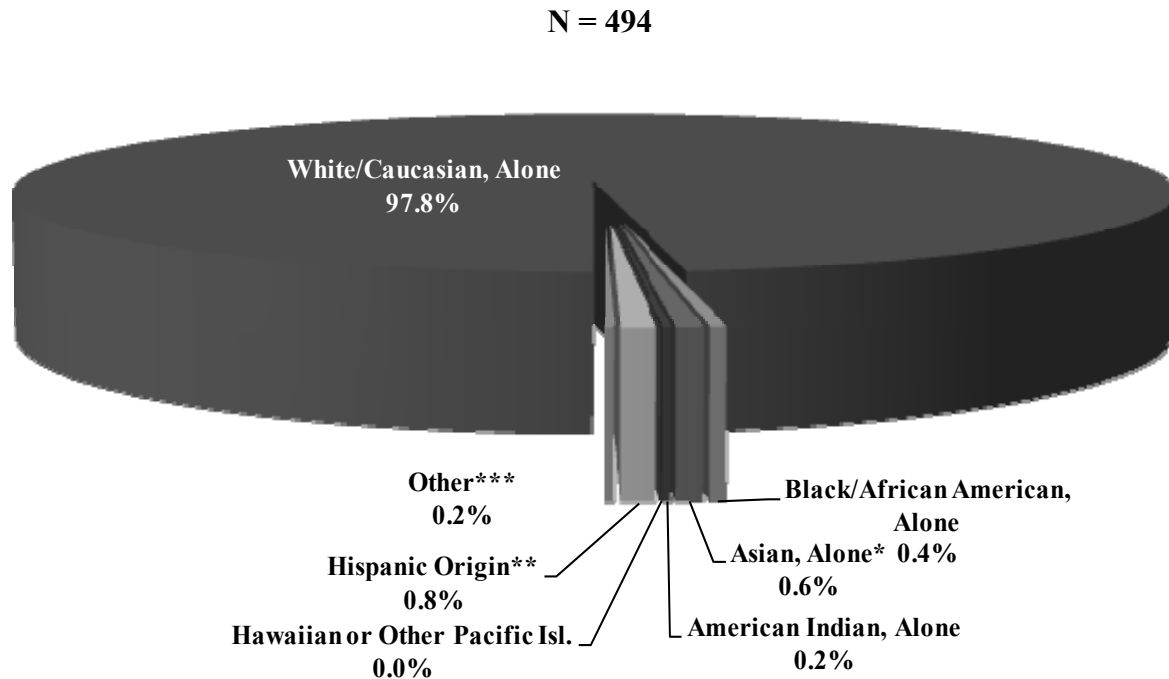
**Figure 6. Gender Distribution of Actively Practicing Physician Assistants, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.



**Figure 7. Race and Ethnicity of Actively Practicing Physician Assistants, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

Note: Physician assistant data had 104 records with missing/unknown race/ethnicity data.

\*"Asian, Alone" category includes Asian Indian, Other Asian, Vietnamese, SE Asian not Vietnam, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\*"Hispanic Origin" category includes Hispanic/Other, Puerto Rican, and Mexican American/Chicano.

\*\*\*"Other" category includes Foreign and Other.

## **Nurses**

The Nebraska Center for Nursing monitors Nebraska's nursing workforce with biennial surveys of RNs and LPNs. According to the center's 2009 annual survey, there were 17,335 actively practicing RNs in Nebraska in 2008. The ratio of RNs to 100,000 population was 972 (Table 2). About a third of RNs (33.6%) were older than 50 years (Figure 8); male nurses represented 4.8% of the RN workforce (Figure 9), and ethnic minorities accounted for about 3% of the RN nursing workforce (Figure 10). Nationally, 6.1% of RNs were men in 2004 (Toward a Method for Identifying, 2007).

According to data obtained from the Nebraska Center for Nursing, there were 5,184 actively practicing LPNs in Nebraska in 2007 (Table 2). The ratio of LPNs to 100,000 population was 293. Data on age were missing for 27.3% of LPNs. Among the LPNs with age and gender data available in 2007, 28.6% were older than 50 years (Figure 11) and 2.9% were male (Figure 12). Gender information was missing for 27.1% of LPNs. The majority (93%) of LPNs, were white non-Hispanic; 3.5% were African American and less than 1% (0.2%), were Hispanic (Figure 13).

There were 767 actively practicing nurse practitioners (NPs) in Nebraska in 2008 (Table 2). About 42% of the nurse practitioners in Nebraska were older than 50 years (Figure 14), and the majority, (86.2%) were women (Figure 15). About a quarter (24.5%) of NPs did not report their race/ethnicity (Figure 16). Among NPs who reported their race/ethnicity, less than 1% identified themselves as African American (0.3%) and Hispanic (0.3%).

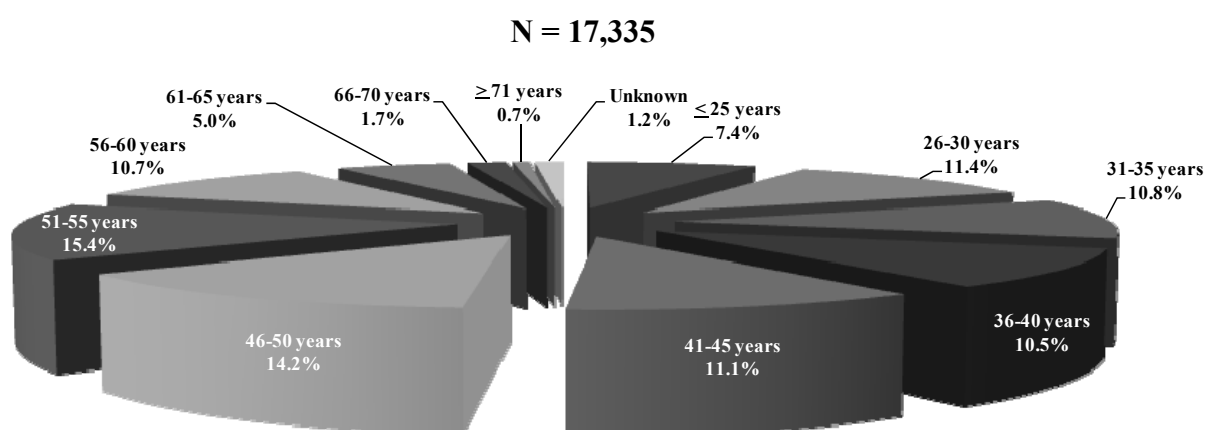
There were 22 actively practicing certified nurse midwives (CNMs) in 2007 and 81 actively licensed clinical nurse specialists (CNSs) and 482 certified nurse anesthetists (CNAs) in 2008 (Table 2). A third of CNSs (34.6%) and CNAs (37.2%) were older than 55 years (Figures 17 & 19). The majority of CNSs (96.3%) were women (Figure 18). More than half of CNAs (59.5%) were men (Figure 20).

**Table 2. Actively Practicing Nursing Professionals, Nebraska 2007-2008**

<b>Nurse Type</b>	<b>Number of Nurses</b>	<b>Ratio of Nurses/100,000 Population</b>
Registered Nurse (RN)	17,335	972.0
Licensed Practical Nurse (LPN)	5,184	293.0
Nurse Practitioner (NP)	767	43.0
Certified Nurse Midwife (CNM)	22	1.2
Clinical Nurse Specialist (CNS)	81	4.5
Certified Nurse Anesthetist (CNA)	482	27.0
<b>Total</b>	<b>23,871</b>	<b>1,340.7</b>

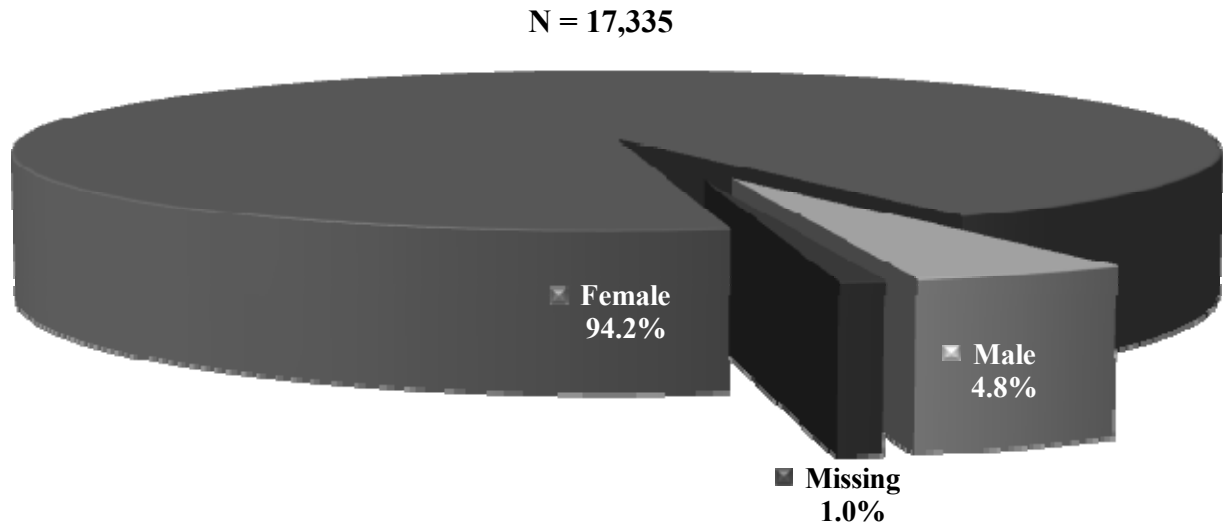
Sources: RN, Nebraska Center for Nursing, 2008; LPN, Nebraska Center for Nursing, 2007; NP and CNM, Health Professions Tracking Service, 2007; and CNS and CNA, Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 8. Age Distribution of Actively Practicing Registered Nurses, Nebraska 2008**



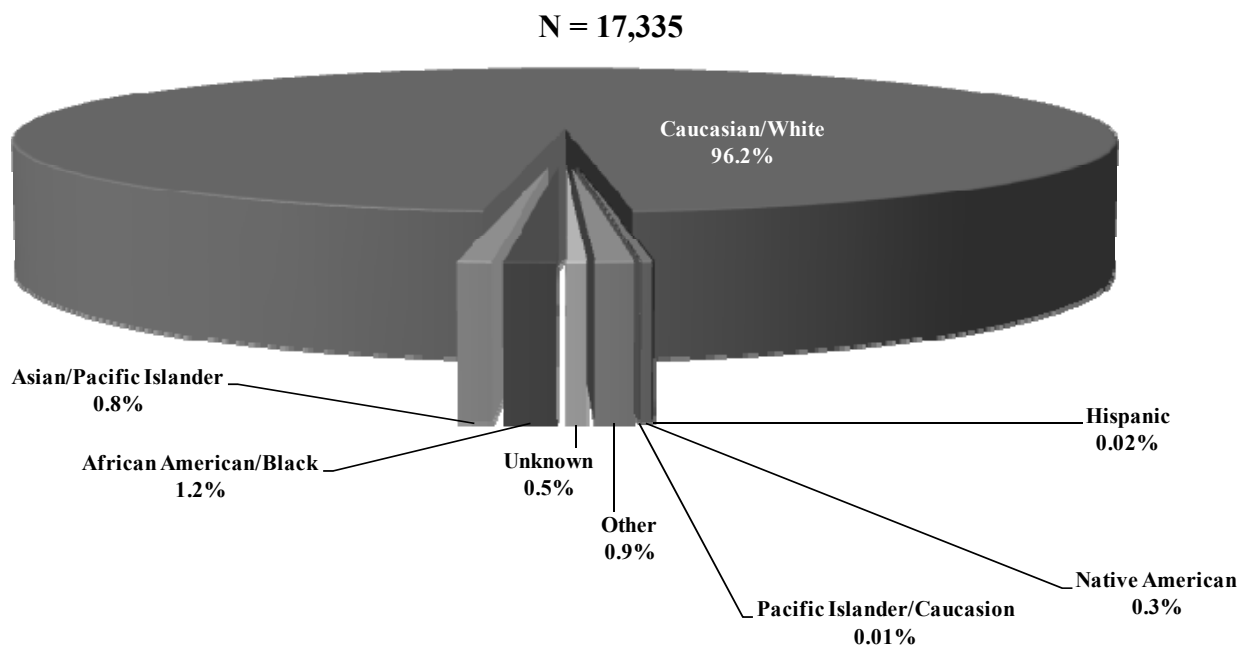
Source: Nebraska Center for Nursing, 2008.

**Figure 9. Gender Distribution of Actively Practicing Registered Nurses, Nebraska 2008**



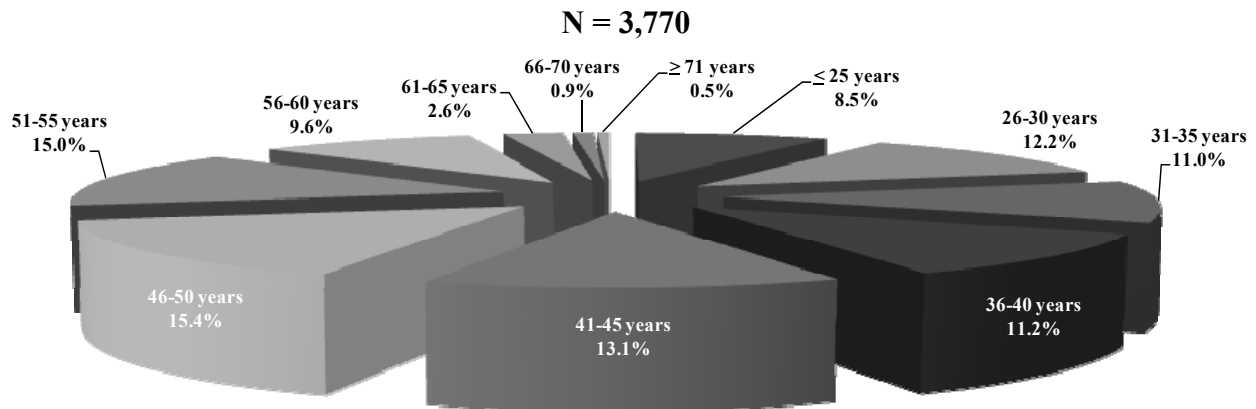
Source: Nebraska Center for Nursing, 2008.

**Figure 10. Race and Ethnicity of Actively Practicing Registered Nurses, Nebraska 2008**



Source: Nebraska Center for Nursing, 2008.

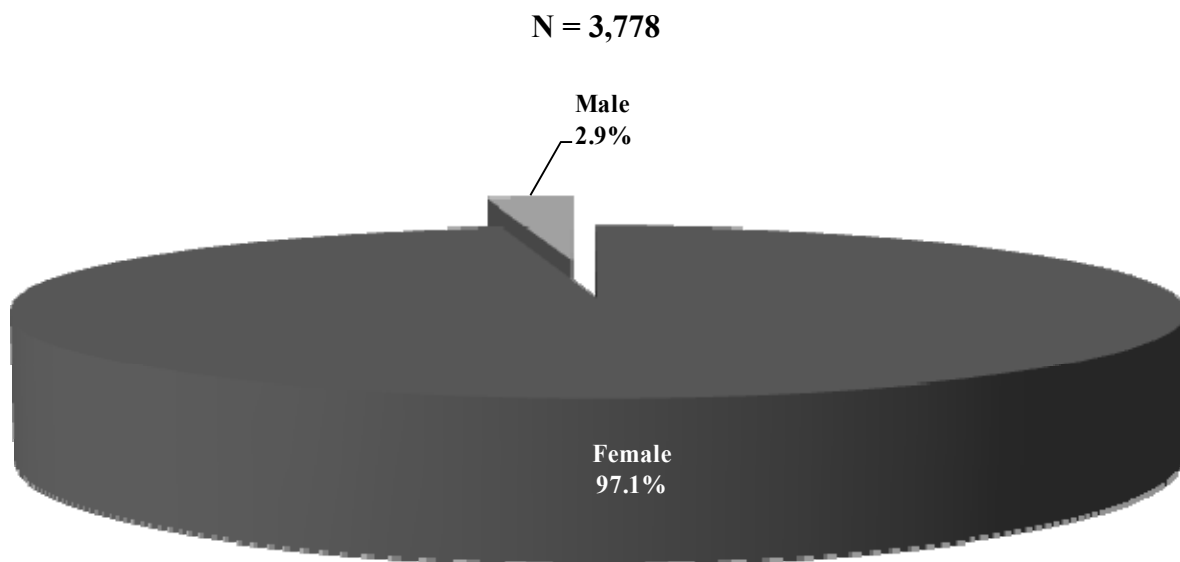
**Figure 11. Age Distribution of Actively Practicing Licensed Practical Nurses, Nebraska 2007**



Source: Nebraska Center for Nursing, 2007.

Note: LPN data had 1,414 records with missing/unknown age data.

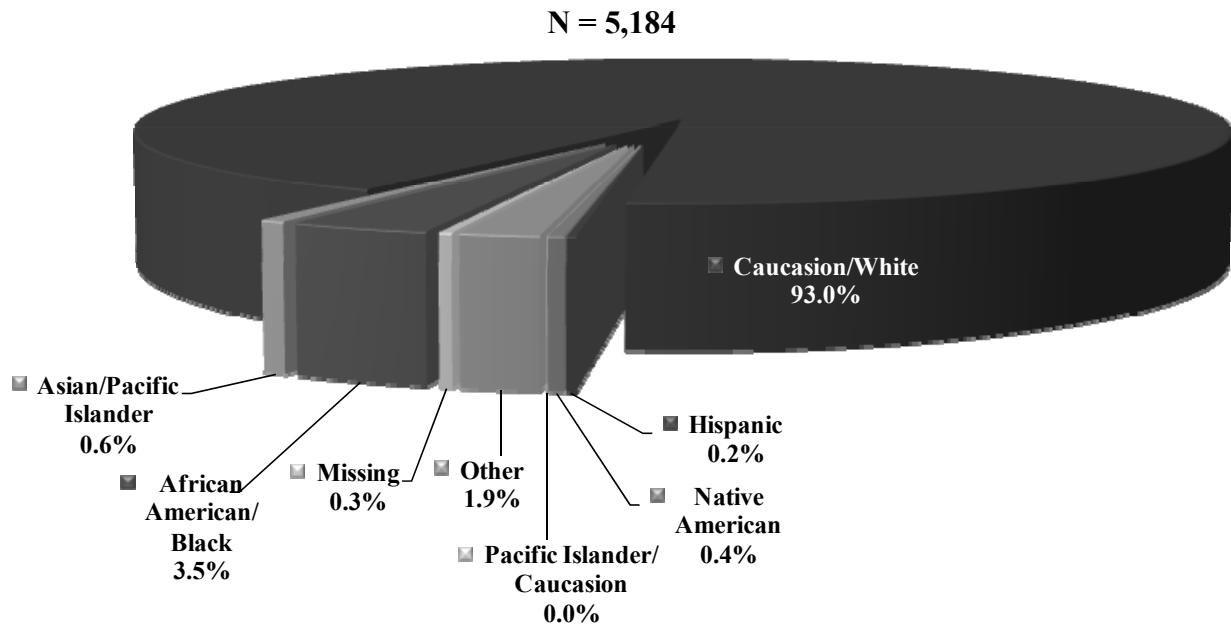
**Figure 12. Gender Distribution of Actively Practicing Licensed Practical Nurses, Nebraska 2007**



Source: Nebraska Center for Nursing, 2007.

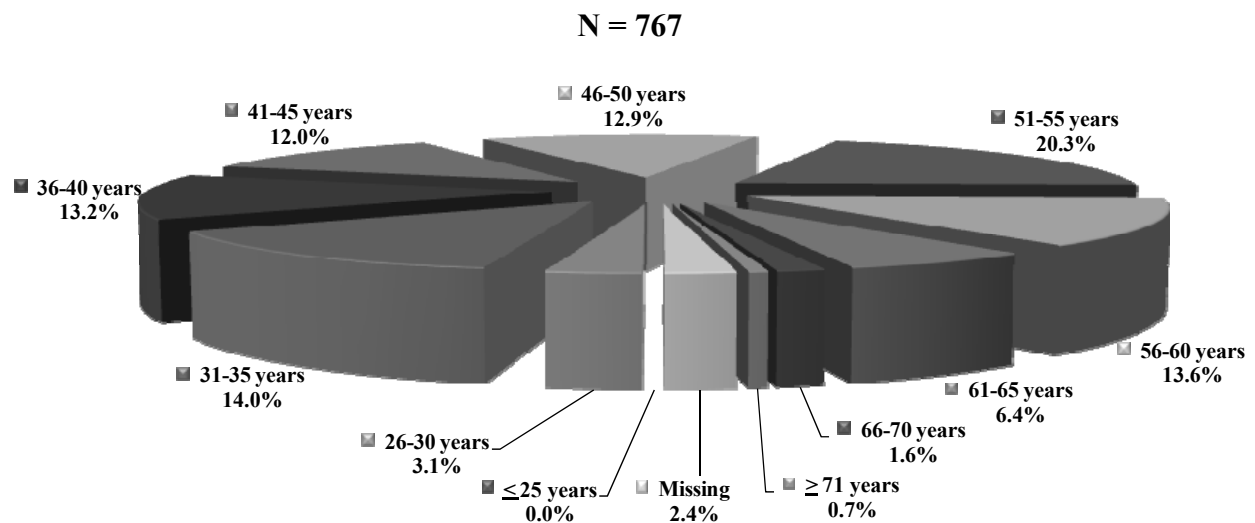
Note: LPN data had 1,406 records with missing/unknown gender data.

**Figure 13. Race and Ethnicity of Actively Practicing Licensed Practical Nurses, Nebraska 2007**



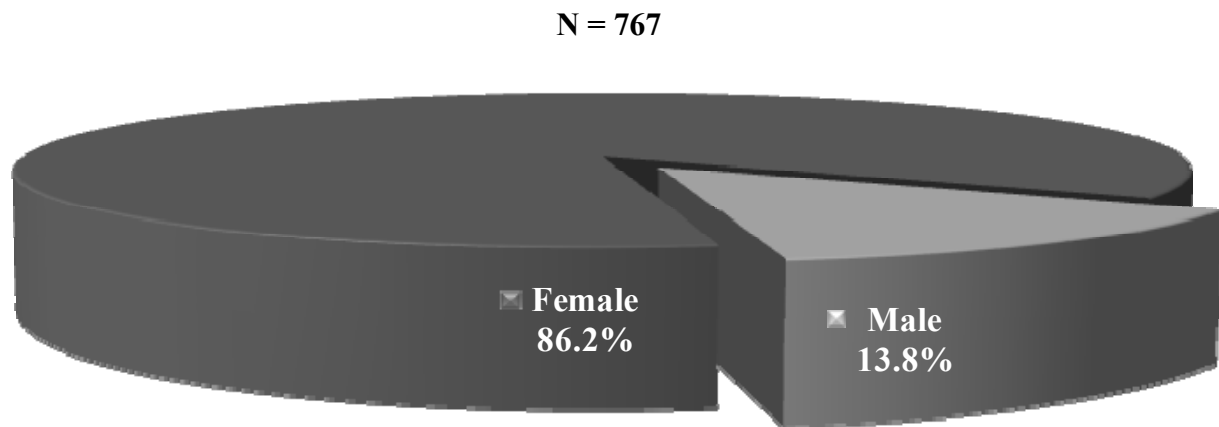
Source: Nebraska Center for Nursing, 2007.

**Figure 14. Age Distribution of Actively Practicing Nurse Practitioners, Nebraska 2008**



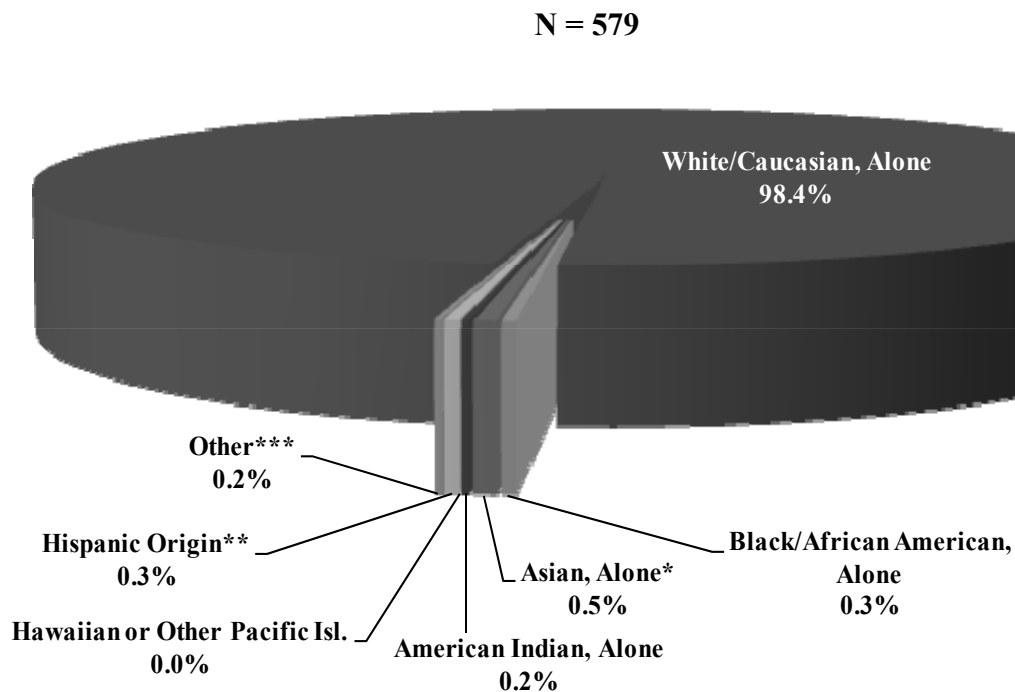
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 15. Gender Distribution of Actively Practicing Nurse Practitioners, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 16. Race and Ethnicity of Actively Practicing Nurse Practitioners, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

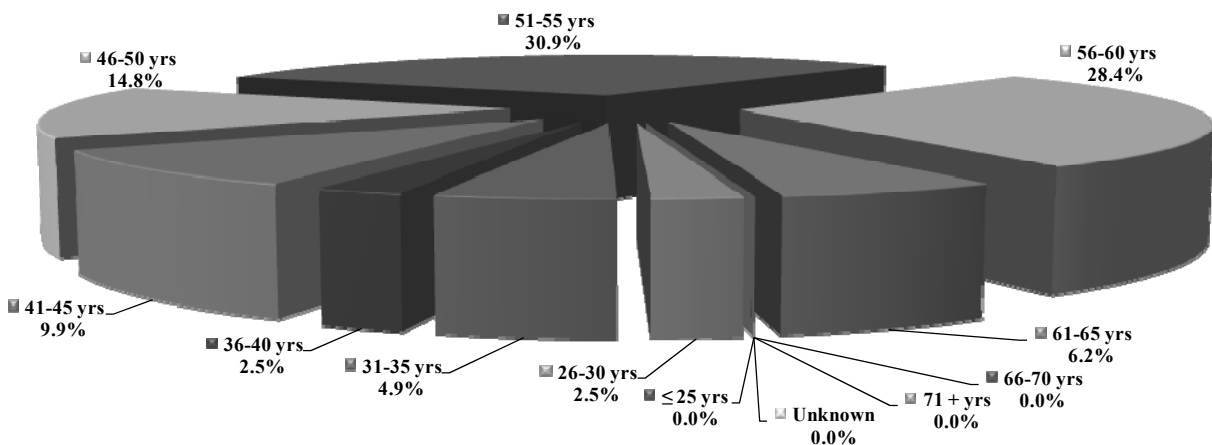
Note: Nurse practitioner data had 188 records with missing/unknown race/ethnicity data.

\*"Asian, Alone" category includes Asian Indian, Other Asian, Vietnamese, SE Asian not Vietnam, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\*"Hispanic Origin" category includes Hispanic/Other, Puerto Rican, and Mexican American/Chicano.

\*\*\*"Other" category includes Foreign and Other.

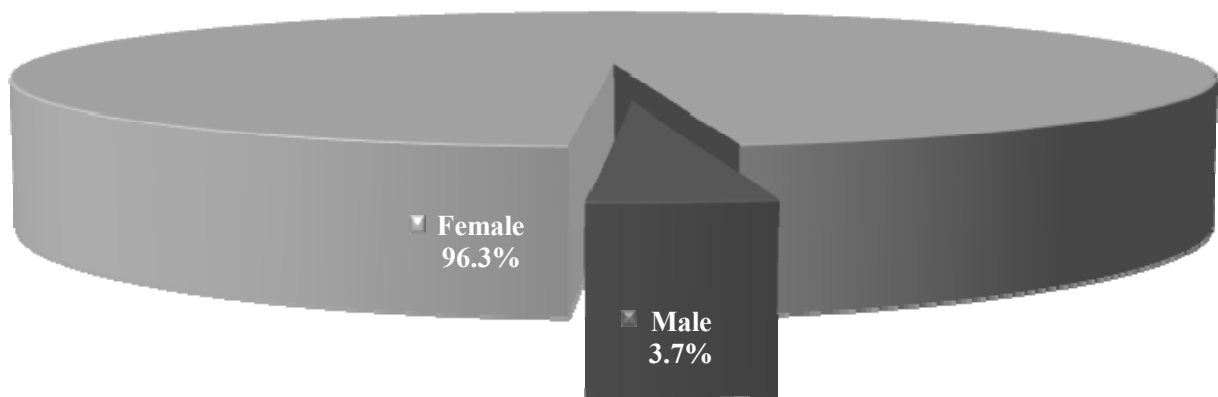
**Figure 17. Age Distribution of Actively Licensed Clinical Nurse Specialists, Nebraska 2008**  
N = 81



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

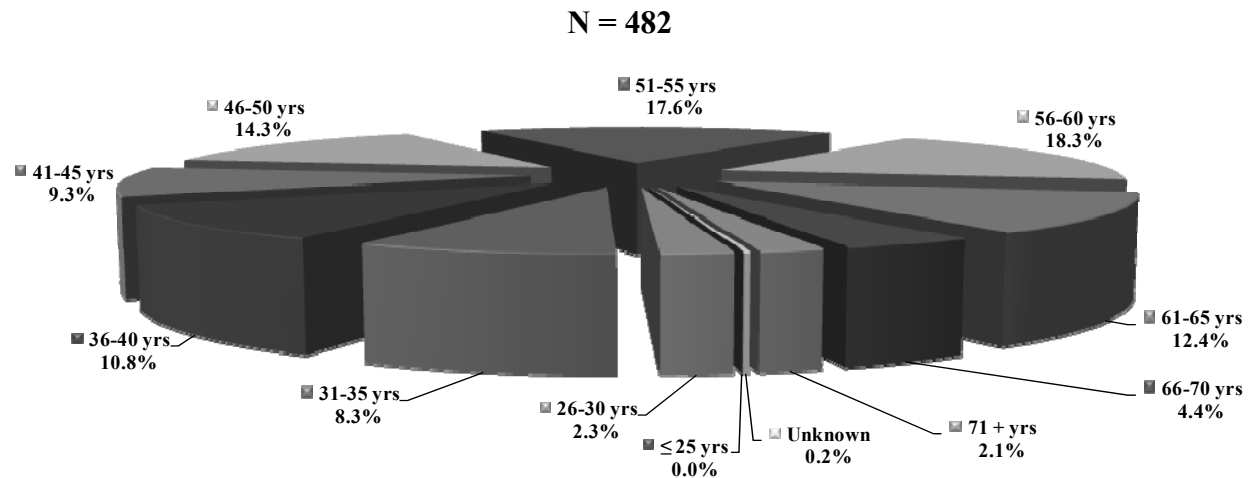
**Figure 18. Gender Distribution of Actively Licensed Clinical Nurse Specialists, Nebraska 2008**

N = 81



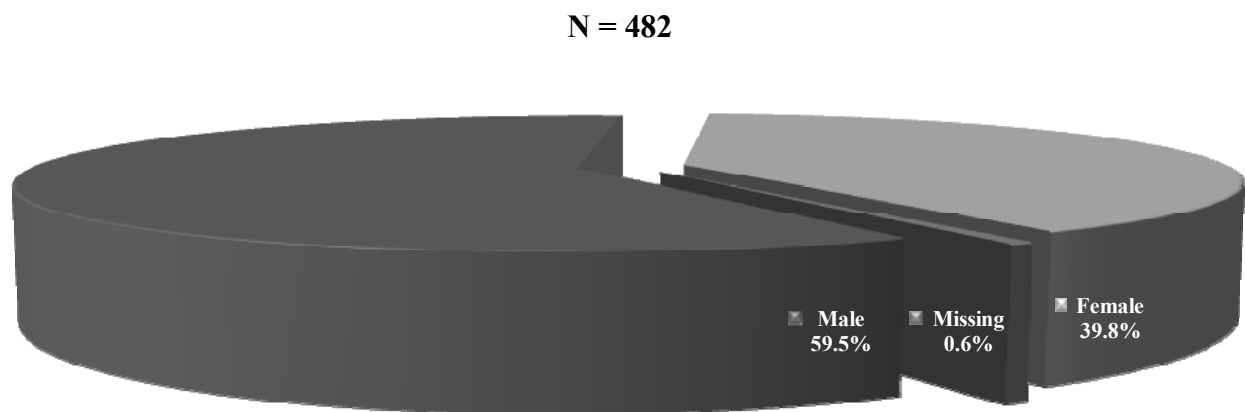
Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 19. Age Distribution of Actively Licensed Certified Nurse Anesthetists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 20. Gender Distribution of Actively Licensed Certified Nurse Anesthetists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.



## **Dental Health Professionals**

There were 1,011 actively practicing dentists in Nebraska in 2007 and 1,038 actively licensed dental hygienists in 2008 (Table 3). Over a third (34.4%) of actively practicing dentists in Nebraska, were older than 55 years (Figure 21) and the majority (83.1%) were men (Figure 22). Race/ethnicity data were not available for 11.9% of dentists. The available data show that African Americans, Native Americans, and Hispanics are underrepresented among dentists (Figure 23). Among those who reported race, only 0.6% of dentists identified themselves as African American and 1.2% as Hispanic.

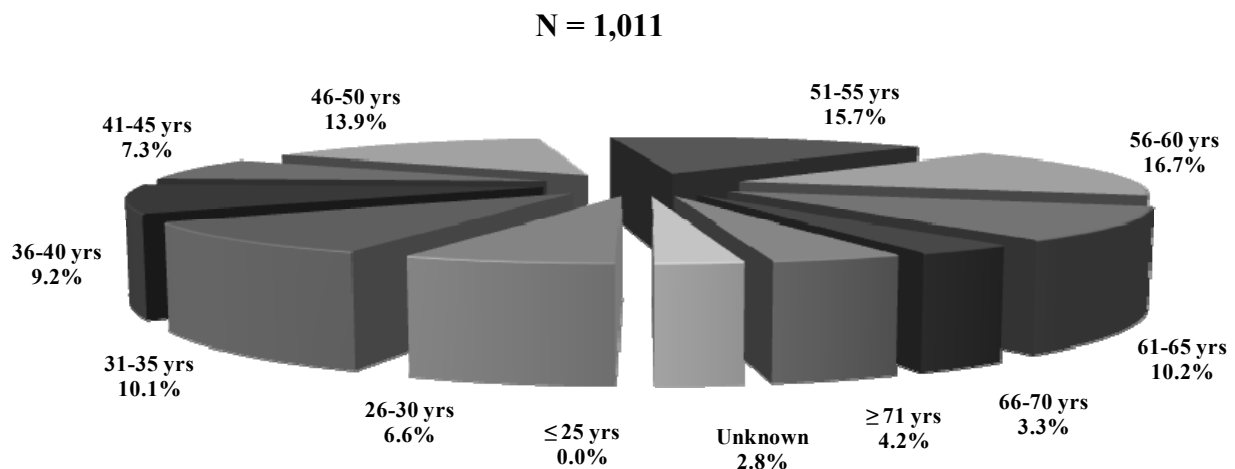
The dental hygienist workforce is younger than the dentist workforce. Only 4.3% of actively licensed dental hygienists who reported age were older than 55 years (Figure 24) and the majority, (98.4%) were women (Figure 25).

**Table 3. Number of Dental Professionals, Nebraska 2007- 2008**

<b>Profession</b>	<b>Number of Dental Professionals</b>	<b>Ratio of Dental Professionals/100,000 Population</b>
Dentists	1,011	57.1
Dental Hygienists	1,038	58.2
<b>Total</b>	<b>2,049</b>	<b>115.3</b>

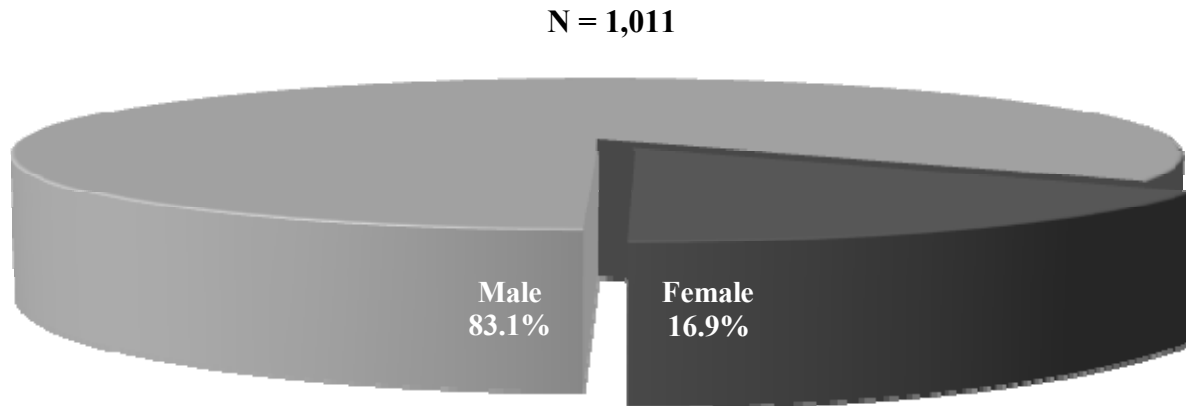
Sources: Actively practicing dentists, Health Professions Tracking Service, University of Nebraska Medical Center, 2007; actively licensed dental hygienists, Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 21. Age Distribution of Actively Practicing Dentists, Nebraska 2007**



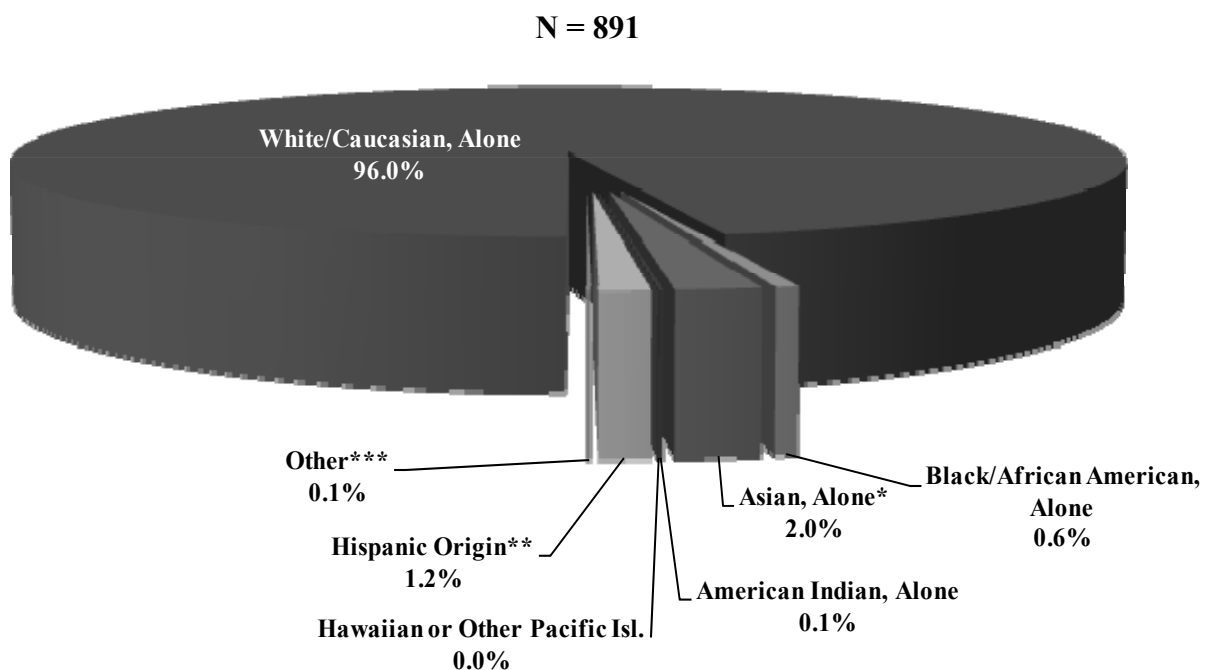
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

**Figure 22. Gender Distribution of Actively Practicing Dentists, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

**Figure 23. Race/Ethnicity of Actively Practicing Dentists, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Dentist data had 120 records with missing/unknown race/ethnicity data.

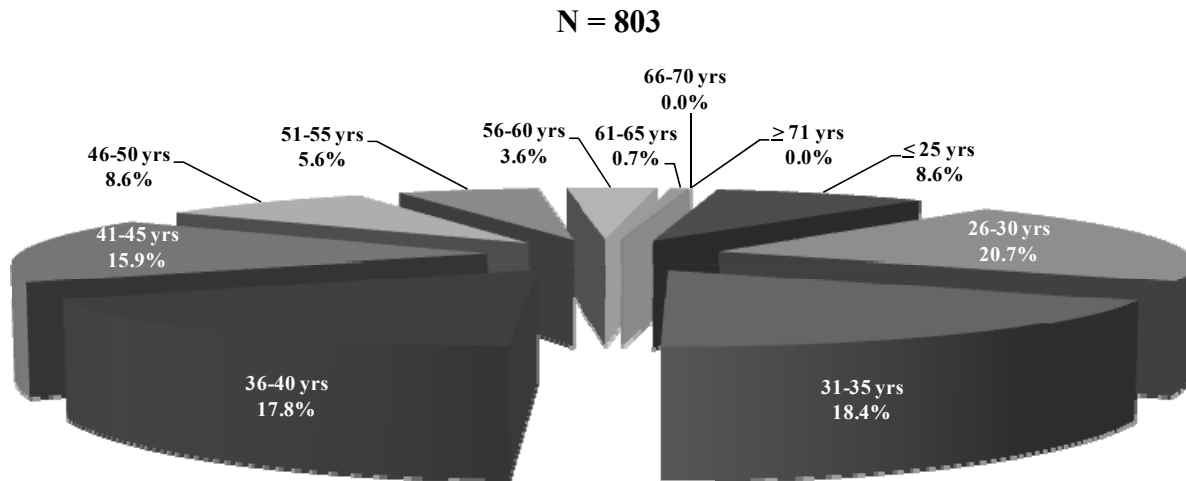
\*"Asian, Alone" category includes Asian Indian, Other Asian, Vietnamese, SE Asian not Vietnam, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\*"Hispanic Origin" category includes Hispanic/Other, Puerto Rican, and Mexican American/Chicano.

\*\*\*"Other" category includes Foreign and Other.

\*\*\*\*"No Response" includes No Response and Unknown.

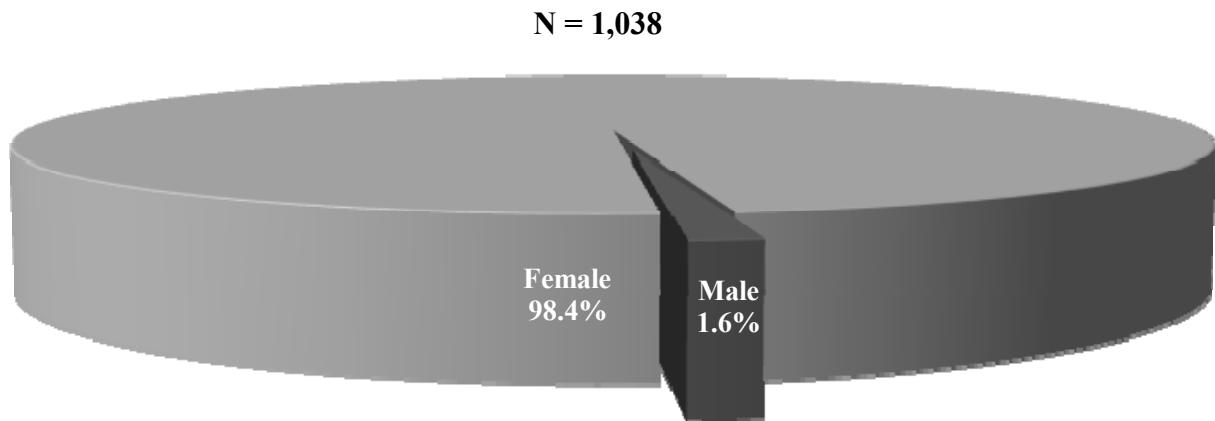
**Figure 24. Age Distribution of Actively Licensed Dental Hygienists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Dental hygienist data had 235 records with missing/unknown age data.

**Figure 25. Gender Distribution of Actively Licensed Dental Hygienists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

## **Pharmacists and Pharmacy Technicians**

### **Pharmacists**

HPTS at UNMC estimates that there were 1,682 actively practicing pharmacists in Nebraska in 2007, i.e., a ratio of 95.1 pharmacists to 100,000 population. Over 20% of actively practicing registered pharmacists in Nebraska were older than 55 years and were likely to retire in the next 10 years (Figure 26). Women make up about half of the pharmacist workforce (Figure 27), similar to the current gender distribution nationally. It is estimated that by 2020, 62% of the nation's pharmacists will be women (The Adequacy of Pharmacist Supply, 2008). Complete data on race/ethnicity of pharmacists were not available; however, the available data show that racial/ethnic minorities were underrepresented in the pharmacist workforce, similar to the national pharmacist workforce profile (The Adequacy of Pharmacist Supply, 2008). Of those who reported race/ethnicity, African American, Hispanic and Native Americans made up only 1.6% of the pharmacist workforce in Nebraska (Figure 28).

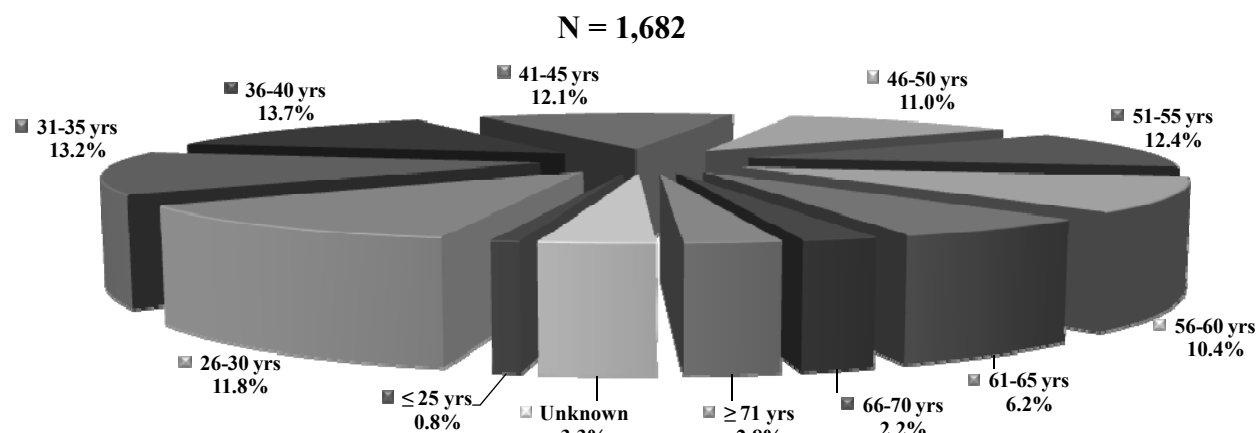
### **Pharmacy Technicians**

As of September 2007, Nebraska law (LB 236) required registration of all pharmacy technicians employed by a facility licensed under the Health Care Facility Licensure Act in Nebraska. There are 2,219 registered pharmacy technicians and 1,137 pharmacist interns in Nebraska in 2009. The majority of pharmacy technicians (78.9%) and pharmacist interns (65%) are women. About 10% of pharmacy technicians are older than 55 years.<sup>2</sup> The pharmacist-to-pharmacy intern and technician ratio in Nebraska in 2009 is 1:2.

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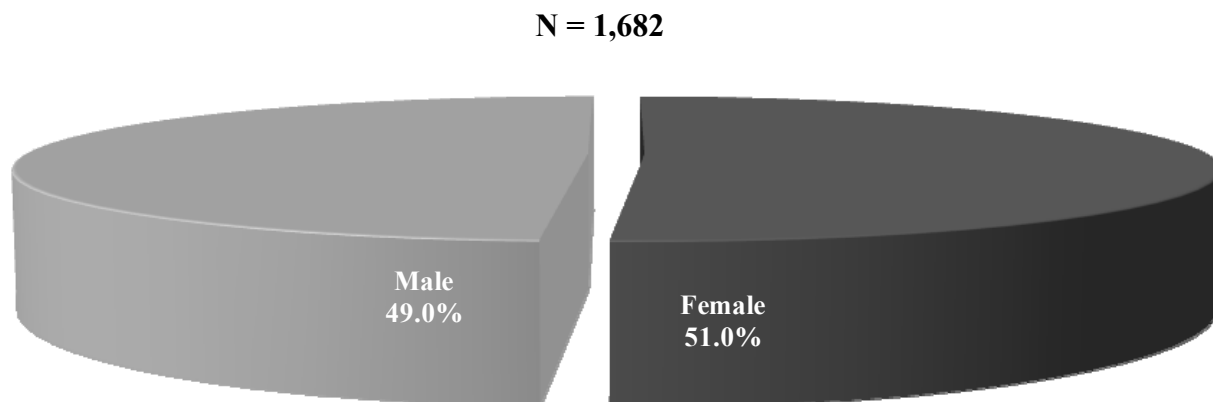
<sup>2</sup> Data on pharmacy technicians and interns were obtained from the Nebraska Department of Health and Human Services' Licensure Unit, July 2009.

**Figure 26. Age Distribution of Actively Practicing Registered Pharmacists, Nebraska 2007**



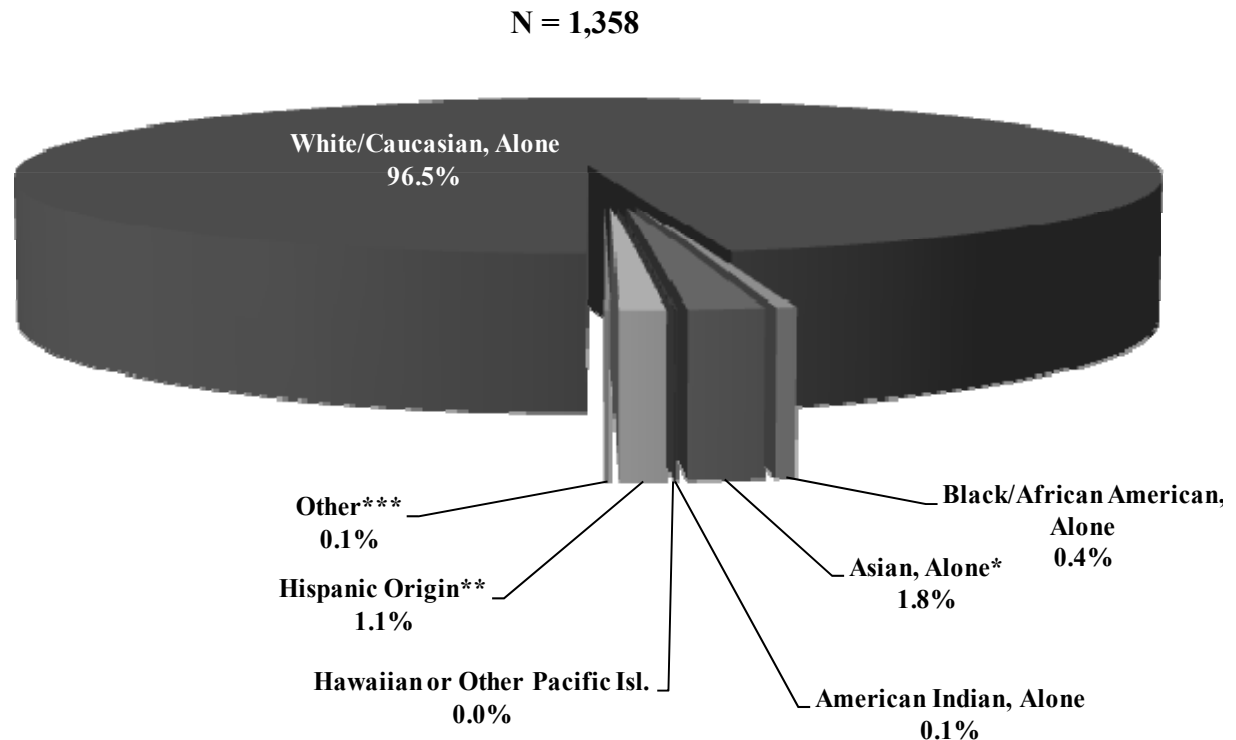
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

**Figure 27. Gender Distribution of Actively Practicing Registered Pharmacists, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

**Figure 28. Race and Ethnicity of Actively Practicing Registered Pharmacists, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Pharmacist data had 324 records with missing/unknown race/ethnicity data.

\*"Asian, Alone" category includes Asian Indian, Other Asian, Vietnamese, SE Asian not Vietnam, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\*"Hispanic Origin" category includes Hispanic/Other, Puerto Rican, and Mexican American/Chicano.

\*\*\*"Other" category includes Foreign and Other.

\*\*\*\*"No Response" includes No Response and Unknown.

## **Allied Health Professionals**

Data on actively licensed allied health professionals in Nebraska in 2008 were obtained from the NDHHS' Licensure Unit. These data could overestimate the number of actively practicing allied health professionals in the state, as all actively licensed professionals may not be actively practicing in the state. Hence, these data have to be interpreted with this limitation in mind. Many allied health professions do not need state licensure (see Appendix 11 for a list of health professions not requiring state licensure).

There were 490 medical nutrition therapists actively licensed in 2008, a ratio of 27.5 per 100,000 population (Table 4). About 20% were older than 55 years (Figure 29), and the majority (96.9%) of those who reported gender were women (Figure 30). There were 1,990 medical radiographers in 2008, a ratio of 111.6 per 100,000 population. Less than 10% (6.8%) of those who reported age were older than 55 years (Figure 31), and the majority (80.4%) of those who reported

gender, were women (Figure 32). There were 1,290 respiratory care practitioners actively licensed in 2008, a ratio of 72.3 per 100,000 population. About 15% of respiratory care practitioners were older than 55 years (Figure 33) and over half (66.3%) who reported gender were women (Figure 34). There were 1,385 physical therapists and 766 occupational therapists actively licensed in 2008, a ratio of 77.7 and 43 per 100,000 population, respectively (Table 4). Reliable data on the age and gender distribution of occupational therapists were not available, with 60.8% missing data on age (Figure 35). About 10% of physical therapists were older than 55 years (Figure 37). The majority of occupational therapists (91.7%) and physical therapists (65%) who reported gender were women (Figures 36 and 38). There were 559 speech-language pathologists and 134 audiologists actively licensed in 2008, a ratio of 31.3 and 7.5 per 100,000 population, respectively (Table 4). Of those for who age data were available, 19.4% of speech language pathologists (Figure 39) and 22.9% of audiologists (Figure 41) were older than 55 years. The majority (94.2%) of speech-language pathologists and audiologists (73.3%) who reported gender data were women (Figures 40 and 42). There are 12 actively licensed perfusionists in Nebraska in 2009. Of these, nine (75%) are men, and three (25%) are older than 55 years.<sup>3</sup> Table 5 summarizes the number of actively licensed emergency medical technicians (EMTs) in Nebraska. The data on EMTs were obtained from the NDHHS licensure database.

**Table 4. Actively Licensed Allied Health Professionals, Nebraska 2008**

<b>Profession</b>	<b>Number of Allied Health Professionals</b>	<b>Ratio of Allied Health Professionals/100,000 Population</b>
Medical Nutrition Therapist	490	27.5
Medical Radiographer	1,990	111.6
Respiratory Care Practitioner	1,290	72.3
Occupational Therapist	766	43.0
Physical Therapist	1,385	77.7
Speech-Language Pathologist	559	31.3
Audiologist	134	7.5
<b>Total</b>	<b>6,614</b>	<b>370.9</b>

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

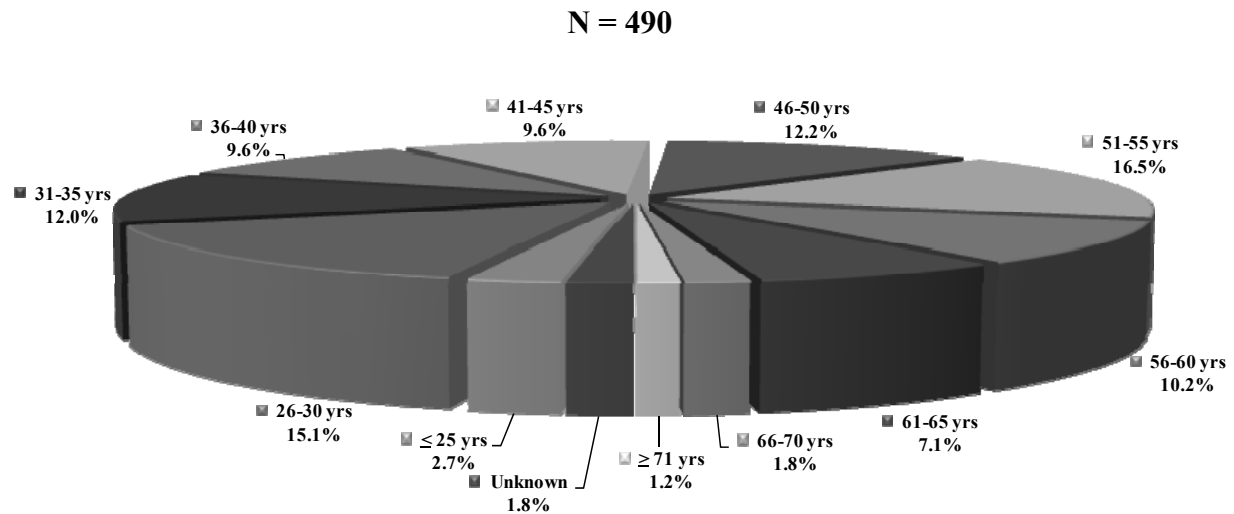
**Table 5. Actively Licensed Emergency Medical Technicians, Nebraska 2008**

<b>Profession</b>	<b>Number of EMTs</b>
EMT – Paramedic	814
EMT – Intermediate	163
EMT – Basic	6,538
EMT – First Responder	936

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

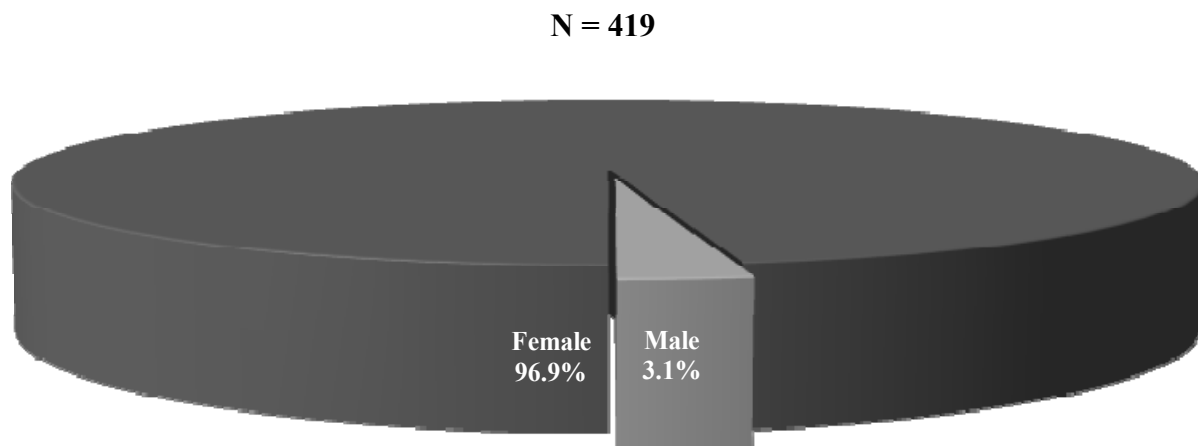
<sup>3</sup> Data on perfusionists were obtained from the Nebraska Department of Health and Human Services, Licensure Unit, July, 2009

**Figure 29. Age Distribution of Actively Licensed Medical Nutrition Therapists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

**Figure 30. Gender Distribution of Actively Licensed Medical Nutrition Therapists, Nebraska 2008**

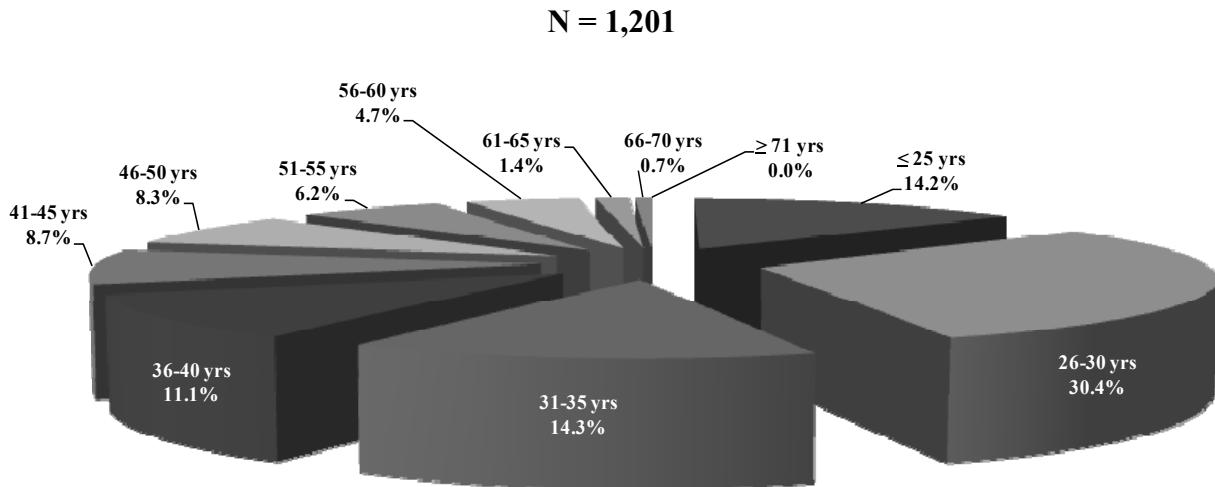


Source: Nebraska Department of Health and Human Services, 2008.

Note: Medical nutrition therapist data had 71 records with missing gender data.



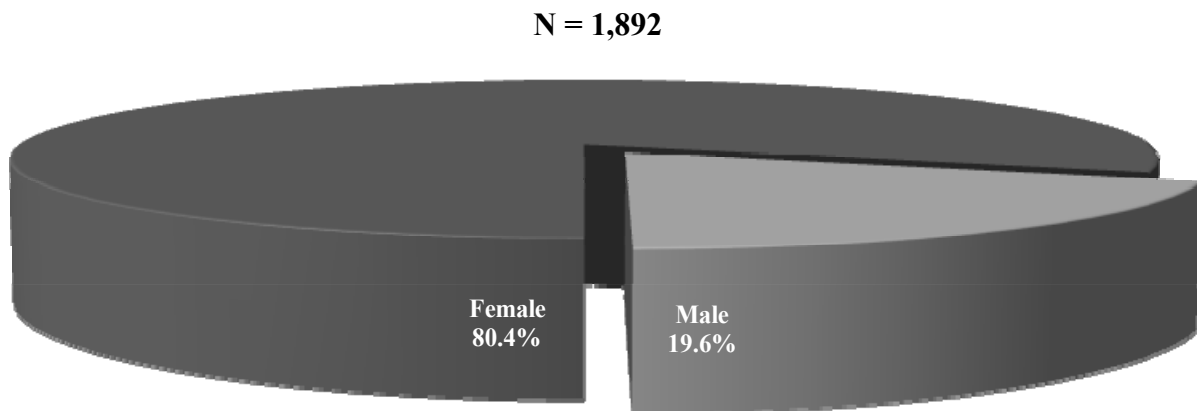
**Figure 31. Age Distribution of Actively Licensed Medical Radiographers, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Medical radiographer data had 789 records with missing/unknown age data.

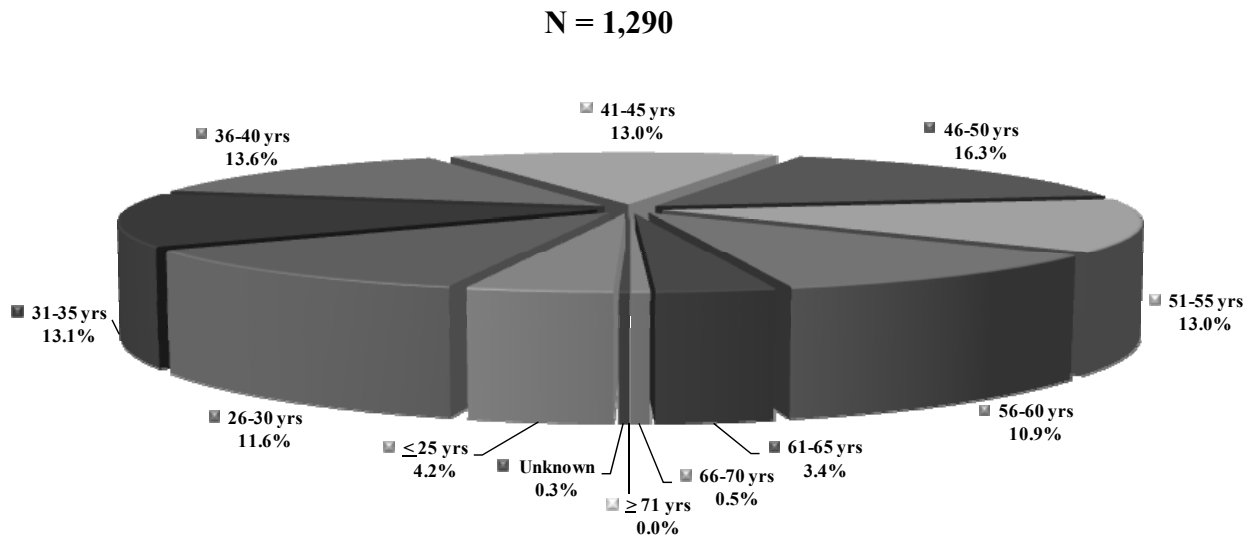
**Figure 32. Gender Distribution of Actively Licensed Medical Radiographers, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

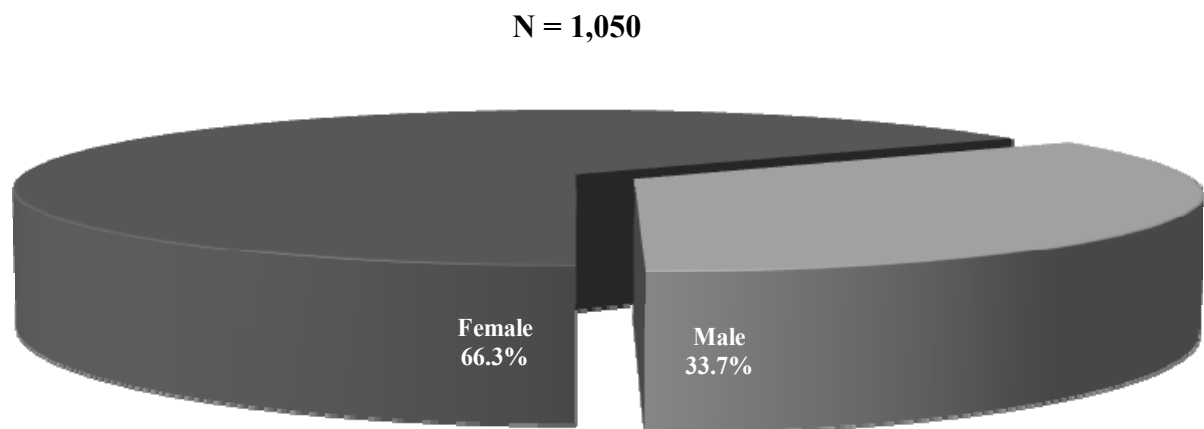
Note: Medical radiographer data had 98 records with missing/unknown gender data.

**Figure 33. Age Distribution of Actively Licensed Respiratory Care Practitioners, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

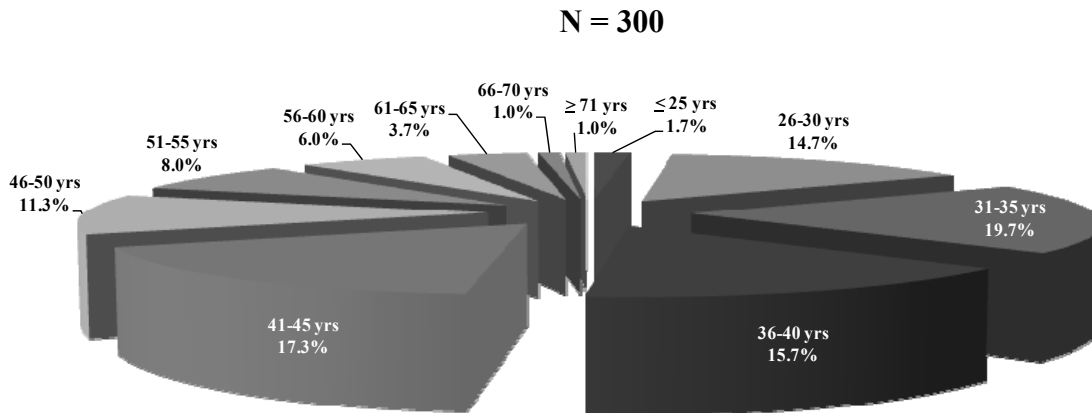
**Figure 34. Gender Distribution of Actively Licensed Respiratory Care Practitioners, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Respiratory care practitioner data had 240 records with missing/unknown gender data.

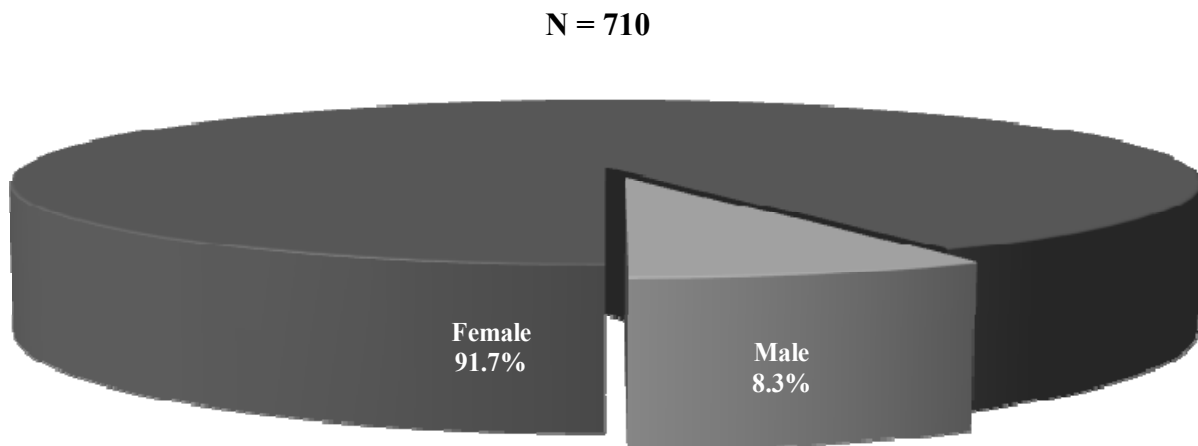
**Figure 35. Age Distribution of Actively Licensed Occupational Therapists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Occupational therapist had 466 records with missing/unknown age data.

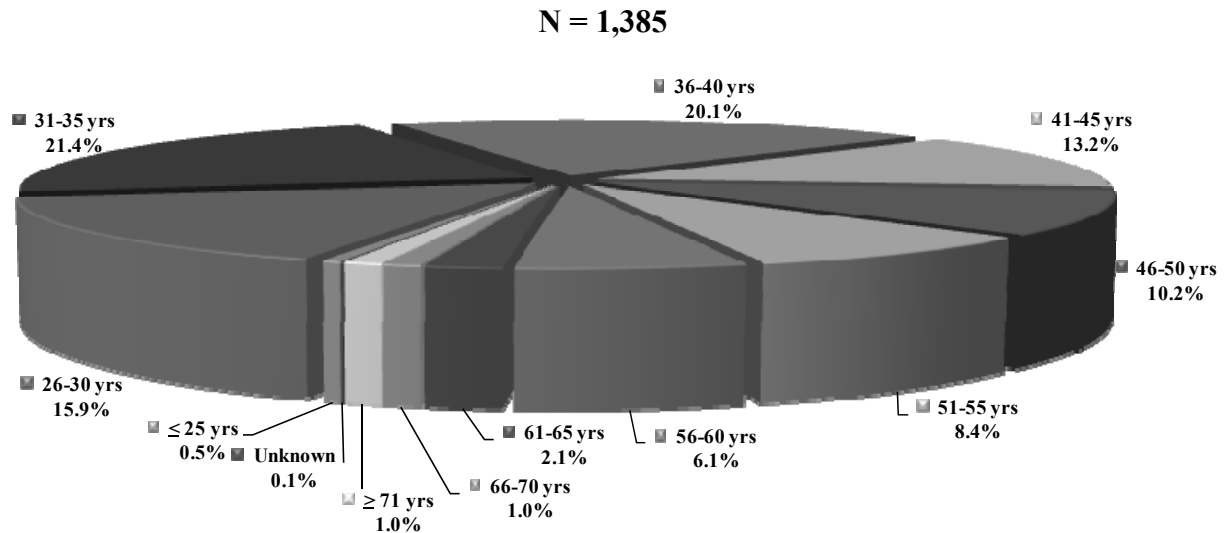
**Figure 36. Gender Distribution of Actively Licensed Occupational Therapists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

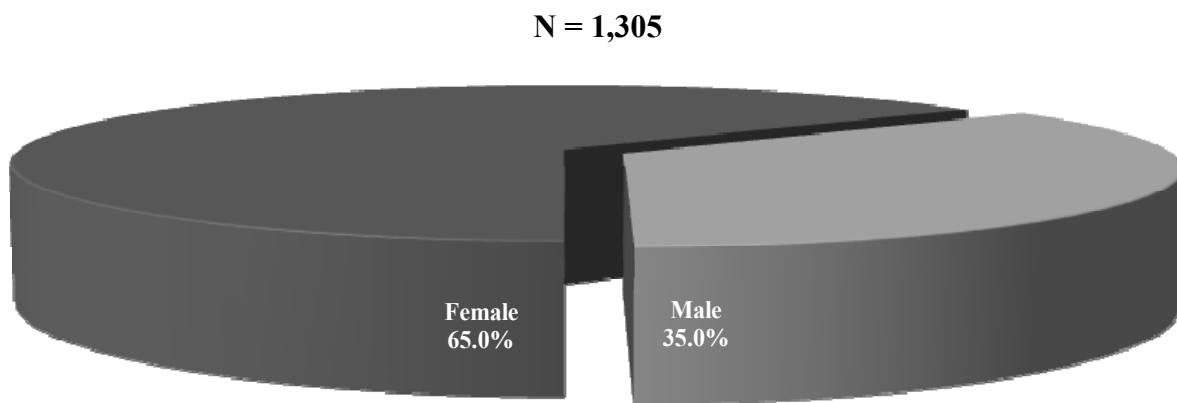
Note: Occupational therapist data had 56 records with missing/unknown gender data.

**Figure 37. Age Distribution of Actively Licensed Physical Therapists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

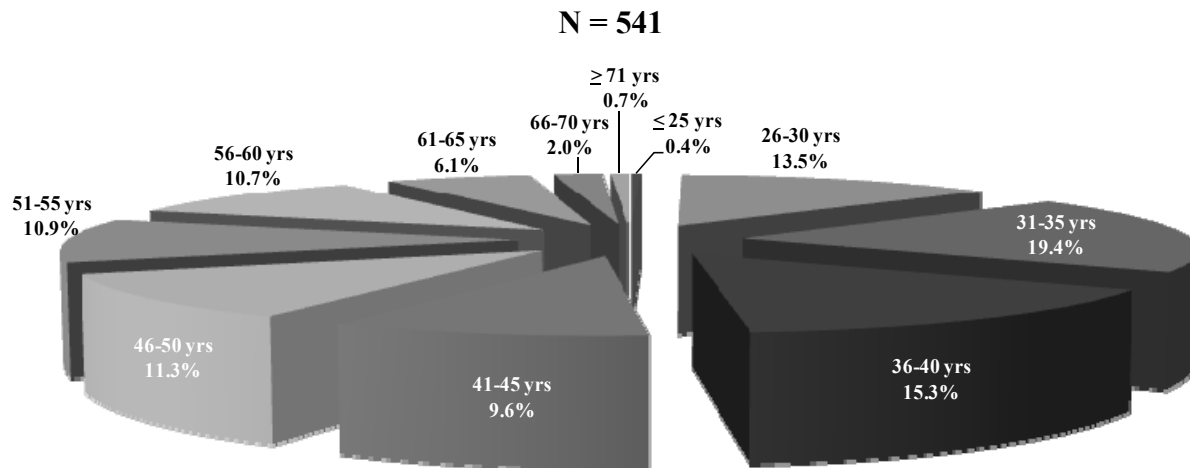
**Figure 38. Gender Distribution of Actively Licensed Physical Therapists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Physical therapists data had 80 records with missing/unknown gender data.

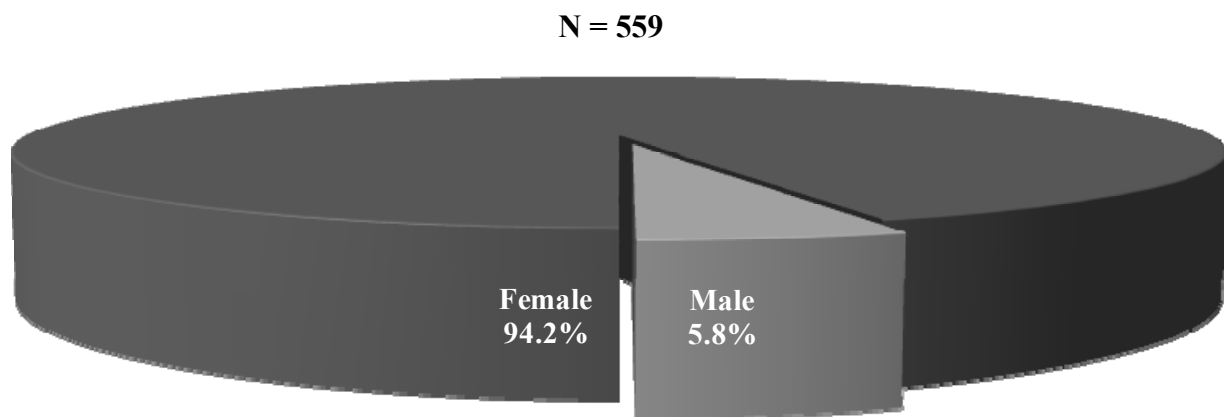
**Figure 39. Age Distribution of Actively Licensed Speech-Language Pathologists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

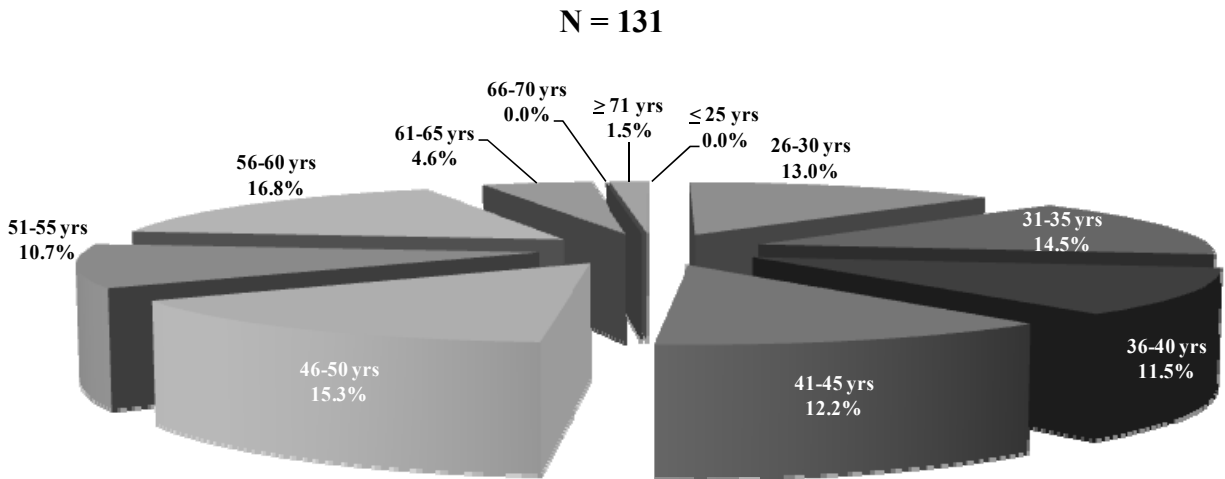
Note: Speech language pathologist data had 18 records with missing/unknown age data.

**Figure 40. Gender Distribution of Actively Licensed Speech-Language Pathologists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

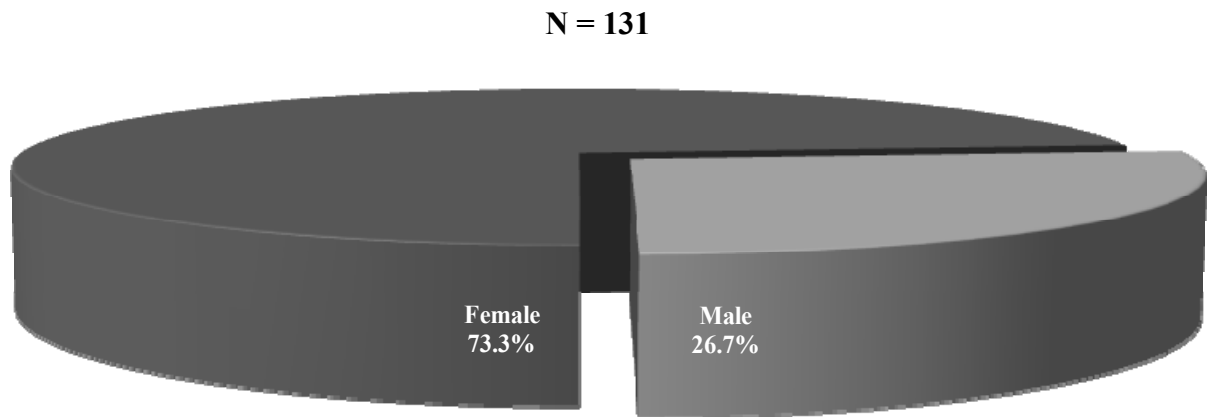
**Figure 41. Age Distribution of Actively Licensed Audiologists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Audiologist data had 3 records with missing/unknown age data.

**Figure 42. Gender Distribution of Actively Licensed Audiologists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Audiologist data had 3 records with missing/unknown gender data.

## **Public Health Professionals**

Data on public health professionals were obtained from the state health department and the 20 local health departments in the state through “A Survey of Local Health Departments in Nebraska (2008),” a component of “A Systematic Study of Nebraska's Regional Public Health Agency Model” funded by the Robert Wood Johnson Foundation. The findings are summarized in Table 7. In 2007, 198 public health professionals were employed in the Nebraska Division of Public Health (working in environmental health, health surveillance, data management, bioterrorism, public health, disease prevention, family health, rural health, minority health and women's health) and 598 public health professionals were employed in local health departments (Table 6). In 2008-2009, 603 public health professionals were employed in the local health departments and 464 employees were employed in the state health department. In local health departments, the average number of employees was 57.4, with a median of 9 employees. The number of full-time equivalent (FTE) employees was 572 in local health departments and 511 in the state health department. The mean number of FTE employees in local health departments was 28.6 and the median was 8. Local health departments had a total of 482 full-time employees and the state health department had 457. Of the 603 professionals employed in the local health departments, 157 (26%) were eligible for retirement.<sup>4</sup> Of the 464 employees at the state health department, 278 (59.9%) were eligible for retirement.

Table 8 summarizes the categories of public health professionals employed at the state and local public health departments. Eighteen of the 20 local health departments have a health director/administrator, with a median FTE of 1. Only 6 local health departments have a physician, with a median FTE of 1. All 20 local health departments have nurses, with a median FTE of 2. Fourteen local health departments have no environmental health specialist; the remainder, have a median FTE of 2. Fifteen local health departments have no epidemiologist; the rest have a median FTE of 1. Fifteen local health departments do not have a nutritionist; the remainder employs a median FTE of 1.7. Fourteen local health departments do not have an information systems (IS) specialist; the remainder employs a median FTE of 0.5. Twelve local health departments have no public information specialist; the remainder employ a median FTE of 1. Fourteen local health departments have no social worker; the remainder employs a median FTE of 2.75. All of the local health departments have an emergency preparedness coordinator and administrative personnel, with a median of 1 FTE emergency preparedness coordinator and 1.5 administrative/clerical personnel. Only three local health departments do not have a surveillance coordinator, and two do not have a health educator; the remainder employs a median FTE of 1 surveillance coordinator and 1 health educator.<sup>5</sup> The state health department employs 76 health service administrators, 17 nurses, 24 environmental health specialists, 40 environmental health technicians, 11 epidemiologists, 1 surveillance coordinator, 27 health educators, 8 nutritionists,

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<sup>4</sup> Please do not further distribute local health department information without the study's principal investigator's permission. Principal Investigator: Li-Wu Chen, PhD, Associate Professor, Department of Health Services Research & Administration, College of Public Health, University of Nebraska Medical Center.

<sup>5</sup> Local Health Department Data were obtained from "A Survey of Local Health Departments in Nebraska (2008)," a component of "A Systematic Study of Nebraska's Regional Public Health Agency Model" funded by the Robert Wood Johnson Foundation. Principal Investigator: Li-Wu Chen, PhD, Associate Professor, Department of Health Services Research & Administration, College of Public Health, University of Nebraska Medical Center.

13 IS specialists, 2 public information specialists, 1 emergency preparedness coordinator, 7 EMS specialists, and 2 forensic scientists.<sup>6</sup>

A total of 109 public health nurses were employed in Nebraska in 2008. The majority of public health nurses in Nebraska work in either official public health agencies or in selected community-based organizations such as community action agencies. Public health agencies (health departments or districts) employed 10 masters of science in nursing (MSN)-prepared nurses; 5 nurses as health directors (1 MSN; 3 with a bachelor of science in nursing [BSN]; 1 RN); and 57 BSNs, 13 RNs, and 1 LPN. Community action agencies employed 9 RNs. There were 6 public health nurses employed in the Indian Health Services, of which 1 had a doctoral degree and 5 had BSN degrees. The NDHHS employs 8 BSN public health nurses.<sup>7</sup>

In 2009, there are 76 registered environmental health specialists in Nebraska. The majority are men (73.6%), and 40% are in the preretirement age group, i.e., older than 55 years.<sup>8</sup>

**Table 6. Public Health Professionals in Nebraska, 2007**

Public Health Professionals	Number	Percent
Nebraska Division of Public Health	198	24.9%
Local Health Departments	598	75.1%
<b>Total</b>	<b>796</b>	<b>100.0%</b>

Source: Nebraska state and local health departments, 2007.

<sup>6</sup> State health department data were obtained by personal communication from David Palm, Administrator, Office of Public Health, Nebraska Department of Health & Human Services.

<sup>7</sup> Data on public health nurses was provided by personal communication from Katherine Kaiser PhD, APHN, RN, Associate Professor, University of Nebraska Medical Center, Department of Community-Based Health. The data were obtained by a survey completed by all public health departments/districts (n=20). There was one question related to public health nurse staffing and there was a 100% response rate for that question.

<sup>8</sup> Data on environmental health specialists were obtained from the Nebraska Department of Health and Human Services' Licensure Unit, July 2009.



**Table 7. Number of Public Health Professionals, Nebraska 2008-2009**

		Local Health Departments (LHD) (N = 20)	State Health Department (SHD)
Number of Employees	Total	603	464
	Mean	57.4	NA
	Median	9	NA
	Range	(3, 603)	NA
Number of FTE	Total	572	511**
	Mean	28.6	NA
	Median	8	NA
	Range	(2.6, 240)	NA
Number of Full-Time	Total	482	457
	Mean	24.1	NA
	Median	7	NA
	Range	(1, 180)	NA
Number Eligible for Retirement*	Total (%)	157 (26.0%)	278 (59.9%)
	Mean	7.9	NA
	Median	1	NA
	Range	(0, 105)	NA

Source: Local health department data: "A Survey of Local Health Departments in Nebraska (2008)," a component of "A Systematic Study of Nebraska's Regional Public Health Agency Model" funded by the Robert Wood Johnson Foundation. Principal Investigator: Li-Wu Chen, PhD, Associate Professor, Department of Health Services Research & Administration, College of Public Health, University of Nebraska Medical Center. **[Please do not further distribute Local Health Department information without the study's principal investigator's permission.];** State health department data: Personal communication, David Palm, Administrator Office of Public Health, Nebraska Department of Health & Human Services, June 2009.

\*Includes those who are eligible and will be eligible within the next five years.

\*\*Includes unfilled positions

**Table 8. FTE Public Health Professionals at Local Health Department and Number of Public Health Professionals at State Health Department by Category, Nebraska 2008-2009**

Job Category/Description	Local Health Departments (N = 20)				State Health Department
	Number of LHDs with No Staff	Number of LHDs with Staff, but FTE Data Unavailable/Unreported	Number of LHDs with Staff	Median FTE	Number of Staff
Health service manager, administrator, health director	2	1	17	1.0	76
Physician	14	2	4	1.0	0
Nurse	0	1	19	2.0	17
Environmental health specialist (e.g., sanitarian)	14	2	4	2.0	24
Other environmental health scientist or technician.	10	1	9	0.8	40
Epidemiologist	15	1	4	1.0	11
Surveillance coordinator	3	3	14	1.0	1
Health educator	2	2	16	1.0	27
Nutritionist	15	1	4	1.7	8
Information systems specialist	14	3	3	0.5	13
Public information specialist	12	2	6	1.0	2
Social worker (e.g., community organizer, HIV/AIDS counselor, health social worker)	14	1	5	2.8	0
Emergency preparedness coordinator	0	2	18	1.0	1
Administrative or clerical personnel	0	1	19	1.5	89
Investigations	NA	NA	NA	NA	37
EMS specialist	NA	NA	NA	NA	7
Licensing	NA	NA	NA	NA	138
Training	NA	NA	NA	NA	3
Data Analysis	NA	NA	NA	NA	15
Forensic scientist	NA	NA	NA	NA	2

Source: Local health department data: "A Survey of Local Health Departments in Nebraska (2008)," a component of "A Systematic Study of Nebraska's Regional Public Health Agency Model" funded by the Robert Wood Johnson Foundation. Principal Investigator: Li-Wu Chen, PhD, Associate Professor, Department of Health Services Research & Administration, College of Public Health, University of Nebraska Medical Center. **[Please do not further distribute Local Health Department information without the study's Principal Investigator's permission.]**; state health department data: Personal Communication, David Palm, Administrator Office of Public Health, Nebraska Department of Health and Human Services, June 2009.

Note: State health department staff also includes several unclassified "working" managers and administrators.

## **Non-Physician Clinicians**

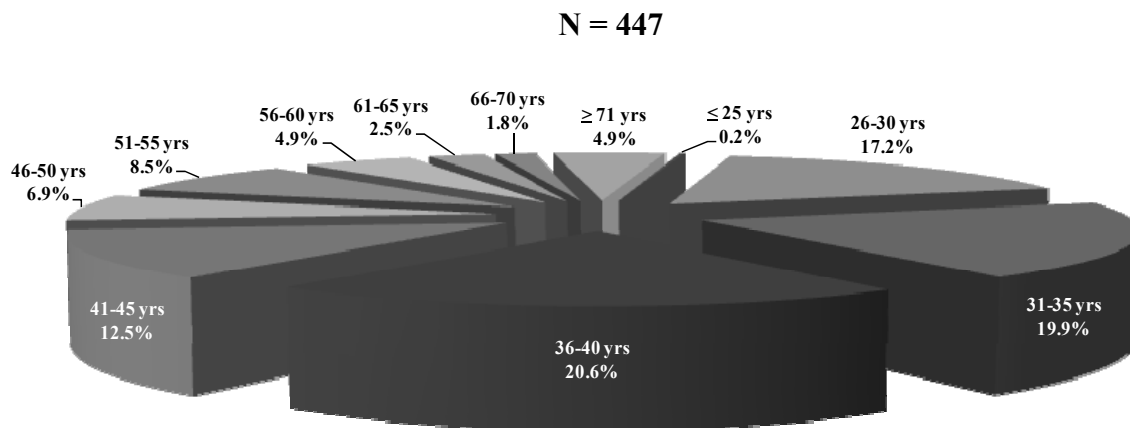
Non-physician clinicians (Cooper, Laud, & Dietrich, 1998) have been classified as traditional (including nurse practitioners, physician assistants, and certified nurse midwives), alternate (chiropractors<sup>9</sup> and podiatrists), and specialists (optometrists and nurse anesthetists). For this report, nurse practitioners, nurse anesthetists, and CNMs have been included in the section on nursing, and physician assistants have been included in the section on physicians. The description of non-physician clinicians in this section includes chiropractors, podiatrists, and optometrists. The data on actively licensed non-physician clinicians in 2008 were obtained from the licensure unit of NDHHS. There were 373 optometrists, 90 podiatrists, and 501 chiropractors actively licensed in Nebraska in 2008 (Table 9). Among chiropractors for whom age data was available, 14.1% were older than 55 years (Figure 43). Complete data on age of podiatrists were not available; 22.2% had missing data. About 7% of podiatrists were older than 55 years (Figure 45). Less than 5% of optometrists with age data available were older than 55 years (Figure 47). About 80% of chiropractors in the state (Figure 44), 85.6% of podiatrists (Figure 46), and 74.5% of optometrists (Figure 48) were men.

**Table 9. Actively Licensed Non-Physician Clinicians, Nebraska 2008**

Profession	Number of Non-Physician Clinicians	Ratio of Non-Physician Clinicians/100,000 population
Chiropractors	501	28.1
Podiatrists	90	5.0
Optometrists	373	20.9
<b>Total</b>	<b>964</b>	<b>54.0</b>

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 43. Age Distribution of Actively Licensed Chiropractors, Nebraska 2008**

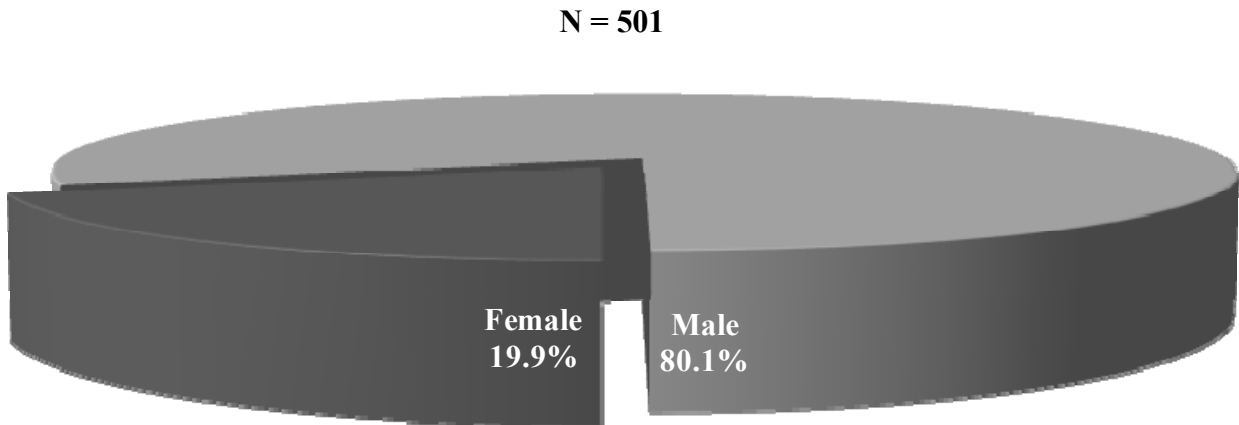


Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

Note: Chiropractor data had 66 records with missing/unknown age data.

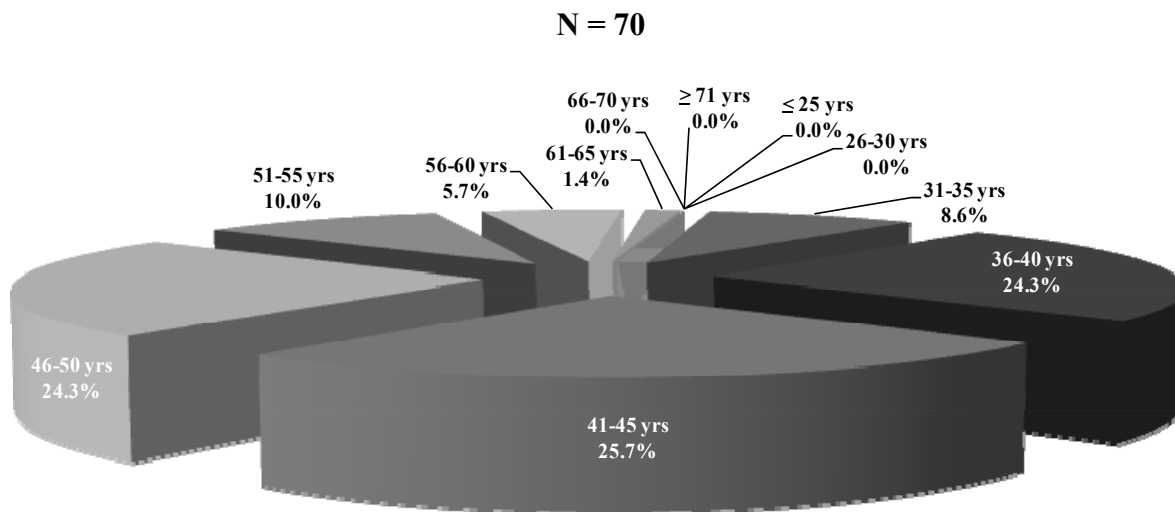
<sup>9</sup>In Title 172 NAC 29, Practice of Chiropractic, a chiropractor is referred to as a chiropractor or a chiropractic physician.

**Figure 44. Gender Distribution of Actively Licensed Chiropractors, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 45. Age Distribution of Actively Licensed Podiatrists, Nebraska 2008**

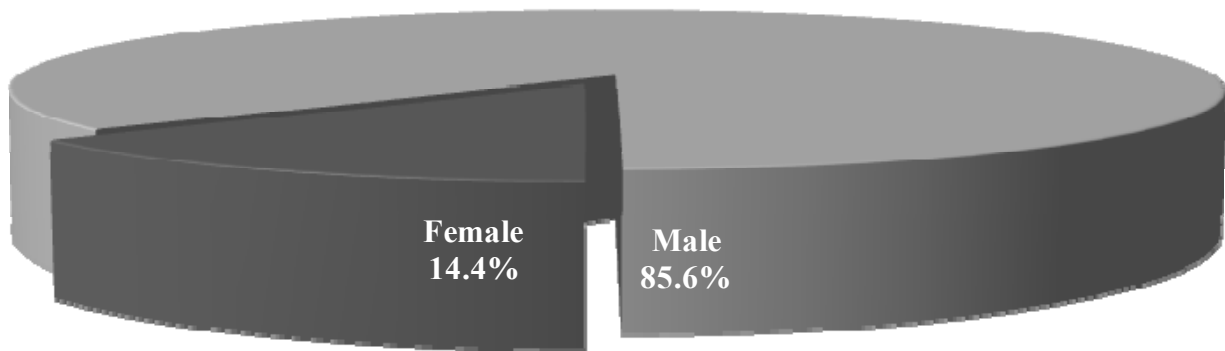


Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

Note: Podiatrist data had 20 records with missing/unknown age data.

**Figure 46. Gender Distribution of Actively Licensed Podiatrists, Nebraska 2008**

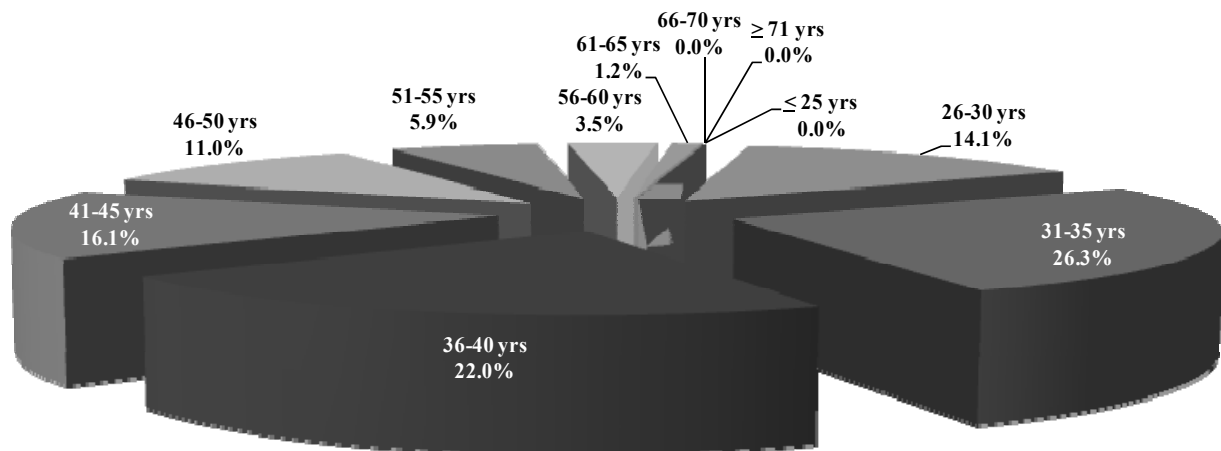
**N = 90**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

**Figure 47. Age Distribution of Actively Licensed Optometrists, Nebraska 2008**

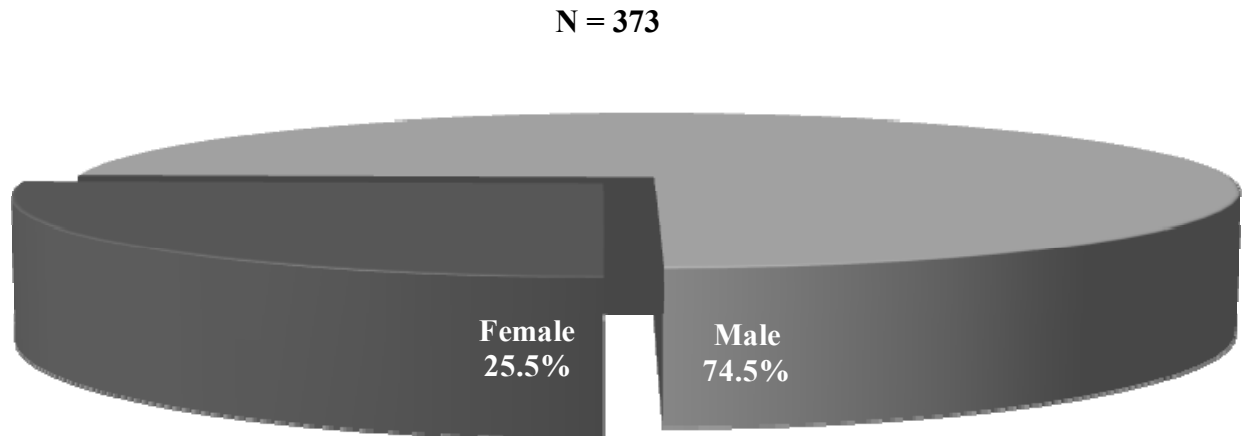
**N = 255**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

Note: Optometrist data had 118 records with missing/unknown age data.

**Figure 48. Gender Distribution of Actively Licensed Optometrists, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

### **Auxiliary Health Professionals**

There were 10,269 medication aides, 26,961 nurse aides, 1,954 nurse aides in an intermediate care facility for the mentally retarded (ICF-MR), and 277 paid dining assistants in Nebraska in 2008 (Table 10). Less than 10% of auxiliary health professionals, including medication aides, nurse aides, and paid dining assistants, were older than 55 years (Figure 49), and the majority (87%) of those with gender data available, were women (Figure 50).

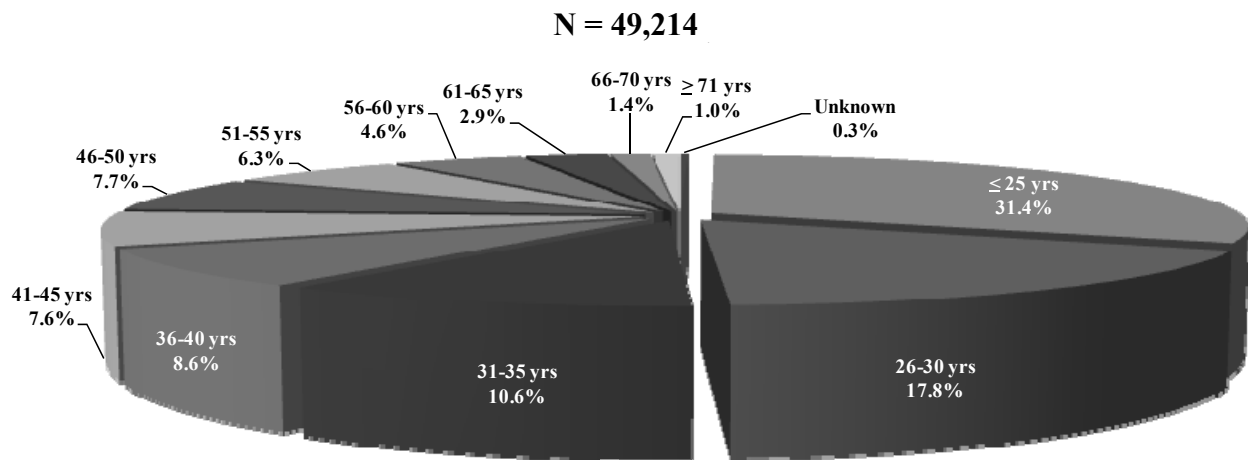
**Table 10. Auxiliary Health Professionals, Nebraska 2008**

Profession	Number	Percent
Medication Aides	9,685	19.7
Medication Aides – 20 hour	68	0.1
Medication Aides – 40 hour	10,269	20.9
Nurse Aides	26,961	54.8
Nurse Aides ICF – MR*	1,954	4.0
Paid Dining Assistants	277	0.6
<b>TOTAL</b>	<b>49,214</b>	<b>100.0</b>

Source: Nebraska Department of Health and Human Services, Licensure Unit, June 2008.

\*Intermediate care facility for the mentally retarded.

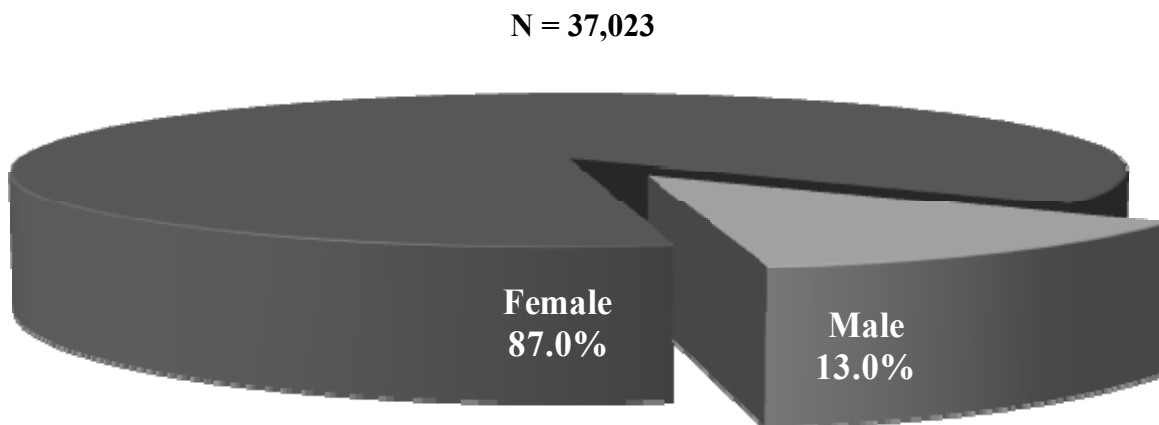
**Figure 49. Age Distribution of Actively Licensed Auxiliary Health Professionals, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, June 2008.

Note: Includes medication aides, medication aides – 20 Hour, medication aides – 40 Hour, nurse aides in an intermediate care facility for the mentally retarded and paid dining assistants.

**Figure 50. Gender Distribution of Actively Licensed Auxiliary Health Professionals, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, June 2008.

Note: Includes medication aides, medication aides – 20 Hour, medication aides – 40 Hour, nurse aides in an intermediate care facility for the mentally retarded, and paid dining assistants. Auxiliary data had 12,191 records with missing/unknown gender data.

## **Primary Care Providers**

Primary care providers were defined as MDs, DOs, NPs, and PAs with specialties of general practice, general family practice, general internal medicine, general pediatrics and obstetrics. This definition is consistent with the specialties used for the federal primary care health professional shortage area (HPSA) designation. However, the federal primary care HPSA designations do not include mid-level providers (NPs and PAs). We have included them in the definition of primary care providers, the rationale being that in rural areas mid-level providers have a significant role in providing primary care, especially in the rural health clinics. This is particularly salient in view of the recent call by the American Association of Colleges of Nursing (2009) to designate NPs as leaders of the patient-centered medical home. There were 1,245 MDs, 60 DOs, 286 PAs, and 229 NPs practicing in primary care in Nebraska in 2007 (Table 11). About 17% of the primary care providers with age data available in Nebraska (including MDs, DOs, residents, NPs, and PAs) were older than 55 years (Figure 51). Slightly less than half (46.1%) of all primary care providers in the state were women (Figure 52).

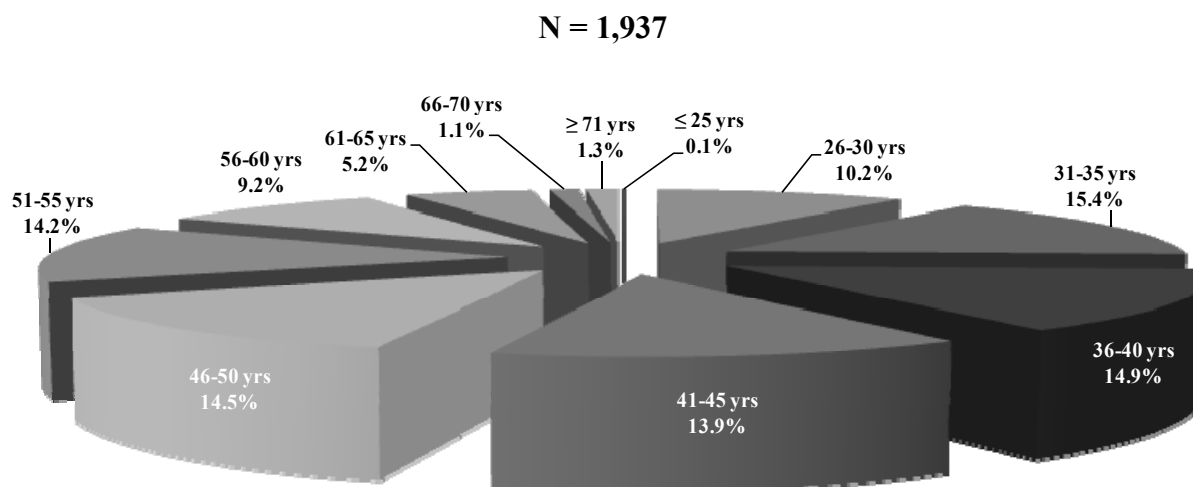
**Table 11. Actively Practicing Primary Care Providers, Nebraska 2007**

<b>Profession</b>	<b>Number of Primary Care Providers</b>	<b>Ratio of Primary Care Providers /100,000 Population</b>
Allopathic Physician (MD)	1,245	68.9
Osteopathic Physician (DO)	60	3.3
Resident	237	13.1
Nurse Practitioner (NP)	229	12.7
Physician Assistant (PA)	286	15.8
<b>Total</b>	<b>2,057</b>	<b>113.8</b>

Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.



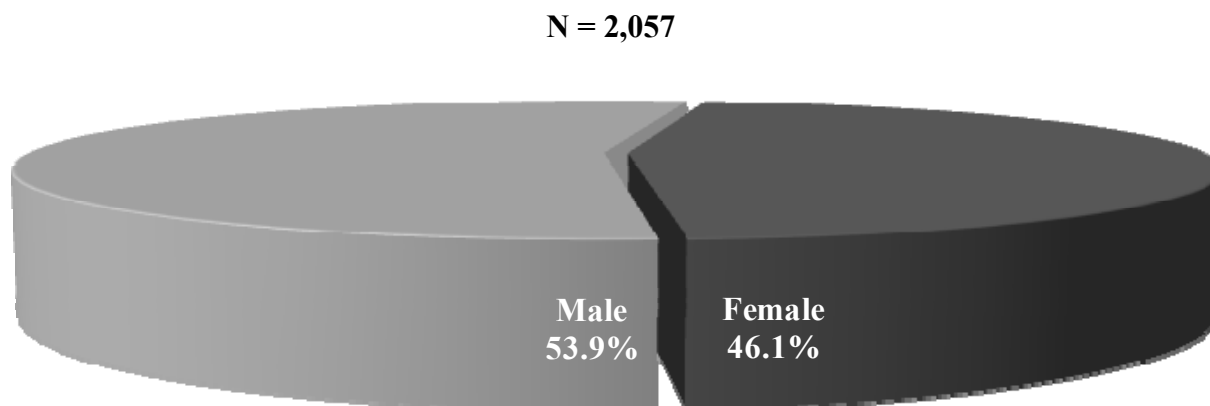
**Figure 51. Age Distribution of Actively Practicing Primary Care Providers, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Includes allopathic physicians, osteopathic physicians, residents, nurse practitioners, and physician assistants. Primary care provider data had 120 records with missing age data.

**Figure 52. Gender Distribution of Actively Practicing Primary Care Providers, Nebraska 2007**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2007.

Note: Includes allopathic physicians, osteopathic physicians, residents, nurse practitioners, and physician assistants.

## **Mental Health Professionals**

There were 148 physicians, 9 PAs, and 54 NPs specialized in psychiatry and 1,585 behavioral health professionals (including counselors, mental health practitioners, and psychologists) actively practicing in Nebraska in 2008 (Table 12). Over a third (35.1%) of actively practicing psychiatrists in Nebraska, were older than 55 years (Figure 53), and 35.1% were women (Figure 54). Race/ethnicity data were not available for all psychiatrists. The available data show that African Americans and Hispanics were underrepresented among psychiatrists, making up only 1.4% of psychiatrists who reported race/ethnicity data (Figure 55).

A third (33.3%) of PAs specialized in psychiatry in 2008 were older than 55 years (Figure 56) and were women (Figure 57). Although complete data on race/ethnicity of PAs specialized in psychiatry were not available, with 22.2% missing data, the available data show that African Americans and Hispanics were underrepresented. None of the PAs specialized in psychiatry with race/ethnicity data available identified themselves as Hispanic or African American (Figure 58).

Approximately 40% of NPs specialized in psychiatry in 2008 were older than 55 years (Figure 59) and the majority (90.7%) were women (Figure 60). Although complete data on race/ethnicity of NPs specialized in psychiatry were not available, with 14.8% missing data, the available data show that African Americans and Hispanics were underrepresented. None of the NPs specialized in psychiatry with race/ethnicity data available identified themselves as African American or Hispanic (Figure 61).

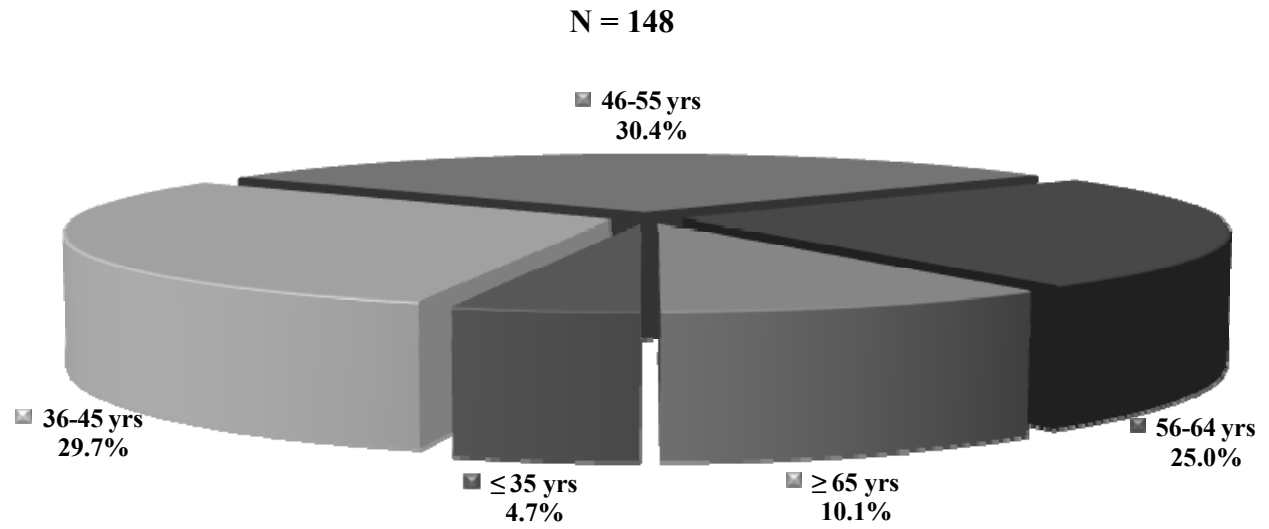
Approximately 40% of behavioral health professionals (including psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors) were older than 55 years (Figure 62). The majority of behavioral health professionals (72.2%) were women (Figure 63). Race/ethnicity data were not available for all behavioral health professionals. The available data show that 2.1% of behavioral health professionals who reported race/ethnicity data in 2008 identified themselves as African American and 1.5% as Hispanic (Figure 64).

**Table 12. Actively Practicing Mental Health Professionals, Nebraska 2008**

Profession	Number of Behavioral Health Professionals	Number/100,000 population
Physicians Specialized in Psychiatry	148	8.3
Advanced Practice Registered Nurses Specialized in Psychiatry	54	3.0
Physician Assistants Specialized in Psychiatry	9	0.5
SUBTOTAL	211	11.8
Alcohol & Drug Counselors	98	5.5
Mental Health Practitioners	1,061	59.5
Psychologists	257	14.4
Certified Compulsive Gambling Counselors	5	0.3
SUBTOTAL	1,421	79.7
Alcohol & Drug Counselor, Mental Health Practitioners	139	7.8
Alcohol & Drug Counselor, Psychologists	3	0.2
Mental Health Practitioner, Psychologists	10	0.6
Mental Health Practitioner, Certified Compulsive Gambling Counselors	9	0.5
Alcohol & Drug Counselor, Certified Compulsive Gambling Counselors	2	0.1
SUBTOTAL	163	9.2
Mental Health Provider, Alcohol & Drug Counselor, Certified Compulsive Gambling Counselors	1	0.1
SUBTOTAL	1	0.1
TOTAL	1,796	100.8

Sources: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

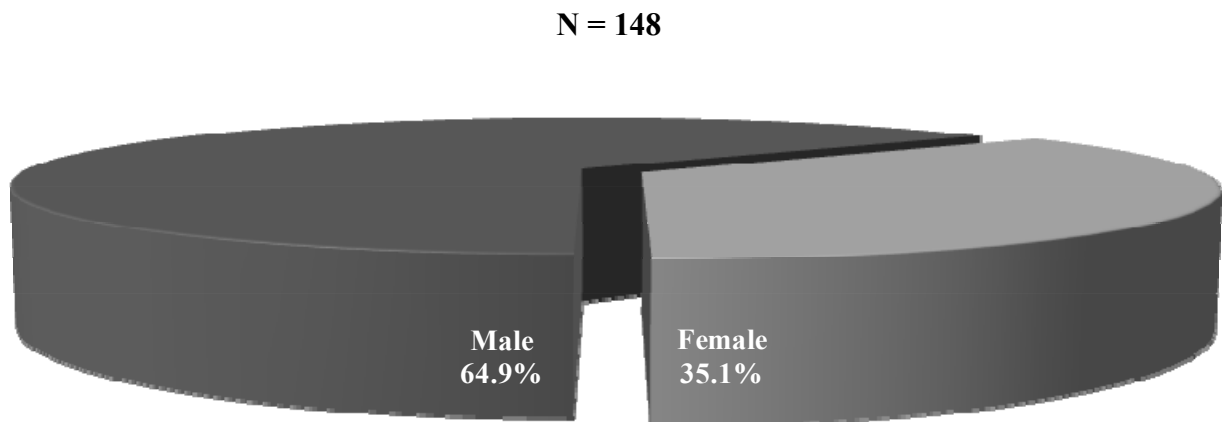
**Figure 53. Age Distribution of Actively Practicing Psychiatrists, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, November 2008.

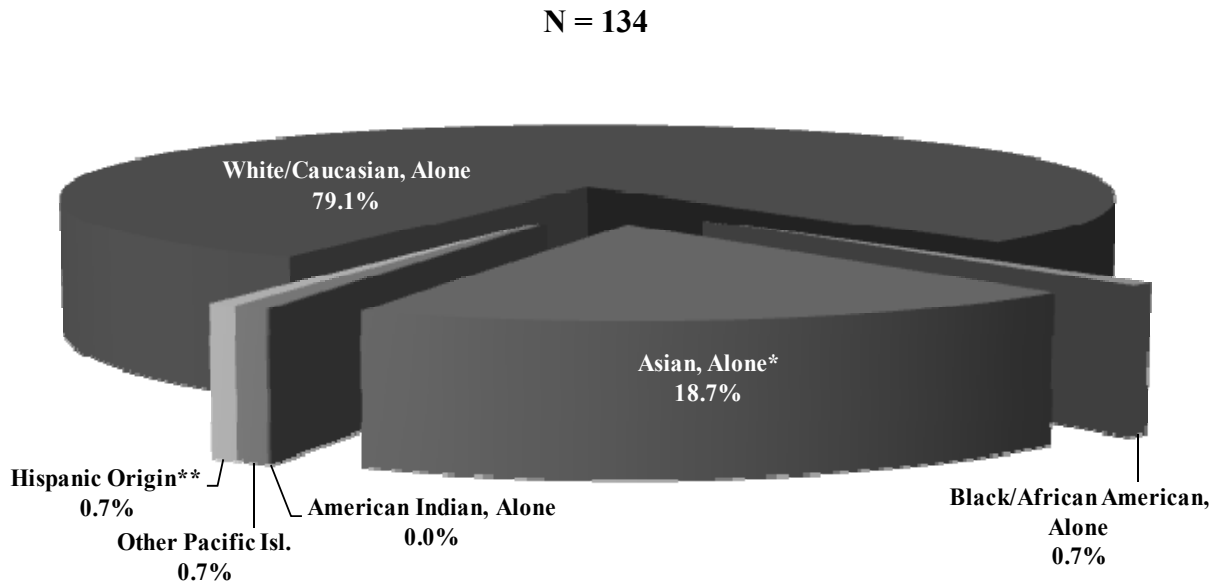
Note: Includes allopathic physicians, osteopathic physicians, residents and house officers.

**Figure 54. Gender Distribution of Actively Practicing Psychiatrists, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

**Figure 55. Race and Ethnicity of Actively Practicing Psychiatrists, Nebraska 2008**



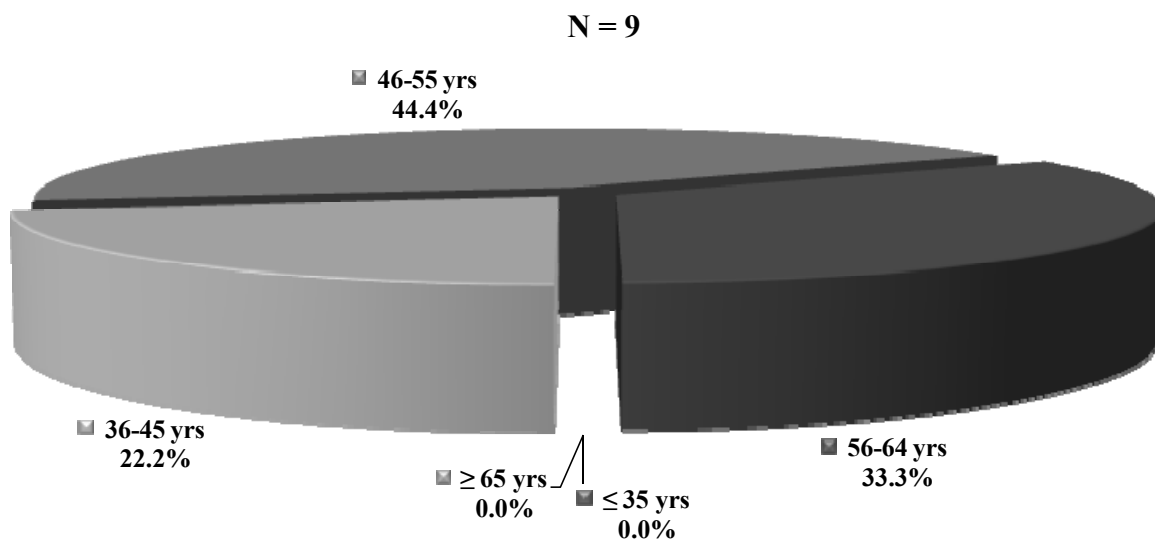
Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

Note: Psychiatrist data had 14 records with missing/unknown race/ethnicity data.

\*"Asian, Alone" category includes Asian Indian, Indian, Other Asian, Vietnamese, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\*"Hispanic Origin" category includes Hispanic/Other, and Mexican American/Chicano.

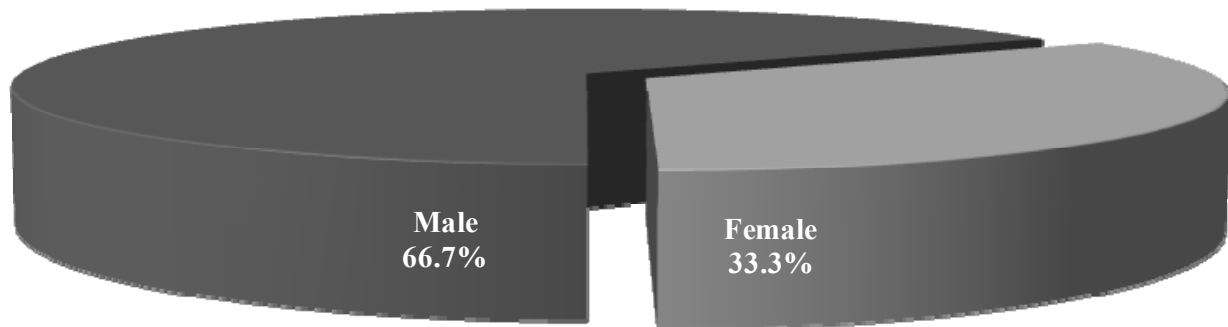
**Figure 56. Age Distribution of Actively Practicing Physician Assistants Specialized in Psychiatry, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

**Figure 57. Gender Distribution of Actively Practicing Physician Assistants Specialized in Psychiatry, Nebraska 2008**

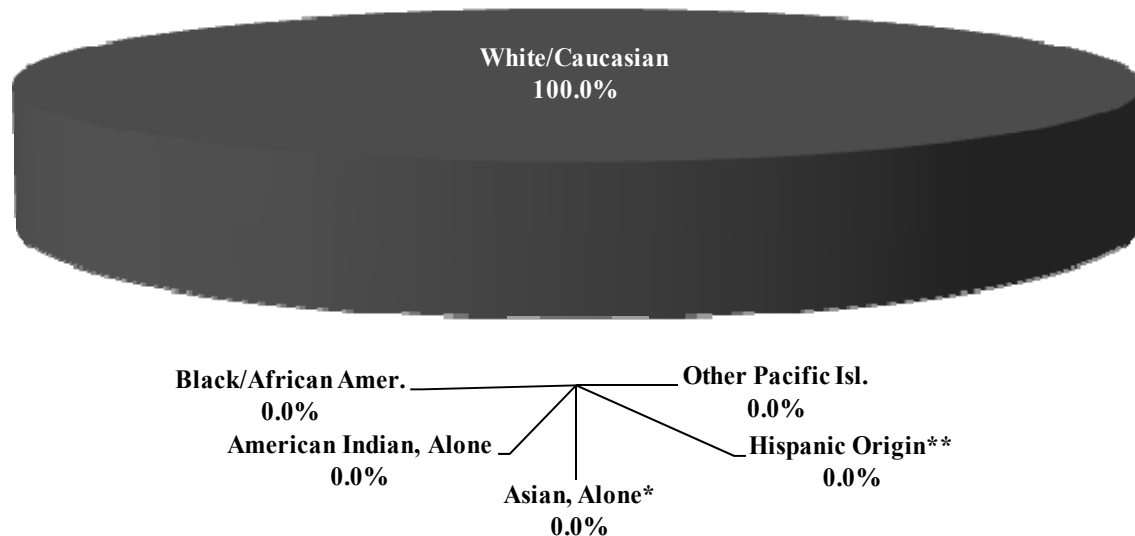
**N = 9**



Source: Nebraska Department of Health and Human Services, December 2008.

**Figure 58. Race and Ethnicity of Actively Practicing Physician Assistants Specialized in Psychiatry, Nebraska 2008**

**N = 7**



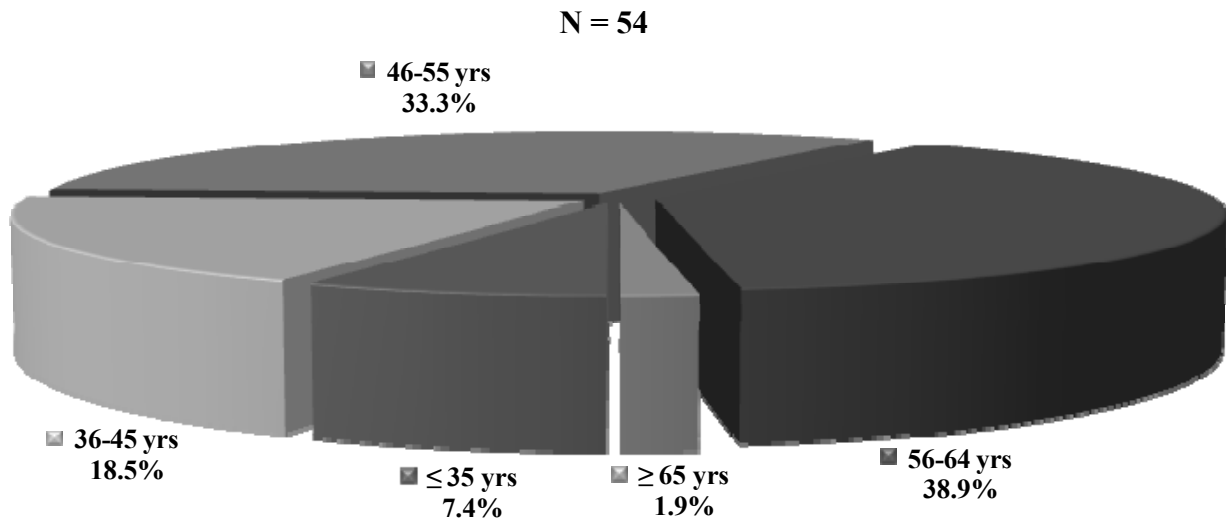
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

Note: Physician assistants specialized in psychiatry data had 2 records with missing/unknown race data.

\* "Asian, Alone" category includes Asian Indian, Indian, Other Asian, Vietnamese, Chinese, Korean, Japanese, Pakistani, and Filipino.

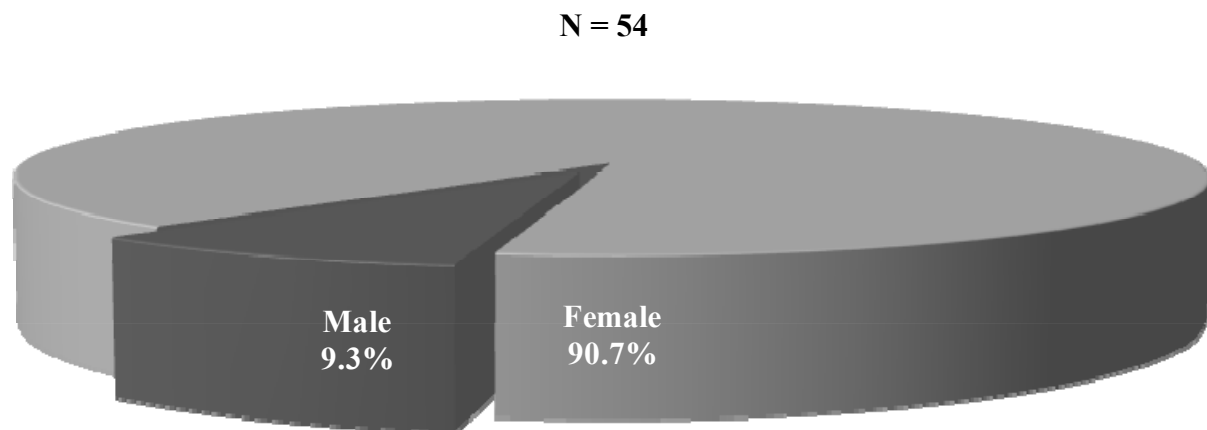
\*\* "Hispanic Origin" category includes Hispanic/Other, and Mexican American/Chicano.

**Figure 59. Age Distribution of Actively Practicing Nurse Practitioners Specialized in Psychiatry, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

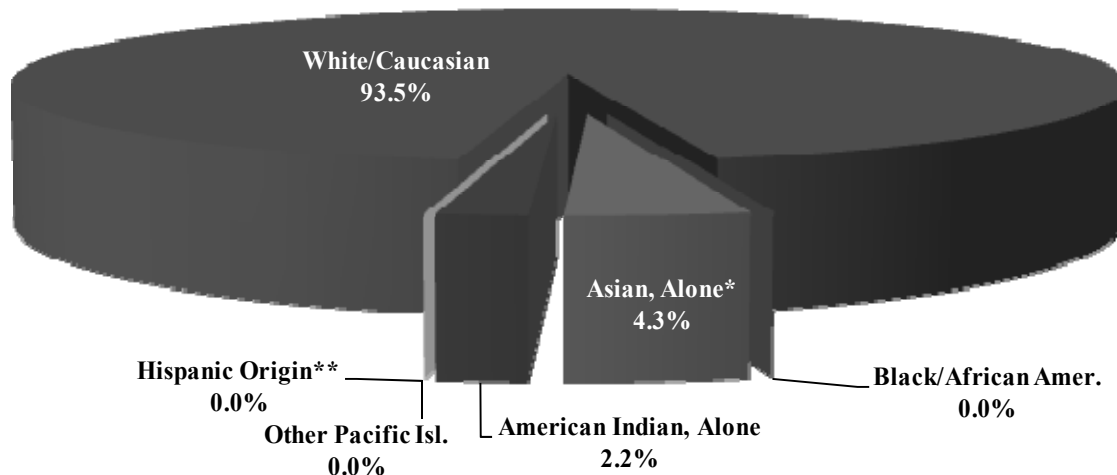
**Figure 60. Gender Distribution of Actively Practicing Nurse Practitioners Specialized in Psychiatry, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, December 2008.

**Figure 61. Race and Ethnicity of Actively Practicing Nurse Practitioners Specialized in Psychiatry, Nebraska 2008**

N = 46



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

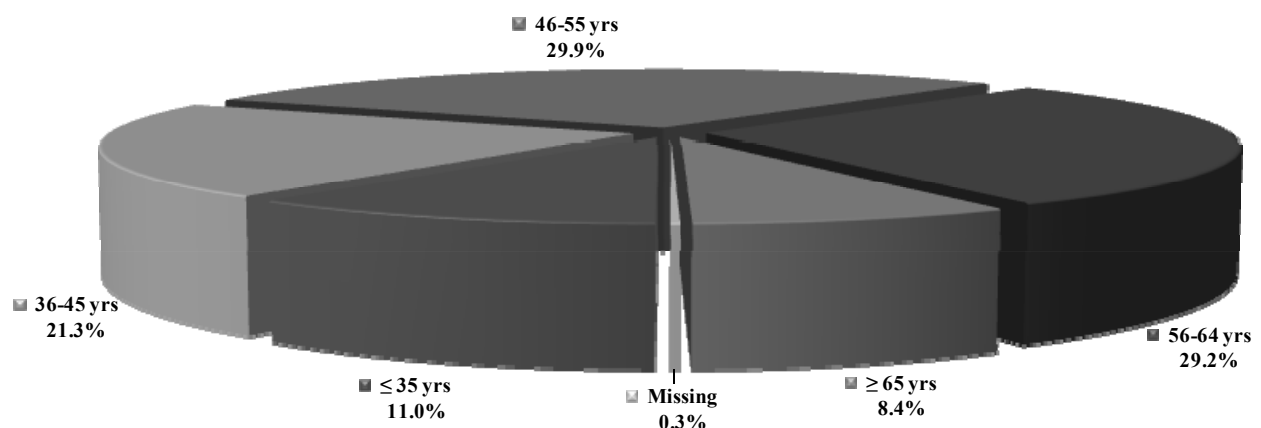
Note: Nurse practitioners specialized in psychiatry data had 8 records with missing/unknown race/ethnicity data.

\* "Asian, Alone" category includes Asian Indian, Indian, Other Asian, Vietnamese, Chinese, Korean, Japanese, Pakistani, and Filipino.

\*\* "Hispanic Origin" category includes Hispanic/Other, and Mexican American/Chicano.

**Figure 62. Age Distribution of Behavioral Health Professionals, Nebraska 2008**

N = 1,585

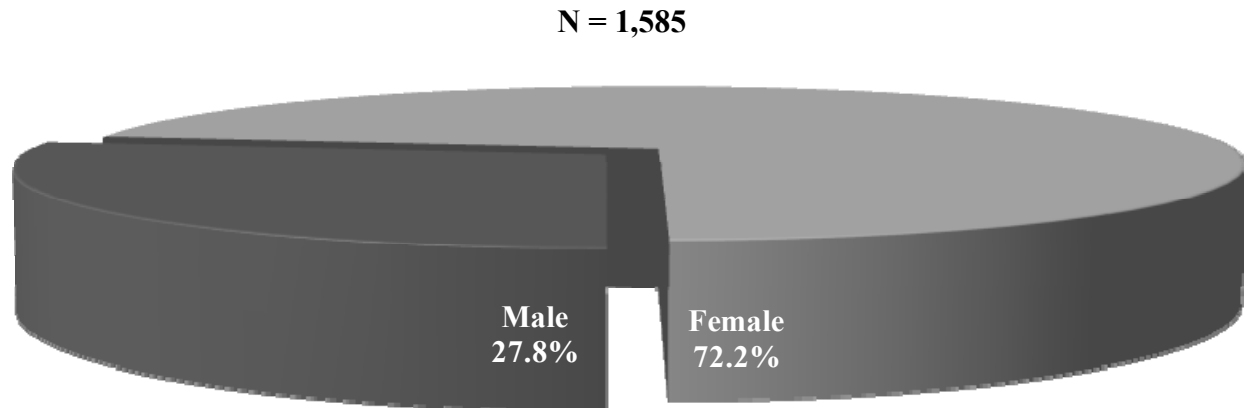


Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

Note: Includes psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors; excludes psychiatrists and physician assistants and nurse practitioners specialized in psychiatry.



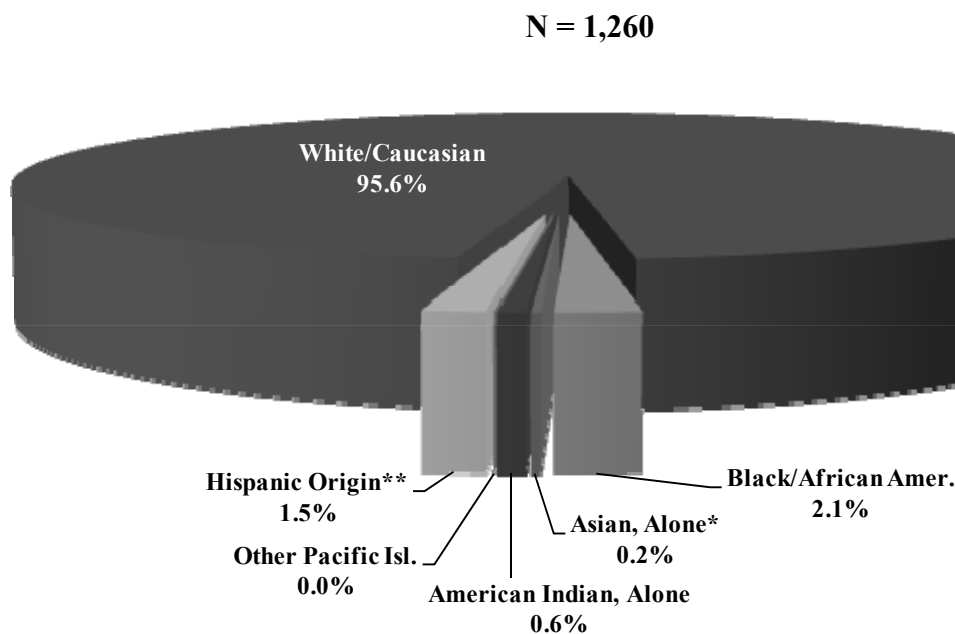
**Figure 63. Gender Distribution of Behavioral Health Professionals, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, December 2008.

Note: Includes psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors; excludes psychiatrists and physician assistants and nurse practitioners specialized in psychiatry.

**Figure 64. Race and Ethnicity of Behavioral Health Professionals, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

Note: Includes psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors; excludes psychiatrists and physician assistants and nurse practitioners specialized in psychiatry. Behavioral health professionals data had 125 records with missing/unknown race/ethnicity data.

\*"Asian, Alone" category includes Asian Indian, Indian, Other Asian, Vietnamese, Chinese, Korean, Japanese, Pakistani, and Filipino. \*\*"Hispanic Origin" category includes Hispanic/Other, and Mexican American/Chicano.

## **CHAPTER II**

### **ASSESSMENT OF CURRENT NEEDS FOR HEALTH PROFESSIONALS IN NEBRASKA, 2007 – 2008**

The objectives of Phase 2 of the project were to assess how the current supply of health professionals compares to benchmark ratios used for federal and state shortage area designations and to national average ratios of health care providers to population. The significant findings of this phase of the project are that in terms of statewide ratios, for most of the health professions, Nebraska compares favorably to the rest of the nation. For physicians, dentists, certified nurse midwives, psychologists, chiropractors, and podiatrists, (Table 13) the state's current ratio of health providers to population is below the national average ratio in 2004 (The US Health Workforce Profile, 2006). For nurse practitioners, Nebraska's 2004 ratio was below the national average ratio. However, for a predominantly rural state such as Nebraska, the significant issue is the rural/urban distribution of health professionals. Nine of Nebraska's 93 counties are metropolitan counties. Of the 84 non-metro counties almost half, 38, are frontier counties (less than 7 persons per square mile). Thirty-seven counties in Nebraska do not have a nurse practitioner or mental health professional. Seventy-nine counties do not have a psychiatrist (Table 14). Fifteen of the frontier or isolated rural counties have no health care providers for almost all categories of health professionals (Table 15). This is not surprising as these sparsely populated counties are not likely to have the resources to support the providers. Only three counties in Nebraska, Douglas, Lancaster, and Scotts Bluff, have health professionals above the national average ratios for all categories of health professionals, except for LPNs (Douglas County has below the national average ratio of LPNs) (Table 15). Douglas and Lancaster counties are metropolitan counties. Scotts Bluff County has a regional referral center, which accounts for the higher density of health care providers.

Shortages of health care professionals can be classified as market shortages, normative shortages, or total shortages. A market shortage occurs when the quantity of health services supplied is less than what the market demands. A normative shortage implies that the quantity of health services demanded is less than what is required to maintain the population's health at a predetermined professional standard. Finally, a total shortage is present when the quantity of medical services needed is more than the quantity of services supplied at existing prices (Defrieze and Barker, 1982; Orlans, Mertz, & Grumbach, 2002). From a public health perspective, a total shortage is the most important type of shortage, although in practice it is hard to define. A total shortage perspective addresses the unmet need for services.

Another issue to consider is what constitutes an adequate level of care. There are basically three ways to address this issue: a health status or health needs approach, a social needs approach, or a market or economic approach to supply and demand for health professionals (Born, 1981, Orlans, Mertz, & Grumbach, 2002). There are three approaches to health workforce planning. The first, supply-based estimates, uses population to provider ratios that are based on a normative judgment of the quantity of services required per capita or per unit area. The demand-based approach takes a market approach and compares the market's treatment capacity to current levels of utilization of medical services. However, utilization is not a good proxy for need as it

does not address the unmet need for health care services. Finally, the need-based approach evaluates the supply of health services needed to meet the needs of a population based on the current patterns of disease prevalence. This approach is expensive, as the data required may not be readily available and this may not be suitable to evaluating a market-based health system as in the United States (DeFrieze and Barker, 1983; Orlans, Mertz, & Grumbach, 2002).

### **Supply-Based Estimates**

For a predominantly rural state like Nebraska, we are concerned with the rural/urban distribution of health care providers. Whereas the overall statewide ratios compare favorably with national average provider-to-population ratios (Table 13), the rural/urban distribution of providers is not uniform. In Nebraska, 42% of the population lives in rural (non-metro) areas. However, only 28% of Nebraska's physicians, 32% of nurse practitioners, 35% of dentists, 37% of pharmacists, 19.8% of psychiatrists, and 32% of all mental and behavioral health professionals practice in rural Nebraska.

We compared Nebraska's health care provider-to-population ratio to national average provider to population ratios obtained from the New York Center for Health Workforce Studies (United States Health Workforce Profile, 2006) to designate Nebraska counties as above or below the national average ratio. We do not suggest that these ratios are normative or ideal, but they provide a reference for comparison to guide state policy makers in workforce planning. Counties were also coded as metropolitan, non-metropolitan, and frontier or isolated rural. We were able to accurately identify the locations of physicians, dentists, pharmacists, primary care providers, and mental health professionals, because practice addresses obtained from the Health Professions Tracking Service (HPTS) database at the University of Nebraska Medical Center (UNMC) were geo-coded to the county of practice. For all other professions, state licensure data was used to locate the providers to counties. The limitations of licensure data are that actively licensed health professionals need not be actively practicing and that the address provided is not always the address of the professional's practice location. The following figures that use licensure data should be interpreted with this limitation in mind.

**Table 13. Comparison of Nebraska's Ratio of Health Professionals to 100,000 Population to National Average**

<b>Health Profession</b>	<b>2004 NE Ratio</b>	<b>2007/2008 NE Ratio</b>	<b>2004 National Avg. Ratio</b>
Physicians	185.1	198.7	214.1
Medical Education			
Allopathic Medical School Graduates	12.1	13.3	5.3
Allopathic Residents	32.9	29.9	34.3
Registered Nurses (RNs)	1061.0	972.0	802.0
Licensed Practical/Vocational Nurses (LPNs)	342.8	293.0	239.3
Nurse Practitioners (NPs)	31.3	43.0	42.0
Certified Registered Nurse Anesthetists (CRNAs)	1.2	27.0	2.5
Certified Nurse Midwives (CNMs)	24.7	1.2	149.7
Dentists	63.8	57.1	59.4
Dental Hygienists	54.4	58.2	53.9
Physician Assistants (PAs)	31.6	33.5	16.9
Chiropractors	21.5	28.1	29.1
Podiatrists	4.3	5.0	6.1
Optometrists	13.7	20.9	7.8
Pharmacists	104.7	95.4	77.0
Psychologists	26.3	14.4	33.5
Psychiatrists	7.4	8.3	5.2
Social Workers	163.1	93.6 <sup>1</sup>	158.3
Physical Therapists (PTs)	56.1	77.7	49.5
Occupational Therapists (OTs)	37.8	43.0	29.5
Speech Language Pathologists & Audiologists	46.4	38.8	34.8
Respiratory Therapists	42.4	72.3	32.0
Radiologic Technologists	87.0	111.6 <sup>2</sup>	62.0
Dieticians & Nutritionists	22.3	27.5	16.3

Source: 2004 Data are from New York Center for Health Workforce Studies (October 2006); Health Professions Tracking Service, UNMC, 2007 and 2008; Nebraska Department of Health and Human Services 2008; Nebraska Center for Nursing, Nebraska 2008 and 2007; US Census Bureau.

<sup>1</sup>2008 Nebraska ratio of social workers includes MSW, MSW-CMSW, social worker, provisional MSW.

<sup>2</sup>2008 Nebraska ratio of medical radiographers to 100,000 population.

**Table 14. Number of Counties Without Health Professionals by Health Planning Region (HPR), Nebraska 2007 – 2008**

Number of Counties Without Provider (Total Number of Nebraska Counties = 93)														
Profession	HPR I		HPR II		HPR III		HPR IV		HPR V		HPR VI		Nebraska	
	All Counties	Frontier Counties	All Counties	Frontier Counties	All Counties	Frontier Counties	All Counties	Frontier Counties	All Counties	Frontier Counties	All Counties	Frontier Counties	All Counties	Frontier Counties
Physicians	2	2	9	9	4	4	3	1	0	0	0	0	18	16
Primary Care Providers <sup>1</sup>	2	2	7	7	4	4	2	1	0	0	0	0	15	14
Physician Assistants	3	3	9	9	7	6	5	4	0	0	0	0	24	22
Nurse Practitioners	4	4	13	12	8	6	6	3	6	1	0	0	37	26
Non-Physician Clinicians <sup>2</sup>	3	3	10	9	5	5	4	3	3	1	0	0	25	21
Dentists	3	3	10	10	5	5	2	1	0	0	0	0	20	19
Psychiatrists	10	8	17	13	18	10	20	6	14	1	0	0	79	38
Mental Health Professionals <sup>3</sup>	5	5	12	11	10	7	9	3	1	1	0	0	37	27
Pharmacists	2	2	10	10	6	5	4	3	0	0	0	0	22	20
Physical Therapists	4	4	11	11	5	4	3	2	2	1	0	0	25	22
Occupational Therapists	4	4	12	12	9	9	9	3	2	0	0	0	36	28
Medical Radiographers	2	2	6	6	3	3	2	2	0	0	0	0	13	13
Audiologists <sup>4</sup>	10	8	15	13	18	10	18	6	13	1	0	0	74	38
Speech Language Pathologists <sup>5</sup>	7	6	14	13	9	8	10	3	3	1	0	0	43	38
Medical Nutrition Therapists	6	6	12	11	8	6	11	4	1	0	0	0	38	27
Respiratory Care Practitioners	6	6	10	10	6	6	4	2	4	0	0	0	30	24
Registered Nurses	1	1	4	4	2	2	1	1	0	0	0	0	8	8
Licensed Practical Nurses	2	2	5	5	3	3	0	0	0	0	0	0	10	10

Sources: Physicians, primary care providers, dentists, psychiatrists, mental health professionals, and pharmacists, Health Professions Tracking Service, UNMC, 2007; non-physician clinicians, physical therapists, occupational therapists, medical radiographers, audiologists, speech-language pathologists, medical nutrition therapists, and respiratory care practitioners, Nebraska Department of Health and Human Services, Licensure Unit, 2008; physician assistants and nurse practitioners, Health Professions Tracking Service, UNMC, November 2008; registered nurses and licensed practical nurses, Nebraska Center for Nursing, 2008 and 2007.

<sup>1</sup> Primary care providers includes physicians (medical doctors and doctors of osteopathy), and nurse practitioners and physician assistants specializing in primary care.

<sup>2</sup> Non-physician clinicians include chiropractors, podiatrists, and optometrists.

<sup>3</sup> Mental health professionals includes psychiatrists and physician assistants and nurse practitioners specializing in psychiatry, psychologists, mental health providers, alcohol and drug counselors, and certified compulsive gambling counselors.

<sup>4</sup> Audiologists data has 21 records with unknown/missing county data.

<sup>5</sup> Speech-language pathologists data has 54 records with unknown/missing county data.

**Table 15. Supply of Health Professionals by Health Planning Region, Nebraska 2007-2008**

Health Planning Region 1															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Banner <sup>2</sup>	X	X	X		X	X	X	X	X	X	X	X	X	XX	X
Box Butte <sup>1</sup>	XX			XX		X				XX	XX	XX	XX	XX	
Cheyenne <sup>1</sup>			XX	XX		X				XX	X			XX	
Dawes <sup>2</sup>	XX		XX			X				XX	XX	XX		XX	
Deuel <sup>2</sup>	XX			X		X	X		XX	XX		X	X	XX	
Garden <sup>2</sup>	XX			X		X			X	XX	X	X	X	XX	
Kimball <sup>2</sup>	XX		XX	XX	X	X	X		XX		X	X	X	XX	
Morrill <sup>2</sup>	XX		XX	XX	XX	X	X		XX		X		X	XX	
Scotts Bluff <sup>1</sup>															
Sheridan <sup>2</sup>	XX		XX			X		XX	XX		X	X	XX	XX	
Sioux <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Health Planning Region 2															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Arthur <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chase <sup>2</sup>	XX		XX	XX		X	X	XX			X	X		XX	
Dawson <sup>1</sup>	XX		XX			X		XX	XX	XX	XX	XX		XX	
Dundy <sup>2</sup>	XX		XX			X	X	XX	XX	XX	X	X	X	XX	
Frontier <sup>2</sup>	X	XX	XX	X	X	X		X	X		X	X		XX	XX
Furnas <sup>1</sup>	XX		XX	X		X	X				X			XX	
Gosper <sup>2</sup>	X	X	X	X	X	X		X	X		X		X	XX	
Grant <sup>2</sup>	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Hayes <sup>2</sup>	X	X	X	X	X	X	X	X	X		X	X	X	XX	
Hitchcock <sup>2</sup>	X	XX	XX	X	X	X	X	X	X	X	X	X	X	XX	
Hooker <sup>2</sup>	XX		X	X	X	X	X	X	X	X	X		X	XX	
Keith <sup>1</sup>	XX		XX			X			XX			X		XX	XX
Lincoln <sup>1</sup>	XX		XX					XX	XX		XX	XX			
Logan <sup>2</sup>	X	X	X		X	X	X	X	X	X	X	X	X	X	X
McPherson <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Perkins <sup>2</sup>	XX		XX	XX		X	X	XX	XX		X	X			
Red Willow <sup>1</sup>	XX		XX			X			XX		XX				
Thomas <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	XX	X

(Table 15 continued on the next page) Explanatory notes to this table are available on page 58

**Table 15. Supply of Health Professionals by Health Planning Region, Nebraska 2007-2008 (continued)**

Health Planning Region 3															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Adams <sup>1</sup>			XX												
Blaine <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Buffalo <sup>1</sup>			XX	XX					XX				XX		
Clay <sup>1</sup>	XX	XX	X	XX		X	X	X	XX		XX	XX	XX	XX	
Custer <sup>2</sup>	XX		XX	XX		X					XX			XX	
Franklin <sup>2</sup>	XX			X		X	X	XX	XX		X	X	X	XX	
Garfield <sup>2</sup>	XX		X			X	X		XX	X	X		X	XX	
Greeley <sup>2</sup>	X	X	X	X	X	X	X	X	XX		X			XX	
Hall <sup>1</sup>	XX		XX								XX				
Hamilton <sup>1</sup>	XX		XX			X		XX			XX	XX		XX	
Harlan <sup>2</sup>	XX		XX	XX		X	X	XX	X		XX			XX	
Howard <sup>1</sup>	XX		XX	XX		X	X	XX	XX	XX	X			XX	XX
Kearney <sup>1</sup>	XX			XX		X	X	XX	XX	XX		XX		XX	
Loup <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Merrick <sup>1</sup>	XX		XX	XX		X			XX		XX	X	XX	XX	
Nuckolls <sup>1</sup>	XX		XX	XX		X			XX			X			
Phelps <sup>1</sup>	XX		XX			X			XX		XX	XX			
Sherman <sup>2</sup>	XX		X	XX		X		X	XX	XX	X	X	X	XX	XX
Valley <sup>1</sup>	XX					X				XX	XX			XX	
Webster <sup>2</sup>	XX		XX	X	X	X			XX		X	X		XX	
Wheeler <sup>2</sup>	X	X	X		X	X	X	X	X		X	X	X	XX	X

(Table 15 continued on the next page) Explanatory notes to this table are available on page 58.

**Table 15. Supply of Health Professionals by Health Planning Region, Nebraska 2007-2008 (continued)**

Health Planning Region 4															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Antelope <sup>1</sup>	XX			XX	XX	X	X		XX		XX	X		XX	
Boone <sup>1</sup>	XX		XX	XX		X			XX						
Boyd <sup>2</sup>			XX	X		X	X	X	XX			X		XX	
Brown <sup>2</sup>	XX		XX			X				X	X		XX	XX	
Burt <sup>1</sup>	XX		XX	XX		X	X		XX	XX	X			XX	
Cedar <sup>1</sup>	XX		XX	XX		X	X	XX	XX	XX	X	X		XX	
Cherry <sup>2</sup>	XX		XX			X			XX		XX	X		XX	XX
Colfax <sup>1</sup>	XX		XX			X	XX	XX	XX	XX	X		XX	XX	
Cuming <sup>1</sup>	XX		XX	XX		X		XX			XX		XX	XX	
Dakota	XX	XX	XX					XX	XX	XX	XX	XX	X	XX	XX
Dixon	XX	XX	XX	XX		X	X	XX	XX	XX		X	XX	XX	
Dodge <sup>1</sup>	XX		XX						XX		XX	XX			
Holt <sup>2</sup>	XX					X			XX		XX				
Keya Paha <sup>2</sup>	X	X	X	X	X	X	X	X		X	X	X	X	X	XX
Knox <sup>1</sup>	XX			XX		X	XX	XX	XX		XX			XX	
Madison <sup>1</sup>											XX				
Nance <sup>1</sup>	X			XX		X	X	XX	XX		X	X		XX	
Pierce <sup>1</sup>	XX		XX	XX		X	XX	XX	XX		X	X	XX	XX	
Platte <sup>1</sup>	XX		XX	XX		XX			XX		XX		XX	XX	
Rock <sup>2</sup>	XX			X		X	X	X	X		X	X	X	XX	
Stanton <sup>1</sup>	X	X	XX	XX	X	X	X	X	XX	XX	X	X	X	XX	XX
Thurston <sup>1</sup>			XX	X		X		XX	XX	XX	XX	XX	XX	XX	XX
Washington	XX		XX	XX		X		XX			XX			XX	XX
Wayne <sup>1</sup>	XX		XX			X		XX	XX	XX		X		XX	

(Table 15 continued on the next page) Explanatory notes to this table are available on page 58.



**Table 15. Supply of Health Professionals by Health Planning Region, Nebraska 2007-2008 (continued)**

Health Planning Region 5															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Butler <sup>1</sup>	XX		XX	XX		X		XX		XX	X			XX	
Cass	XX	XX	XX	XX		X		XX	XX	XX	XX			XX	XX
Fillmore <sup>1</sup>	XX		XX		XX	X			XX		XX		X	XX	
Gage <sup>1</sup>	XX		XX	XX		X					XX			XX	
Jefferson <sup>1</sup>	XX		XX	XX		X								XX	
Johnson <sup>1</sup>	XX			XX					XX		XX		X	XX	
Lancaster															
Nemaha <sup>1</sup>	XX		X			X			XX				XX	XX	
Otoe <sup>1</sup>	XX		XX			X		XX	XX		XX			XX	
Pawnee <sup>2</sup>	XX			X		X	X		XX		X			XX	
Polk <sup>1</sup>	XX		XX	X		X		XX	XX	XX	X	X	X	XX	
Richardson <sup>1</sup>	XX		XX	XX		X	XX		XX	XX		XX	XX	XX	
Saline <sup>1</sup>	XX		XX						XX					XX	
Saunders	XX	XX	XX	XX		X	XX	XX	XX		XX	XX		XX	XX
Seward	XX		XX			X		XX	XX		XX			XX	
Thayer <sup>1</sup>	XX		XX	X	XX	X					XX		X	XX	
York <sup>1</sup>	XX		XX			X			XX		XX				
Health Planning Region 6															
County Name	Phys	Prim	PA, NP, CNM	NPC	Dent	Psych	Ment	Pharm	OT/ PT	Radio	Aud/ SLP	Nutr	Resp	RN	LPN
Douglas															XX
Sarpy	XX		XX	XX				XX						XX	XX

**“X” indicates no provider; “XX” indicates less than national average provider-to-population ratio**

Sources: Actively practicing physicians, primary care providers, physician assistants, nurse practitioners, certified nurse midwives, dentists, mental health professionals, and pharmacists, Health Professions Tracking Service, UNMC, 2007; actively licensed non-physician clinicians, occupational therapists, physical therapists, medical radiographers, audiologists and speech-language pathologists, medical nutrition therapists, and respiratory therapists, Nebraska Department of Health and Human Services, Licensure Unit, 2008; actively practicing registered nurses and licensed practical nurses, Nebraska Center for Nursing, 2008 and 2007.

<sup>1</sup> Non-Metropolitan County.

<sup>2</sup> Frontier County (<7 People /Sq. mile).

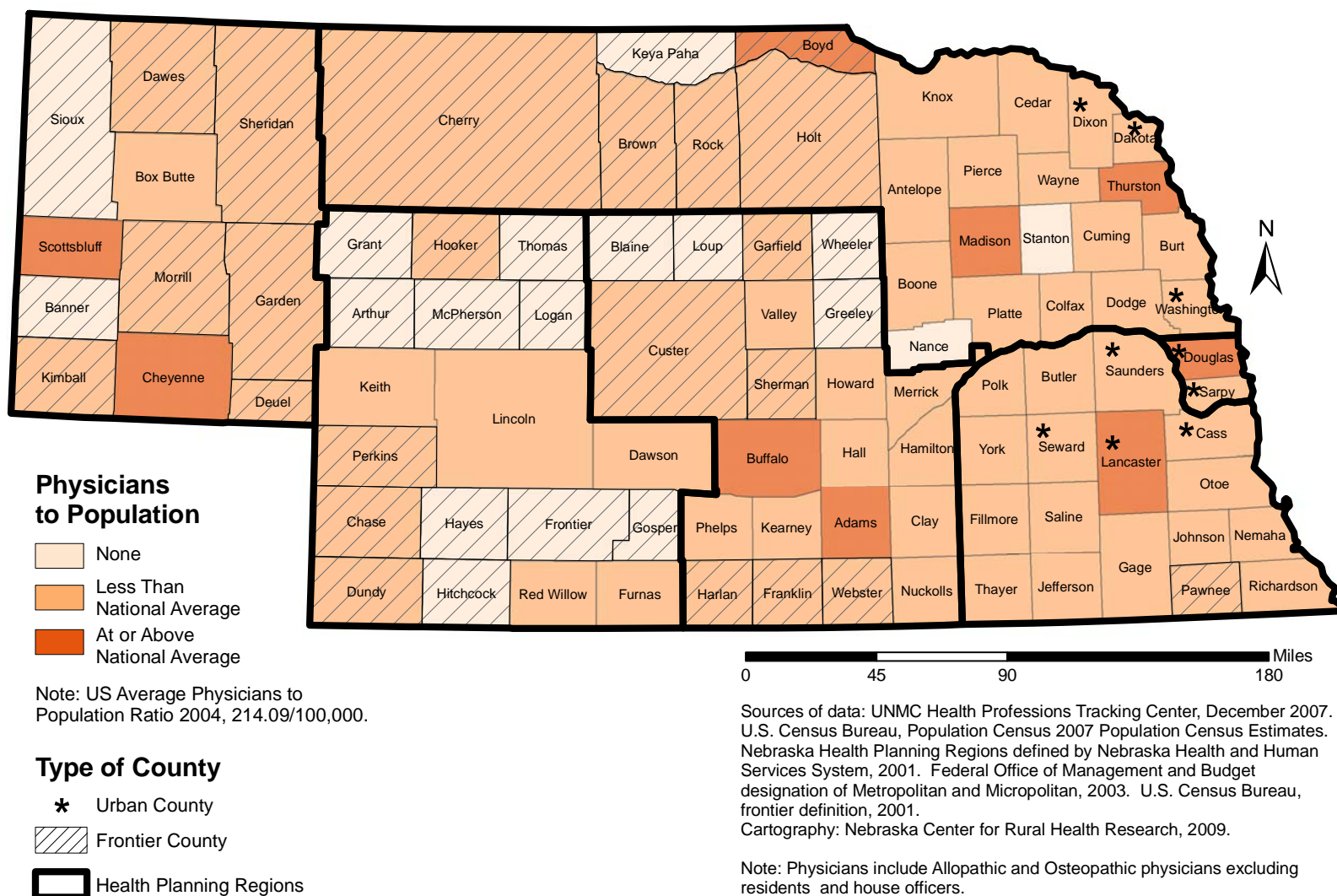
Notes and Abbreviations:; “Aud/SLP” includes audiologists and speech-language pathologists; “Dent” includes dentists; “LPN” includes licensed practical nurses; “Ment” includes psychiatrists, physician assistants and nurse practitioners specialized in psychiatry, psychologists, mental health practitioners, alcohol and drug counselors, and certified compulsive gambling counselors; “NPC” includes chiropractors, podiatrists, and optometrists; “Nutr” includes medical nutrition therapists; “OT/PT” includes occupational and physical therapists; “PA, NP, CNM” includes physician assistants, nurse practitioners, and certified nurse midwives; “Pharm” includes pharmacists; “Phys” includes physicians (medical doctors, doctors of osteopathy), excludes residents; “Prim” includes primary care medical doctors, doctors of osteopathy, nurse practitioners, and physician assistants; “Psych” includes psychiatrists; “Radio” includes medical radiographers; “Resp” includes respiratory care practitioners; “RN” includes registered nurses.

## **Physicians and Physician Assistants**

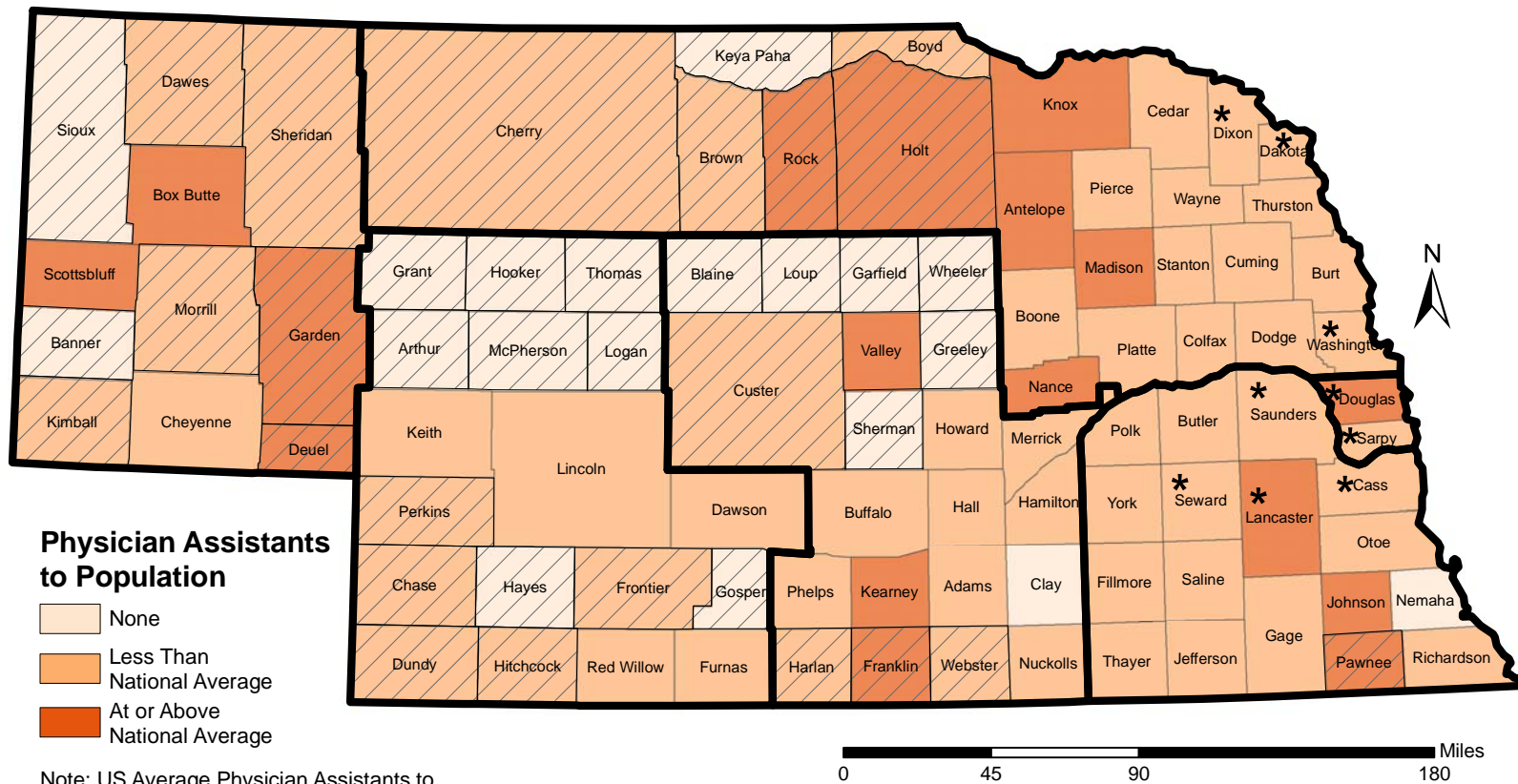
Only 9 of Nebraska's 93 counties have a physician-to-population ratio above the 2004 national average ratio of 214.1 physicians to 100,000 population (United States Health Workforce Profile, 2006) (Figure 65). These counties are Adams, Boyd, Buffalo, Cheyenne, Douglas, Lancaster, Madison, Thurston, and Scotts Bluff. Douglas and Lancaster are metropolitan counties, and Boyd is a frontier county. Eighteen counties (Arthur, Banner, Blaine, Frontier, Gosper, Grant, Greeley, Hayes, Hitchcock, Keya Paha, Logan, Loup, McPherson, Nance, Sioux, Stanton, Thomas, and Wheeler) have no physicians. All of these counties are frontier counties, except Nance and Stanton, which are non-metro counties.

Fifty-six counties have a physician assistant-to-population ratio above the 2004 national average ratio of 16.9 to 100,000 population. Twenty-four counties (Arthur, Banner, Blaine, Boyd, Brown, Clay, Garden, Garfield, Gosper, Grant, Greeley, Hayes, Hooker, Keya Paha, Logan, Loup, McPherson, Perkins, Rock, Sherman, Sioux, Stanton, Thomas, and Wheeler) have no physician assistants. Except for Clay and Stanton, all 24 are frontier counties (Figure 66).

**Figure 65. Distribution of Actively Practicing Physicians per 100,000 Population by County, Nebraska 2007**



**Figure 66. Distribution of Actively Practicing Physician Assistants per 100,000 Population by County, Nebraska 2008**



## Nurses

There does not appear to be a consensus on what constitutes a nursing shortage or how to best define it. Much of the literature predicts future shortfalls. Current shortages are mostly based on vacancy rates. The Bureau of Health Professions commissioned a study by the New York Center for Health Workforce Studies to develop a better method to define nursing shortages. The research team in February 2007 convened four expert advisory panel meetings to guide their efforts to develop a method to identify facilities and communities with nursing shortages. The expert panels agreed on a set of guiding principles based on theoretical, practical, or fairness concerns. Some of the guiding principles were that both facility and community characteristics be considered, community characteristics are more important than facility characteristics, and analyses should primarily focus on employer demand for registered nurses (RNs) (i.e., what the local labor market will actually support) rather than the health needs of the population (Methods for Identifying, 2007)..

### *Nurses to Population Ratio Method*

One way to define shortages is a supply-based geographical estimate using a nurse-to-population ratio. However, the caveat for using this method is that there is no consensus on what the "ideal" ratio should be. The estimated number of RNs required in a county is calculated based on population need rather than on demand for RNs created by the existing health care infrastructure and assumes that people receive nursing services where they live. This ratio has been criticized for being very crude, because it ignores the actual utilization patterns of services and demographic variations in health care needs. Knowing where RNs and patients live does not necessarily tell researchers where services were provided or received, and thus where shortages actually existed. Furthermore, the use of county-level data can mask large differences in facilities within counties (Toward a Method for Identifying, 2007).

Using the supply-based geographical approach to shortages, the 2004 estimated national average ratio of RNs to 100,000 population was 802 (The United States Health Workforce Profile, 2006). According to data obtained from the Nebraska Center for Nursing based on RN surveys, Nebraska's ratio of RNs to 100,000 population was 981.7 in 2006 and 972 in 2008. We coded Nebraska's counties as being above or below the 2004 national average ratio of RNs (Figure 67), licensed practical nurses (LPNs) (Figure 68), and nurse practitioners to 100,000 population (Figure 69). Only 16 of Nebraska's 93 counties had a ratio of RNs to 100,000 population at or above the national average. These counties were Adams, Boone, Buffalo, Dodge, Douglas, Hall, Holt, Lancaster, Lincoln, Madison, Nuckolls, Perkins, Phelps, Red Willow, Scotts Bluff, and York (Figure 67). Eight counties (Arthur, Blaine, Grant, Keya Paha, Logan, Loup, McPherson, and Sioux) had no RNs.

The national average ratio of LPNs to 100,000 population in 2004 was 239.3. Nebraska had a ratio of 293 LPNs to 100,000 population in 2007. Ten of Nebraska's counties (Arthur, Banner, Blaine, Hayes, Logan, Loup, McPherson, Sioux, Thomas, and Wheeler) had no LPNs in 2007 (Figure 68). Fourteen counties (Cass, Cherry, Dakota, Douglas, Frontier, Howard, Keith, Keya Paha, Sarpy, Saunders, Sherman, Stanton, Thurston, and Washington) had an LPN-to-100,000 population ratio below the national average (Figure 68). Therefore, although state-level ratios for

RNs and LPNs are above the national average, the distribution of RNs and LPNs in Nebraska is not uniform, and this could be reflecting the distribution of health care facilities.

Only 20 counties have a nurse practitioner-to-population ratio higher than the 2004 national average ratio of 42 to 100,000 population. Over a third (37) of Nebraska's counties (Arthur, Banner, Blaine, Butler, Chase, Cherry, Deuel, Dixon, Dundy, Fillmore, Frontier, Gosper, Grant, Greeley, Harlan, Hayes, Hitchcock, Hooker, Howard, Jefferson, Keya Paha, Kimball, Logan, Loup, McPherson, Merrick, Nance, Pawnee, Pierce, Polk, Red Willow, Rock, Seward, Sherman, Sioux, Thomas, and Wheeler) have no nurse practitioners (Figure 69). Of these, 11 counties (Butler, Dixon, Fillmore, Howard, Jefferson, Merrick, Nance, Pierce, Polk, Red Willow, and Seward) are not frontier counties (Figure 69). Dixon and Seward are designated metro counties.

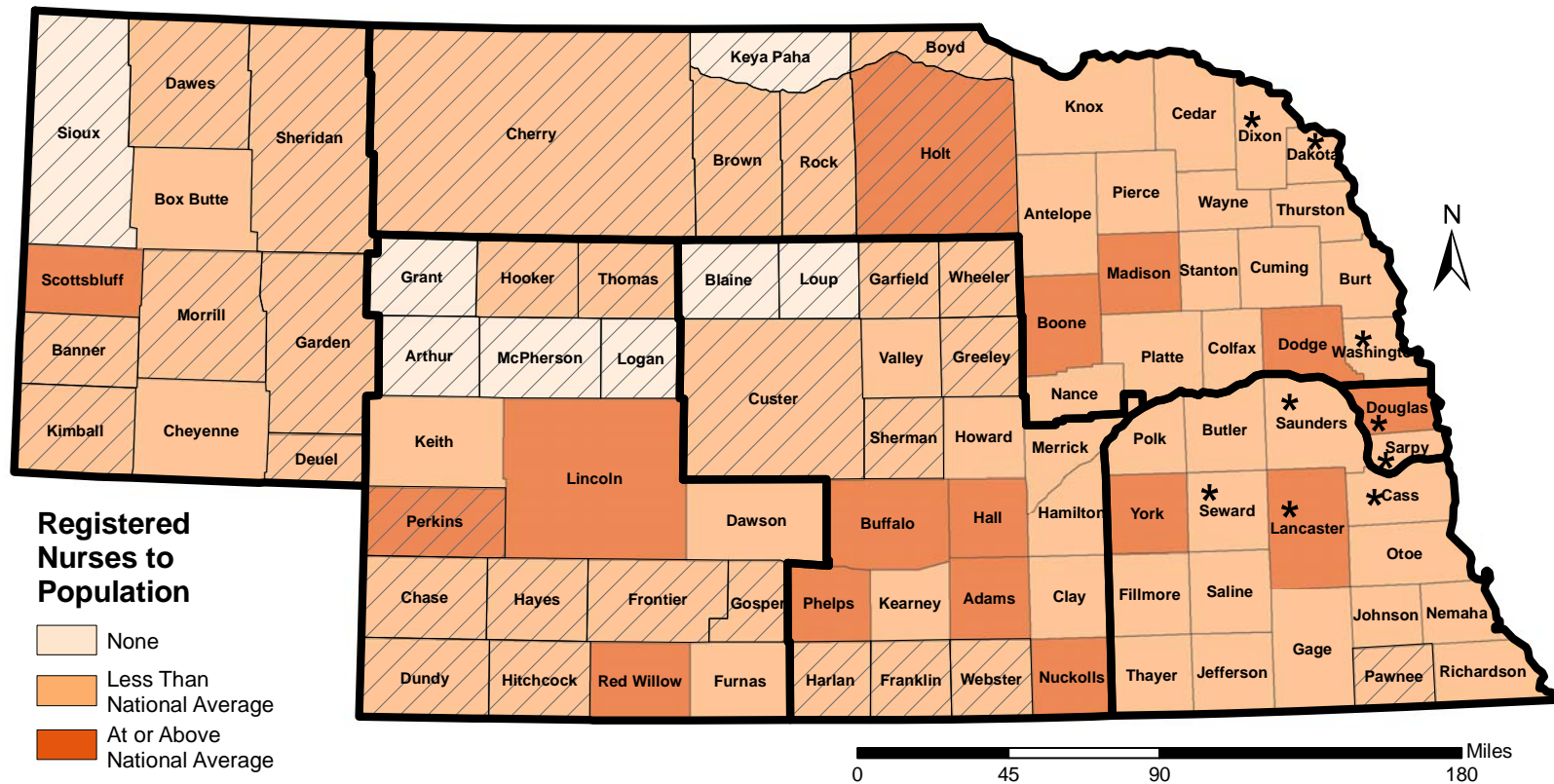
### ***RN to Physician Ratio***

Physician supply can be used as a crude proxy for RN employer demand. The limitation of using this ratio is that areas that are short on both physicians and RNs appear comparable to areas that have surpluses of both physicians and RNs because they could have similar ratios. This is particularly concerning because physician shortage areas may have the greatest need for RNs to provide basic primary care (Toward a Method for Identifying, 2007).

### ***Preferred Method***

The New York Center for Health Workforce Studies developed a preferred method of defining nursing shortages. The estimation of RN shortages was based upon the difference between estimated demand for RNs and the number of RNs in the county (adjusted for commuting patterns). Raw shortage numbers were then standardized as a percent of demand. According to the New York Center for Health Workforce Studies (2007) report, using this preferred method, 45 of Nebraska's counties have RN shortages. Ten counties in Nebraska have 50% to 100% shortages, 15 counties have 25% to 50% shortages, 14 have 10% to 25% shortages, and 6 counties have 0% to 10% shortages (Methods for Identifying Facilities, 2007).

**Figure 67. Distribution of Actively Practicing Registered Nurses per 100,000 Population by County, Nebraska 2008**



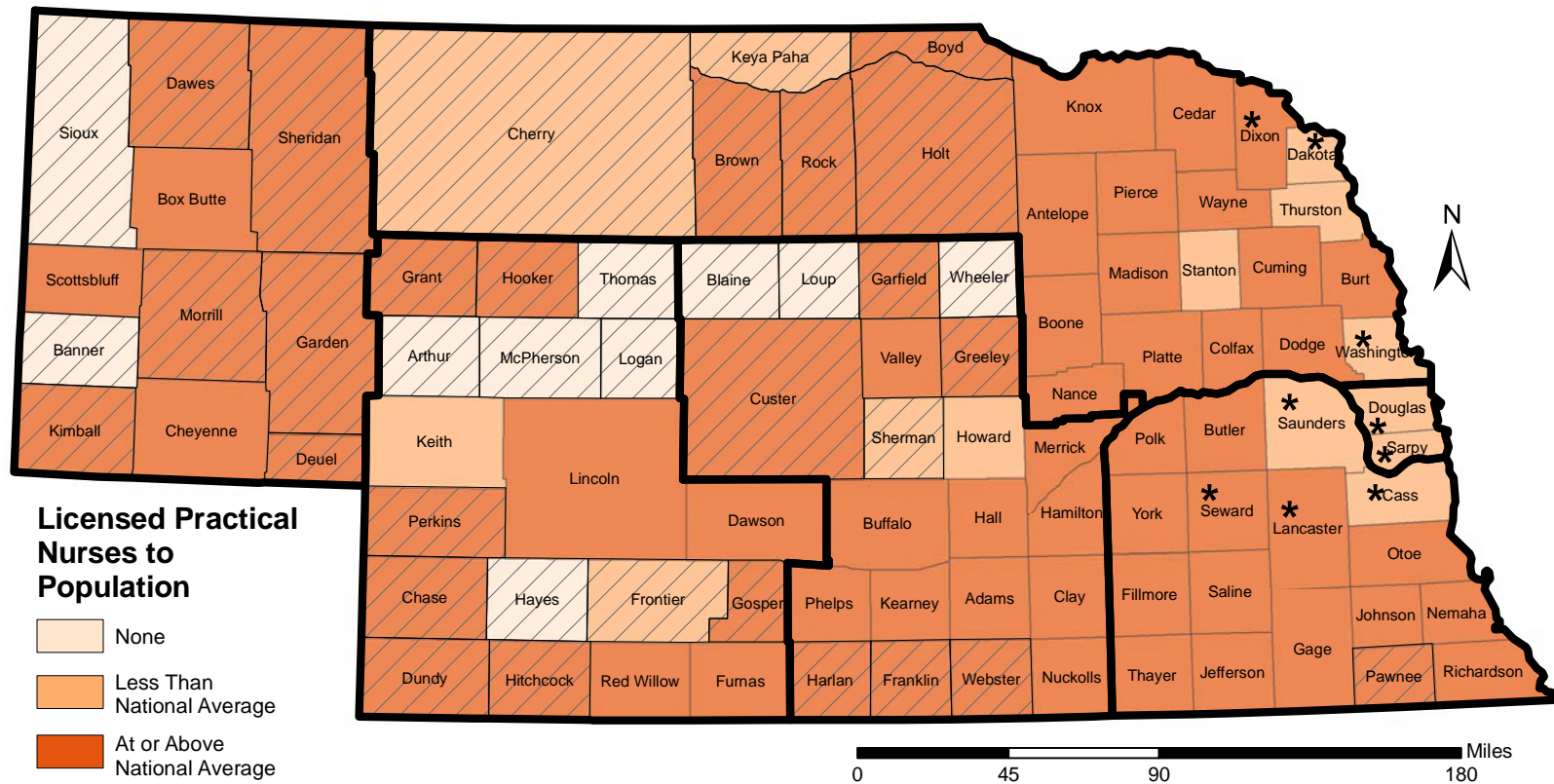
Note: U.S. Average Registered Nurses to Population Ratio 2004, 802/100,000.

Sources of data: Nebraska Center for Nursing, 2008. U.S. Census Bureau, Population Census 2008 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2009.



**Figure 68. Distribution of Actively Practicing Licensed Practical Nurses per 100,000 Population by County, Nebraska 2007**



Note: U.S. Average Licensed Practical Nurses to Population Ratio 2004, 239.3/100,000.

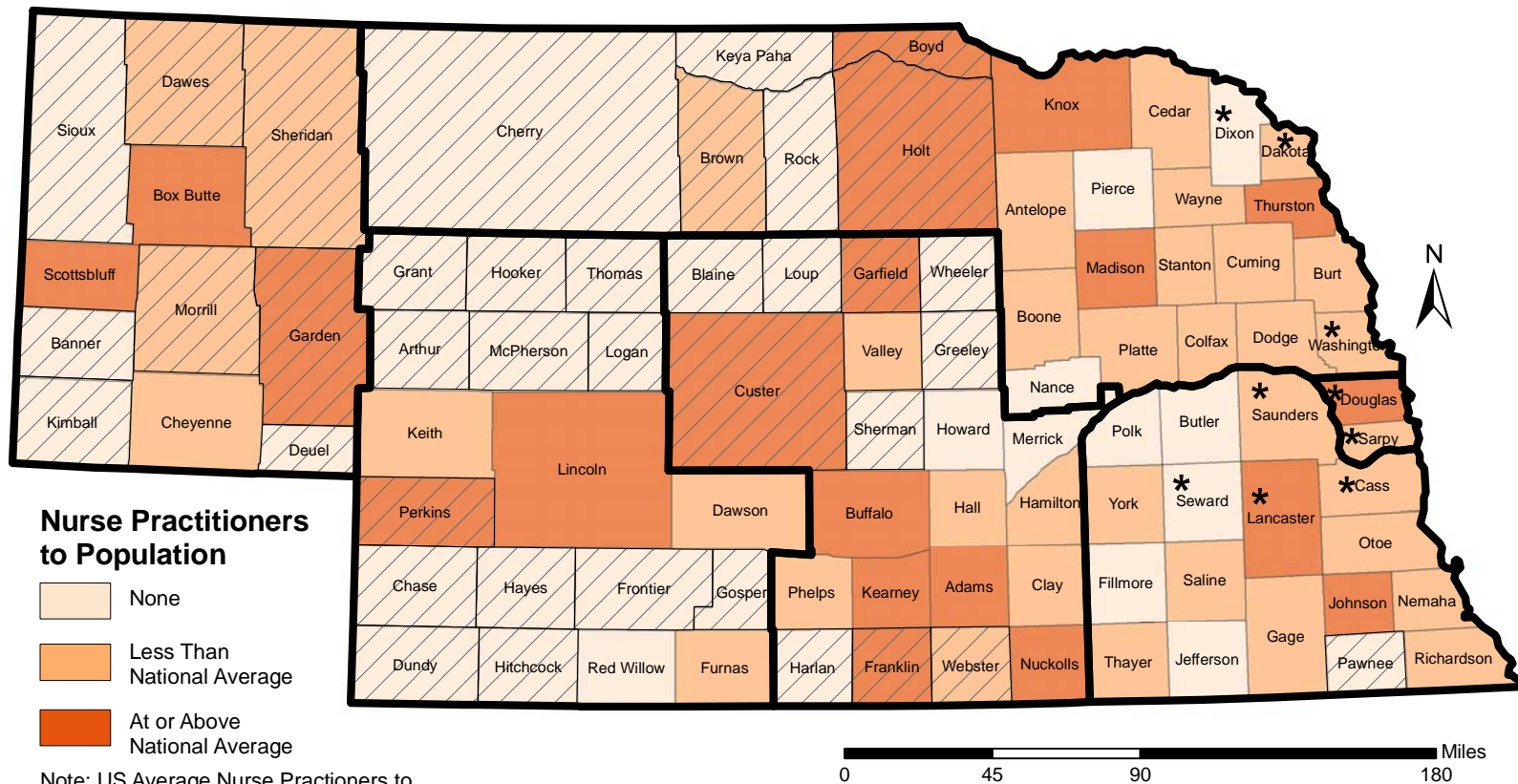
Sources of data: Nebraska Center for Nursing, 2007. U.S. Census Bureau, Population Census 2007 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2008.

\*Note: 2007 LPN survey had 41 records with missing county data.



**Figure 69. Distribution of Actively Practicing Nurse Practitioners per 100,000 Population by County, Nebraska 2008**



Sources of data: UNMC Health Professions Tracking Center, December 2008. U.S. Census Bureau, Population Census 2008 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

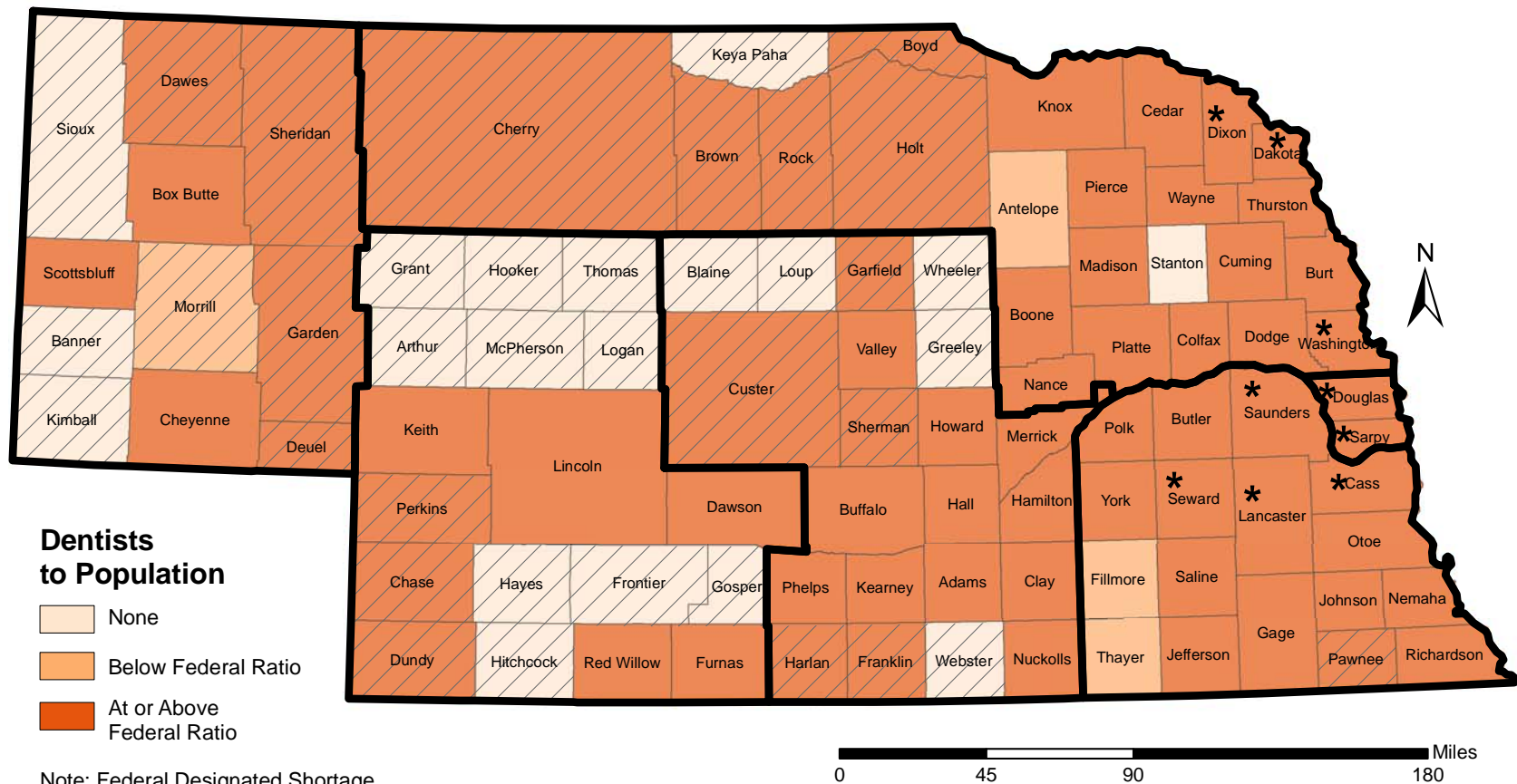
Cartography: Nebraska Center for Rural Health Research, 2009.

## Dental Health Professionals

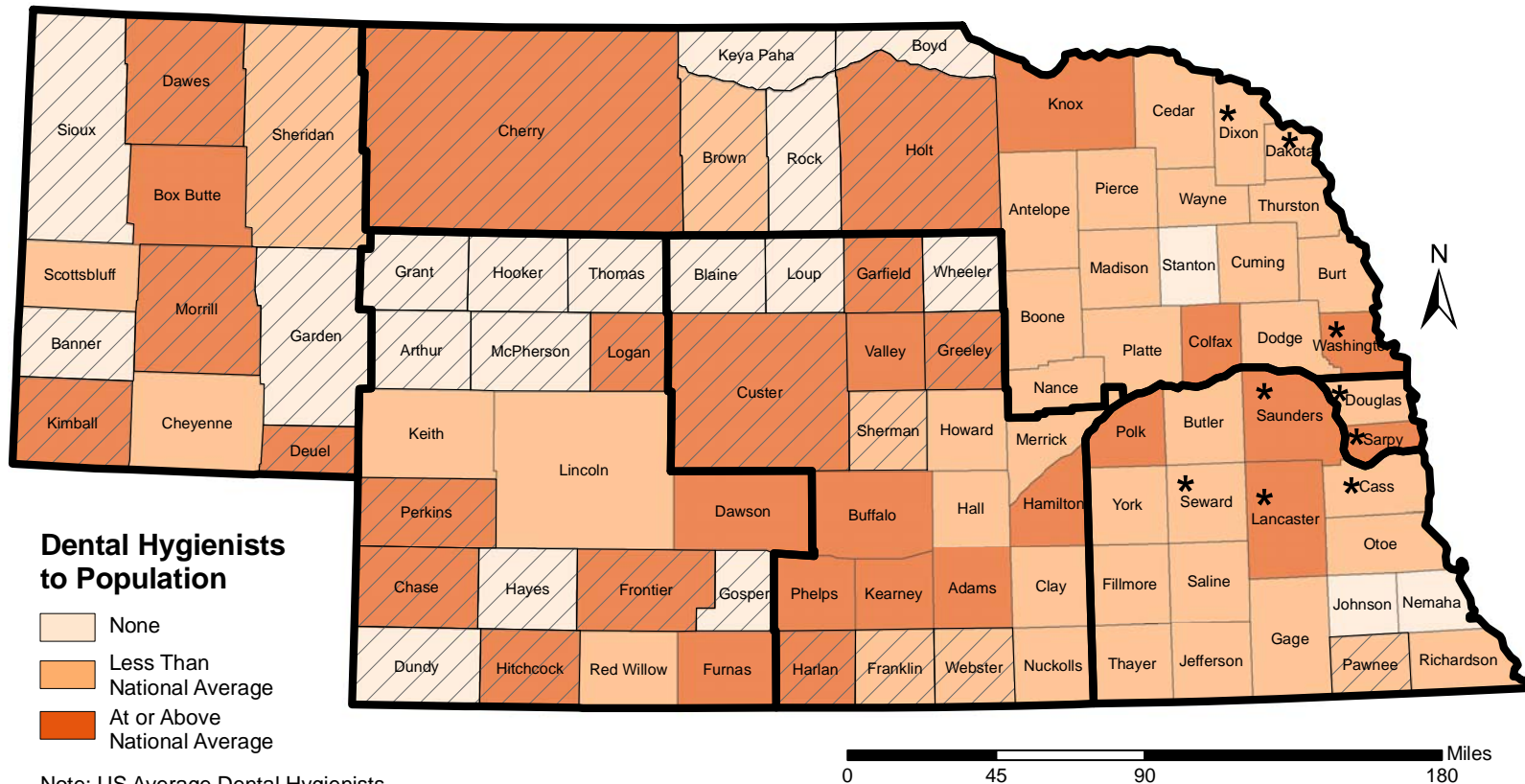
The national average ratio in 2004 was 59 dentists to 100,000 population. Nebraska's ratio of dentists to 100,000 population in 2004 was 63.8 (The United States Health Workforce Profile, 2006)). The federal dental shortage area designation uses a ratio of 1 dentist to 5,000 population. Nebraska's counties were designated as being above or below this ratio as shown in the map in Figure 70. Twenty of Nebraska's counties had no dentists in 2007. These counties were Arthur, Banner, Blaine, Frontier, Gosper, Grant, Greeley, Hayes, Hitchcock, Hooker, Keya Paha, Kimball, Logan, Loup, McPherson, Sioux, Stanton, Thomas, Webster, and Wheeler. Of these, all except Stanton are frontier counties. Four counties, Antelope, Fillmore, Morrill and Thayer, have a dentist-to-population ratio below the federal shortage area designation.

Twenty counties have no dental hygienists (Arthur, Banner, Blaine, Boyd, Dundy, Garden, Gosper, Grant, Hayes, Hooker, Johnson, Keya Paha, Loup, McPherson, Nemaha, Rock, Sioux, Stanton, Thomas, and Wheeler). Of these, all but three, Stanton, Johnson, and Nemaha, are frontier counties. About a third (31) of Nebraska counties are at or above the national average ratio of 53.9 dental hygienists to 100,000 population (Figure 71).

**Figure 70. Distribution of Actively Practicing Dentists by County, Nebraska 2007**



**Figure 71. Distribution of Actively Licensed Dental Hygienists per 100,000 Population by County, Nebraska 2008**



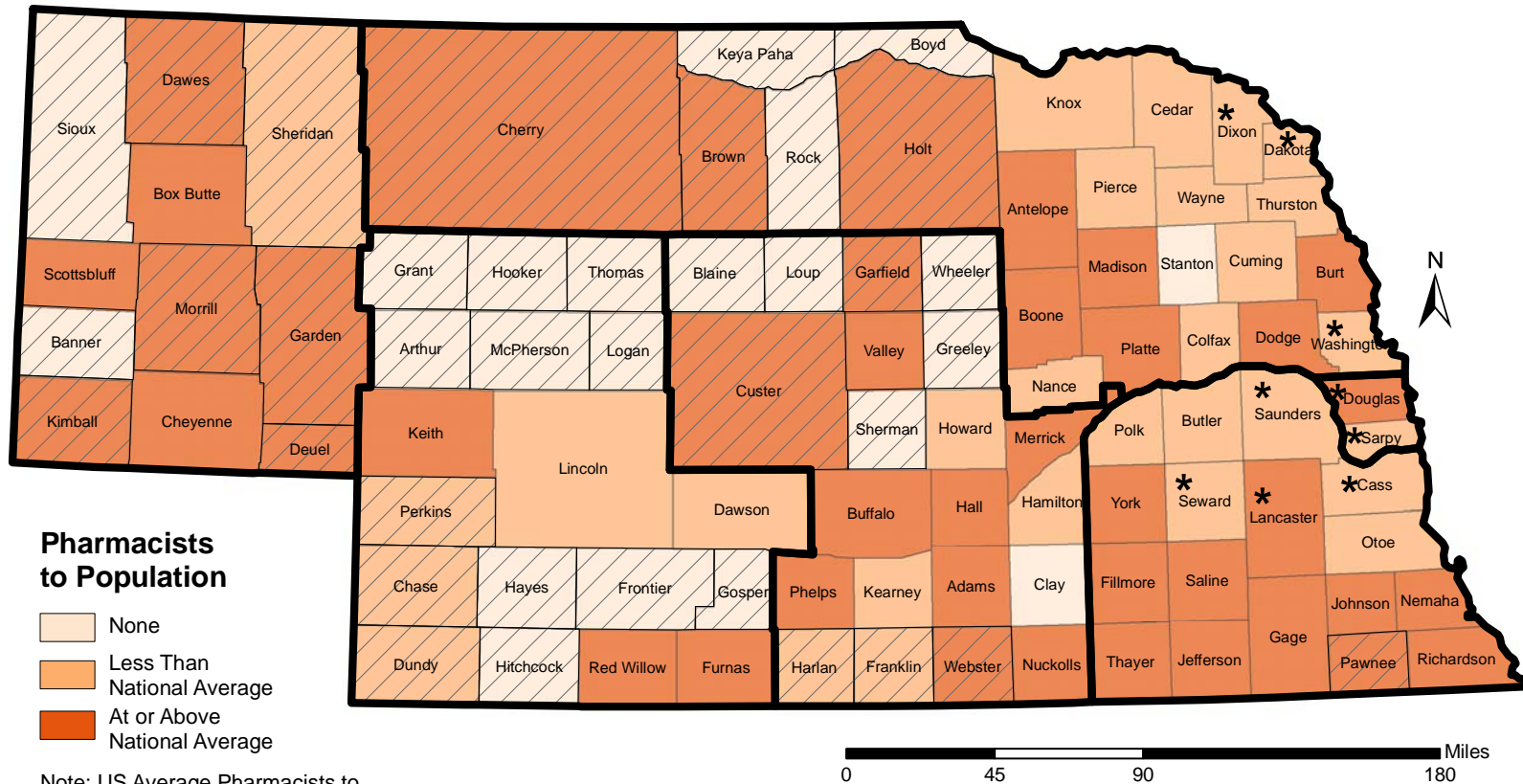
Sources of data: Nebraska DHHS, Department of Regulation and Licensure, February, 2008. U.S. Census Bureau, Population Census 2007 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2008.

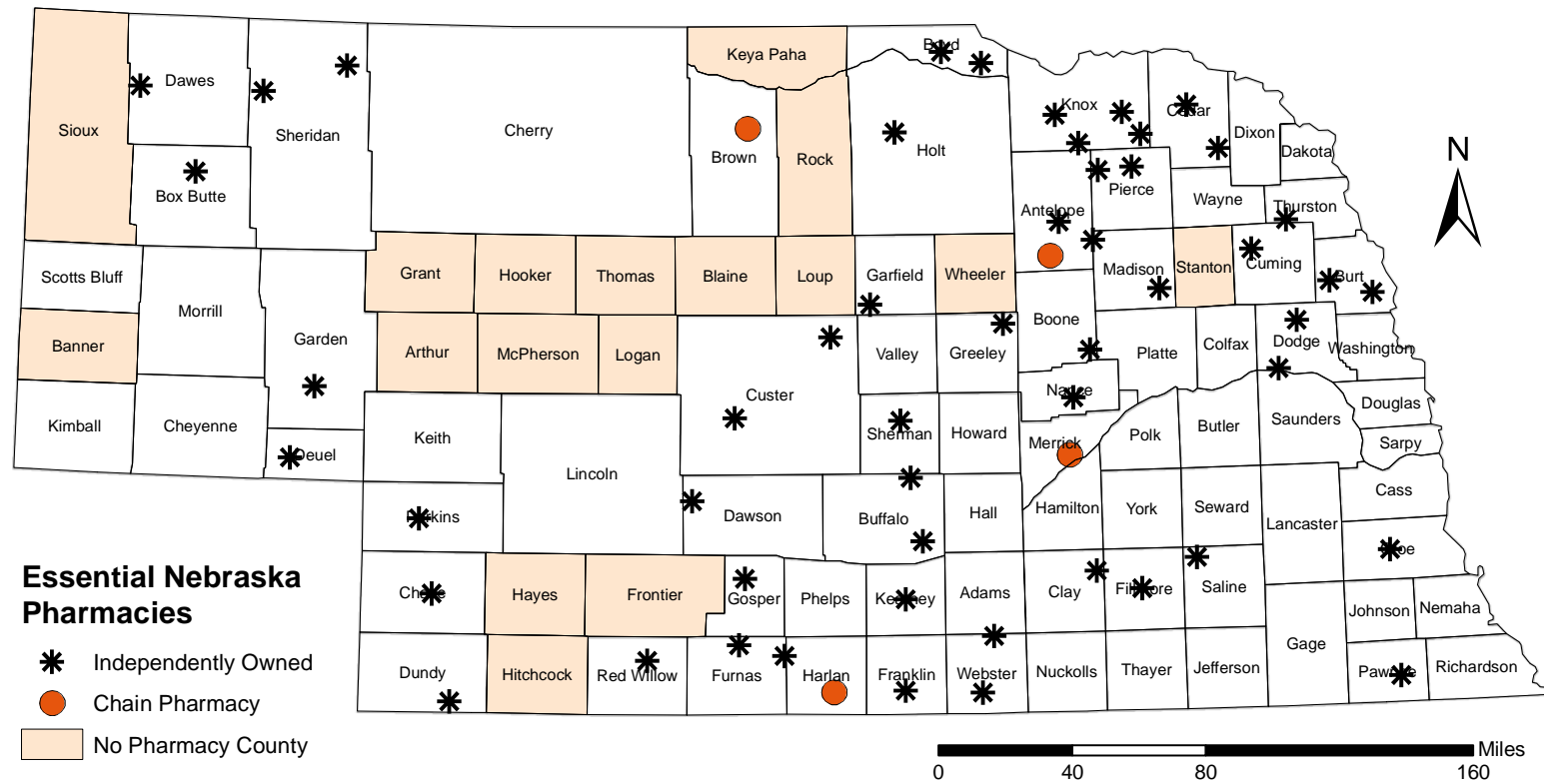
## Pharmacists

HPTS estimates that there were 1,682 actively practicing pharmacists in Nebraska in 2007 (a ratio of 95.4 pharmacists to 100,000 population). Nebraska's ratio of pharmacists to population is higher than the national average ratio in 2004 of 77 to 100,000 population (The U.S. Health Workforce Profile, 2006). As seen in the map (Figure 72), 22 of Nebraska's 93 counties (Arthur, Banner, Blaine, Boyd, Clay, Frontier, Gosper, Grant, Greeley, Hayes, Hitchcock, Hooker, Keya Paha, Logan, Loup, McPherson, Rock, Sherman, Sioux, Stanton, Thomas, and Wheeler) had no pharmacists. Of these, all except Stanton and Clay are frontier counties. Almost a third (29) of Nebraska counties had less than the national average pharmacists-to-population ratio. Figure 73 depicts the location of essential pharmacies in Nebraska, and Figure 74 shows the distance between essential pharmacies in Nebraska. Essential pharmacies or sole community pharmacies are defined as pharmacies with no other pharmacy within 10 miles or more. Seventeen counties in Nebraska do not have a pharmacy. Nebraska has 56 essential pharmacies, of which 52 are independent pharmacies and 4 are chain pharmacies.

**Figure 72. Distribution of Actively Practicing Registered Pharmacists per 100,000 population by County, Nebraska 2007**



**Figure 73. Location of Essential Pharmacies, Nebraska 2008**

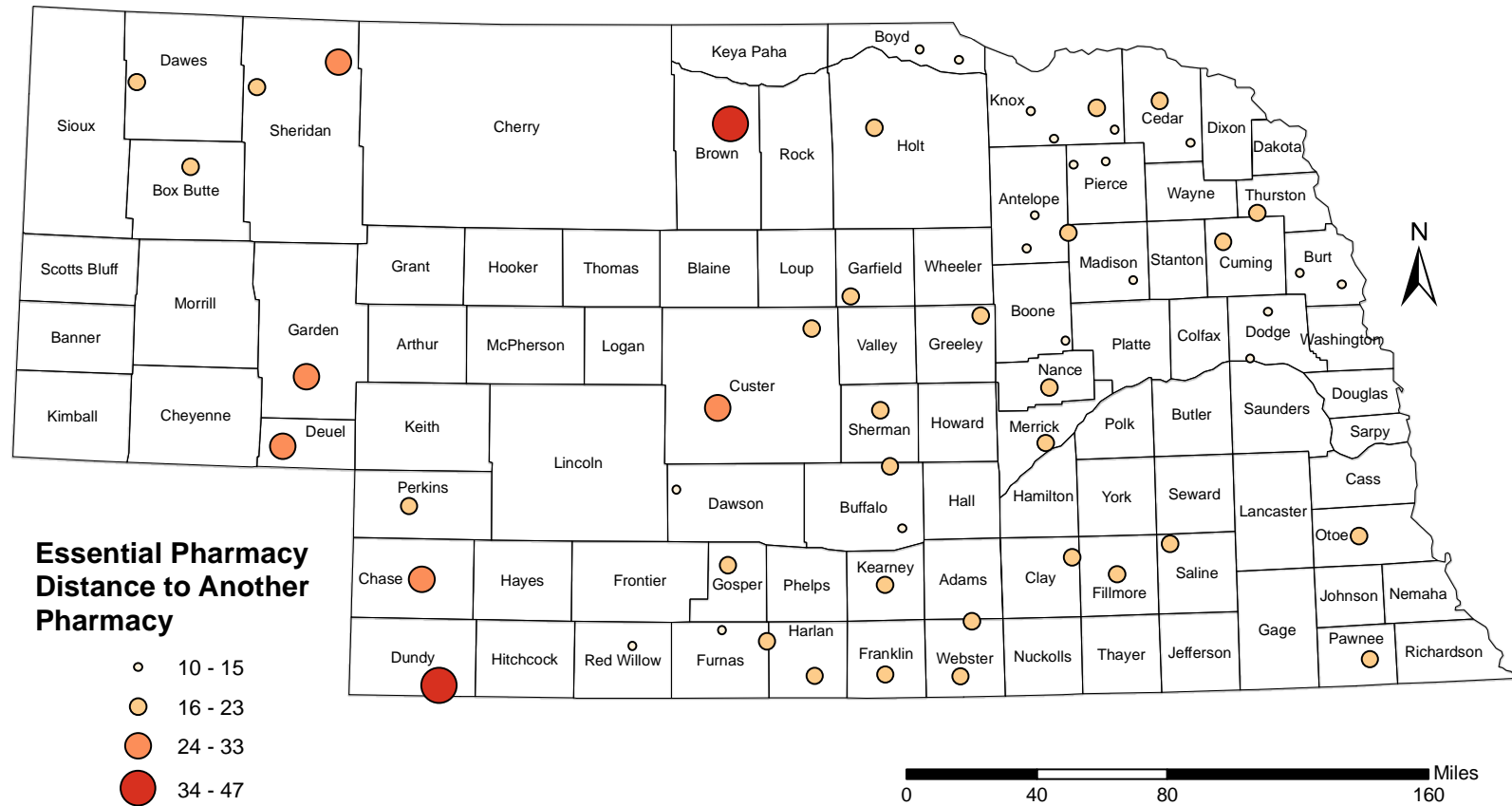


Note: Essential pharmacies are the only retail pharmacies present in a community and/or zip code and at least 10 miles from another pharmacy.

Sources of data: National Council for Prescription Drug Programs, data pulled on 1/2008.

Cartography: Nebraska Center for Rural Health Research, 2009.

**Figure 74. Distance to Essential Pharmacies, Nebraska 2008**



Note: Essential pharmacies are the only retail pharmacies present in a community and/or zip code and at least 10 miles from another pharmacy.

Sources of data: National Council for Prescription Drug Programs (NCPDP); data pulled on 1/2008.

Cartography: Nebraska Center for Rural Health Research, 2009.



## Allied Health Professionals

For allied health professionals, the data were obtained from the Nebraska Department of Health and Human Services (DHHS) licensure database. The address field in the licensure database may not accurately reflect the practice location of the health professionals. Therefore, the county maps have to be viewed with this limitation in mind. In addition, as mentioned earlier, many allied health professions do not require state licensure (see Appendix 11 for a list of health professions not requiring state licensure). Statewide ratios of allied health professionals compare favorably with the national average ratios. Nebraska's provider-to-100,000 population ratios in 2004 and 2008 for physical and occupational therapists, speech-language pathologists, audiologists, respiratory therapists, radiologic technologists, and medical nutritionists were higher than the national average ratios for 2004 (Table 13). However, the distribution of allied health professionals in rural and urban counties is not uniform.

Over a third (38) of Nebraska's counties (Antelope, Arthur, Banner, Blaine, Boyd, Cedar, Chase, Cherry, Deuel, Dixon, Dundy, Franklin, Frontier, Garden, Grant, Hayes, Hitchcock, Keith, Keya Paha, Kimball, Logan, Loup, McPherson, Merrick, Nance, Nuckolls, Perkins, Pierce, Polk, Rock, Sheridan, Sherman, Sioux, Stanton, Thomas, Wayne, Webster, and Wheeler) have no medical nutrition therapists (Figure 75). Of these, all but 11 (Antelope, Cedar, Dixon, Keith, Merrick, Nance, Nuckolls, Pierce, Polk, Stanton, and Wayne) are frontier counties. Forty-two of Nebraska's counties are at or above the national average ratio of 16.3 medical nutrition therapists to 100,000 population.

The majority of Nebraska's counties have medical radiographers above the national average ratio of 62 to 100,000 population. Thirteen counties (Arthur, Banner, Blaine, Brown, Garfield, Hitchcock, Hooker, Keya Paha, Logan, Loup, McPherson, Sioux, and Thomas), all of which are frontier counties, have no medical radiographers (Figure 76).

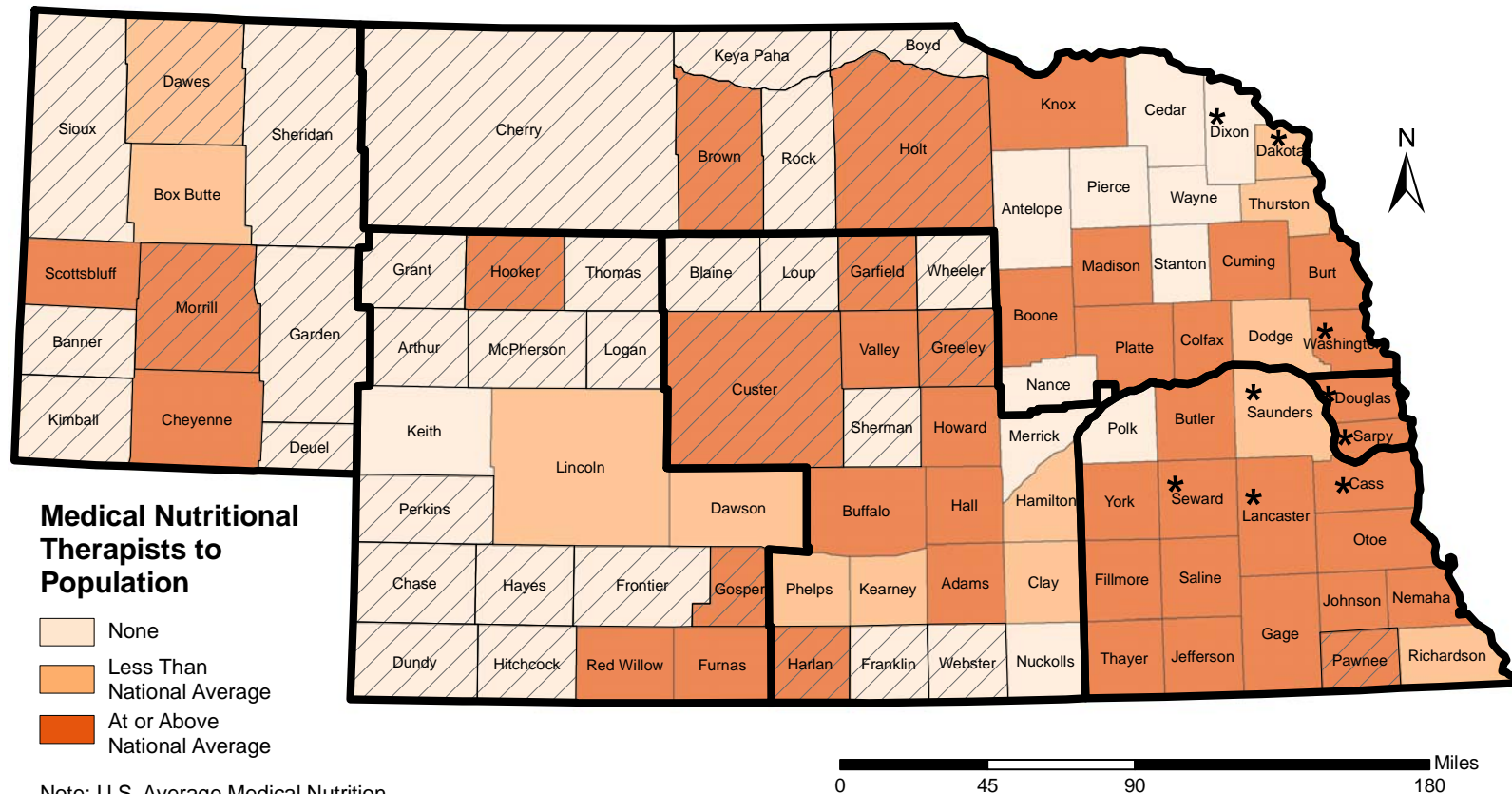
About a third (30) of Nebraska's counties (Arthur, Banner, Blaine, Dakota, Deuel, Dundy, Fillmore, Franklin, Garden, Garfield, Gosper, Grant, Hayes, Hitchcock, Hooker, Johnson, Keya Paha, Kimball, Logan, Loup, McPherson, Morrill, Polk, Rock, Sherman, Sioux, Stanton, Thayer, Thomas, and Wheeler) have no respiratory care practitioners (Figure 77). Of these, all but six (Dakota, Fillmore, Johnson, Polk, Stanton, and Thayer) are frontier counties. Forty-nine of Nebraska's counties have respiratory care practitioners at or above the national average ratio of 32.0 to 100,000 population.

Over a third (36) of Nebraska's counties (Arthur, Banner, Blaine, Chase, Cherry, Colfax, Dundy, Franklin, Frontier, Garden, Garfield, Gosper, Grant, Greeley, Harlan, Hayes, Hitchcock, Hooker, Johnson, Keya Paha, Kimball, Logan, Loup, McPherson, Nance, Nemaha, Pierce, Rock, Sherman, Sioux, Stanton, Thomas, Thurston, Wayne, Webster, and Wheeler) have no occupational therapists. Of these counties, eight (Colfax, Johnson, Nance, Nemaha, Pierce, Thurston, Stanton, and Wayne) are not frontier counties (Figure 78). Only 30 counties have an occupational therapist-to-population ratio higher than the 2004 national average ratio of 29.5 to 100,000 population.

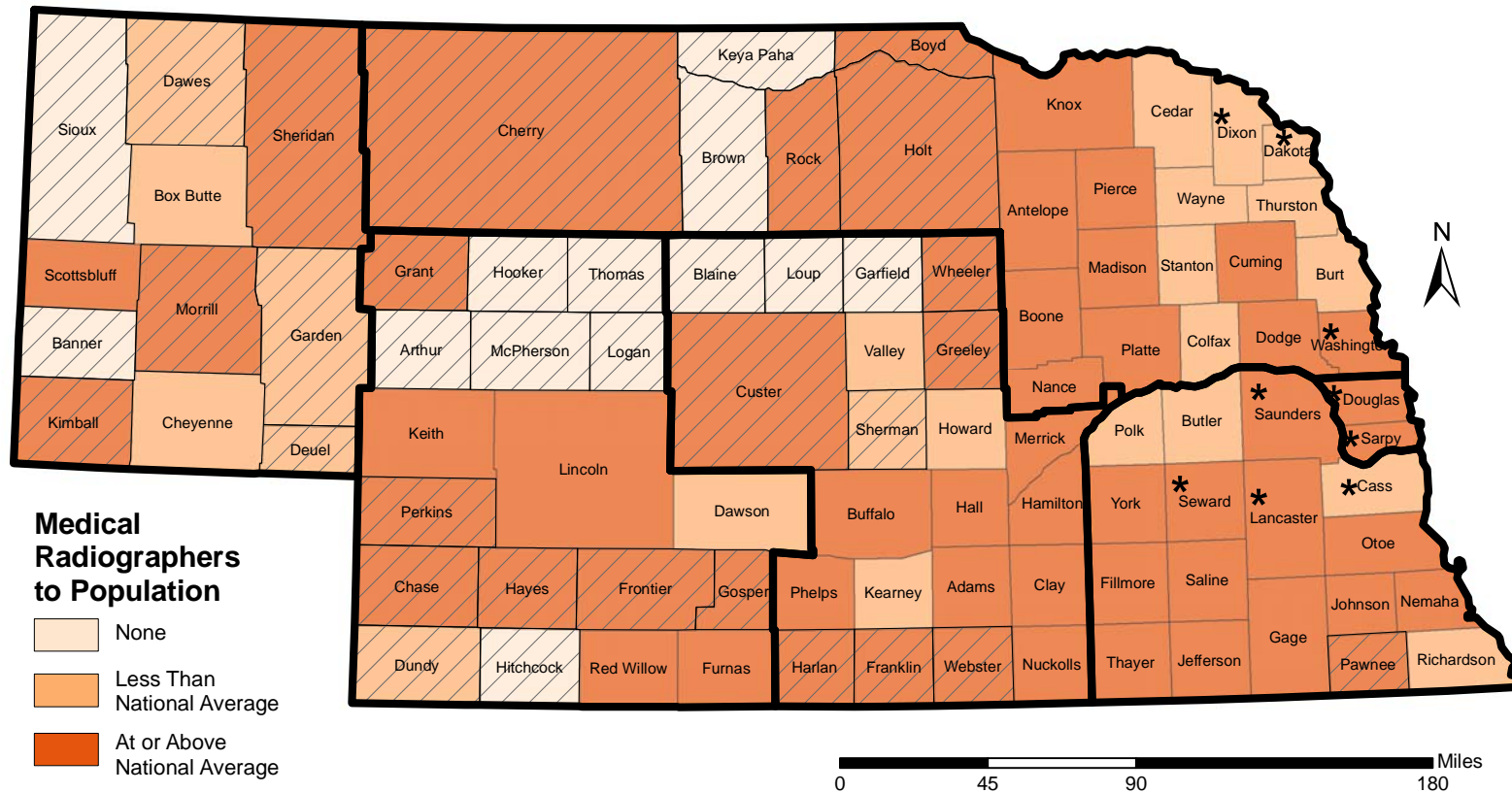
Only 26 counties have a physical therapist-to-population ratio higher than the 2004 US national average ratio of 49.5 per 100,000 population. Twenty-five counties (Arthur, Banner, Blaine, Boyd, Deuel, Frontier, Garden, Gosper, Grant, Harlan, Hayes, Hitchcock, Hooker, Kearney, Knox, Logan, Loup, McPherson, Pawnee, Perkins, Polk, Rock, Sioux, Thomas, and Wheeler) have no physical therapists. Of these, all but three, Kearney, Knox, and Polk, are frontier counties (Figure 79).

Forty-two counties (Arthur, Banner, Blaine, Brown, Burt, Butler, Cedar, Chase, Cheyenne, Colfax, Dundy, Franklin, Frontier, Furnas, Garden, Garfield, Gosper, Grant, Greeley, Hayes, Hitchcock, Hooker, Howard, Keya Paha, Kimball, Logan, Loup, McPherson, Morrill, Nance, Pawnee, Perkins, Pierce, Polk, Rock, Sheridan, Sherman, Sioux, Stanton, Thomas, Webster, and Wheeler) have no speech-language pathologists and audiologists (Figure 80). The majority of these counties are frontier counties, except Burt, Butler, Cedar, Cheyenne, Colfax, Furnas, Howard, Nance, Pierce, Polk, and Stanton. Only 18 counties have a speech-language pathologist and audiologist-to-100,000 population ratio higher than the 2004 national average of 34.8.

**Figure 75. Distribution of Actively Licensed Medical Nutrition Therapists per 100,000 Population by County, Nebraska 2008**



**Figure 76. Distribution of Actively Licensed Medical Radiographers per 100,000 Population by County, Nebraska 2008**

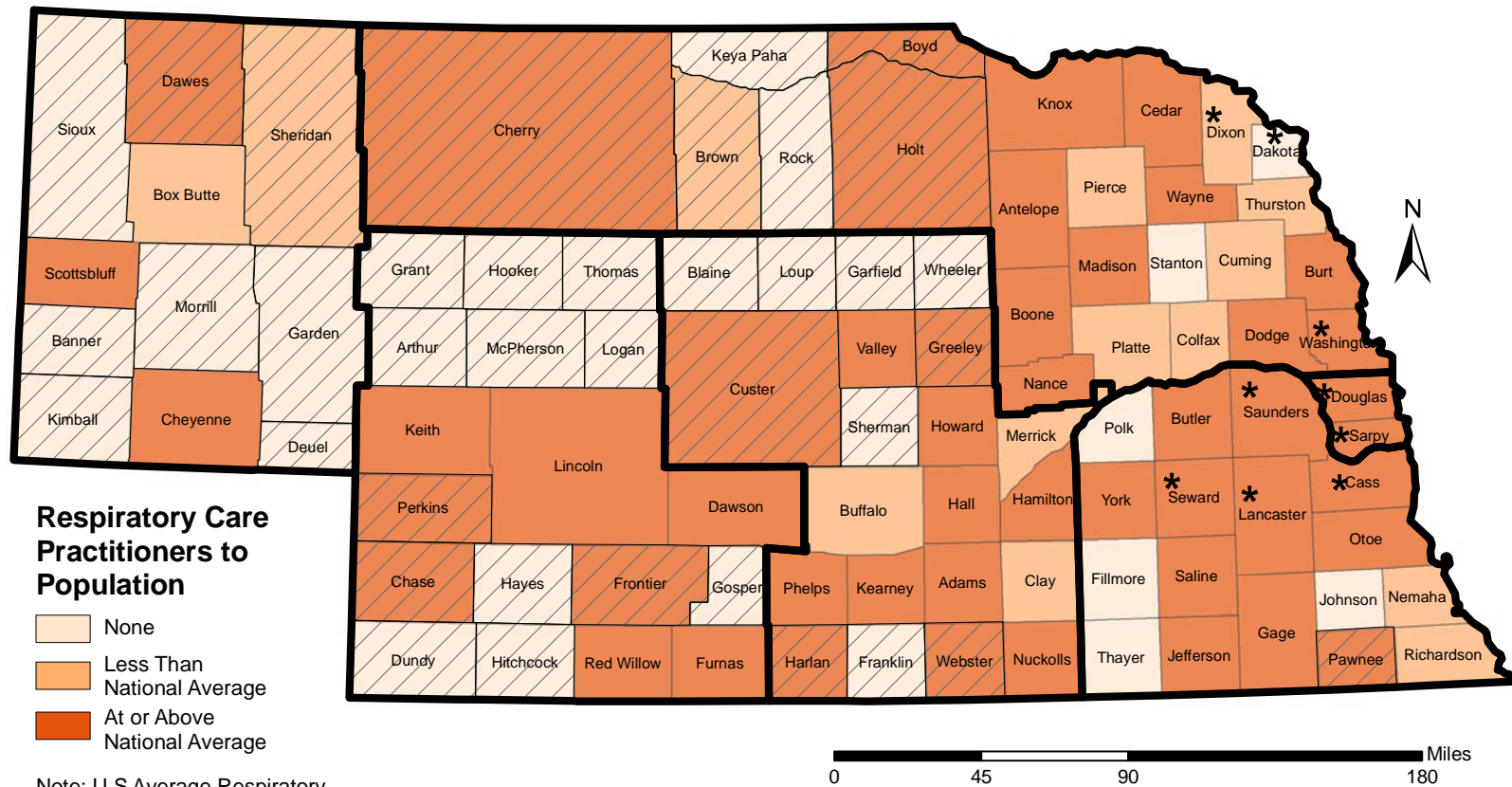


Note: U.S Average Medical Radiographers to Population Ratio, 2004, 62.01/100,000.

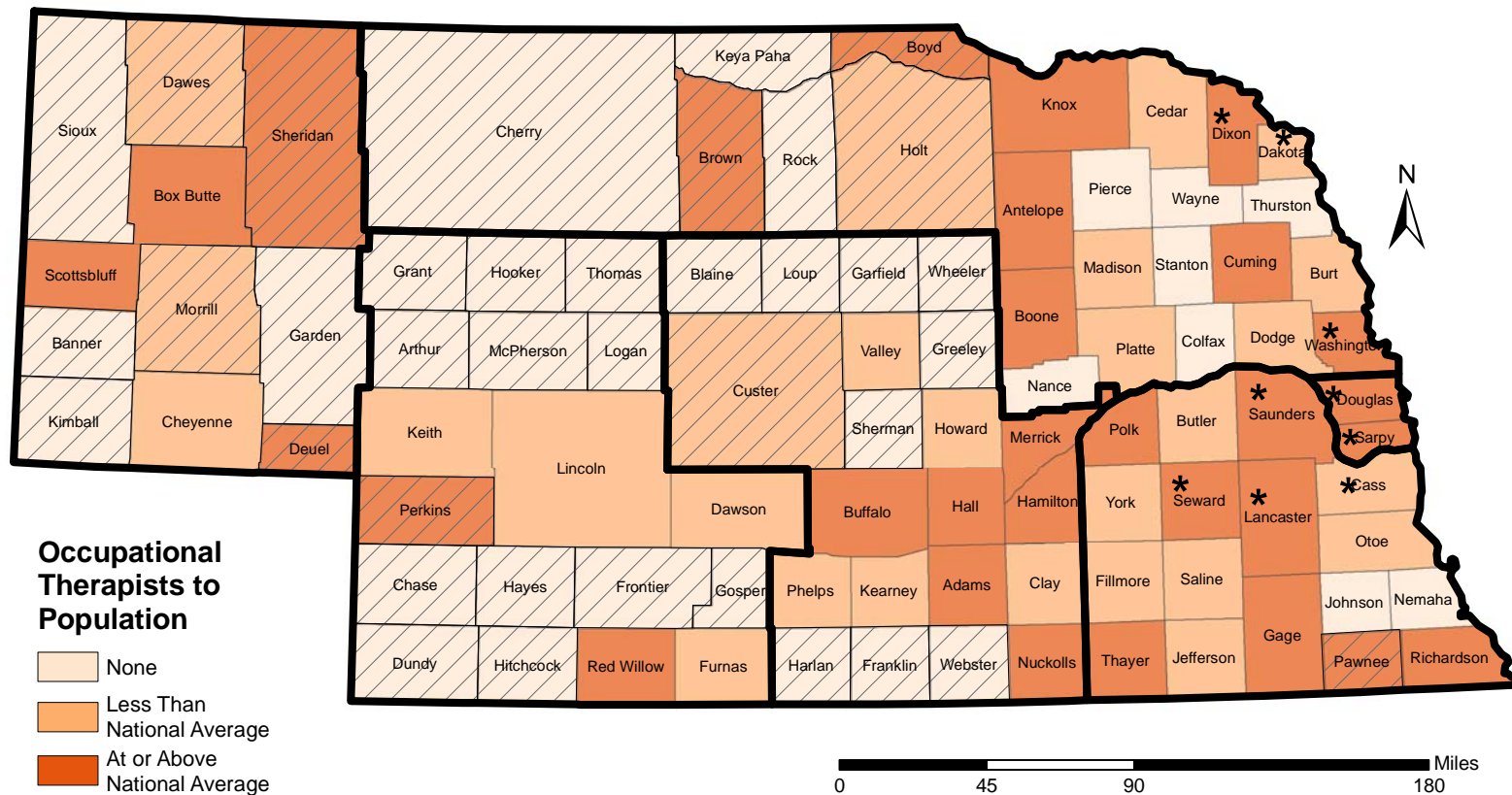
Sources of data: Nebraska DHHS, Department of Regulation and Licensure, February, 2008. U.S. Census Bureau, Population Census 2007 Population Census Estimates . Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2009.

**Figure 77. Distribution of Actively Licensed Respiratory Care Practitioners per 100,000 Population by County, Nebraska 2008**



**Figure 78. Distribution of Actively Licensed Occupational Therapists per 100,000 Population by County, Nebraska 2008**

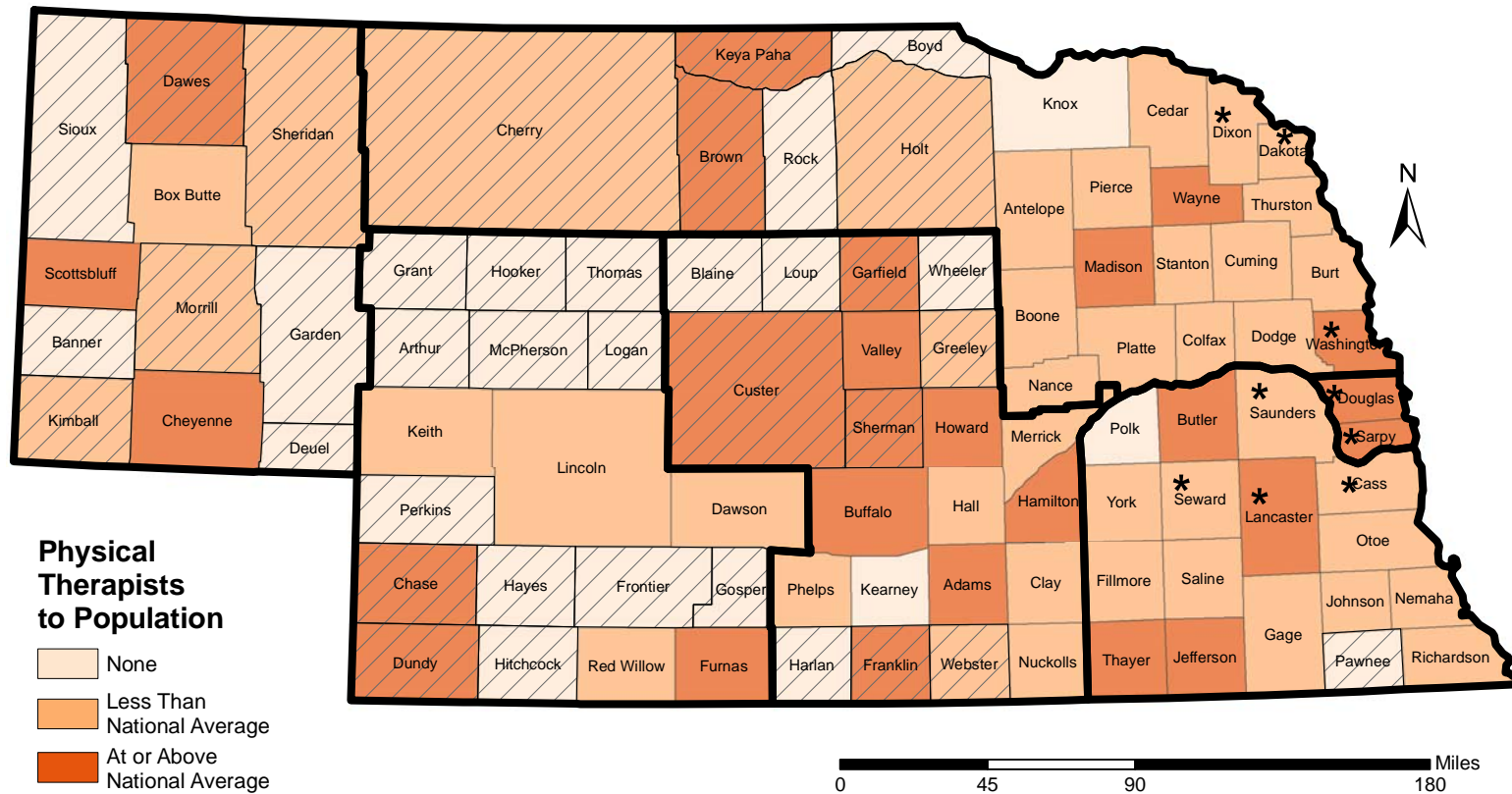


Note: U.S. Average Occupational Therapists to Population Ratio 2004, 29.53/100,000.

Sources of data: Nebraska DHHS, Department of Regulation and Licensure, February, 2008. U.S. Census Bureau, Population Census 2008 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2009.

**Figure 79. Distribution of Actively Licensed Physical Therapists per 100,000 Population by County, Nebraska 2008**



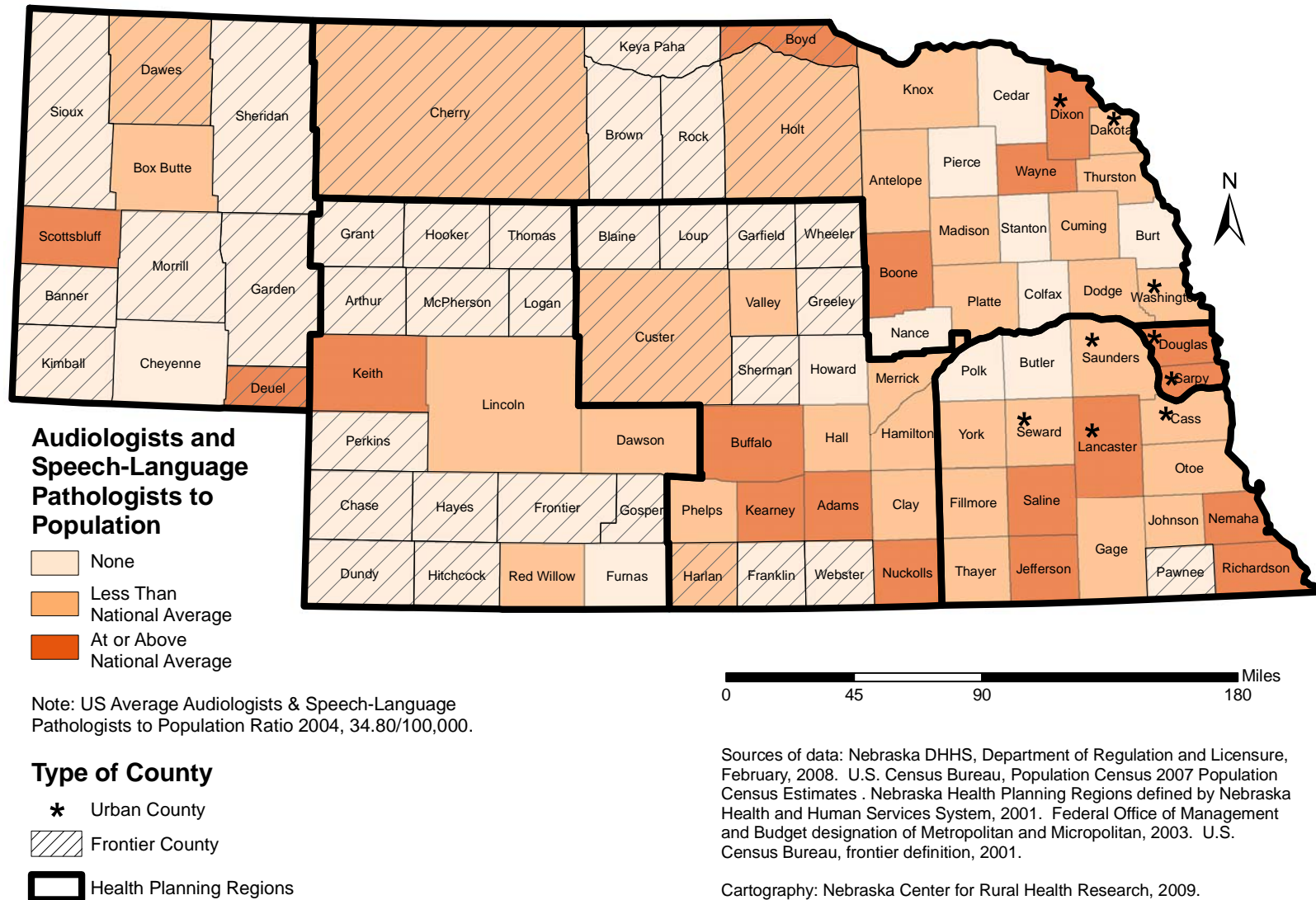
Note: U.S. Average Physical Therapists to Population Ratio 2004, 49.45/100,000.

Sources of data: Nebraska DHHS, Department of Regulation and Licensure, February, 2008. U.S. Census Bureau, Population Census 2008 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2009.



**Figure 80. Distribution of Actively Licensed Audiologists and Speech Pathologists per 100,000 Population by County, Nebraska 2008**





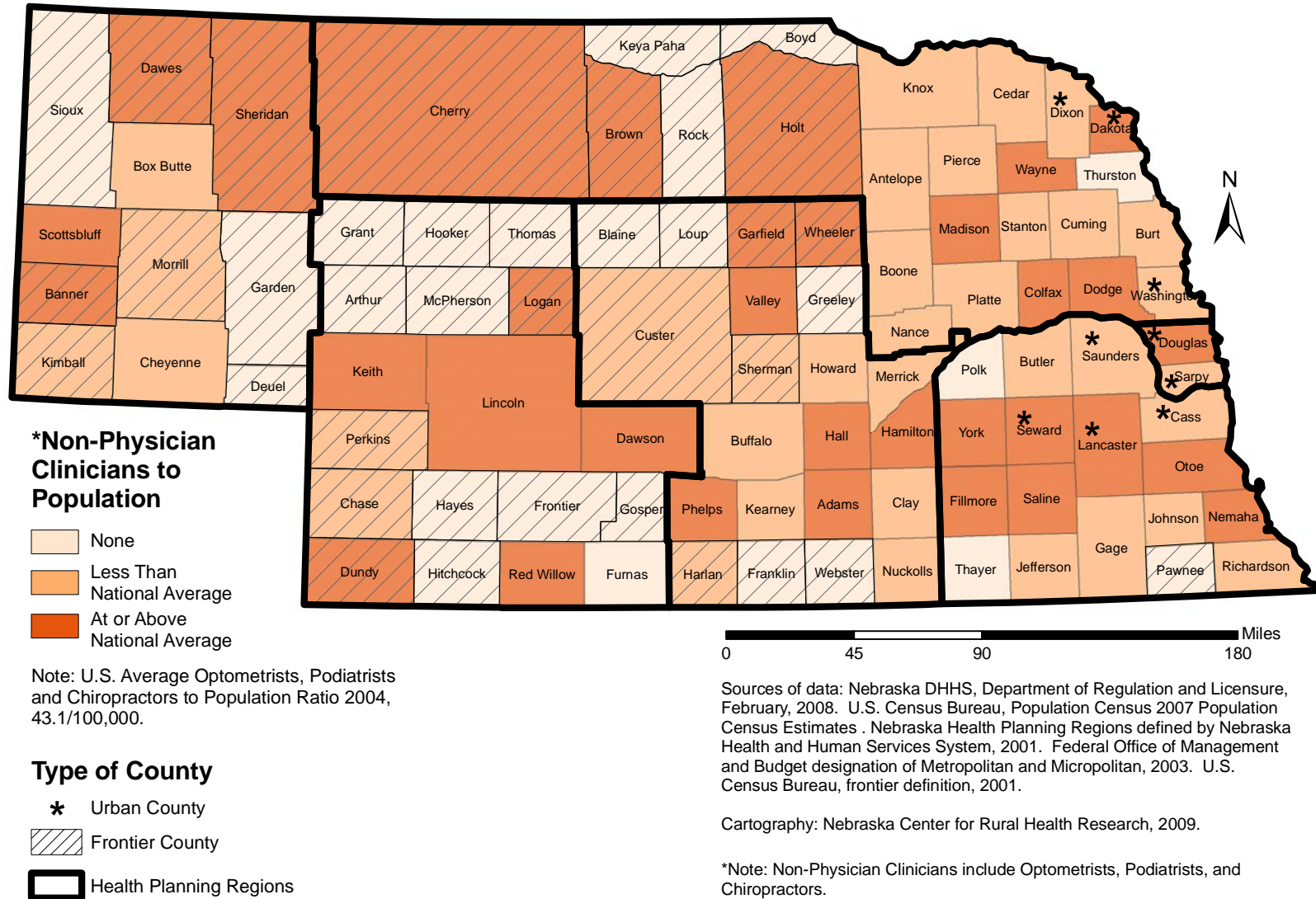
## **Non-Physician Clinicians**

Twenty-five counties (Arthur, Blaine, Boyd, Deuel, Franklin, Frontier, Furnas, Garden, Gosper, Grant, Greeley, Hayes, Hitchcock, Hooker, Keya Paha, Loup, McPherson, Pawnee, Polk, Rock, Sioux, Thayer, Thomas, Thurston, and Webster) have no non-physician clinicians (NPCs), i.e., chiropractors,<sup>10</sup> podiatrists, and optometrists (Figure 81). Of these, all but four, Furnas, Thurston, Polk, and Thayer, are frontier counties. About a third (33) of the counties have an NPC-to-population ratio above the 2004 national average of 43.1 to 100,000 population.

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<sup>10</sup>In Title 172 NAC 29, Practice of Chiropractic, a chiropractor is referred to as a chiropractor or a chiropractic physician.

**Figure 81. Distribution of Actively Licensed Non-Physician Clinicians per 100,000 Population by County, Nebraska 2008**



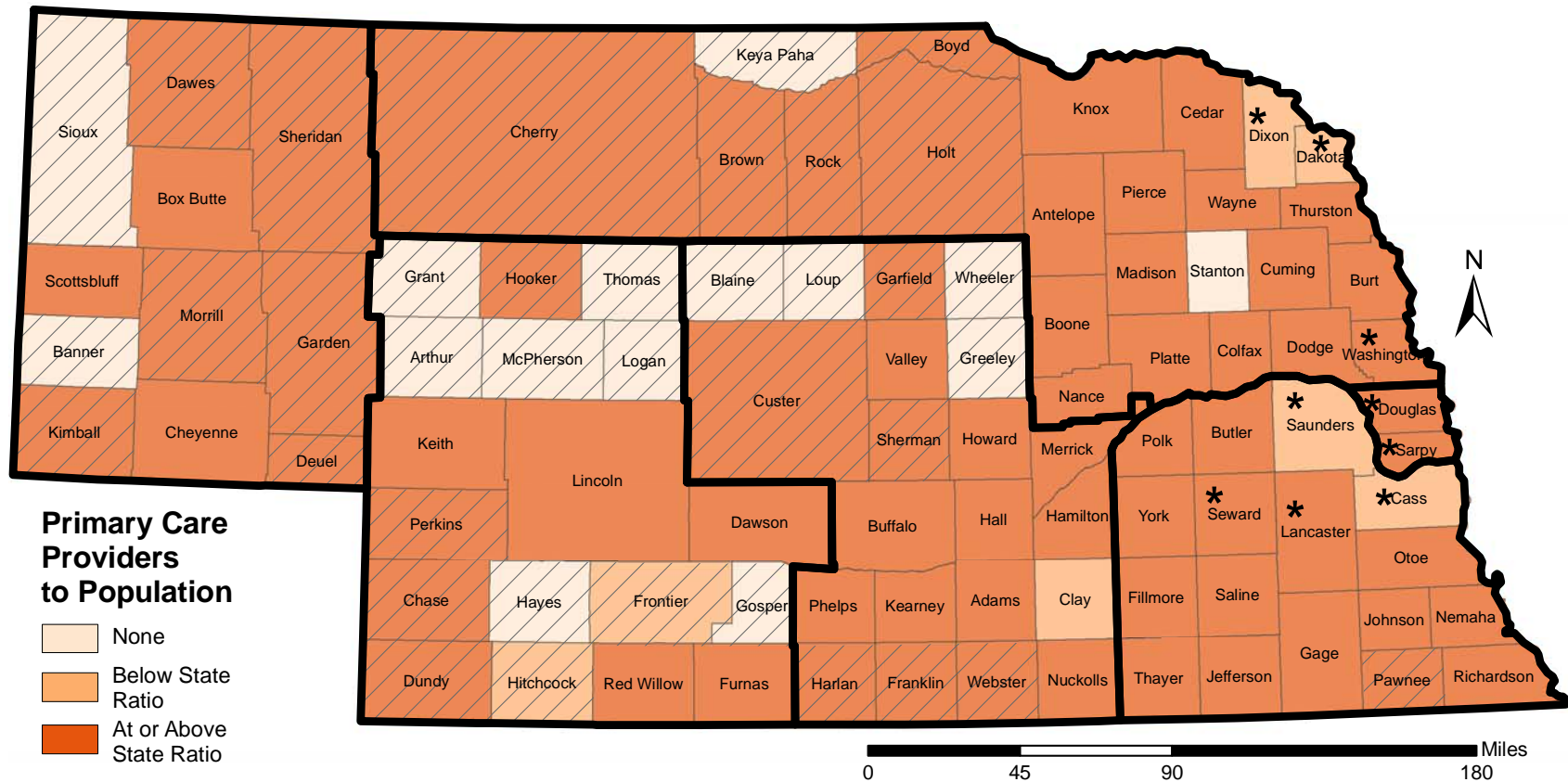
## Primary Care Providers

Primary care providers include the specialties of general practice, family practice, general internal medicine, general pediatrics, and obstetrics. The federal primary care Health Professional Shortage Area (HPSA) designation uses a ratio of 1 primary care physician (medical doctors and doctors of osteopathy) to 3,500 population. In areas of high need, the ratio is 1:3,000. Nebraska's state-designated shortage areas use a benchmark ratio of 1:2,000. We designated Nebraska's counties as being above or below the state's benchmark ratio of 1:2,000. However, we used a broader definition of primary care practitioners by including nurse practitioners and physician assistants practicing in primary care. The rationale for this was that in rural areas, especially in rural health clinics, mid-level practitioners have an important role in primary care.

Figure 82 depicts the distribution of primary care providers based on the primary practice location in 2007. Fifteen counties had no primary care provider. These counties are Arthur, Banner, Blaine, Gosper, Grant, Greeley, Hayes, Keya Paha, Logan, Loup, McPherson, Sioux, Stanton, Thomas and Wheeler. Of these, all but one, Stanton, are frontier counties. Seven counties, Frontier, Hitchcock, Clay, Dixon, Dakota, Saunders and Cass, were below the Nebraska benchmark ratio. Of these, two, Frontier and Hitchcock, are frontier counties, and Saunders and Cass are metropolitan counties.

In addition, the full-time equivalent (FTE) primary care provider supply was calculated using the number of hours worked at both primary and satellite locations. All practitioners were measured in FTE units weighted for workforce participation and relative productivity and scope of practice. Practitioners working full time were weighted as 1.0 and part time as 0.5. The productivity/scope of practice weights used to calculate FTEs for nurse practitioners and physician assistants were 0.5 (Ricketts, et al., 2007). Figure 83 shows the distribution of FTE primary care physicians in Nebraska. Figure 84 shows the distribution of FTE primary care providers in Nebraska.

**Figure 82. Distribution of Actively Practicing Primary Care Providers by County, Nebraska 2007**

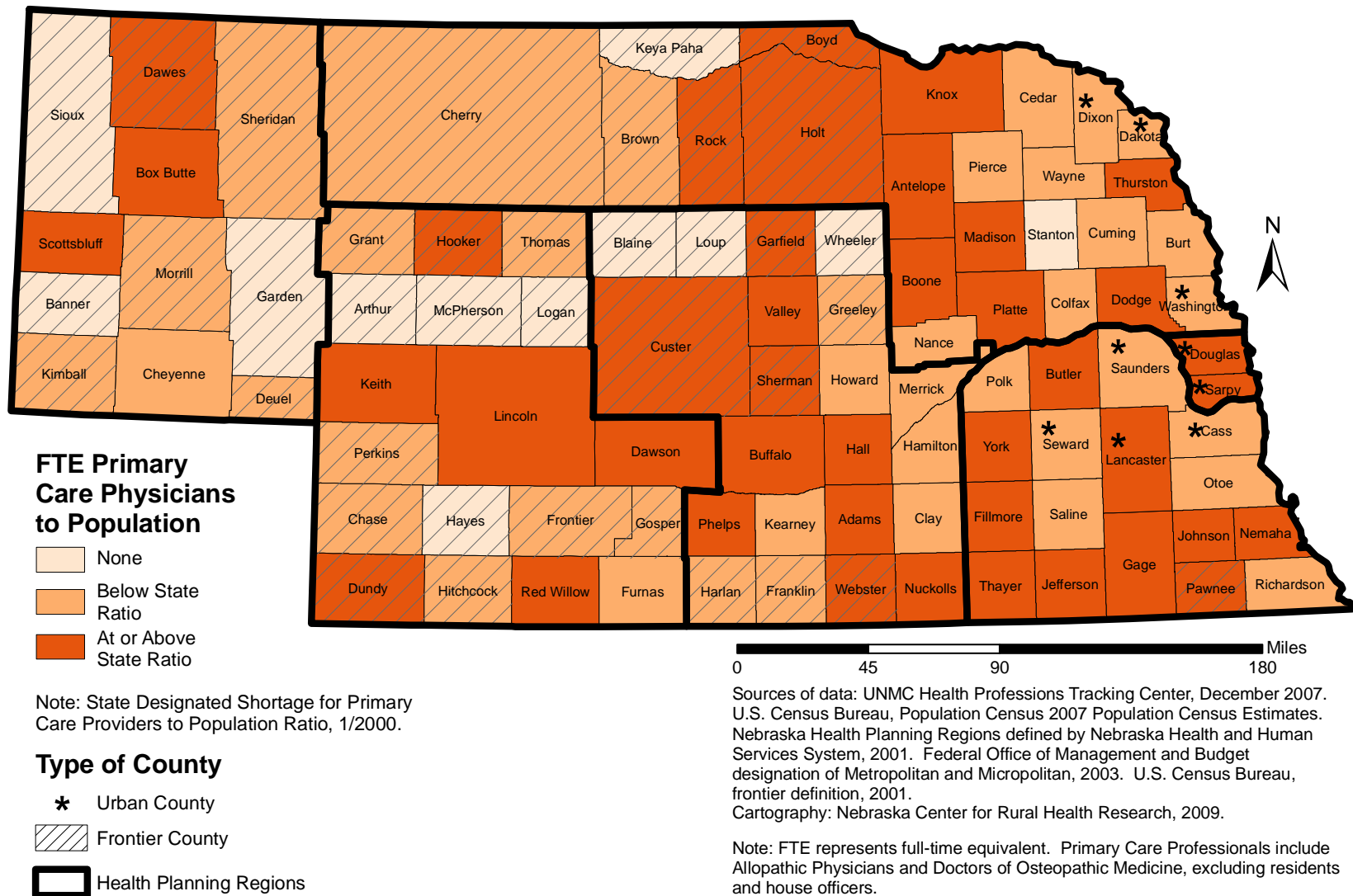


Note: State Designated Shortage for Primary Care Providers to Population Ratio, 1/2000.

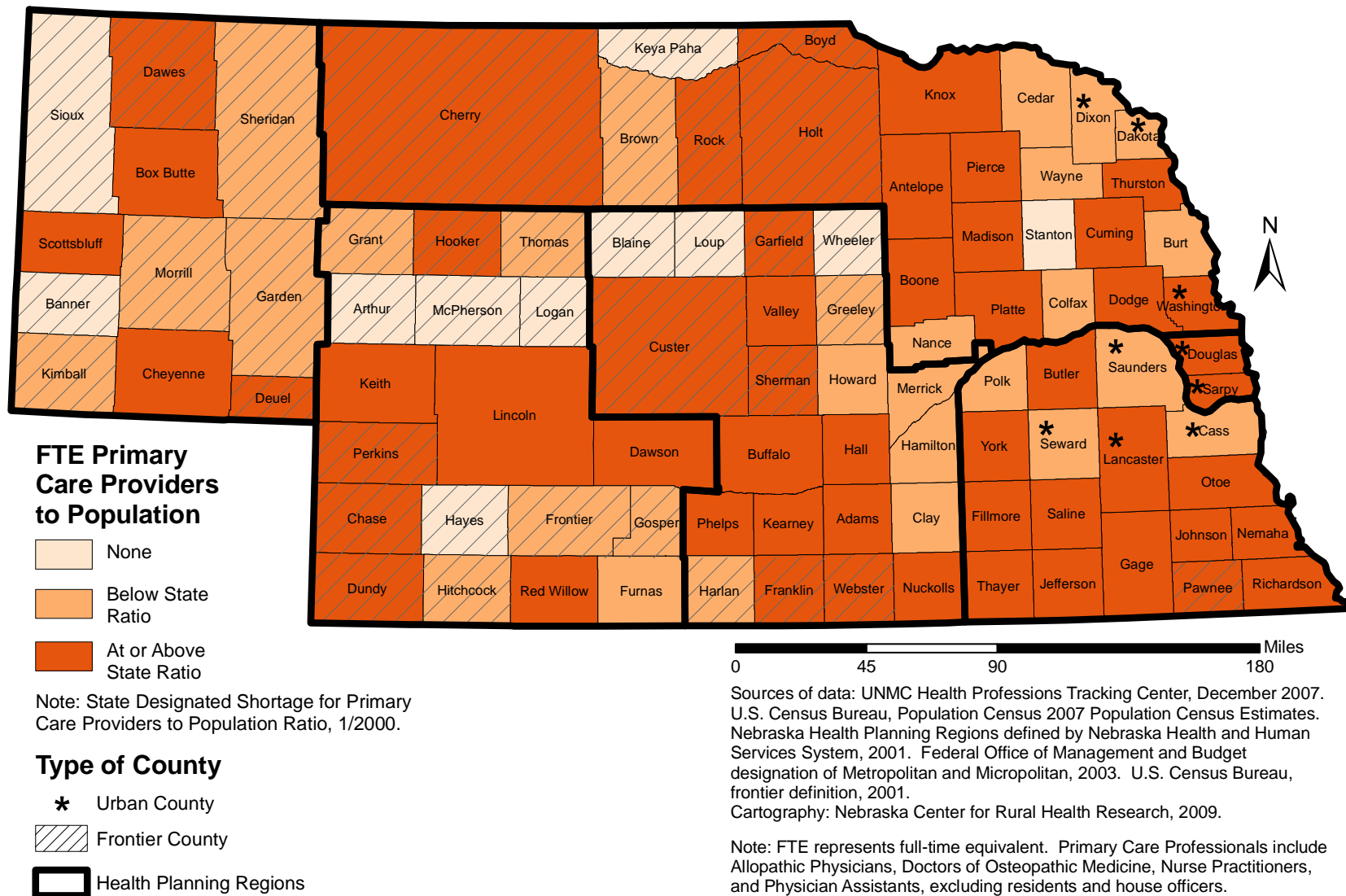
Sources of data: UNMC Health Professions Tracking Center, December 2007. U.S. Census Bureau, Population Census 2007 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001. Cartography: Nebraska Center for Rural Health Research, 2008.

Note: Primary Care Providers include Allopathic Physicians, Doctors of Osteopathic Medicine, Nurse Practitioners, and Physician Assistants, excluding residents and house officers.

**Figure 83. Distribution of Actively Practicing FTE Primary Care Physicians by County, Nebraska 2007**



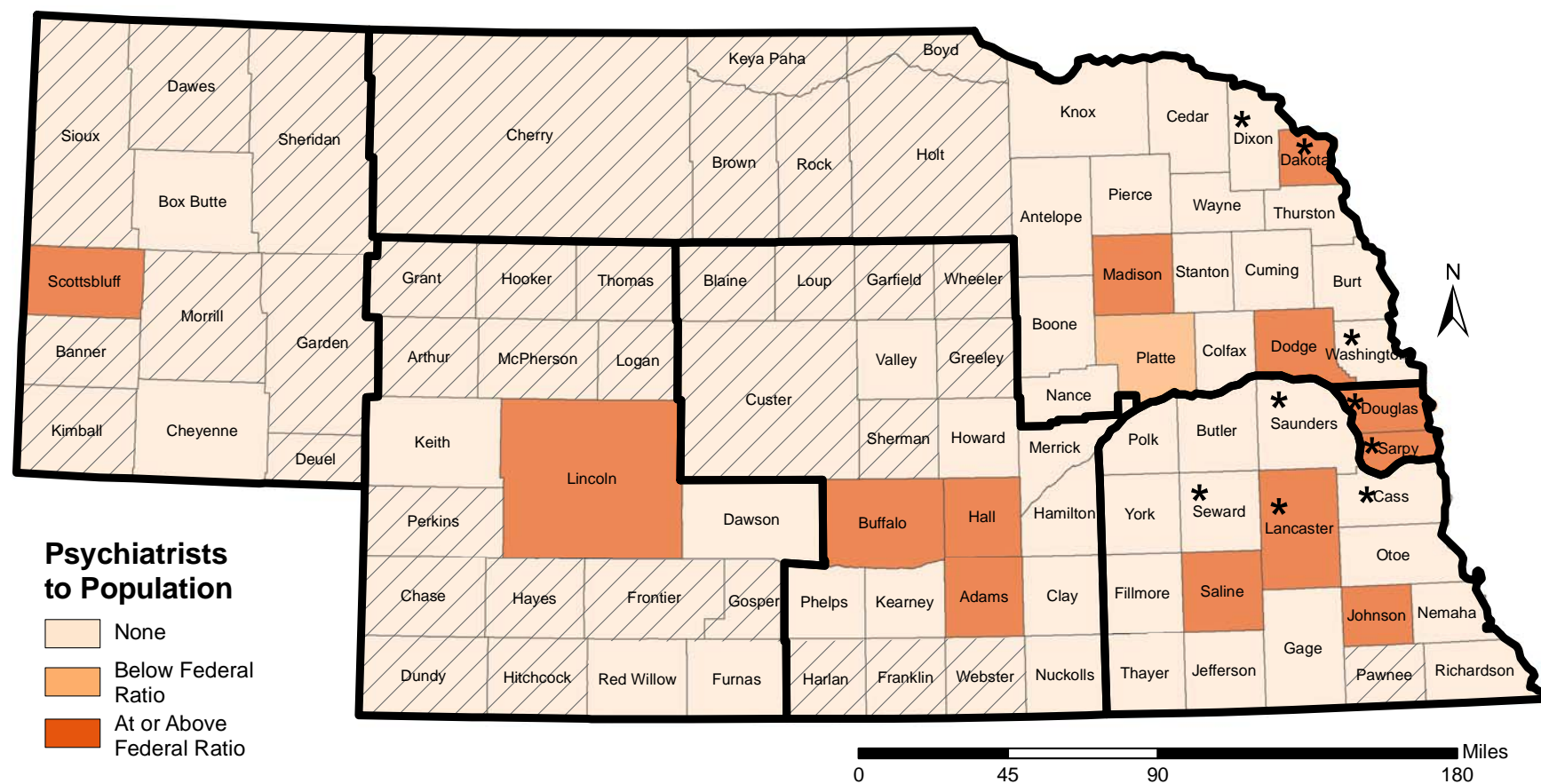
**Figure 84. Distribution of Actively Practicing FTE Primary Care Providers by County, Nebraska 2007**



## **Mental Health Professionals**

The ratio of psychiatrists to 100,000 population in Nebraska in 2008 was 8.3. This is higher than the national average ratio of 7.4 in 2004. The federal mental health HPSA designation uses a ratio of 1 psychiatrist to 30,000 population. Nebraska's statewide ratio is higher than this, at 1 psychiatrist to 12,050 population. However, in terms of regional needs, only 13 of Nebraska's 93 counties in 2008 had a ratio at or above the federal shortage area designation ratio of 1:30,000 (Figure 85). These counties are Adams, Buffalo, Dakota, Dodge, Douglas, Hall, Johnson, Lancaster, Lincoln, Madison, Saline, Sarpy, and Scotts Bluff. All the rest, except Platte County, have no psychiatrists. For all behavioral health professionals, Nebraska's ratio is 101.2 per 100,000 population. Over a third (37) of Nebraska's 93 counties, have no behavioral health professionals (Figure 86). Of these, Dixon is a metropolitan county. Five counties, Knox, Pierce, Colfax, Saunders, and Richardson, are below the federal shortage area designation ratio of 1 behavioral health provider to 6,000 population.

**Figure 85. Distribution of Actively Practicing Psychiatrists by County, Nebraska 2007**



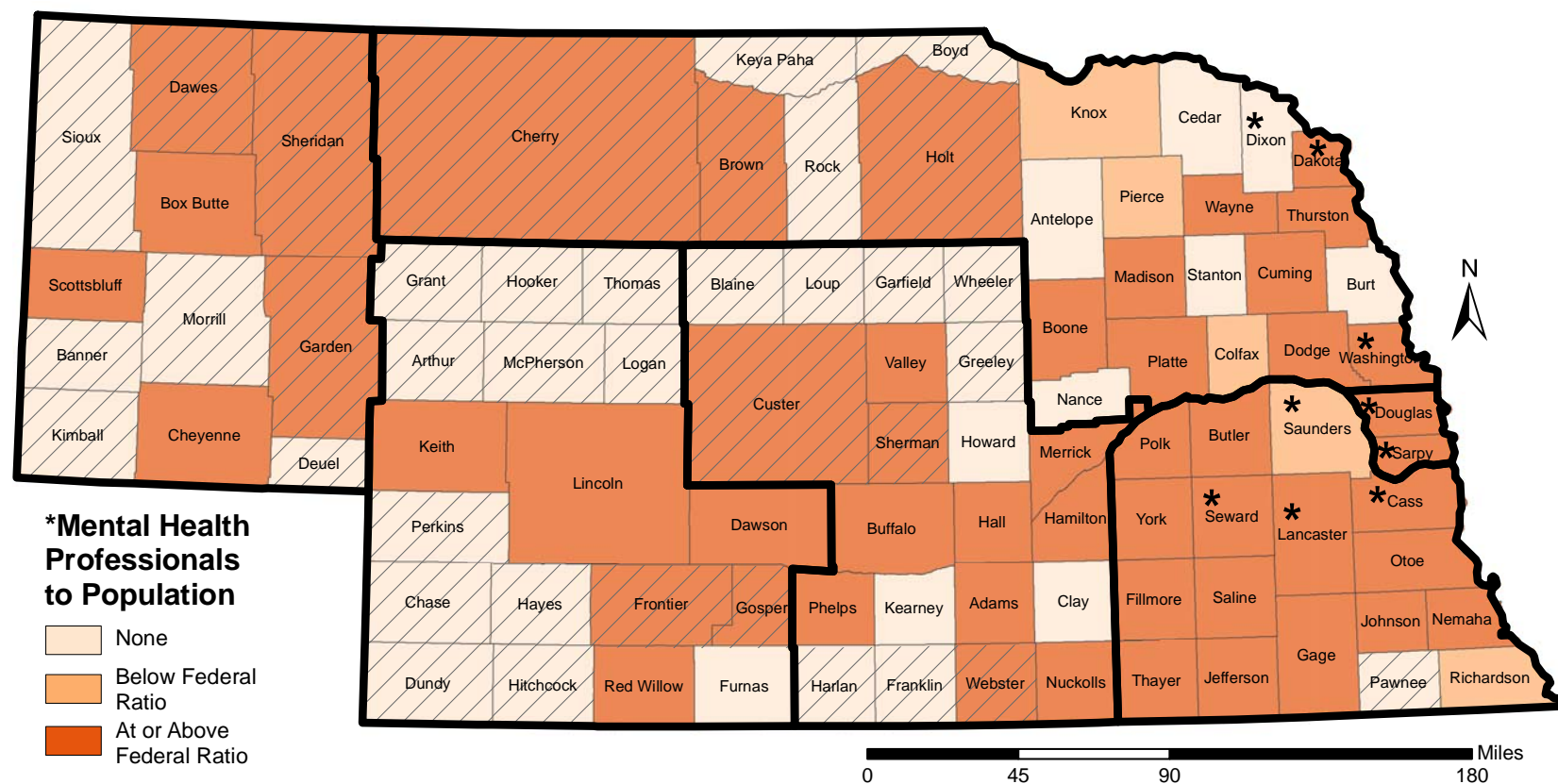
Note: Federal Designated Shortage for Psychiatrists to Population Ratio, 1/30,000.

Sources of data: UNMC Health Professions Tracking Center, December 2007. U.S. Census Bureau, Population Census 2007 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001.

Cartography: Nebraska Center for Rural Health Research, 2009.



**Figure 86. Distribution of Actively Practicing Mental Health Professionals by County, Nebraska 2008**



Note: Federal Designated Shortage for Mental Health Providers to Population Ratio, 1/6000.

Sources of data: UNMC Health Professions Tracking Center, December 2007. U.S. Census Bureau, Population Census 2007 Population Census Estimates. Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001. Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003. U.S. Census Bureau, frontier definition, 2001. Cartography: Nebraska Center for Rural Health Research, 2009.

\*Note: Mental Health Professionals include Psychiatrists, Nurse Practitioners and Physician Assistants, Clinical Psychologists, Licensed Mental Health Practitioners, Alcohol and Drug Counselors, and Psychologists.

## **Federal Shortage Area Designation**

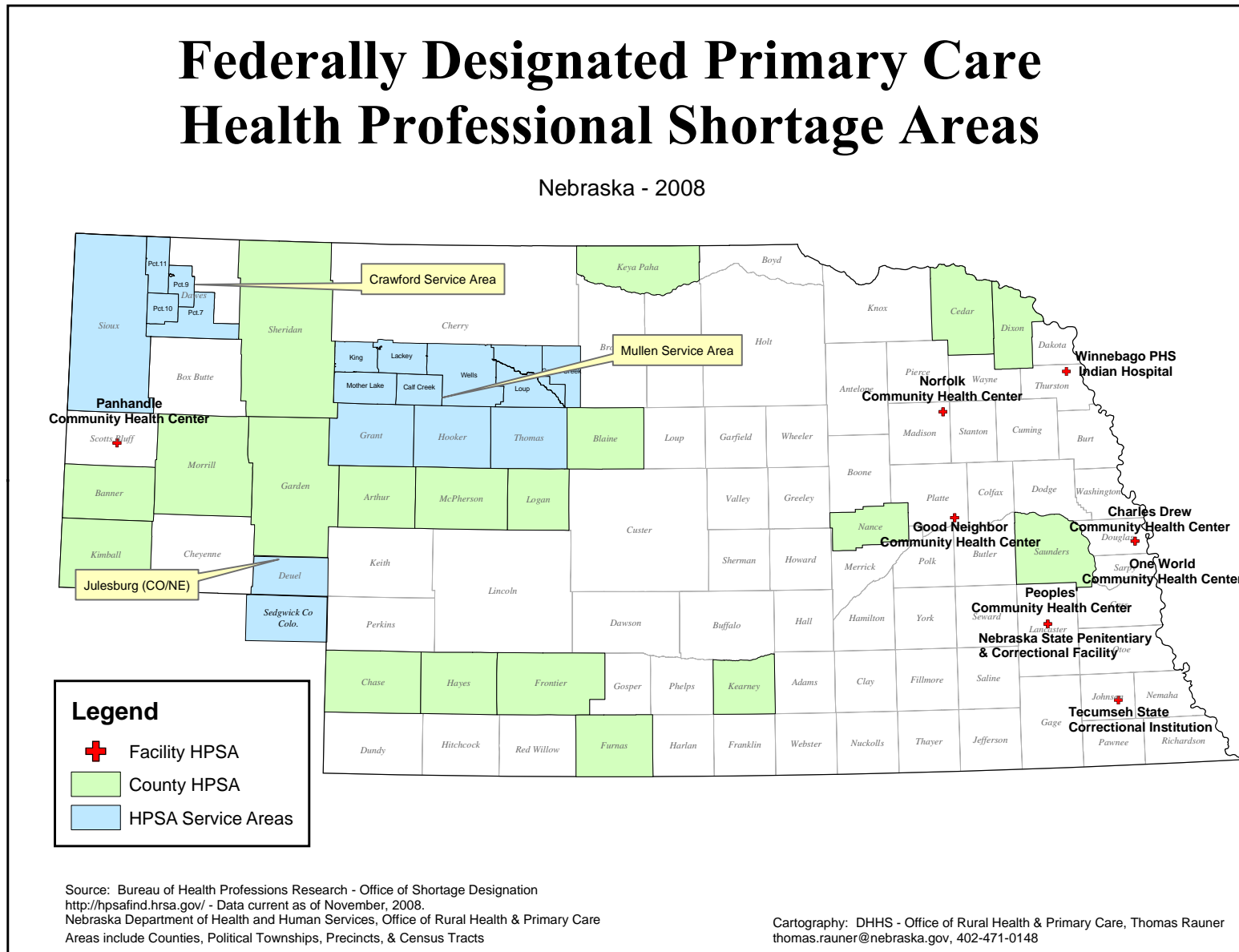
### **Primary Care Professionals**

Primary care HPSAs are currently designated in a tiered process based on geography-level characteristics, facility-level characteristics, or service to special populations. As shown in Figure 87, HPSAs are designated based on county, facility, and service area characteristics and are used for the placement of primary care physicians under the National Health Service Corps (NHSC) and J-1 visa waiver or Conrad 30 programs. Fifty-one of Nebraska's 93 counties are currently federally designated primary care HPSAs. Of these, 24 are designated single-county HPSAs.<sup>11</sup> The HPSA designations are updated regularly by the Office of Rural Health, NDHHS.

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<sup>11</sup> Accessed at <http://hpsafind.hrsa.gov/HPSASearch.aspx> on August 24, 2009.

Figure 87. Federally Designated Primary Care Health Professional Shortage Areas, Nebraska 2008



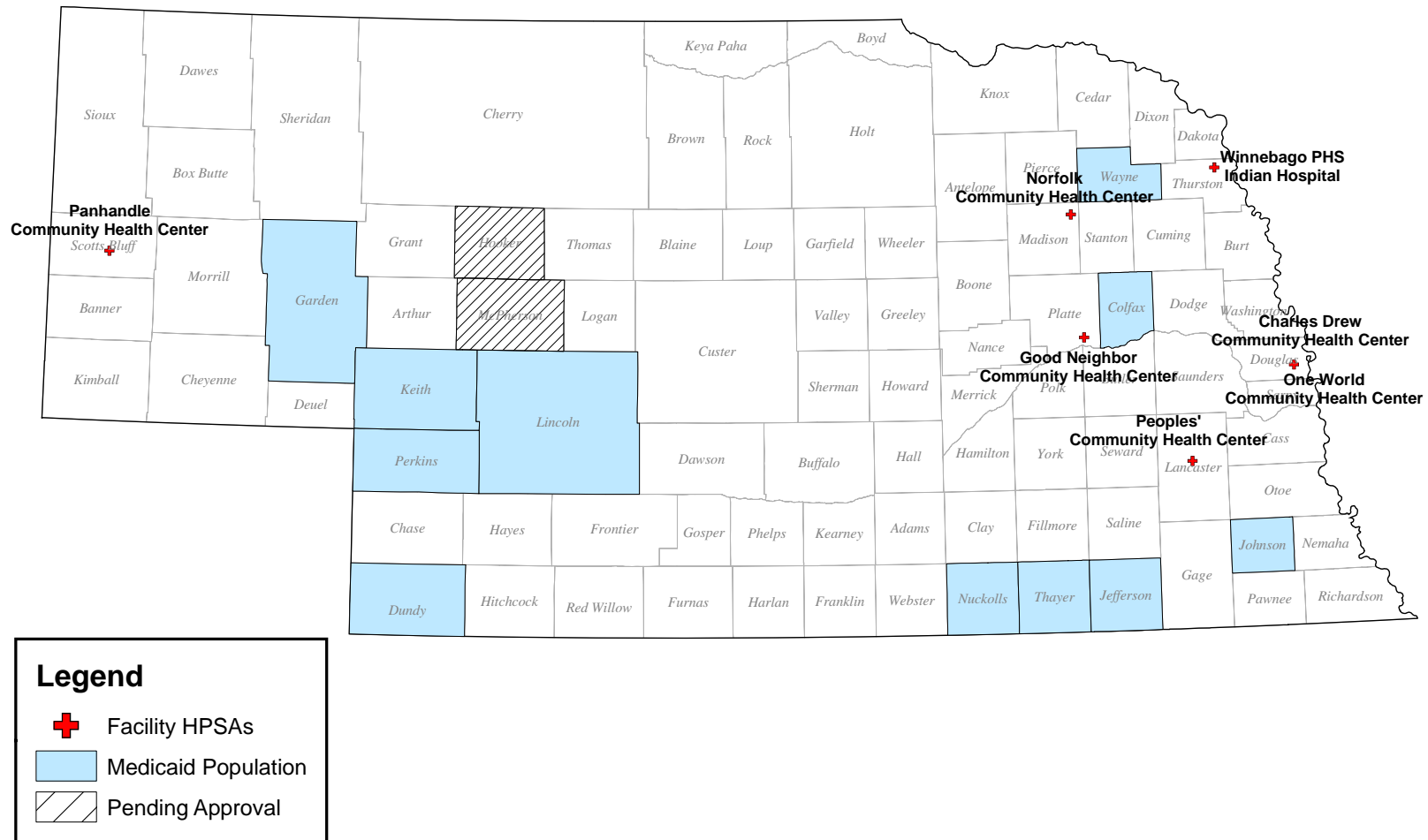
## **Dental Health Professionals**

The federal threshold ratio of 1 dentist to 5,000 population has been criticized because it is considered to indicate dental services that are grossly inadequate and because the ratio is roughly two and a half times the national average ratio and double the average patient load of a typical dental practice (Orlans, Mertz, & Grumbach, 2002). The national median has been suggested as an alternative standard, but this is not yet universally accepted. Twenty-five of Nebraska's counties are currently federally designated dental HPSAs.<sup>12</sup> The Nebraska Office of Rural Health updates the information on dental HPSAs (Figure 88).

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<sup>12</sup> Accessed at <http://hpsafind.hrsa.gov/HPSASearch.aspx> on August 24, 2009.

**Figure 88. Federally Designated Dental Health Professional Shortage Areas, Nebraska 2008**



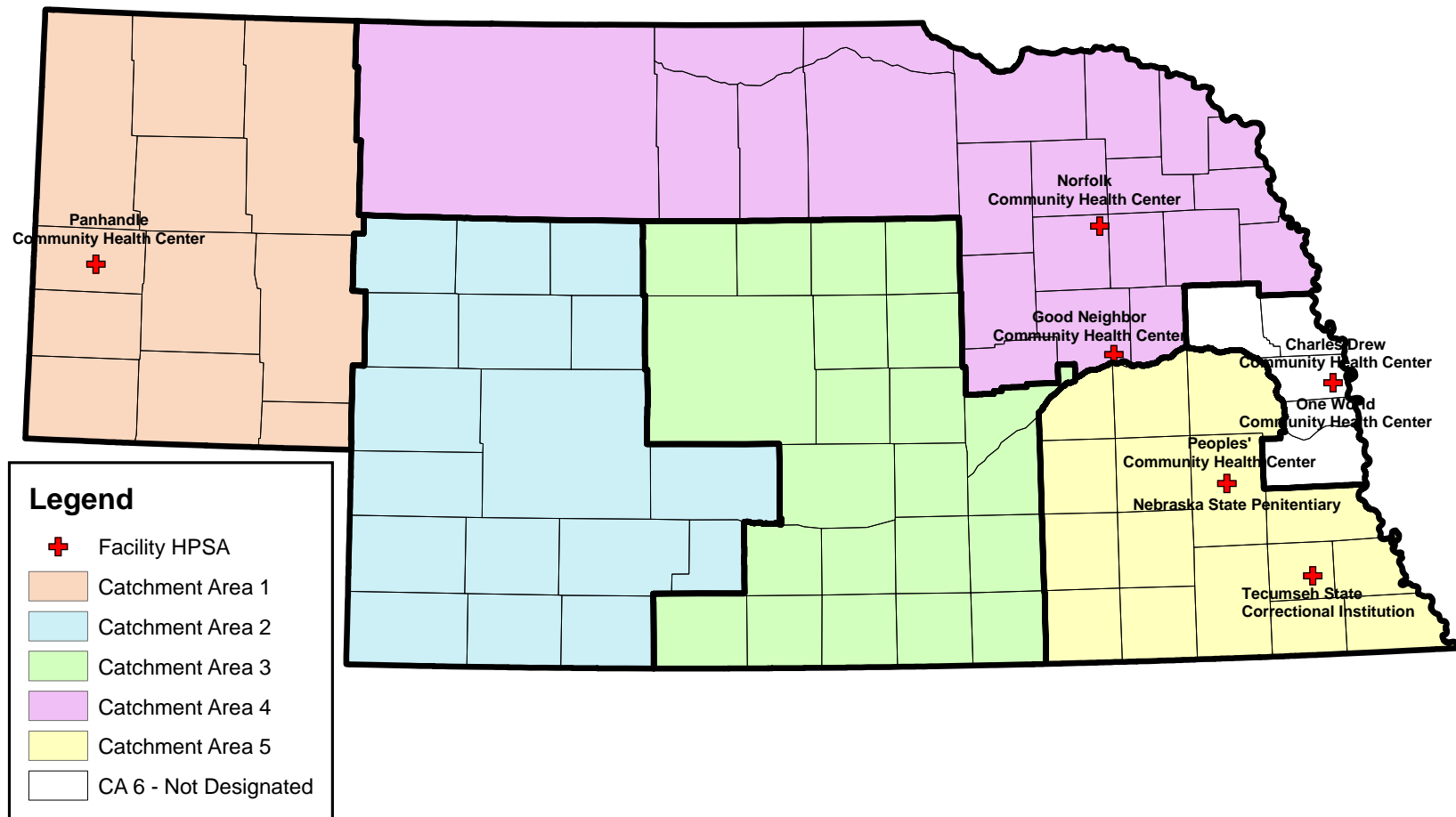
Source: Bureau of Health Professions Research - Office of Shortage Designation  
<http://hpsafind.hrsa.gov> - Data current as of November, 2008.  
 Nebraska Department of Health and Human Services, Office of Rural Health & Primary Care

Cartography: DHHS - Office of Rural Health & Primary Care, Thomas Rauner  
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## **Mental Health Professionals**

As with primary care, mental health HPSAs are currently designated in a tiered process based on geography-level characteristics, on facility-level characteristics, or on service to special populations. The federal shortage area designation uses a population-to-psychiatrist ratio greater than or equal to 30,000:1. The Nebraska Office of Rural Health updates the information on mental health HPSAs. The federal mental health HPSAs include all of the counties with the exception of Mental Health Catchment area 6 (Cass, Dodge, Douglas, Sarpy, and Washington counties) in 2008 (Figure 89).

**Figure 89. Federally Designated Mental Health Professional Shortage Areas, Nebraska 2008**



Source: Bureau of Health Professions Research - Office of Shortage Designation  
<http://hpsafind.hrsa.gov/> - Data current as of 11/2008.  
 Nebraska Department of Health & Human Services, Office of Rural Health & Primary Care

Cartography: Thomas Rauner, Department of Health & Human Services,  
 Office of Rural Health, (402) 471-0148, [thomas.rauner@nebraska.gov](mailto:thomas.rauner@nebraska.gov)

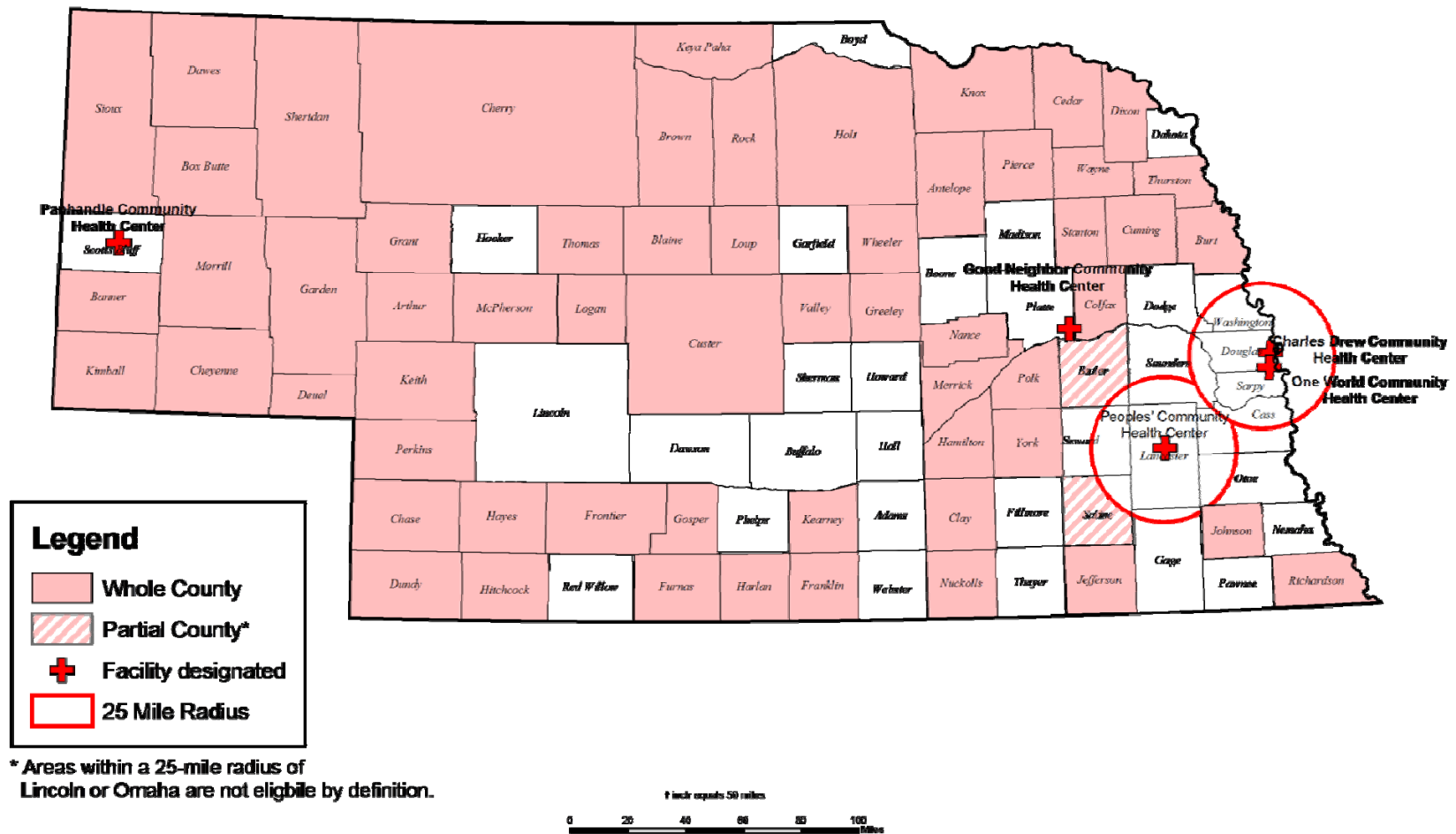
## **State Shortage Area Designation**

The Rural Health Advisory Commission designates state-designated shortage areas for the specialties of family practice, general surgery, general internal medicine, general pediatrics, psychiatry/ mental health, general dentistry, pediatric dentistry and oral surgery, pharmacists, and occupational and physical therapists. This information is updated regularly and is used to administer the state's rural incentive programs (Figures 90 to 97).

A service area is designated as an occupational therapy shortage area or physical therapy shortage area if there is no occupational or physical therapist in the service area or if the population-to-occupational therapist ratio or population-to-physical therapist ratio equals or exceeds 5,000/1. In 2007, 30 of Nebraska's counties were state-designated shortage areas for physical therapists, and about half (46) of Nebraska's counties were designated shortage areas for occupational therapists (Figures 96 and 97).



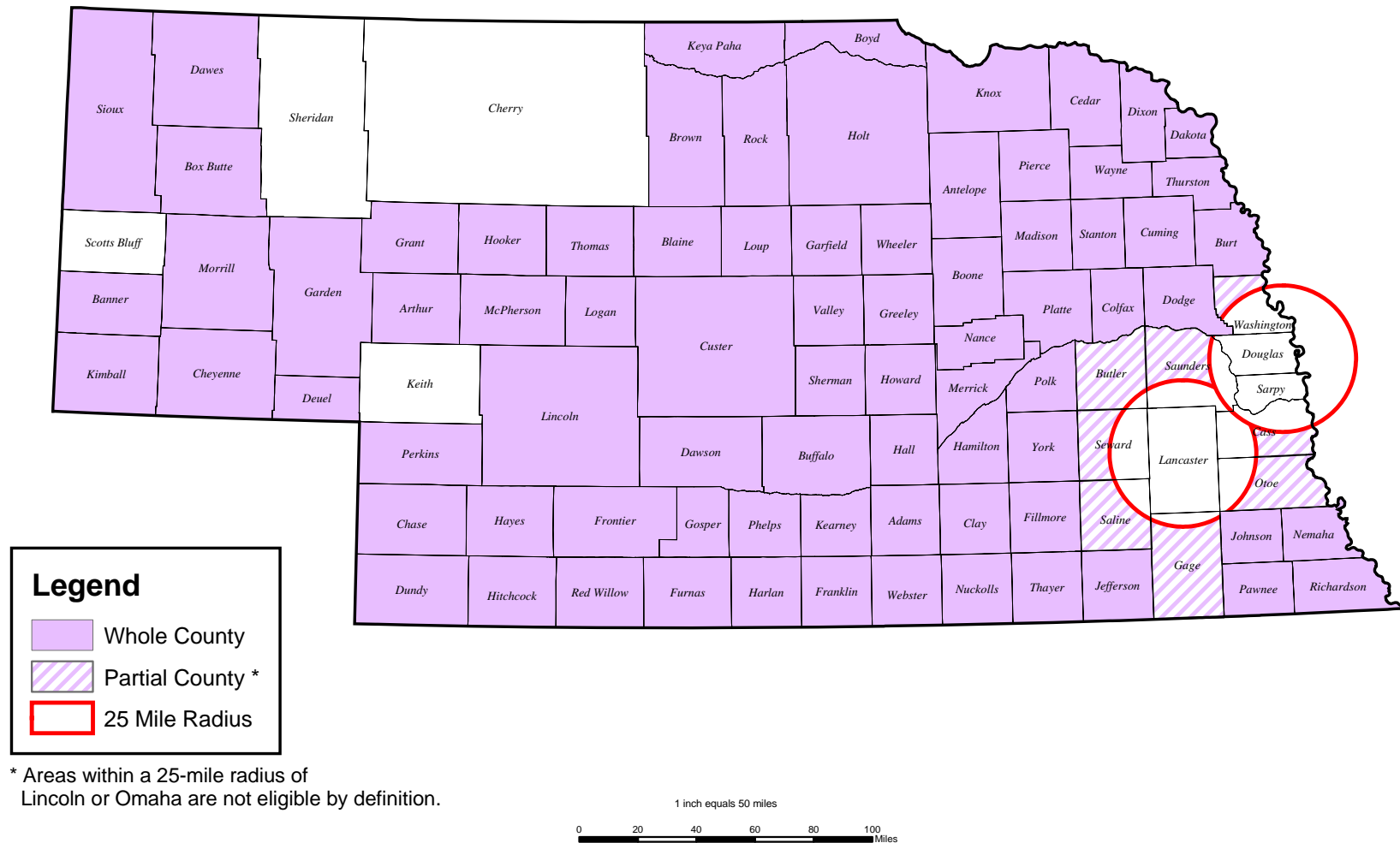
Figure 90. State-Designated Medical Shortage Areas, Family Practice, Nebraska 2007



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update November, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

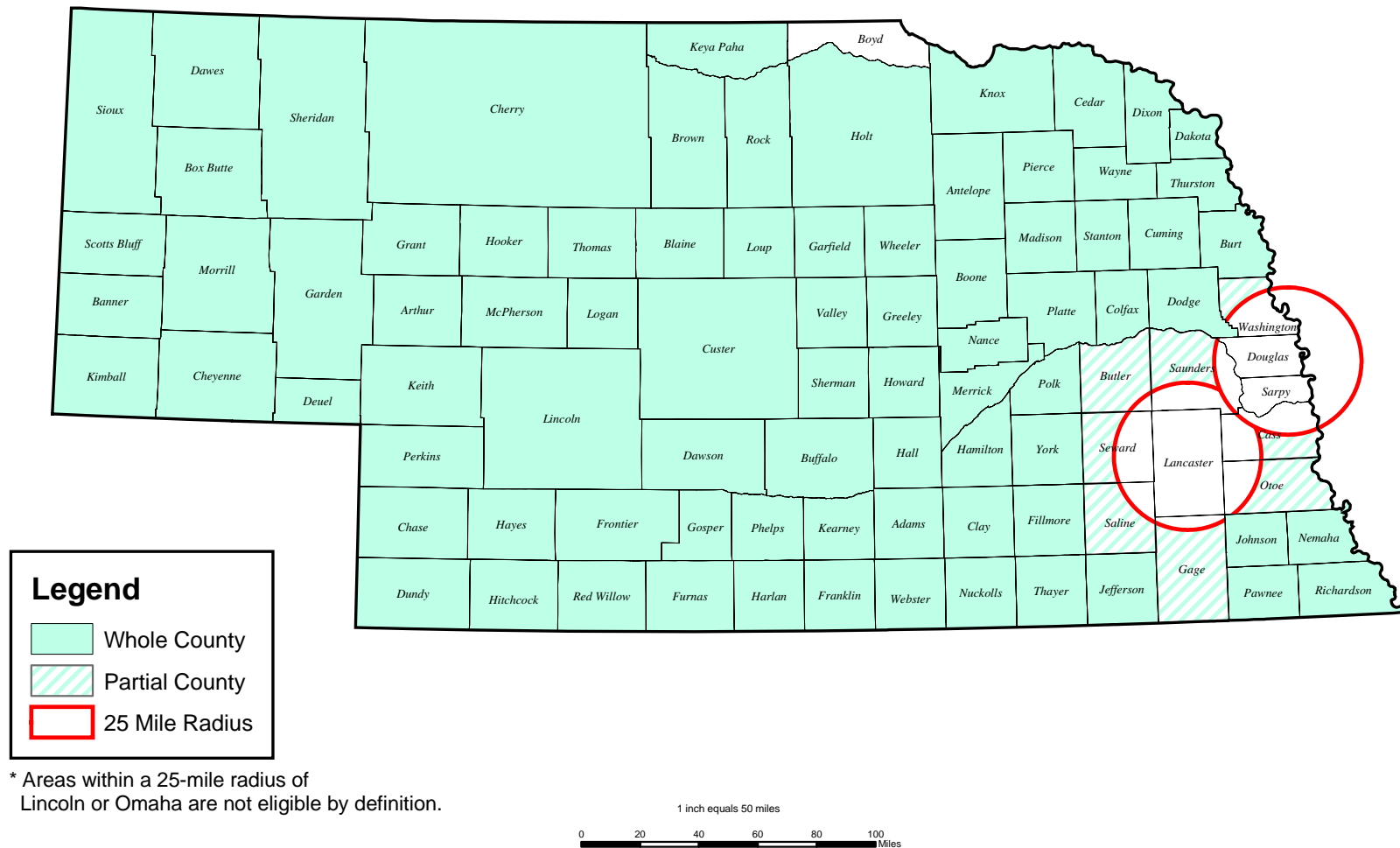
**Figure 91. State-Designated Medical Shortage Areas, General Surgery, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update July, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

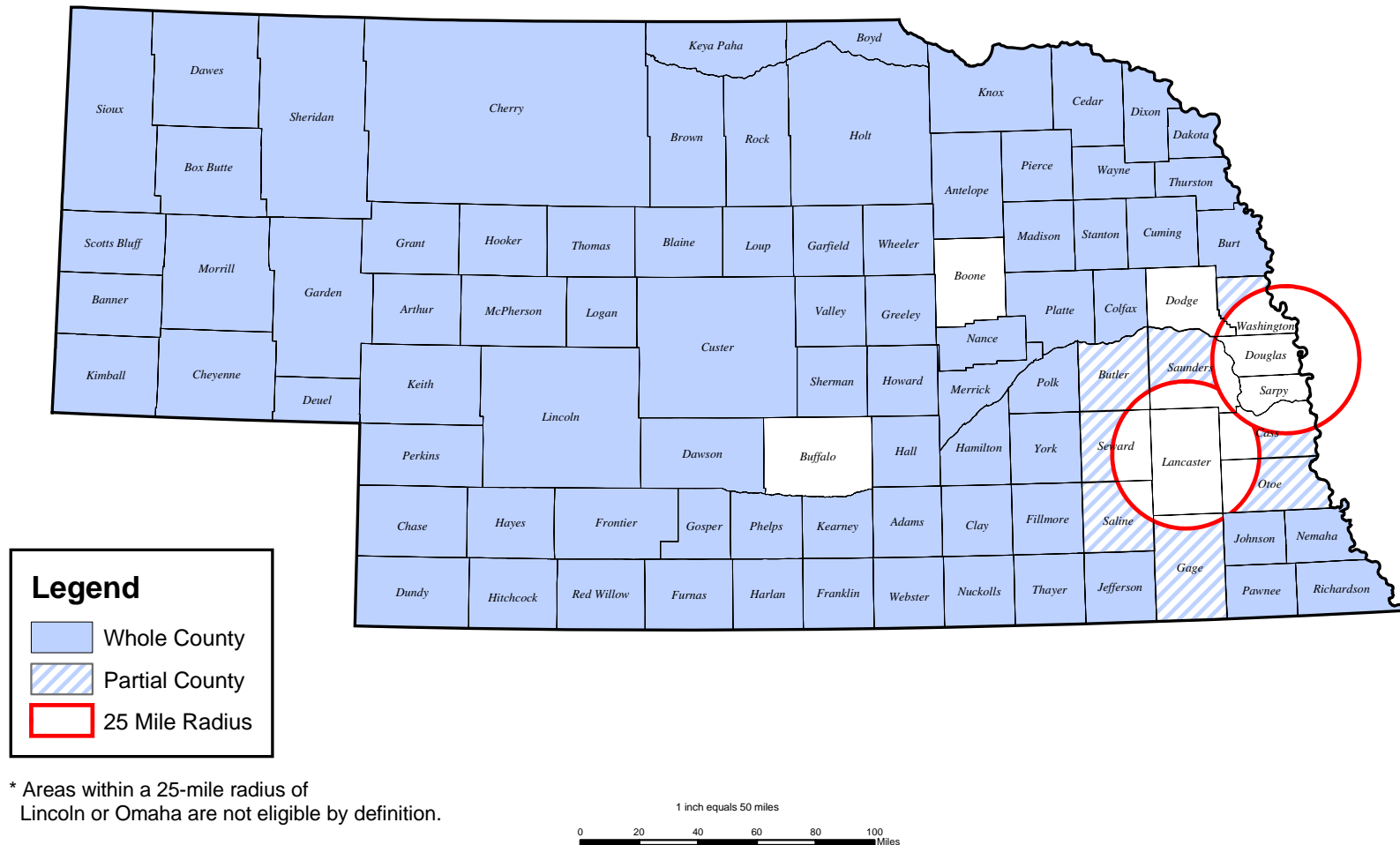
**Figure 92. State-Designated Medical Shortage Areas, General Internal Medicine, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update October, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

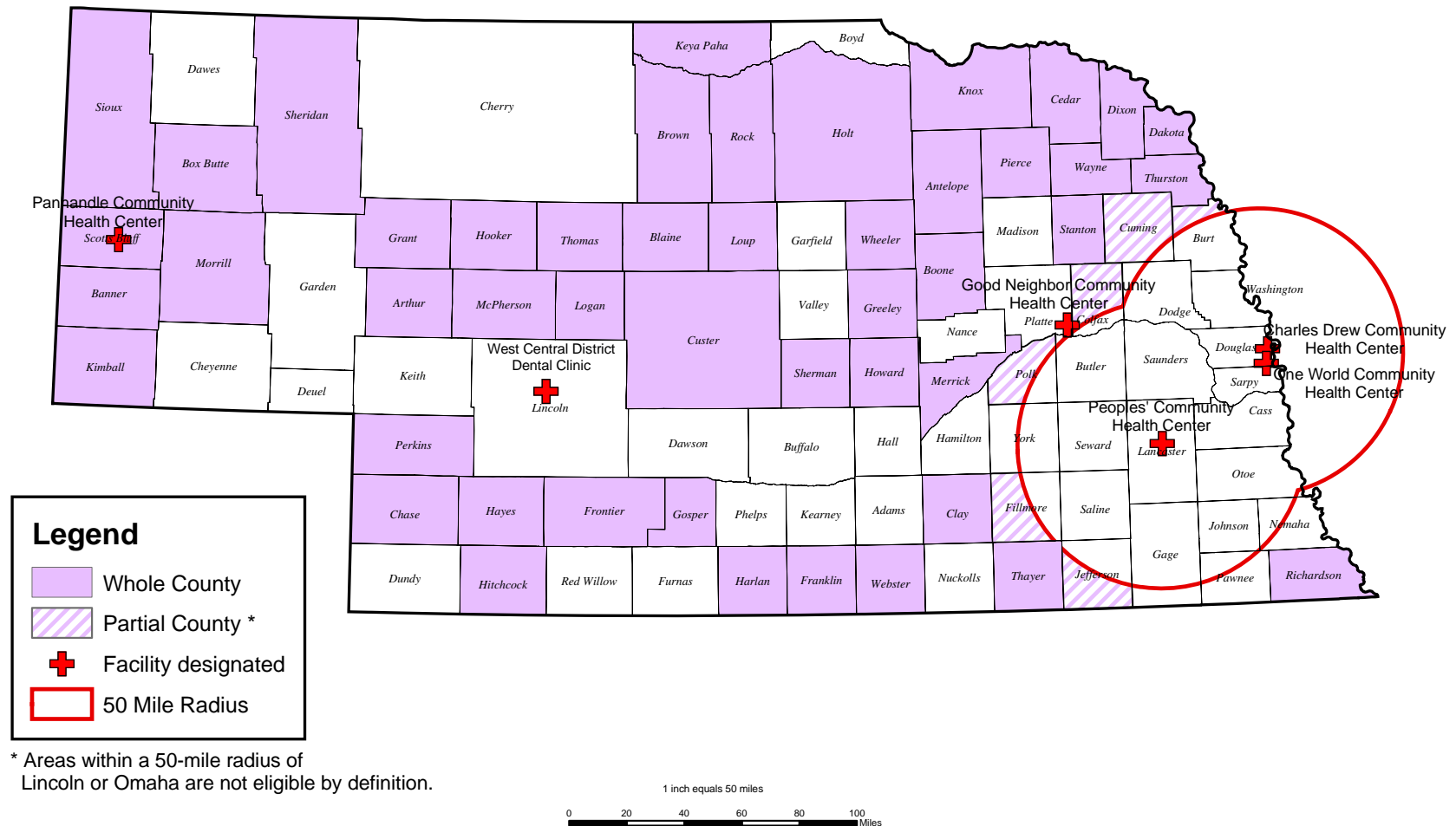
**Figure 93. State-Designated Medical Shortage Areas, General Pediatrics, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update July, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

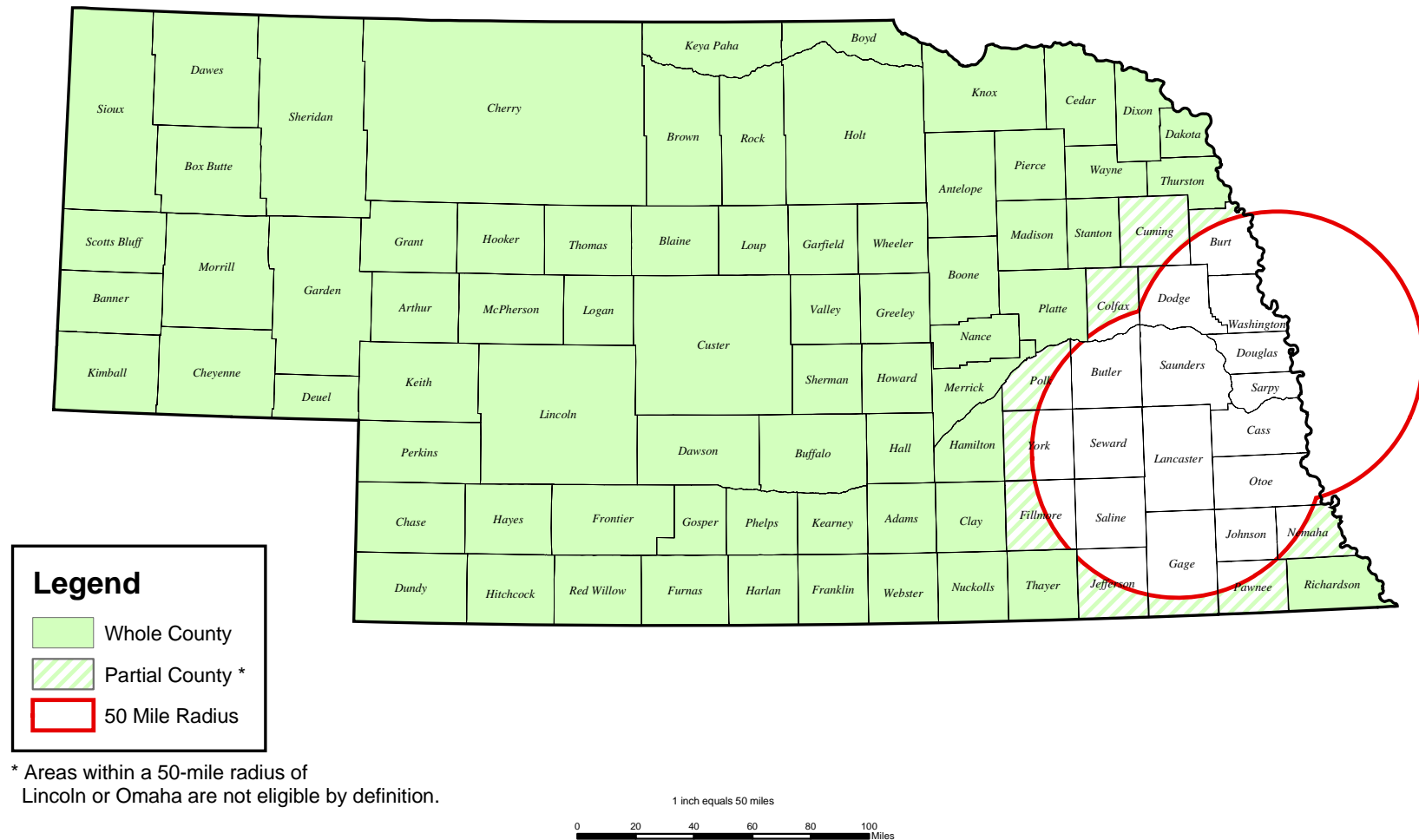
**Figure 94. State-Designated Dental Shortage Areas, General Dentistry, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update June, 2008.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

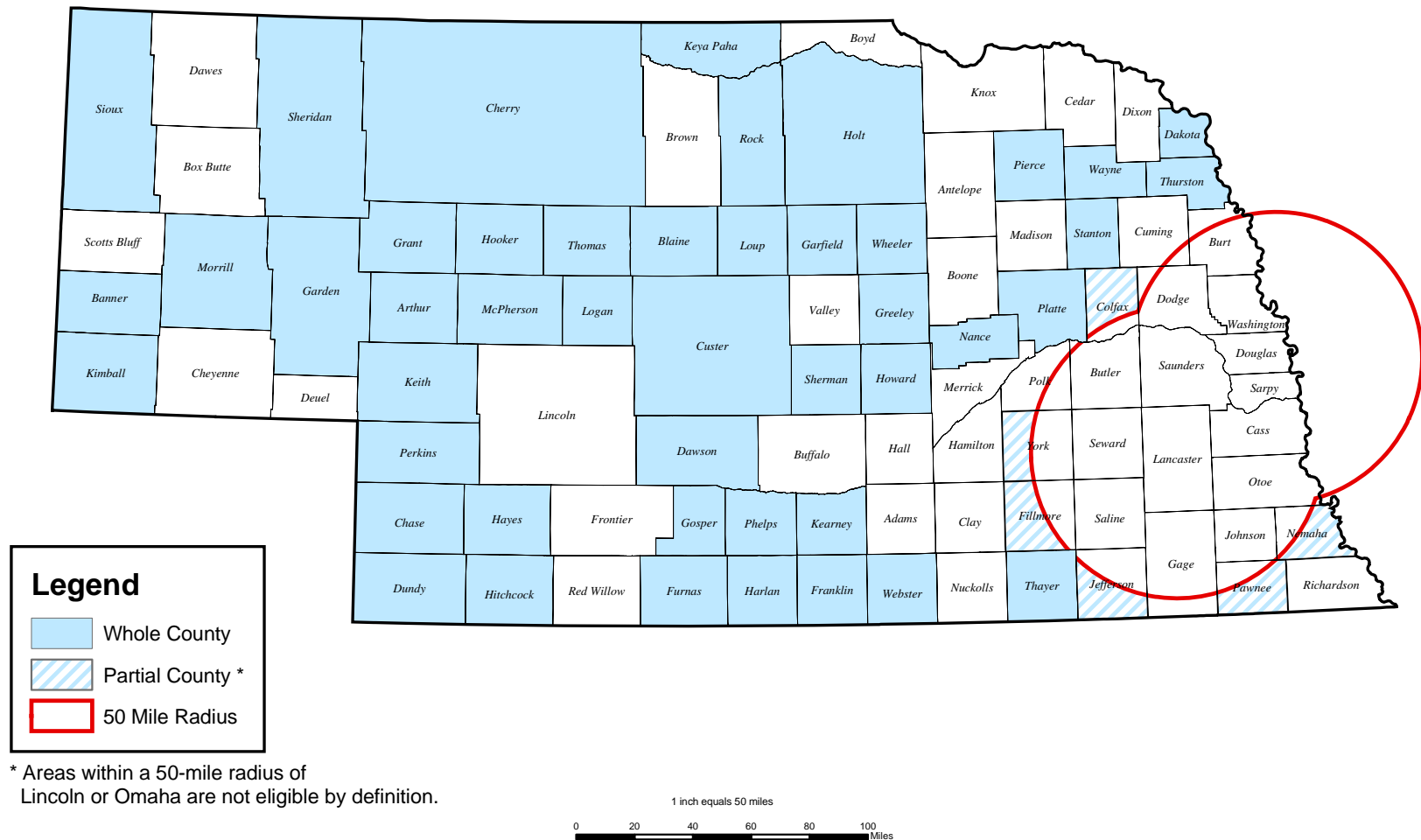
**Figure 95. State-Designated Dental Shortage Areas, Pediatric and Oral Surgery, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update July 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337. <http://www.dhhs.ne.gov>.

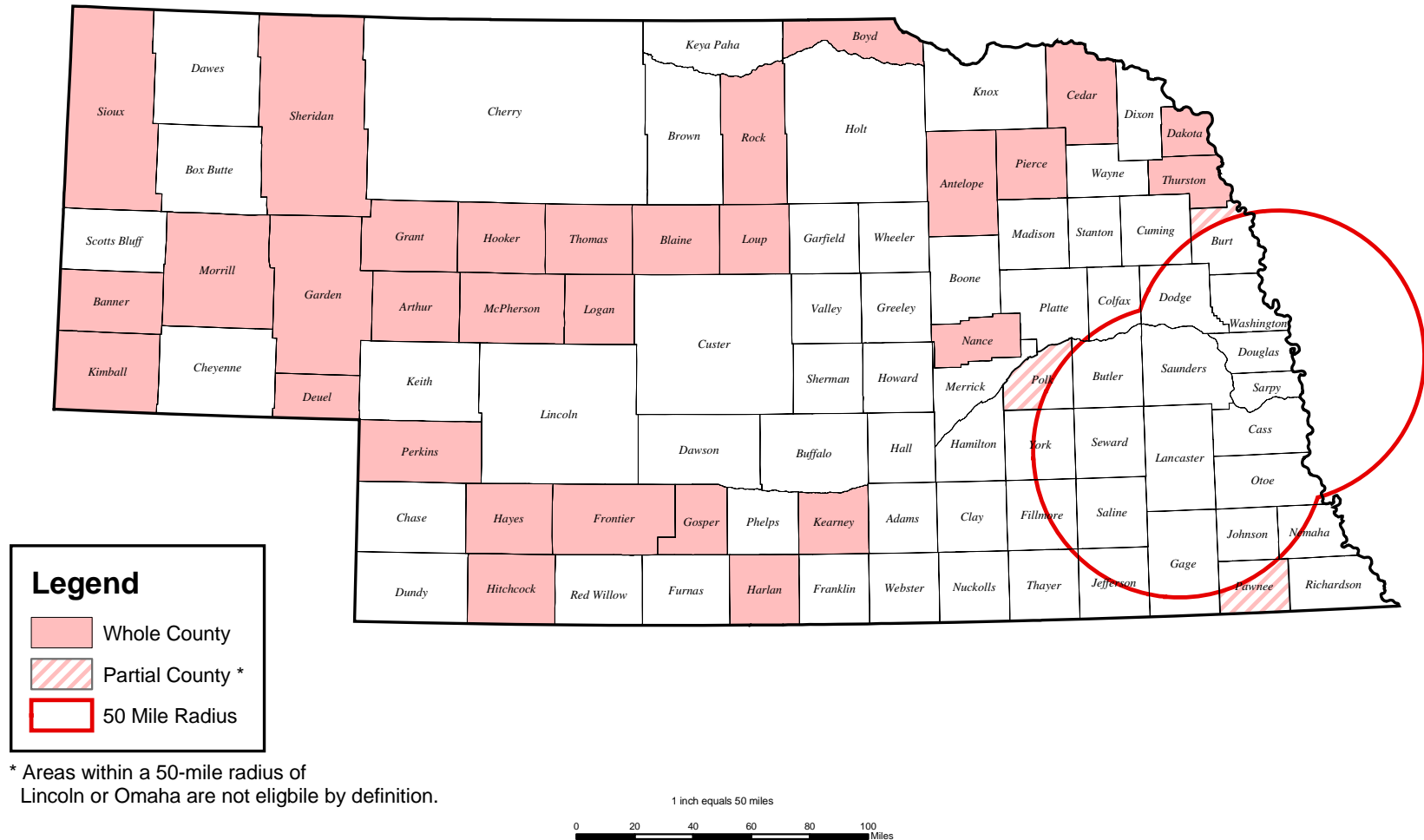
**Figure 96. State-Designated Allied Health Shortage Areas, Occupational Therapists, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update July, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

**Figure 97. State-Designated Allied Health Shortage Areas, Physical Therapists, Nebraska 2007**



Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update July, 2007.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.



## Market Demand-Based Estimates

Vacancy rates are market demand-based estimates of health professional shortages. The problem with using vacancy rates to identify shortages is that it is a facility-based approach to shortages, and in the case of nursing, it has been found that vacancy rates do not correlate well with the number of reported effects of the nursing shortage (Toward a Method for Identifying, 2007). The inability of a facility to recruit and retain health professionals in a county with sufficient overall supply of health professionals may be a result of organizational culture rather than a genuine shortage. Turnover can certainly reflect limited supply but also seems likely to reflect problems of organizational culture, particularly in facilities that had low vacancy rates but high turnover, which might mean that they had no trouble recruiting health professionals but had trouble retaining them (Towards a Method for Identifying, 2007).

### Nurses

According to a February 2002 report on health workforce shortages prepared by First Consulting Group for the American Hospital Association and other trade groups, the average nurse vacancy rate in U.S. hospitals was 13% (The Healthcare Workforce Shortage, 2002). Over one in seven hospitals reported a severe RN vacancy rate of more than 20%.

The Nebraska Center for Nursing in 2006 surveyed nursing facilities in the state to assess the vacancy rates for RNs, LPNs, and UAPs (unlicensed assistive personnel). Eight types of nursing facilities were surveyed, including assisted living facilities, hospices, hospitals, nursing homes, health clinics, home health agencies, end stage renal dialysis centers, and ambulatory surgery centers. The vacancy rates for RNs decreased from 10% in 2000 to 5.9% in 2006. However, for LPNs the vacancy rate decreased from 10.2% in 2000 to 3.8% in 2002 and then increased to 6.7% in 2006. Similarly for UAPs, the vacancy rates decreased from 7.9% in 2000 to 4.8% in 2002 and then increased to 5.4% in 2006. There were also regional differences in the vacancy rates, with the lowest rate (2.4%) in the northern region and the highest rate (7.6%) in the eastern region (Nebraska Nursing Employer Vacancy Survey Report, 2006).

The 2008 Nebraska Hospital Association vacancy report estimates the RN vacancy rate for Nebraska in 2008 at 4.5% and the turnover rate at 9.5%. The vacancy rate was 5.2% for non-IV-certified LPNs and 7% for IV-certified LPNs. The turnover rate for non-IV-certified LPNs was 10.4% and for IV-certified LPNs was 8.7% (Table 16) (Nebraska Workforce Report, 2008). Critical Access Hospitals (CAHs) in Nebraska have higher vacancy and turnover rates. The RN vacancy rate for CAHs in Nebraska was 7.5% and the turnover rate was 10.8%.

## **Pharmacists**

The 2000 national pharmacist workforce study described a shortage of pharmacists, with vacancy rates rising: 7% in community pharmacies, 9% in hospitals, and 11% in public hospitals (Cooksey, Knapp, Walton, & Cultice, 2002). Nationally, pharmacist vacancy rates dropped from 8% in the early 2000s to 5% in 2004. This drop was due to rising salaries for pharmacists, increased use of pharmacy technicians, and expansion in the scope of work of pharmacy technicians and technology that contributed to higher pharmacist productivity (The Adequacy of Pharmacist Supply, 2008).

Since mid-1999, the Pharmacy Manpower Project has tracked the shortage of pharmacists nationally by surveying employers of pharmacists monthly. The shortage is tracked using a tool known as the Aggregate Demand Index (ADI), which quantifies the difficulty in filling pharmacist vacancies at the levels of practice setting, state, region, and the nation. The ADI is reported monthly on [www.pharmacymanpower.com](http://www.pharmacymanpower.com) (Knapp & Livesey, 2002). ADI ratings are defined as follows: 5 = high demand for pharmacists, difficult to fill positions, 4 = moderate demand, some difficulty filling positions, 3 = demand in balance with supply, 2 = demand is less than the pharmacist supply available and 1 = demand is much less than the pharmacist supply available (Knapp, Quist, Walton, & Miller, 2005). From 1999 through 2003, the mean ADI for Nebraska was 3.6. Currently, the ADI for Nebraska is 3.5. Some states, such as Texas and New Mexico, have a higher demand, as high as 4.0.

## **Public Health Professionals**

The Great Plains Public Health Leadership Institute (GPPHLI) in 2007 undertook a project to identify the composition and training needs and address the recruitment and retention issues of Nebraska's public health workforce. GPPHLI reported that 55% of the state's public health workforce in 2007 were age 50 and older (Hahn & Svoboda, 2007).

## **Allied Health Professionals**

In 2008, the Nebraska Hospital Association reported vacancy and turnover rates for health care workforce positions. Vacancy rates were 14.5% for occupational therapists, 12.3% for physical therapists, 5.3% for respiratory therapists, 7.6% for pharmacists, and 11.1% for medical laboratory technologists. The turnover rates were 5.7% for occupational therapists, 9.4% for physical therapists, 9.6% for respiratory therapists, 12.6% for pharmacists, and 22.7% for medical laboratory technologists (Table 16). The vacancy rate for physical therapists in CAHs was 19.8%. The turnover rate for medical laboratory technicians in CAHs was 22.4% (Nebraska Workforce Report, 2008).

**Table 16. Health Care Workforce Positions with the Highest Vacancy and Turnover Rates, Nebraska 2008**

<b>Profession</b>	<b>Vacancy Rate</b>	<b>Turnover Rate</b>
Nurse, Staff (RN)	4.5%	9.5%
LPN - (Non-IV Certified)	5.2%	10.4%
LPN - (IV Certified)	7.0%	8.7%
Medical Laboratory Technician	11.1%	22.7%
Medical Technologist	5.5%	8.0%
Occupational Therapist	14.5%	5.7%
Physical Therapist	12.3%	9.4%
Pharmacist, Staff	7.6%	12.6%
Radiology Technologist	1.8%	12.5%
Respiratory Therapist - Registered	5.3%	9.6%
Sonographer, Ultrasound Technologist	8.8%	24.0%

Source: Nebraska Workforce Report, 2008. Prepared by Compdata Surveys, Dolan Technologies Corp., on behalf of the Nebraska Hospital Association.

## CHAPTER III

### ASSESSMENT OF FUTURE NEEDS FOR HEALTH PROFESSIONALS IN NEBRASKA, 2010 – 2025

The objective of Phase 3 of the project was to assess the future needs for health professionals in Nebraska using the available data. The Bureau of Health Professions (BHPr) has developed physician supply and requirements models and nursing supply and demand models to project the future supply of and demand for physicians and registered nurses (RNs) in the nation. The Physician Supply Model projects the future supply of physicians in the nation based on the number of physicians in the previous year; the number of new entrants into the physician workforce (including US and international medical graduates); and attrition due to retirement, death, and disability. The Physician Requirement Model projects the requirements for physicians in the nation based on the current utilization patterns of physician services and the expected trends in demographics, insurance coverage, and patterns of care delivery. The assumption is that physician supply is in balance with requirements in the base year. The models project that the nation will face future shortages of non-primary care physicians through 2020, with the growth in requirements outstripping the growth in supply. The supply of and requirements for primary care physicians will grow at the same rate until 2020, when the requirements will grow faster than supply (The Physician Workforce, 2006). However, these models do not make state-specific projections for physicians and also do not reflect the geographical variation in the adequacy of supply of physicians.

#### **Physician Workforce Projections**

Historical trend data on physician supply in Nebraska from 1980 to 2005 were available from the Area Resource File (ARF) 2006 release. The numbers of active non-federal physicians in Nebraska from 1980 through 2005 were obtained from the ARF database (data source for physician counts is the AMA Master file) and were used to project the future supply of physicians through 2020. Physician demand-to-100,000 population ratios from the Bureau of Health Professions' Physician Requirement Model were used to compute the future demand for physicians in Nebraska through 2020. Nebraska will have an estimated shortage of 380 physicians (8.4%) in 2010; however, the gap between supply and demand will close in 2020 (Table 17). The model assumes that physician workforce participation rates, attrition rates and specialty choices would remain at historical levels.

**Table 17. Physician Supply and Demand Projections, Nebraska 2010 to 2020**

Year	Projected Supply	Projected Demand	Shortage/Surplus	Percent Shortage
2010	4,502	4,882	-380	-8.44
2015	4,874	5,061	-187	-3.84
2020	5,277	5,245	32	0.61

Data Source: Area Resource File/AMA Master File.

## **Nursing Workforce Projections**

The BHPr nursing supply and demand models project the future supply and demand for RNs. The RN Supply Model projects RN supply through 2020 based on the number of licensed RNs in the base year (2000), the number of new entrants into the RN workforce, and the estimated number of separations. The RN Demand Model projects the demand for full-time equivalent (FTE) RNs. Nursing demand is defined as the number of FTE RNs employers are willing to hire given population needs, economic considerations, and the health care operating environment. The models estimate that Nebraska will have a shortage of 5,300 RNs by 2020 (Table 18). The Nebraska Center for Nursing adapted the nursing workforce models of the National Center for Health Workforce Analysis and estimates that RN demand will grow from about 16,000 FTE nurses in 2006, to more than 20,000 by 2020. The supply of RNs is projected to increase from about 15,000 in 2006 to only 16,500 by 2020. Thus, Nebraska will face a shortage of 3,800 RNs by 2020 (Table 19). The report also estimates that there will be a shortage of LPNs each year, growing from 8% of demand in 2006 to almost 23% of demand by 2020 (Rosenbaum & Ramirez, 2006).

**Table 18. Projections of Registered Nurse Supply, Demand, and Shortage, Nebraska 2000 to 2020**

<b>Year</b>	<b>Supply</b>	<b>Demand</b>	<b>Shortage</b>	<b>Demand Shortfall</b>
2000	13,300	14,800	-1,500	10%
2005	14,100	15,900	-1,800	11%
2010	14,700	17,100	-2,400	14%
2015	14,900	18,500	-3,600	20%
2020	14,900	20,200	-5,300	26%

Source: Nebraska Workforce Report, 2008. Prepared by Compdata Surveys, Dolan Technologies Corp. on behalf of the Nebraska Hospital Association. Calculations based on National Center for Health Workforce Analysis, <http://bhpr.hrsa.gov/healthworkforce/reports/>.

**Table 19. Nebraska Center for Nursing Projections of Registered Nurse Supply, Demand, and Shortage, Nebraska 2006 to 2020**

<b>Year</b>	<b>FTE RN Supply</b>	<b>FTE RN Demand</b>	<b>Surplus/ (Shortage)</b>	<b>Relative Surplus/ Shortage</b>
2006	15,293	16,182	-889	-5.50%
2010	15,917	17,133	-1,216	-7.10%
2015	16,366	18,567	-2,201	-11.90%
2020	16,491	20,329	-3,838	-18.90%

Source: Rosenbaum, D. I. (2006). The Supply and Demand for Registered Nurses and Licensed Practical Nurses in Nebraska. Nebraska Center for Nursing.

## **Dentist Workforce Projections**

The Health Professions Tracking Service (HPTS) at the University of Nebraska Medical Center (UNMC) has been tracking the dentist workforce since 2000, and reliable data on the supply of dentists in Nebraska from 2000 through 2008 were available. These historical trend data were used to project the future supply of dentists in Nebraska through 2020. The future demand for dentists in Nebraska was computed using the 2004 national average ratio of dentists-to-100,000 population, which is higher than the state's current ratio. It is estimated that Nebraska will have a 1.57% shortage of dentists in 2010, and provided historical trends in supply continue, the supply will catch up with the demand for dentists by 2020 (Table 20). The model assumptions are that workforce participation rates, attrition rates, and specialty choices would remain at historical levels.

**Table 20. Dentist Supply and Demand Projections, Nebraska 2010 to 2020**

<b>Year</b>	<b>Supply</b>	<b>Demand</b>	<b>Shortage</b>	<b>% Shortage</b>
2010	992	1008	-16	-1.57%
2011	995	1011	-15	-1.51%
2012	998	1013	-15	-1.44%
2013	1001	1015	-14	-1.37%
2014	1004	1017	-13	-1.28%
2015	1007	1019	-12	-1.18%
2016	1010	1021	-11	-1.07%
2017	1013	1023	-10	-0.94%
2018	1016	1025	-8	-0.80%
2019	1019	1026	-7	-0.65%
2020	1022	1028	-5	-0.49%

Data Source: Health Professions Tracking Service, 2009.

## **Pharmacist Workforce Trends**

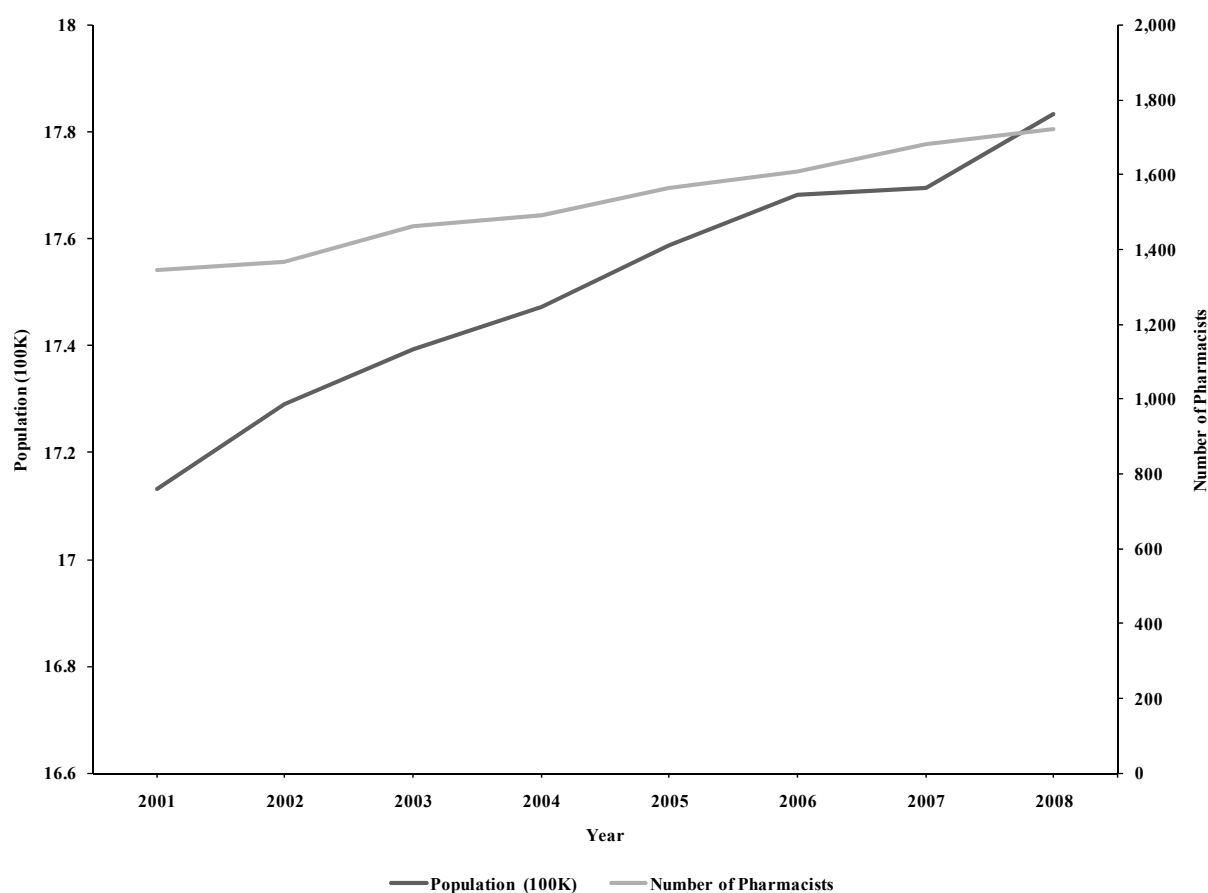
Historical trend data on the supply of pharmacists in Nebraska were available from 2000 through 2008. Analysis of the trend in pharmacist supply in Nebraska shows that the growth was keeping pace with the growth in Nebraska's population until 2007 (Figure 98).

The number of pharmacists per 100,000 population in the nation grew from approximately 56 in 1975 to a current estimate of approximately 78. This number is projected to increase to approximately 101 by 2030. The Health Resources and Services Administration (HRSA) estimated that the active pharmacist workforce in the nation grew between 1991 and 2000. The

pharmacist-to-population ratio increased from 68 per 100,000 population in 1991 to 71 per 100,000 population in 2000 (The Adequacy of Pharmacist Supply, 2008).

In 2008, HRSA found that the national pharmacist supply will grow from 226,000 in 2004 to 305,000 by 2020 and to 368,000 by 2030. These projections are higher than those previously reported by HRSA in 2000. The updated estimates reflect changed retirement patterns, the opening of new pharmacy programs, and increased enrollment in existing programs (The Adequacy of Pharmacist Supply, 2008). Nationally, the future supply of pharmacists is projected to grow at a rate similar to the projected growth in demand from changing demographics. If the per capita consumption of pharmaceuticals is unchanged, then the projected future supply will be adequate to meet the future demand (The Adequacy of Pharmacist Supply, 2008).

**Figure 98. Pharmacist Supply Trend, Nebraska 2001 to 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center; U.S. Census Bureau, Population Census Estimates.

## **Other Health Professionals: Projected Demand**

Table 21 shows the projected demand for health professionals other than physicians, nurses, and dentists from 2010 through 2025, computed using Nebraska's current health professional-to-100,000 population ratios and Nebraska's 2004 health professional-to-population ratios (whichever were higher) and Nebraska's projected population from 2010 through 2025, obtained from the U.S. Census Bureau. For these professions, trend data on supply of health professionals were not available. Therefore, it was not possible to project the future supply of these health professionals.

**Table 21. Other Health Professionals Projected Demand, Nebraska 2010 to 2025**

<b>Health Profession</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Nurse Practitioners**	761	769	775	779
Dental Hygienists**	1,035	1,046	1,054	1,060
Physician Assistants**	593	599	604	607
Chiropractors*	515	521	525	528
Podiatrists*	108	110	111	111
Optometrists*	372	376	379	381
Pharmacists**	1,687	1,706	1,719	1,729
Psychologists*	593	600	604	608
Psychiatrists**	150	152	153	154
Physical Therapists**	1,381	1,396	1,407	1,415
Occupational Therapists**	764	772	778	783
Speech Language Pathologists & Audiologists**	691	698	704	708
Respiratory Care Practitioners**	1,286	1,300	1,310	1,318
Medical Radiographers**	1,984	2,006	2,022	2,033
Medical Nutrition Therapists**	488	494	498	501

\*Based on 2004 national average ratio (New York Center for Health Workforce Studies, October 2006, NY Workforce Report); US Census Bureau Population Projections.

\*\*Based on 2007/2008 current Nebraska ratio (Health Professions Tracking Service, University of Nebraska Medical Center, 2007 and 2008 and Nebraska Department of Health and Human Services, 2008); US Census Bureau Population Projections.



## **Aging of Health Professionals Cohort by Health Planning Region**

The future demand for health professionals in Nebraska will be influenced by population growth and by the aging of the health workforce. About a third or more of the workforce in the following health professions are now in the pre-retirement age group, i.e., 55 years and older: MDs (29.9%), dentists (39.3%), psychiatrists (36.7%), NPs (42.9%) and PAs (33.3%) specialized in psychiatry, psychologists (45.2%) and other behavioral health professionals (40.7%) including licensed mental health practitioners (LMHP), licensed alcohol and drug counselors (LADC), certified compulsive gambling counselors (CCGC) and Masters Social Workers (MSW). Also, rural Nebraska has a higher proportion of health professionals in the preretirement age group (Table 22). For the following categories of health professionals, rural counties have a higher proportion of health professionals in the pre-retirement age group: MDs (32.3%), dentists (44.4%), pharmacists (32.2%), primary care MDs (30.8%), psychiatrists (42.9%), and NPs specialized in psychiatry (50%).

The Nebraska Department of Health and Human Services divided the state of Nebraska into six Health Planning Regions (HPRs) as follows: Region 1 – Western, Region 2 – Southwest, Region 3 – Central, Region 4 – Northern, Region 5 – Southeast, and Region 6 – Eastern. Of these regions, HPRs 1, 2, and 3 are predominantly rural. HPR 6 has two urban counties, Douglas and Sarpy. (See Appendix 4 for a map of HPRs and a list of counties by HPR).

**Table 22. Number of Aging Health Professionals, Nebraska 2008**

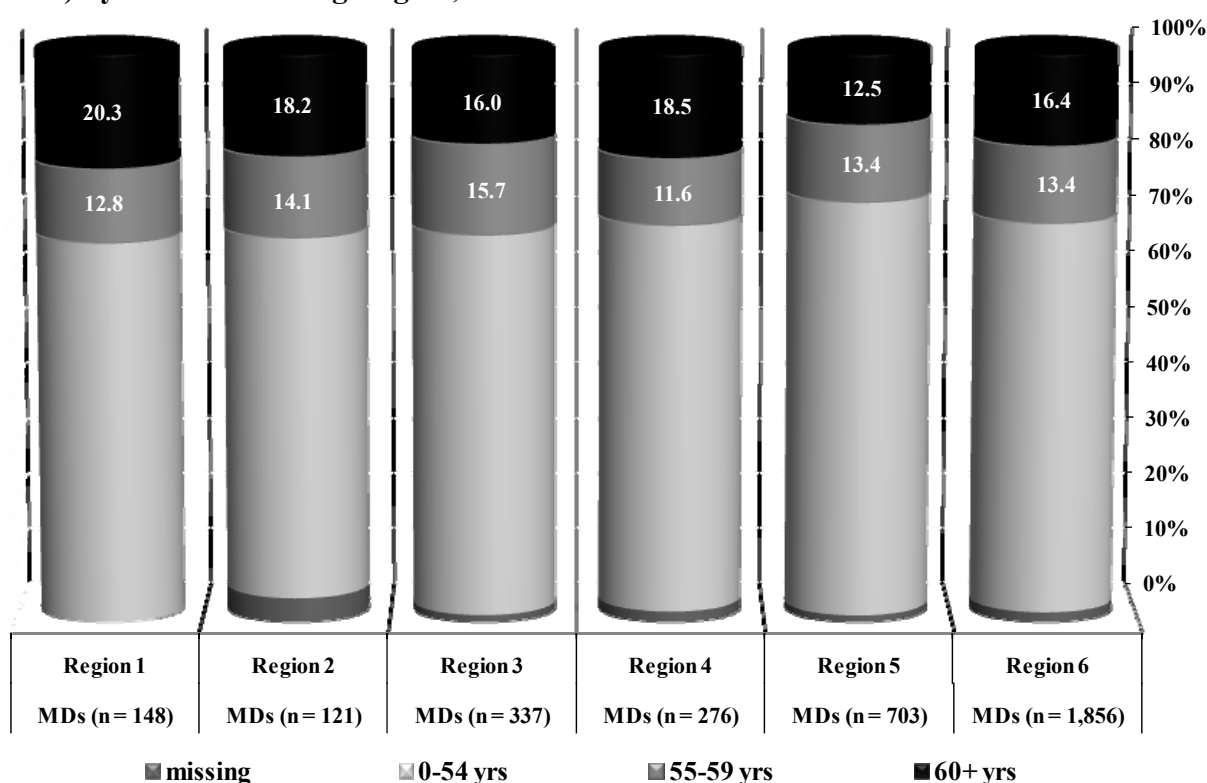
Health Profession	Nebraska			Rural Nebraska				Missing Data			
	Total		55+ years	Total		55+ years		Age		County	
	(N)	(n)	(%)	(N)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Allopathic Physicians (MD)	3,442	1,028	29.9	955	27.8	308	32.3	53	1.5	1	0.0
Osteopathic Physicians (DO)	128	24	18.8	43	33.6	8	18.6	1	0.8	0	0.0
Physician Assistants (PA)	598	73	12.2	227	38.0	31	13.7	8	1.3	0	0.0
Registered Nurses (RN)	17,335	3,627	20.9	5,996	34.6	1,362	22.7	208	1.2	127	0.7
Licensed Practical Nurses (LPN)	5,184	610	11.8	3,131	60.4	336	10.7	1,414	27.3	41	0.8
Nurse Practitioners (NP)	767	190	24.8	250	32.6	61	24.4	18	2.4	0	0.0
Dentists	1,032	406	39.3	367	35.6	163	44.4	20	1.9	0	0.0
Dental Hygienists	1,038	40	3.9	337	32.5	10	3.0	235	22.6	144	13.9
Pharmacists	1,724	445	25.8	643	37.3	207	32.2	3	0.2	1	0.1
Medical Nutrition Therapists	490	118	24.1	148	30.2	41	27.7	9	1.8	56	11.4
Medical Radiographers	1,990	91	4.6	699	35.1	20	2.9	789	39.7	288	14.5
Respiratory Care Practitioners	1,290	217	16.8	307	23.8	61	19.9	4	0.3	188	14.6
Occupational Therapists (OT)	766	40	5.2	206	26.9	14	6.8	466	60.8	95	12.4
Physical Therapists (PT)	1,385	162	11.7	328	23.7	37	11.3	1	0.1	227	16.4
Audiologists	134	32	23.9	23	17.2	6	26.1	3	2.2	21	15.7
Speech-Language Pathologists	559	114	20.4	170	30.4	54	31.8	18	3.2	54	9.7
Chiropractors	501	55	11.0	194	38.7	27	13.9	66	13.2	46	9.2
Podiatrists	90	6	6.7	24	26.7	1	4.2	20	22.2	29	32.2
Optometrists	373	14	3.8	150	40.2	4	2.7	118	31.6	64	17.2
Primary Care MDs	1,286	341	26.5	481	37.4	148	30.8	16	1.2	0	0.0
Primary Care DOs	66	13	19.7	22	33.3	7	31.8	1	1.5	0	0.0
Primary Care NPs	280	56	20.0	109	38.9	17	15.6	6	2.1	0	0.0
Primary Care PAs	307	37	12.1	160	52.1	22	13.8	5	1.6	0	0.0
Psychiatrists	150	55	36.7	28	18.7	12	42.9	0	0.0	0	0.0
NPs Specialized in Psychiatry	56	24	42.9	18	32.1	9	50.0	0	0.0	0	0.0
PAs Specialized in Psychiatry	9	3	33.3	4	44.4	1	25.0	0	0.0	0	0.0
Psychologists	270	122	45.2	67	24.8	26	38.8	0	0.0	0	0.0
LMHP, LADC, CCGC, MSW	1,479	602	40.7	497	33.6	207	41.7	4	0.3	20	1.4

Sources: Allopathic Physicians, Osteopathic Physicians, Physician Assistants, Nurse Practitioners, Dentists, Pharmacists, Primary Care MDs and DOs, Primary Care NPs and PAs, Psychiatrists, NPs and PAs specialized in Psychiatry, Psychologists, licensed mental health practitioners (LMHP), licensed alcohol and drug counselors (LADC), certified compulsive gambling counselors (CCGC), and master social workers (MSW), Health Profession Tracking Services, University of Nebraska Medical Center 2008; RNs, Nebraska Center for Nursing, 2008; LPNs, Nebraska Center for Nursing, 2007; Dental Hygienists, Medical Nutrition Therapists, Medical Radiographers, Respiratory Care Practitioners, OTs, PTs, Audiologists, Speech-Language Pathologists, Chiropractors, Podiatrists, and Optometrists, Nebraska Department of Health and Human Services, Licensure Unit, 2008.

## Physicians and Physician Assistants

Approximately 33% of allopathic physicians (MDs) in HPR 1, 32% in HPR 2, 32% in HPR 3, and 30% in HPR 4 are 55 years of age or older. Less than 30% of MDs in HPRs 5 and 6 are 55 years of age or older (Figure 99). In comparison, nationally in 2006, the New York Center for Health Workforce Studies estimated that 34.5% of MDs were 55 years or older. Forty percent of osteopathic physicians (DOs) in HPR 1 and 23.1% in HPR 5 are 55 years or older. Less than 20% of DOs in the rest of the HPRs are 55 years or older (Figure 100). The physician assistant workforce is younger than the physician workforce, with between 10% and 20% of physician assistants in all the HPRs 55 years or older (Figure 101).

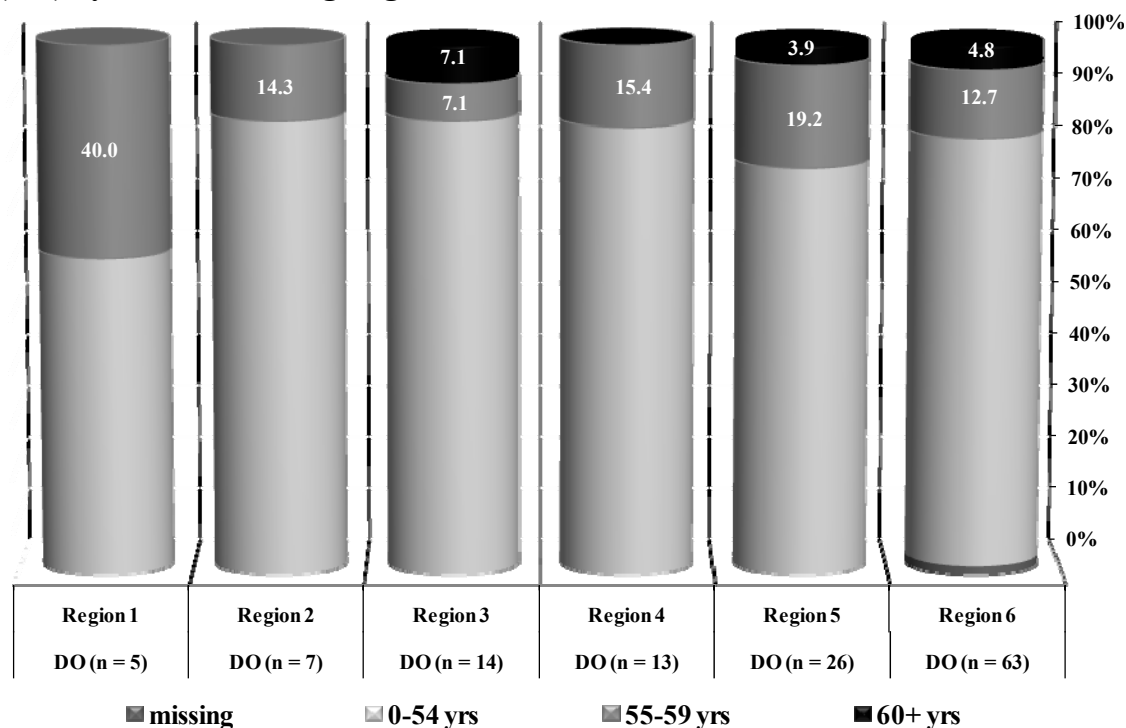
**Figure 99. Pre-Retirement Age Distribution of Actively Practicing Allopathic Physicians (MDs) by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

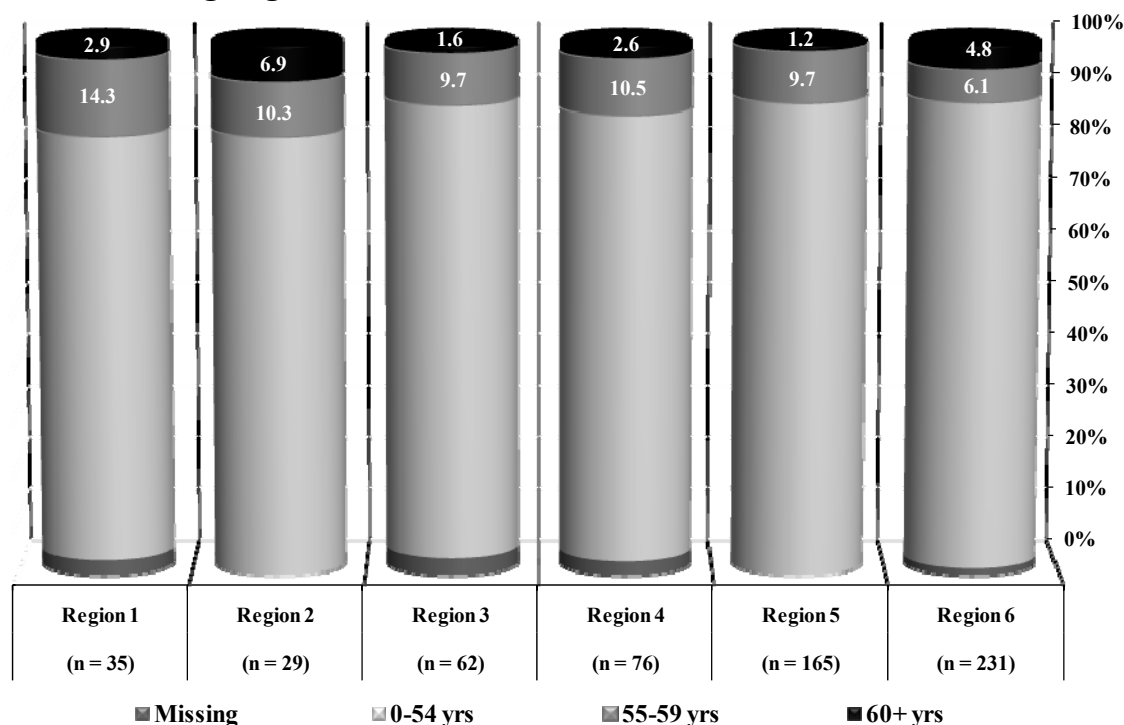
Note: MD data had 1 record with missing county data.

**Figure 100. Pre-Retirement Age Distribution of Actively Practicing Osteopathic Physicians (DO) by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 101. Pre-Retirement Age Distribution of Actively Practicing Physician Assistants by Health Planning Region, Nebraska 2008**

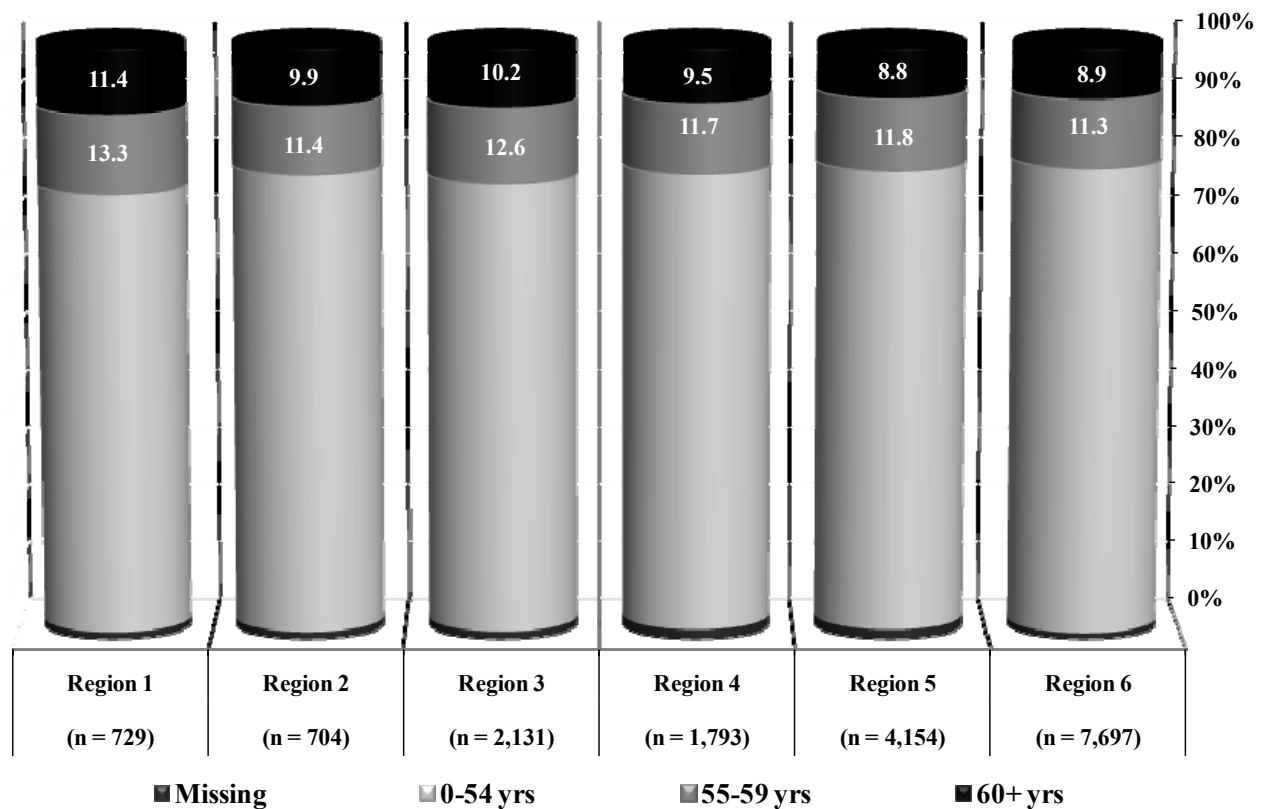


Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

## Nurses

According to the 2008 RN survey conducted by the Nebraska Center for Nursing, about 21% of RNs in Nebraska are in the pre-retirement age group. Approximately a quarter (24.7%) of RNs in HPR 1, 21.3% in HPR 2, 22.8% in HPR 3, 21.2% in HPR 4, 20.6% in HPR 5, and 20.2% in HPR 6 are 55 years or older (Figure 102). Between 10% to 15% of LPNs in all HPRs are in the pre-retirement age group. About 10% of LPNs in HPRs 4 and 5, 11.6% in HPR 1, 11.6% in HPR 2, 12.4% in HPR 3, and 14.8% in HPR 6 are 55 years or older (Figure 103). Thirty percent of NPs in HPR 1, 26.9% in HPR 3, 20.6% in HPR 2, 20.3% in HPR 4, 23.9% in HPR 5, and 24.2% in HPR 6 are in the pre-retirement age group (Figure 104).

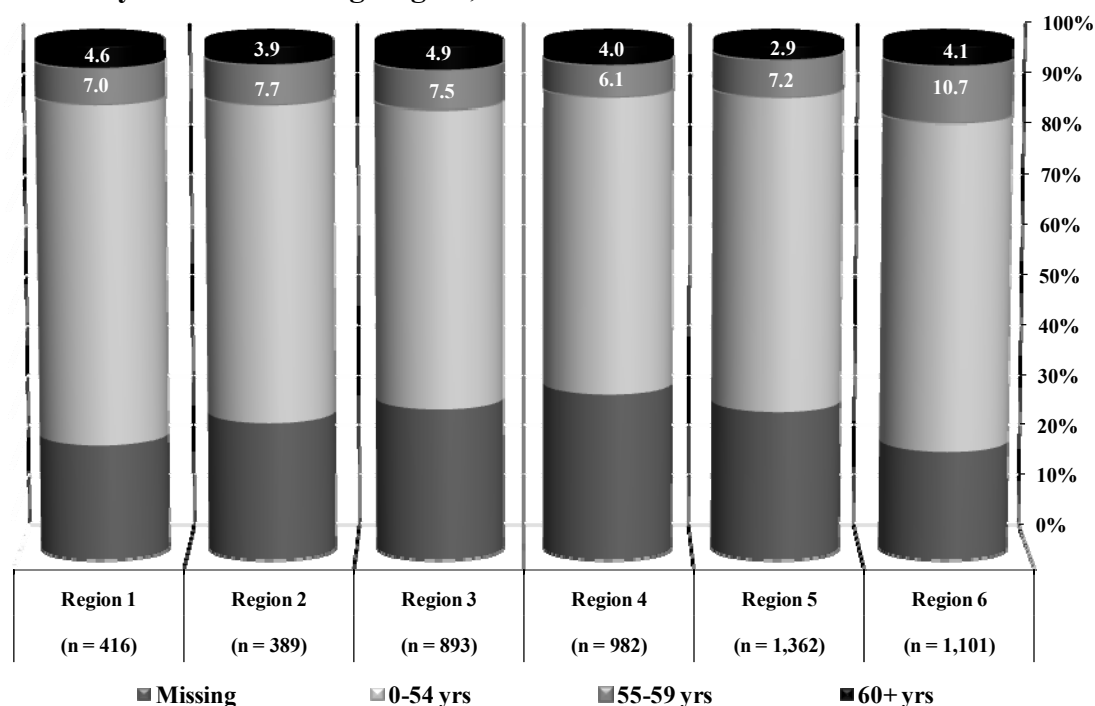
**Figure 102. Pre-Retirement Age Distribution of Actively Practicing Registered Nurses by Health Planning Region, Nebraska 2008**



Source: Nebraska Center for Nursing Survey Data, 2008.

Note: RN data had 127 records with missing county data.

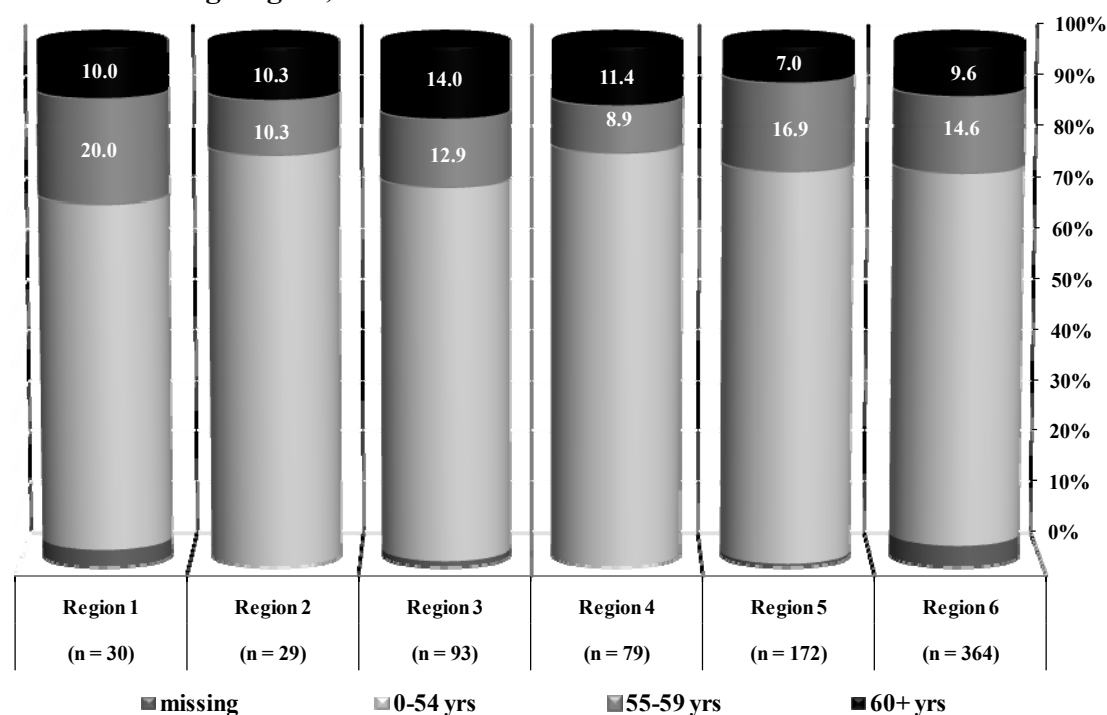
**Figure 103. Pre-Retirement Age Distribution of Actively Practicing Licensed Practical Nurses by Health Planning Region, Nebraska 2007**



Source: Nebraska Center for Nursing, 2007.

Note: LPN data had 41 records with missing county data.

**Figure 104. Pre-Retirement Age Distribution of Actively Practicing Nurse Practitioners by Health Planning Region, Nebraska 2008**

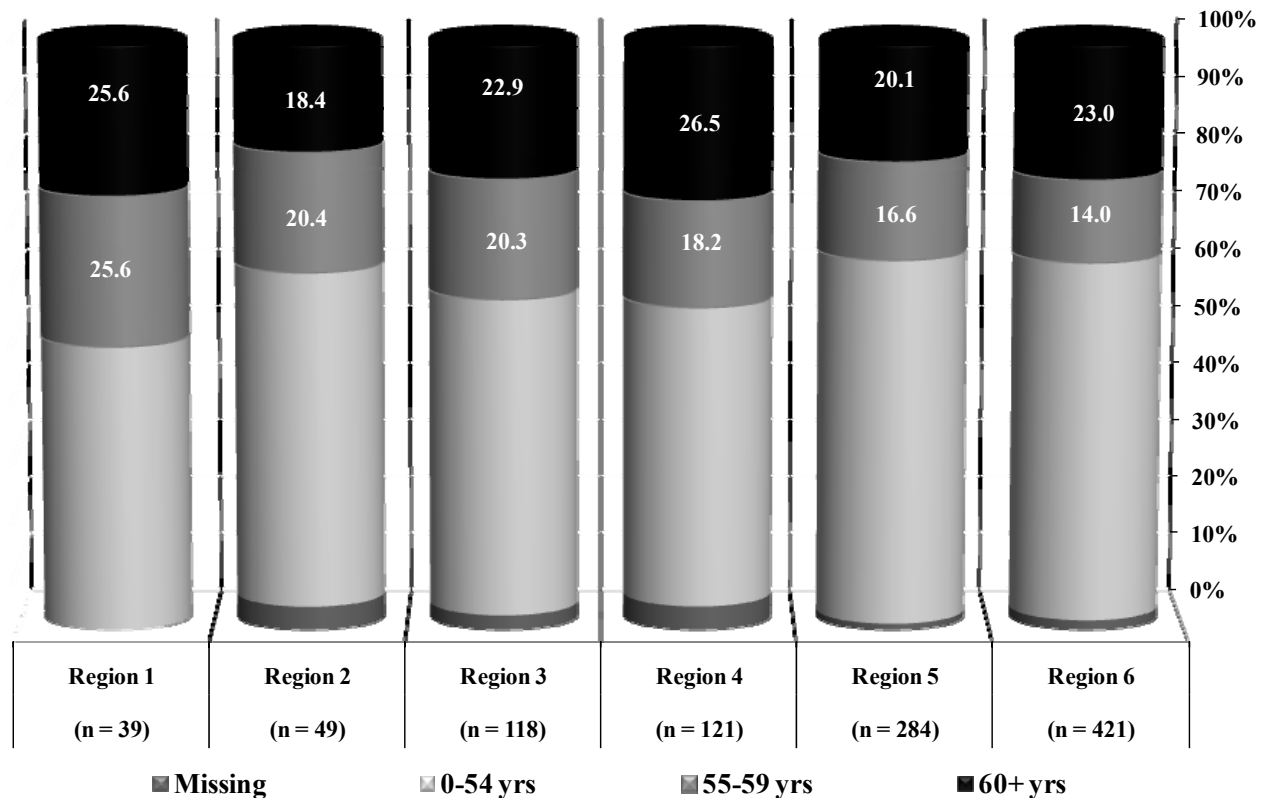


Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

## Dental Health Professionals

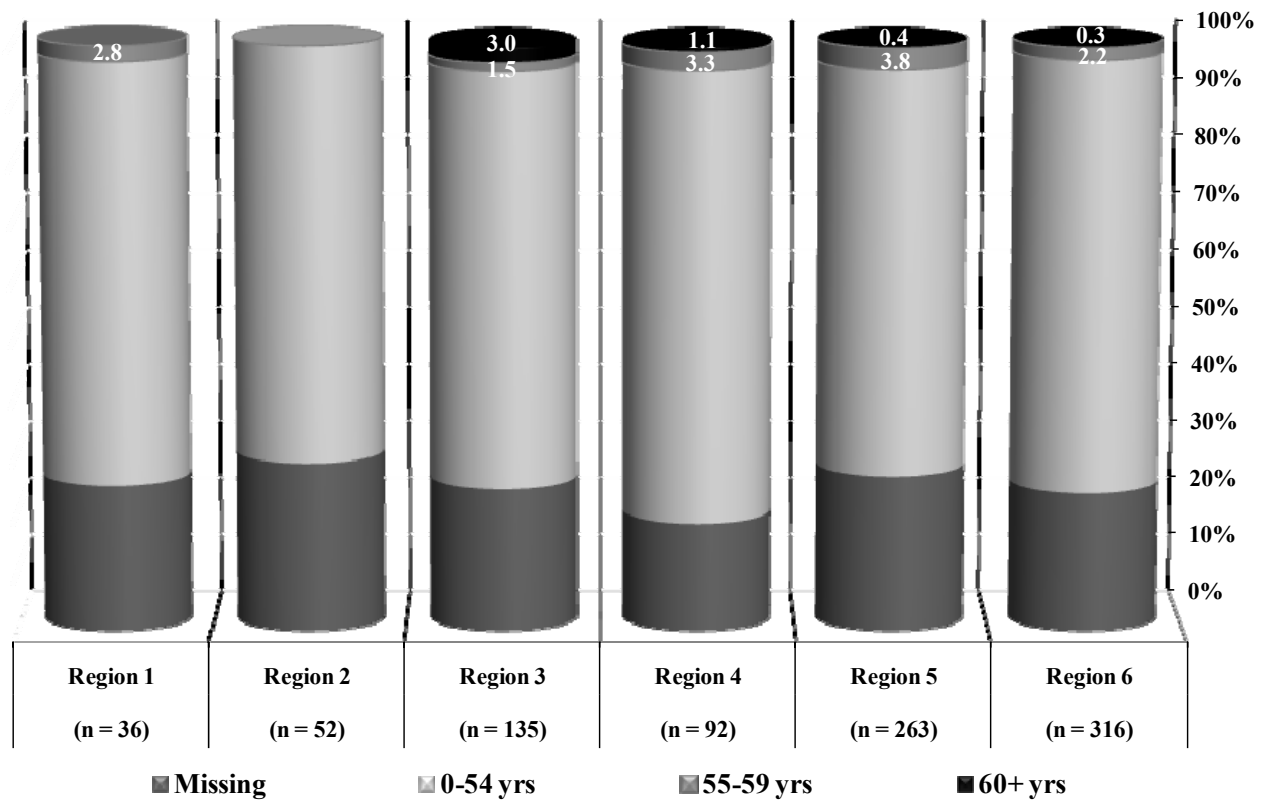
Among dentists, 51.2% in HPR 1, 38.8% in HPR 2, 43.2% in HPR 3, 44.7% in HPR 4, 36.7% in HPR 5, and 37% in HPR 6 are 55 years and older (Figure 105). Aging of the workforce is not an issue among dental hygienists. Less than 5% of dental hygienists in all HPRs are 55 years and older (Figure 106).

**Figure 105. Pre-Retirement Age Distribution of Actively Practicing Dentists by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 106. Pre-Retirement Age Distribution of Actively Licensed Dental Hygienists by Health Planning Region, Nebraska 2008**



Sources: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

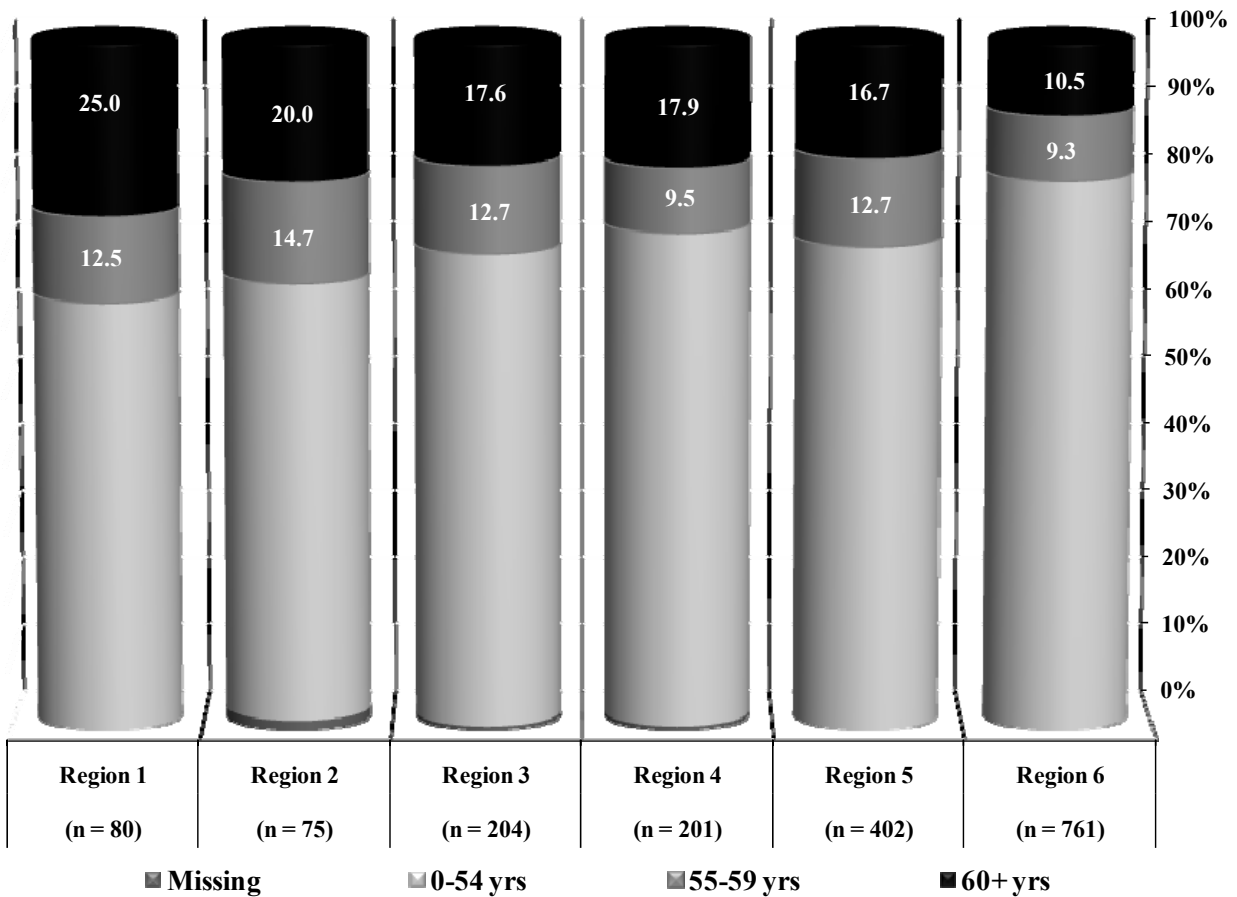
Note: Dental hygienists data had 144 records with missing county data.



## Pharmacists

About a third of pharmacists in HPRs 1, 2, 3, 4, and 5 are 55 years and older, whereas, about 20% of pharmacists in HPR 6 are 55 years or older (Figure 107).

**Figure 107. Pre-Retirement Age Distribution of Actively Practicing Registered Pharmacists by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

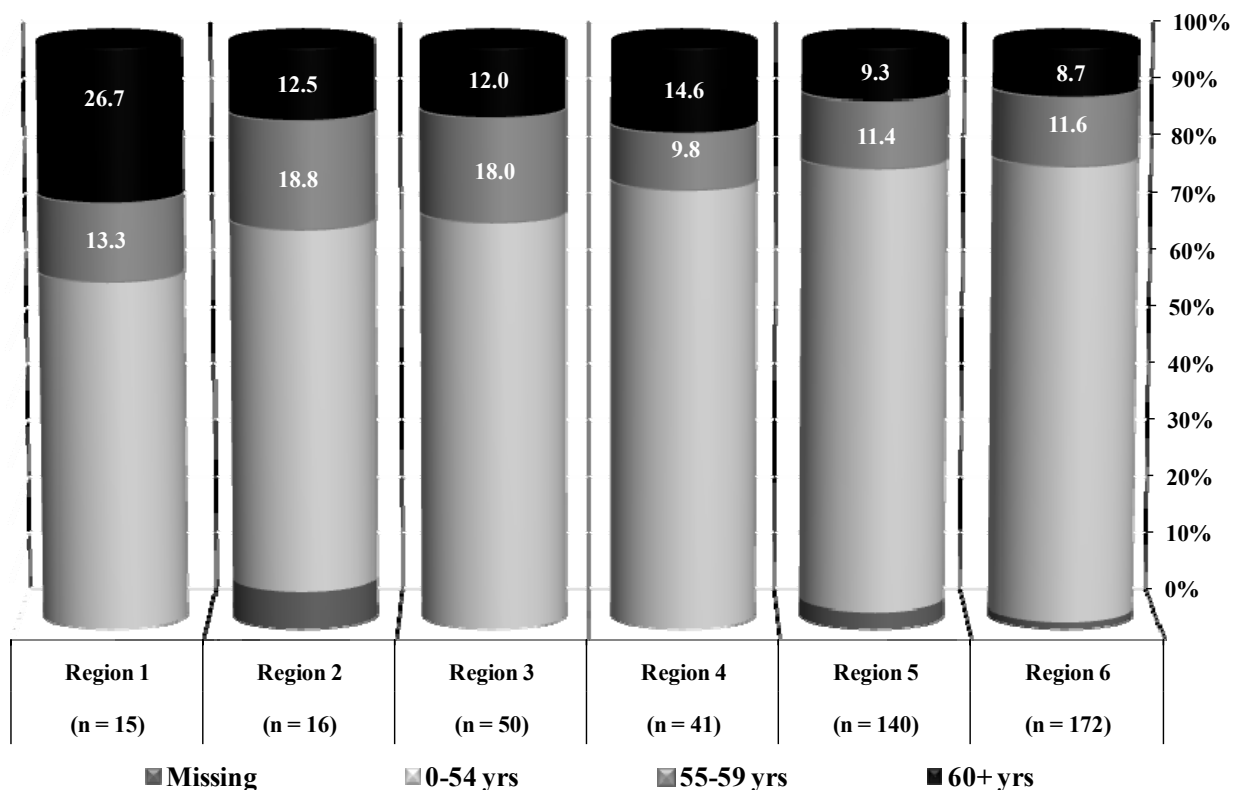
Note: Pharmacists data had 1 record with missing county data.

## Allied Health Professionals

In HPR 1, 40% of medical nutrition therapists (Figure 108), 25% of respiratory therapists (Figure 110), and 20% of physical therapists (Figure 112) are 55 years or older. In HPRs 2 and 3, about 30% of medical nutrition therapists are 55 years or older (Figure 108). In HPR 4, 28.1% of respiratory care practitioners are 55 years or older (Figure 110). The cohorts of medical radiographers (Figure 109) and occupational therapists (Figure 111) are younger, with less than 12% in all HPRs 55 years or older. About a third of speech language pathologists in HPRs 1 and 2 (33.3%), and HPR 3 (32.9%) are 55 years or older, whereas only 13.5% of speech language pathologists in HPR 6 are 55 years or older (Figure 113). Fifty percent of audiologists in HPR 3 and 44.4% of audiologists in HPR 5 are 55 years or older (Figure 114).

The Bureau of Labor Statistics projected employment growth from 2006 to 2016 of 9.8% for audiologists, 27.1% for physical therapists, 22.6% for respiratory therapists, 10.7% for speech-language pathologists, and 15% for radiologic technologists (Bureau of Labor Statistics, 2008).

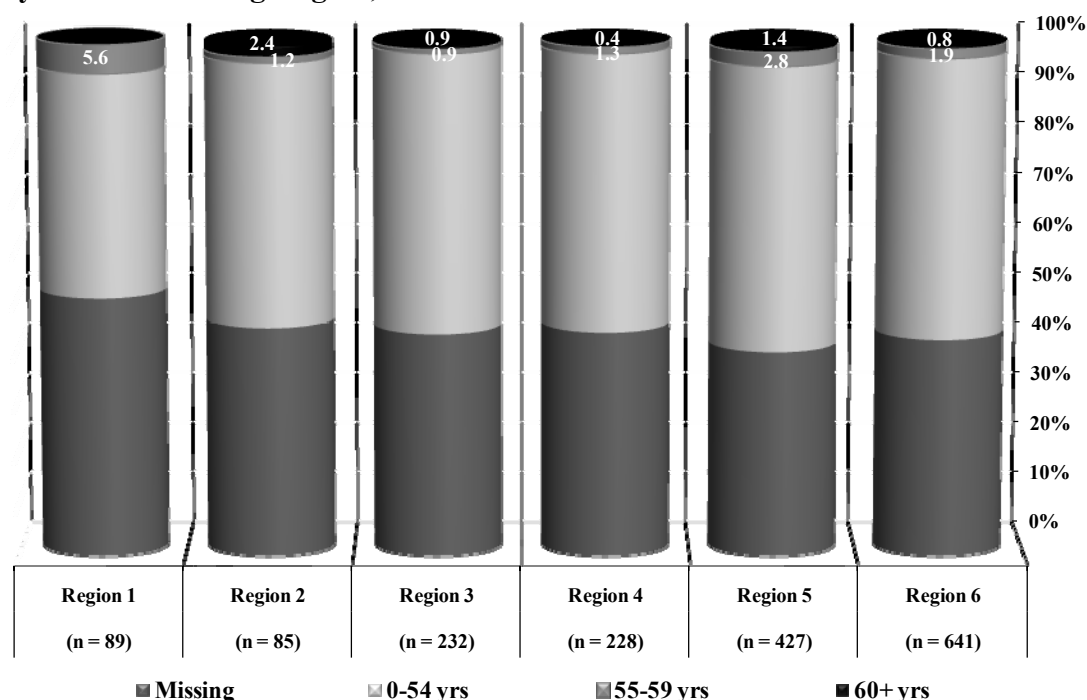
**Figure 108. Pre-Retirement Age Distribution of Actively Licensed Medical Nutrition Therapists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Medical nutrition therapists data had 56 records with missing county data.

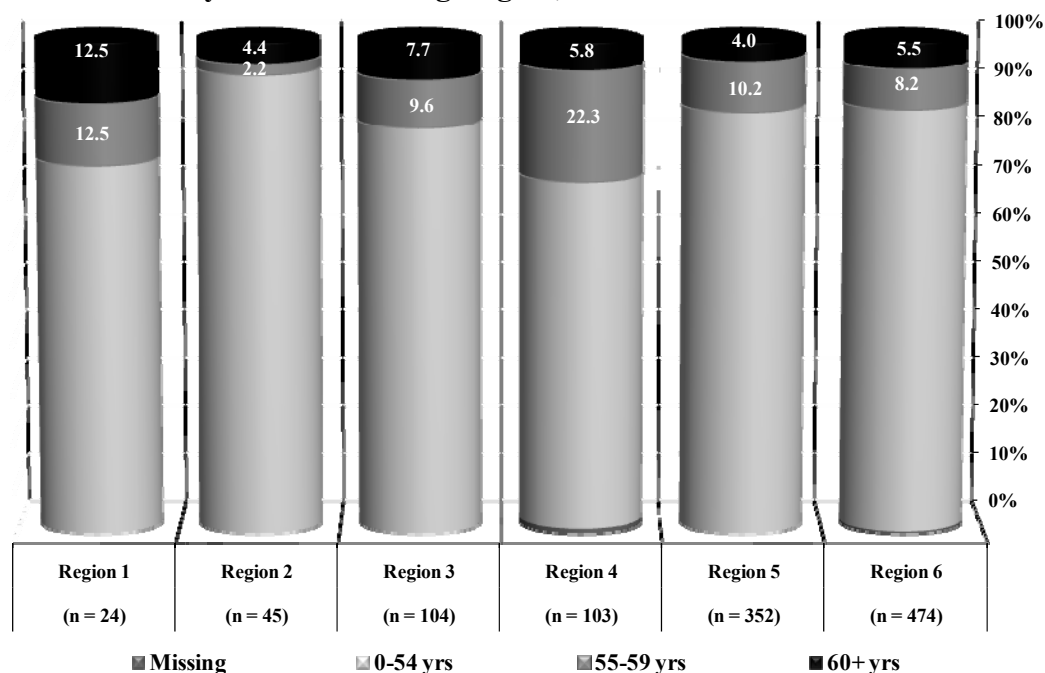
**Figure 109. Pre-Retirement Age Distribution of Actively Licensed Medical Radiographers by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Medical radiographers data had 288 records with missing county data.

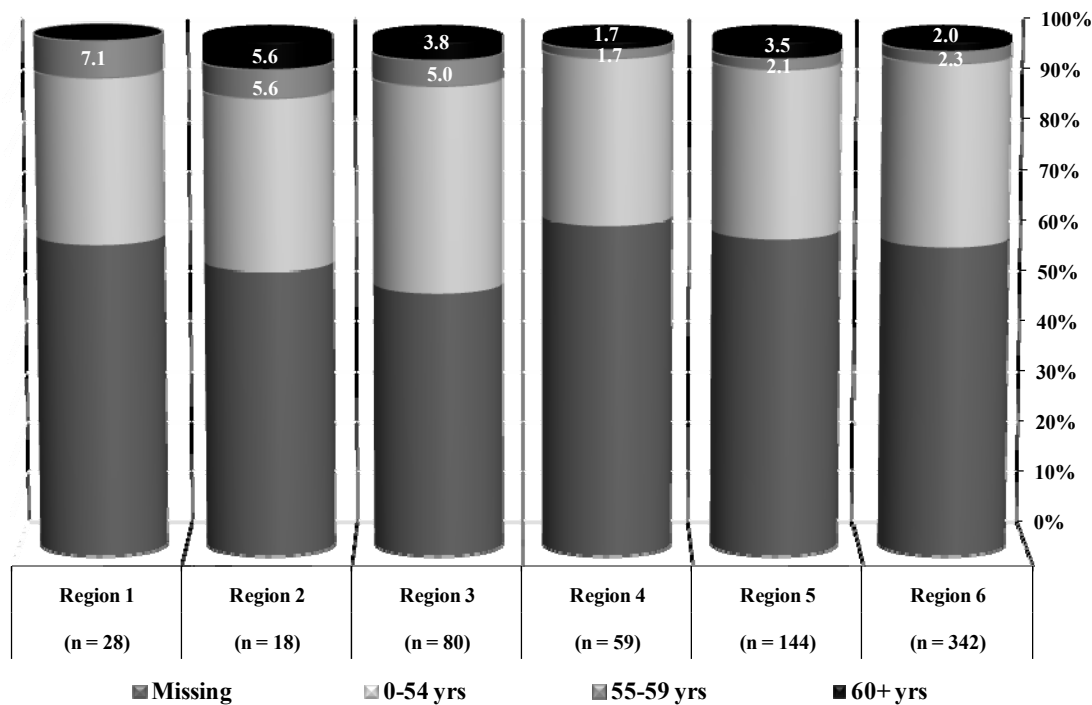
**Figure 110. Pre-Retirement Age Distribution of Actively Licensed Respiratory Care Practitioners by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Respiratory Care Practitioners data had 188 records with missing county data.

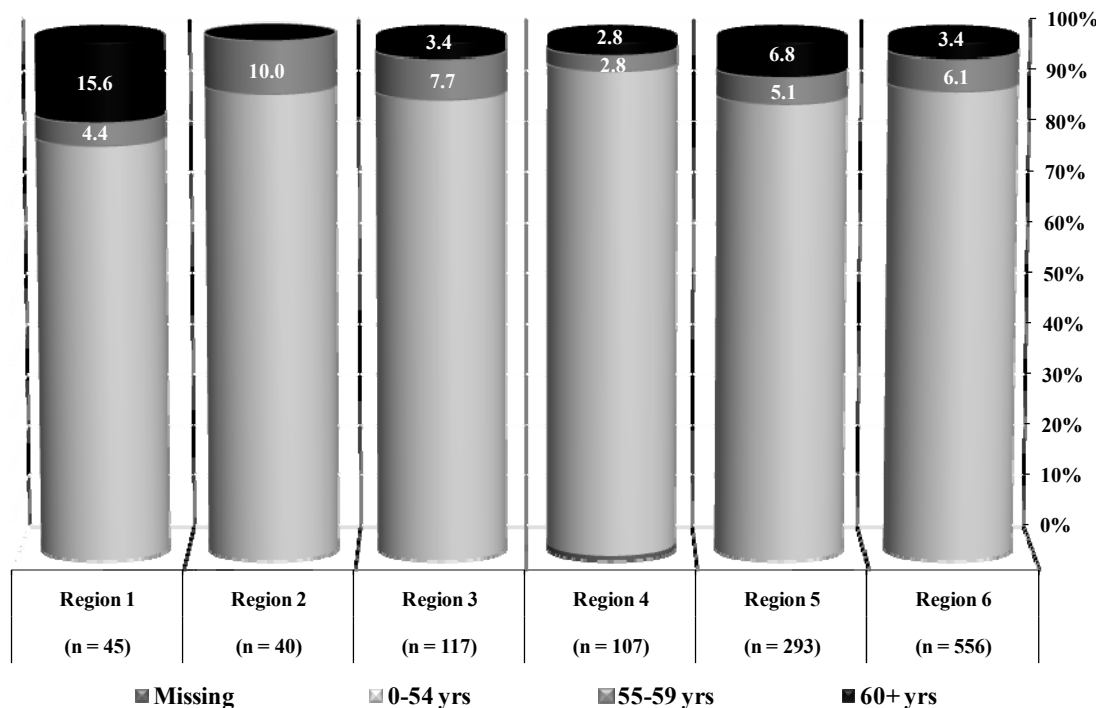
**Figure 111. Pre-Retirement Age Distribution of Actively Licensed Occupational Therapists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Occupational therapists data had 95 records with missing county data.

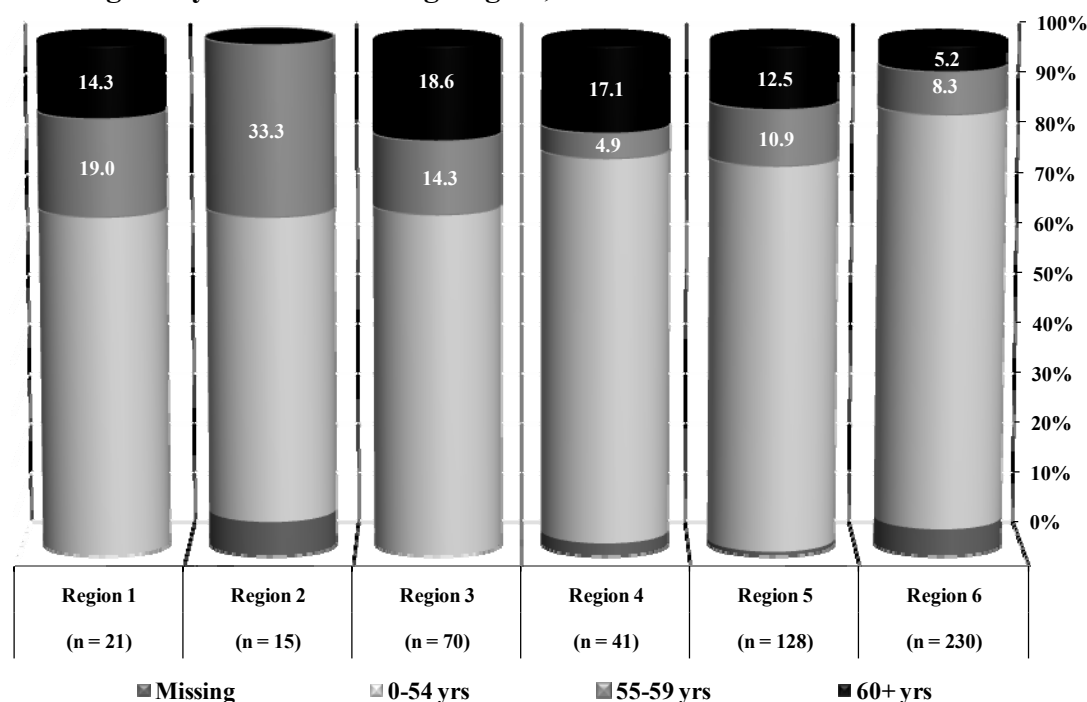
**Figure 112. Pre-Retirement Age Distribution of Actively Licensed Physical Therapists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Physical therapists data had 227 records with missing county data.

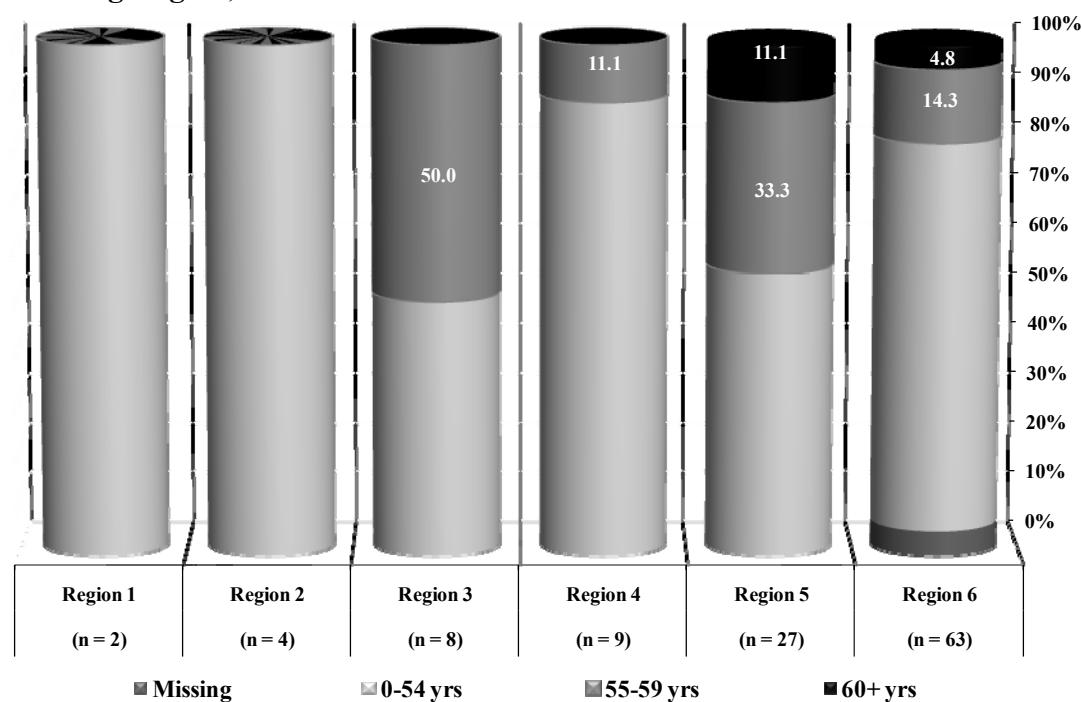
**Figure 113. Pre-Retirement Age Distribution of Actively Licensed Speech-Language Pathologists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

Note: Speech-Language Pathologists (SPL) data had 54 records with missing county data.

**Figure 114. Pre-Retirement Age Distribution of Actively Licensed Audiologists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

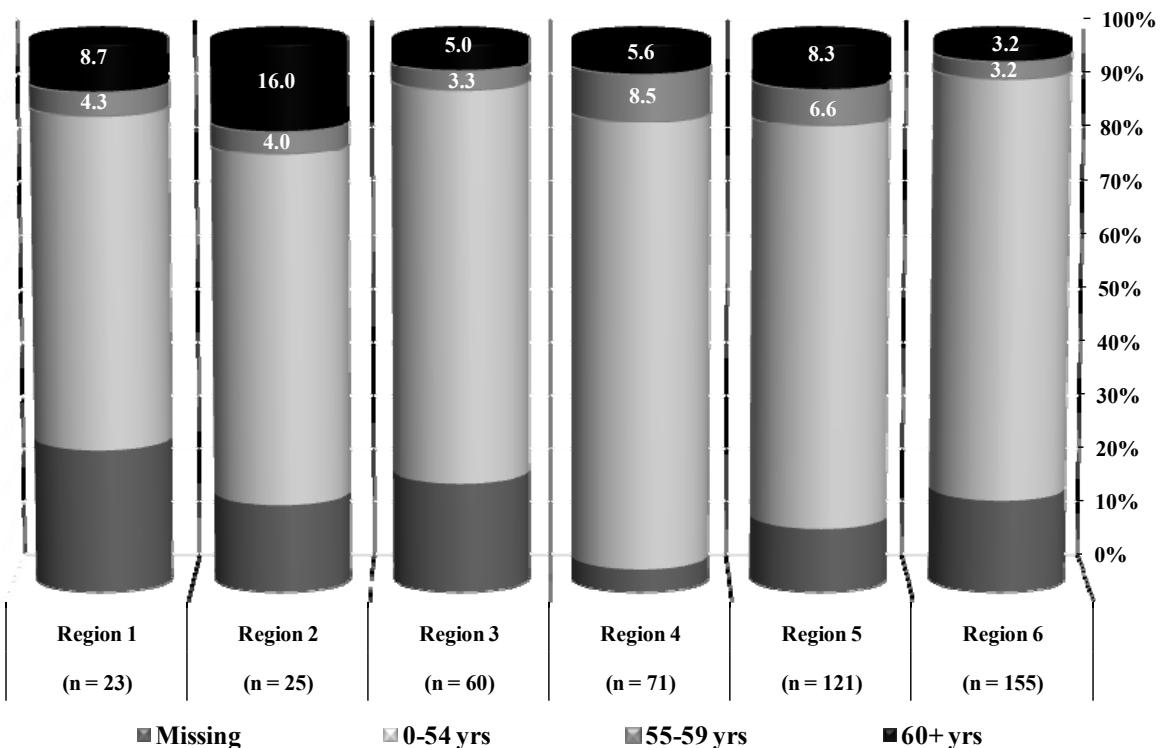
Note: Audiologists data had 21 records with missing county data.

## Non-Physician Clinicians

Among chiropractors, podiatrists, and optometrists, aging of the cohort is not a major issue. Twenty percent of chiropractors in HPR 2 and less than 15% of chiropractors in HPRs 1, 3, 4, 5, and 6 are 55 years of age or older (Figure 115).

About 16% of the podiatrists in HPR 5 and 12.5% in HPR 3 are 55 years or older (Figure 116). Less than 10% of the optometrists in HPRs 1, 3 and 6 are 55 years of age or older (Figure 117).

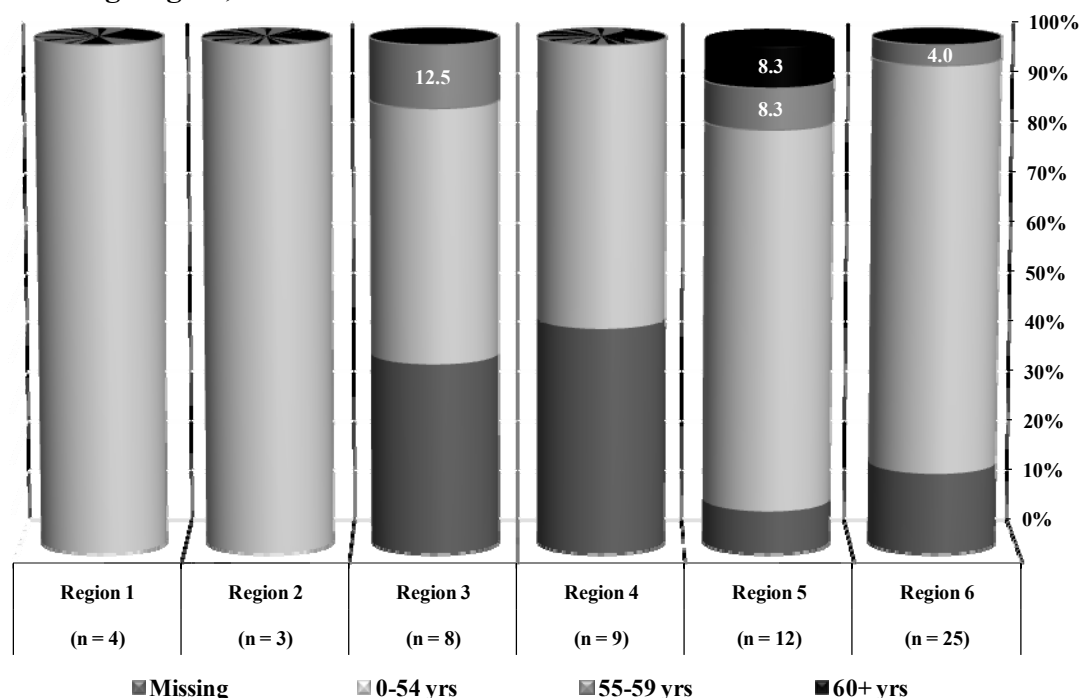
**Figure 115. Pre-Retirement Age Distribution of Actively Licensed Chiropractors by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.

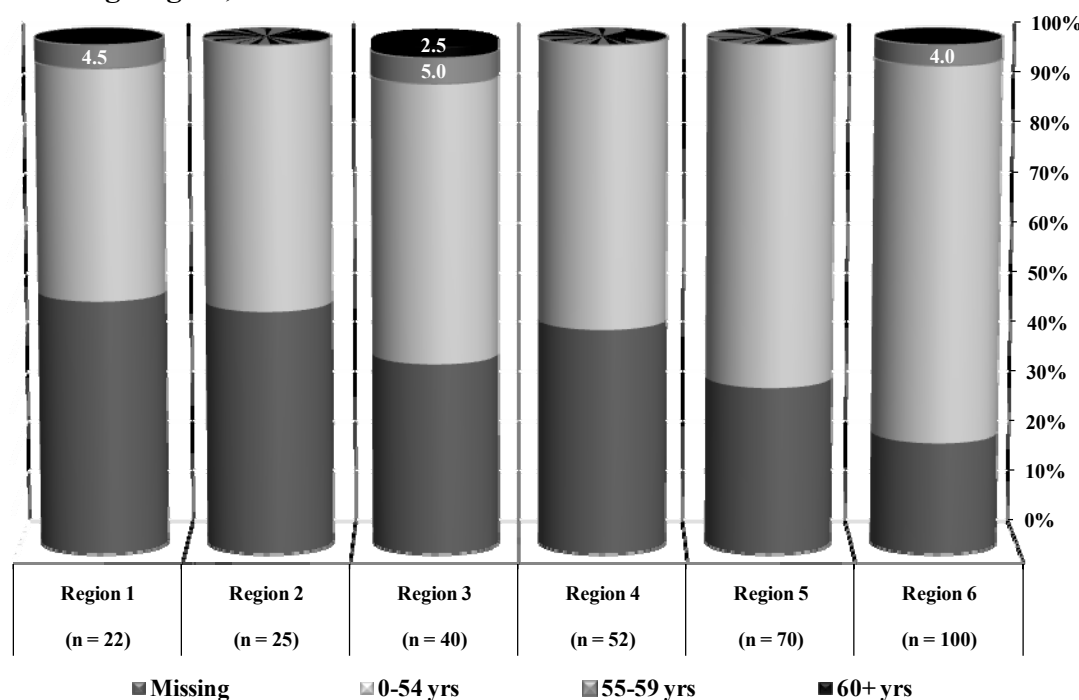
Note: Chiropractors data had 46 records with missing county data.

**Figure 116. Pre-Retirement Age Distribution of Actively Licensed Podiatrists by Health Planning Region, Nebraska 2008**



Source: Nebraska Department of Health and Human Services, 2008.  
 Note: Podiatrists data had 29 records with missing county data.

**Figure 117. Pre-Retirement Age Distribution of Actively Licensed Optometrists by Health Planning Region, Nebraska 2008**



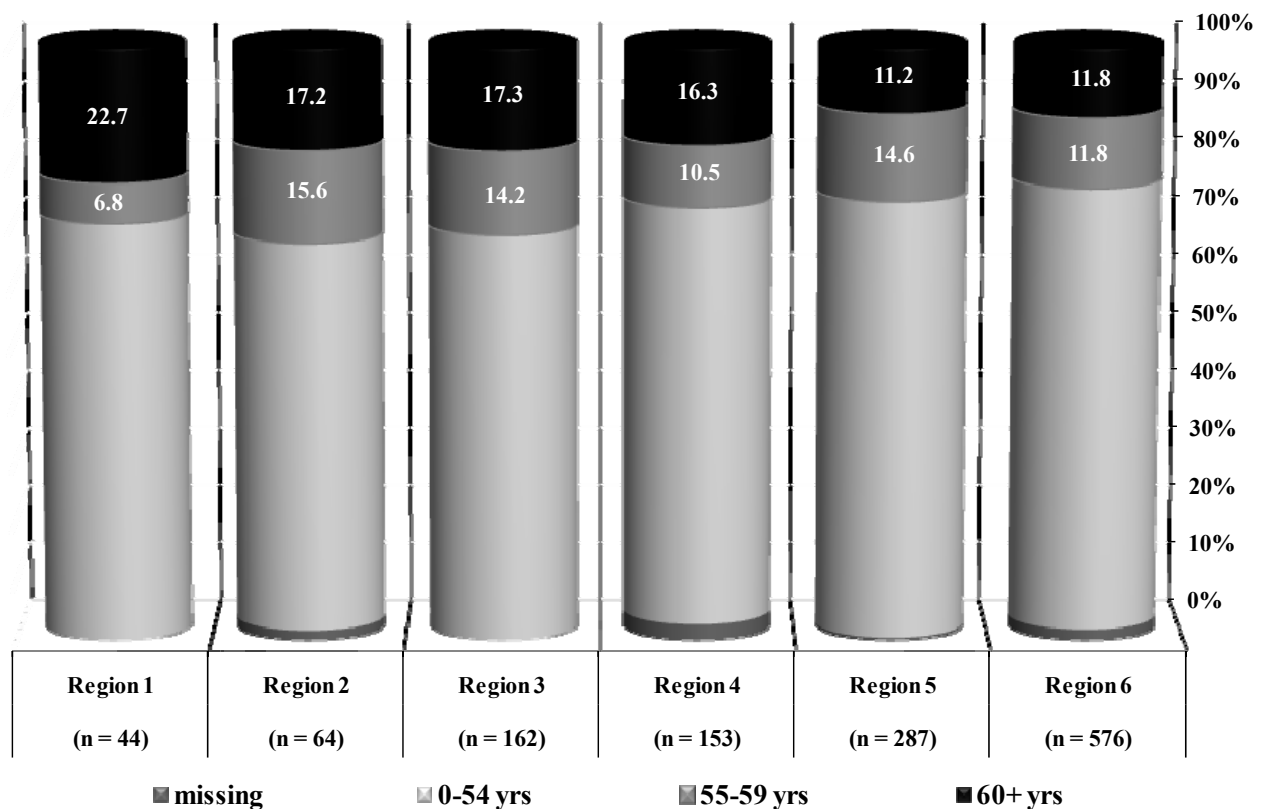
Source: Nebraska Department of Health and Human Services, 2008.  
 Note: Optometrists data had 64 records with missing county data.

## Primary Care Professionals

Approximately a third of primary care MDs in HPRs 1, 2, and 3; 26.8% in HPR 4; and 25.8% in HPR 5 are 55 years or older. Less than a quarter of primary care MDs in HPR 6 are 55 years or older (Figure 118). About a third of primary care DOs in HPRs 1 and 3 are 55 years or older. Less than 12% of primary care DOs in HPR 6 are in the pre-retirement age group (Figure 119).

The cohort of mid-level practitioners (PAs and NPs) in primary care is younger than that of MDs or DOs. Between 10% and 20% of PAs in primary care in HPRs 1, 2, 4, and 5 are 55 years and older. Less than 10% of PAs in primary care in HPRs 3 and 6 are 55 years and older (Figure 120). About 20% of NPs in primary care in HPRs 2, 5, and 6 and about 15% of primary care NPs in HPRs 1, 3, and 4 are 55 years and older (Figure 121).

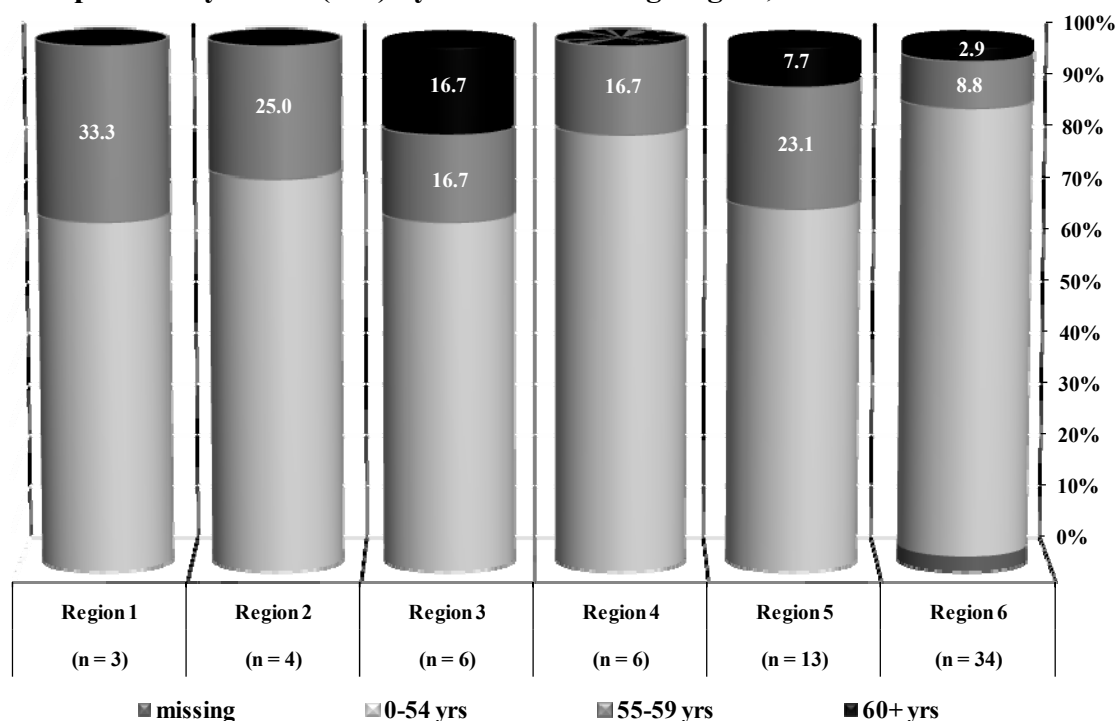
**Figure 118. Pre-Retirement Age Distribution of Actively Practicing Primary Care Allopathic Physicians (MDs) by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

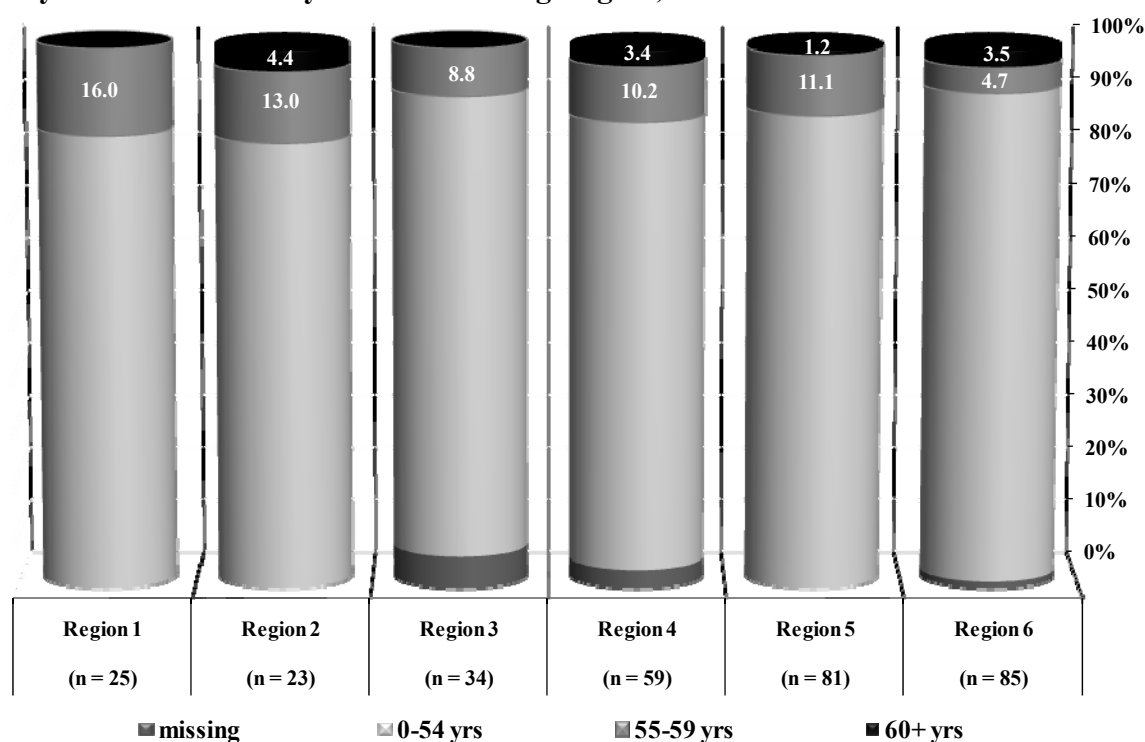


**Figure 119. Pre-Retirement Age Distribution of Actively Practicing Primary Care Osteopathic Physicians (DO) by Health Planning Region, Nebraska 2008**



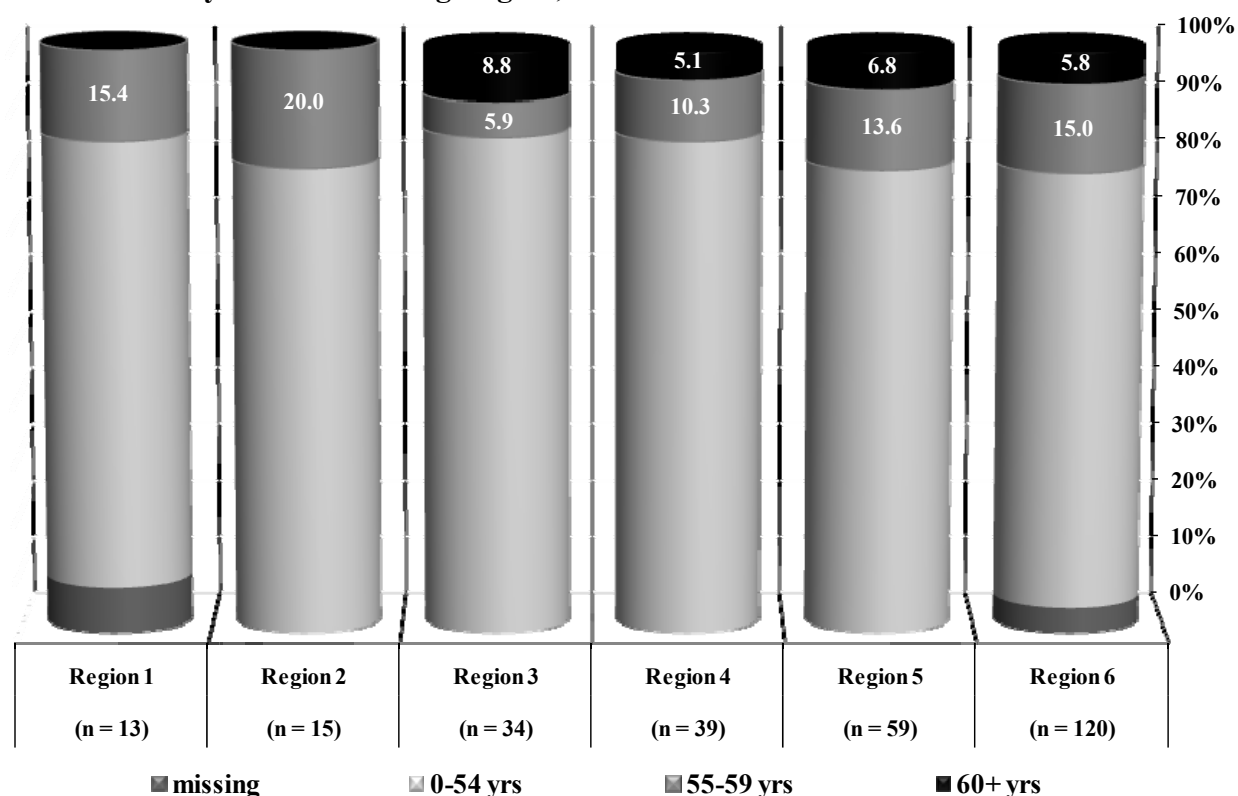
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 120. Pre-Retirement Age Distribution of Actively Practicing Primary Care Physician Assistants by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 121. Pre-Retirement Age Distribution of Actively Practicing Primary Care Nurse Practitioners by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

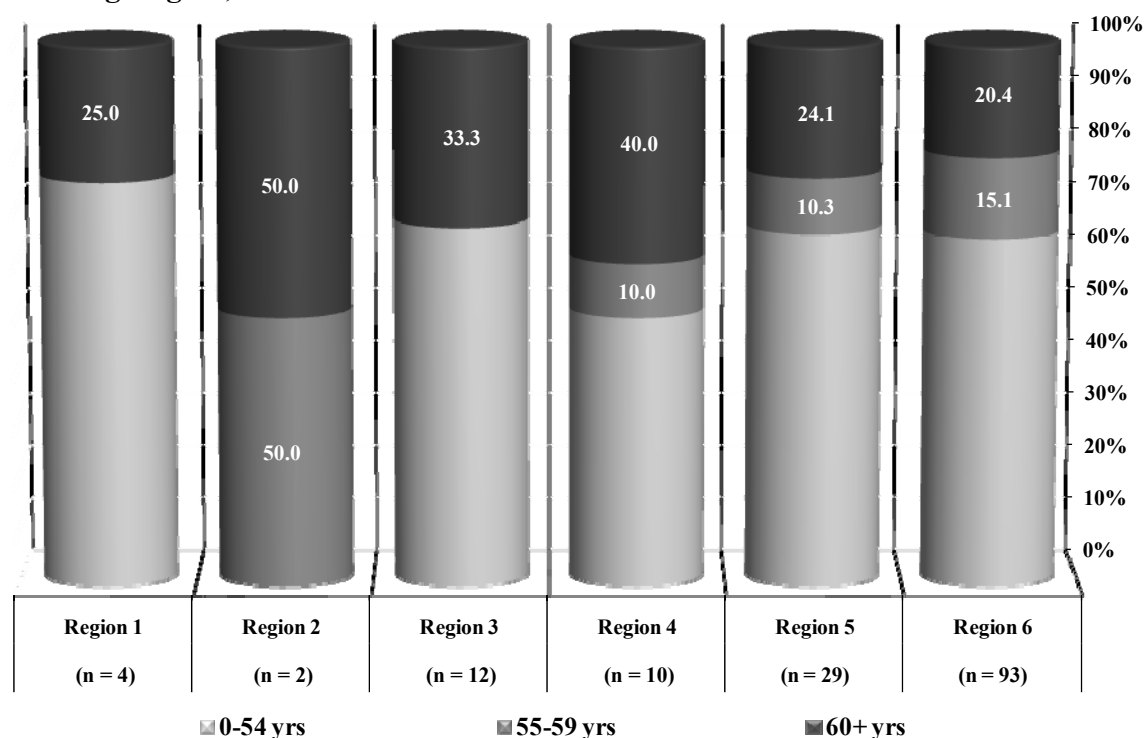
## Mental Health Professionals

Twenty-five percent of psychiatrists in HPR 1 and 33.3% of psychiatrists in HPR 3 are 55 years and older. Both of the psychiatrists (100%) in HPR 2, 50% in HPR 4, 34.4% in HPR 5, and 35.5% in HPR 6 are 55 years and older (Figure 122).

There are no PAs specialized in psychiatry in HPRs 1 and 2. None of the PAs specialized in psychiatry in HPRs 3 and 5 are older than 55 years. Two of the three PAs specialized in psychiatry in HPR 6 (66.7%) and one of the two in HPR 4 (50%) is 55 years and older (Figure 123). One of the two NPs specialized in psychiatry (50%) in HPR 1, one (100%) in HPR 2, and one (9.1%) in HPR 5 are 60 years or older. None of the NPs in HPR 4 are 55 years or older. About 54% of NPs in psychiatry in HPR 3 and 51.8% in HPR 6 are 55 years or older (Figure 124).

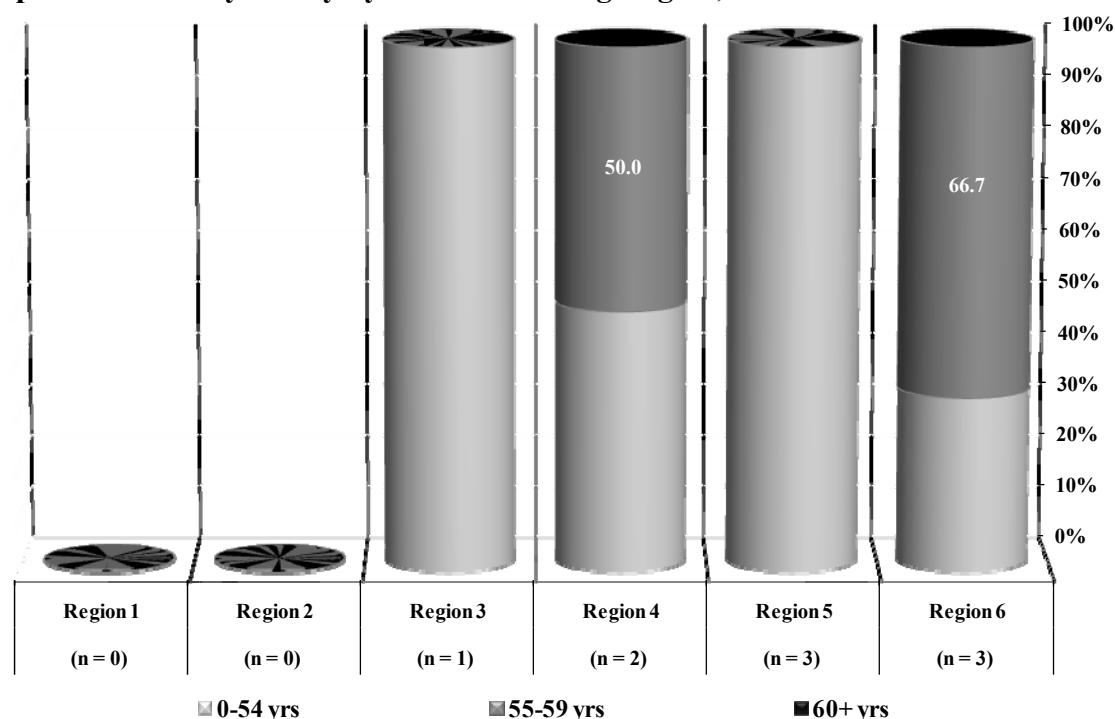
Among behavioral health professionals (including psychologists, licensed mental health practitioners, licensed alcohol and drug counselors, certified compulsive gambling counselors, and masters social workers), 37.9% in HPR 1, 34.9% in HPR 2, 43.1% in HPR 3, 37.4% in HPR 4, 39.1% in HPR 5, and 42.9% in HPR 6 are 55 or older (Figure 125).

**Figure 122. Pre-Retirement Age Distribution of Actively Practicing Psychiatrists by Health Planning Region, Nebraska 2008**



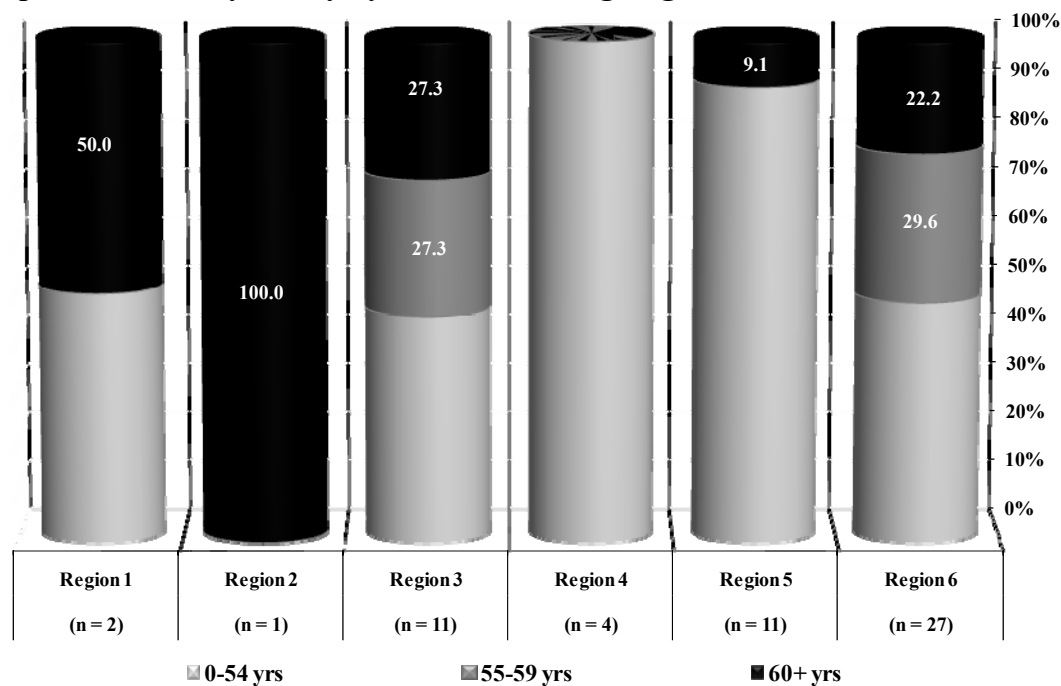
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 123. Pre-Retirement Age Distribution of Actively Practicing Physician Assistants Specialized in Psychiatry by Health Planning Region, Nebraska 2008**



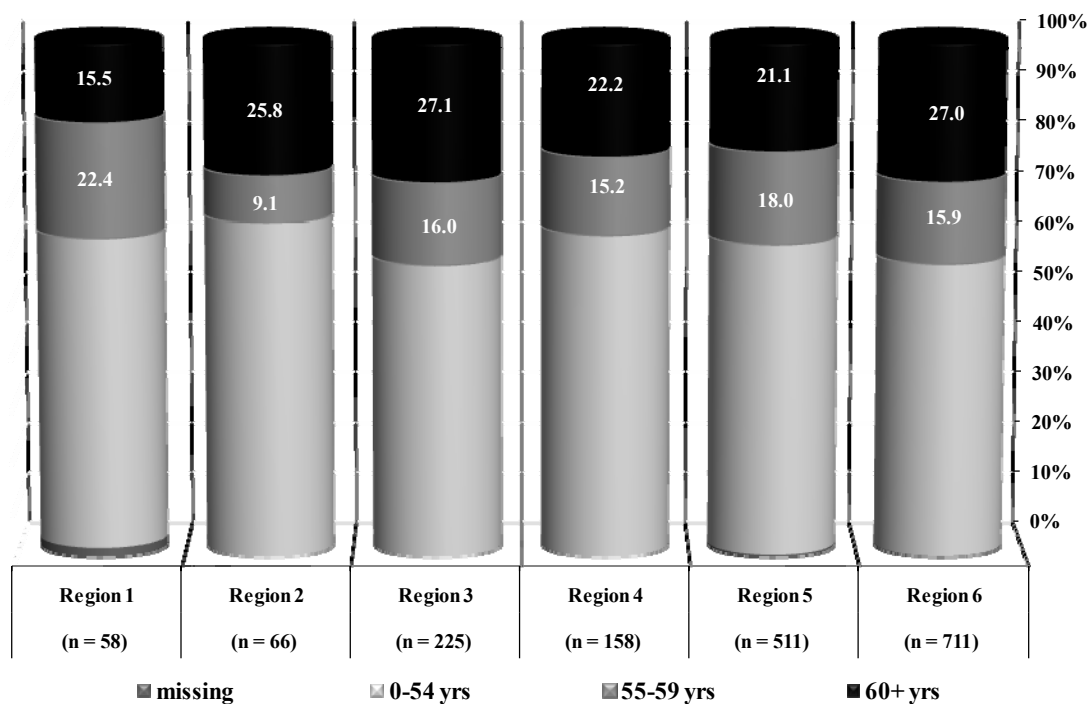
Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 124. Pre-Retirement Age Distribution of Actively Practicing Nurse Practitioners Specialized in Psychiatry by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

**Figure 125. Pre-Retirement Age Distribution of Actively Practicing Behavioral Health Professionals by Health Planning Region, Nebraska 2008**



Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

Note: Behavioral Health Professionals include psychologists, licensed mental health practitioners (LMHPs), licensed alcohol and drug counselors (LADCs), certified compulsive gambling counselors (CCGCs), and master social workers (MSWs); LMHPs, LADCs, CCGCs, and MSWs had 20 missing county data.

## **Retirement Plans of Health Professionals, Nebraska 2009**

The HPTS surveys of health professionals in 2009 showed that 11.4% of primary care physicians and 14.7% of psychiatrists intend to retire in the next ten years. In addition, 28.3% of NPs specialized in psychiatry, 22.2% of PAs specialized in psychiatry, 22.6% of psychologists, and 23.4% of other behavioral health professionals reported that they intend to retire in the next 10 years. A quarter of dentists practicing in Nebraska intend to either close their practice or retire in the next 10 years.<sup>13</sup>

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<sup>13</sup> Data obtained from Health Professions Tracking Service, UNMC, 2009.

## CHAPTER IV

### HEALTH WORKFORCE DEVELOPMENT ACTIVITIES IN NEBRASKA

The objective of the fourth and final phase of the workforce project was to develop a strategic plan and recommendations for Nebraska's health workforce. The workforce team had the following tasks in this phase of the project: (1) to assess current health professions training and pipeline programs, recruitment and retention efforts, and best practices in health workforce development; (2) to conduct a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis of Nebraska's health workforce and workforce planning activities; and (3) to disseminate the key findings of the project to stakeholders in the state and solicit their input to develop the final recommendations.

Chapter IV of this report summarizes our findings regarding health professions training, pipeline programs and recruitment and retention programs in Nebraska, and best practices in workforce development. The SWOT analysis, input from state stakeholders, and final recommendations are discussed in Chapter V.

#### **Health Professions Training**

Educational institutions in Nebraska offer 17 associate degree programs, 20 baccalaureate degree programs, 15 certificate training programs, 11 clinical doctorate programs, 14 master's degree programs, 9 diploma programs, and 2 post-baccalaureate certificate programs training health professionals. Seventy-eight health professions were identified from training and degree programs and the Nebraska Department of Health and Human Services, Licensure Unit. Of those professions identified, 67 have access to a training or degree program in Nebraska and 40 require state licensure. Eleven professions, six of which do not require licensure, do not have access to a training or degree program. The University of Nebraska Medical Center (UNMC) and Creighton University Medical Center offer 20 medical residency programs ranging from two years to six years and 29 fellowship programs ranging from one year to three years. (See Appendices 11 to 14 for further information on training programs, medical residencies, and fellowship programs in Nebraska)<sup>14</sup>.

We contacted 28 educational institutions in the state that train health professionals to obtain data on graduation and retention rates of graduates for years 2003 to 2008. All but three of the institutions provided us with data on yearly graduation from 2003 to 2008. The aggregate data for the state for all health professions that have training programs in Nebraska are summarized in Table 23. The available data show that the number of graduates per year for most professions has remained stable or increased over the last five years.

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<sup>14</sup> Source: Careers in Health Care, 2008 ([http://www.unmc.edu/rhen/index.cfm?L1\\_ID=26&CONREF=16](http://www.unmc.edu/rhen/index.cfm?L1_ID=26&CONREF=16)), and Nebraska Department of Health and Human Services, Licensure Unit (<http://www.hhs.state.ne.us/crl/profindex1.htm>).

We obtained 2007 data from the Health Professions Tracking Service (HPTS) at the University of Nebraska Medical Center (UNMC) on health profession schools attended by physicians, primary care providers, dentists, and pharmacists who were practicing in Nebraska. Most had received their professional training in Nebraska.

## **Physicians**

According to a 2007 report by the Association of American Medical Colleges, Nebraska ranks first in the United States in the percent of physicians practicing in the same state where they completed their undergraduate medical education (State Physician Workforce Data Book, 2007). In 2008, approximately 60% of allopathic physicians practicing in Nebraska were graduates of Nebraska medical schools, 25.8% were graduates of US medical schools outside Nebraska, and 12.3% were graduates of foreign medical schools. In 2008, among all physicians, including allopathic and osteopathic physicians and residents, over half (53.9%) received their medical school training in Nebraska (Table 24). Nebraska does not have a school of osteopathic medicine.

## **Nursing Professionals**

In 2007, the Nebraska Center for Nursing reported that the majority (74.9%) of RNs licensed in Nebraska were graduates of Nebraska schools, 24.1% were graduates of U.S. schools, and 1.1%, were graduates of foreign schools. In 2006, 31% of RNs in Nebraska had received diplomas, 29% received associate degrees, and 40% received baccalaureate degrees (Kelly et al., 2007).

According to the Nebraska Department of Health and Human Services nursing student annual reports, over 1,200 new students have been added to RN programs from 2001 to 2006. Over 530 new students have been added to LPN programs since 2001. In 2006, there were a total of 3,378 students in RN programs and 974 students in LPN programs.<sup>15</sup>

## **Dental Health Professionals**

Eighty-seven percent of dentists in Nebraska in 2007 were graduates of Nebraska's dental schools (Table 24). The College of Dentistry at UNMC has collected data on the retention of dental graduates in Nebraska over the last 20 years. The salient findings include the following:

- In the early 1990s, only 24% of dental graduates stayed in Nebraska. The most recent data show that this has increased to 47%.
- Over the past 20 years, more than half (52%) of graduates who stayed in Nebraska practiced in rural communities.
- Of the students who came from other states (non-residents) and then stayed in Nebraska, of a total of 29, about 2/3 settled in rural communities.
- A larger proportion of women graduates, than men stayed in Nebraska (44% vs. 32%).

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<sup>15</sup> Source: Nebraska HHS, Regulation and Licensure, Nursing Student Annual Reports.

- Of men who stayed in Nebraska, 49% practice in rural communities; of women who stayed in Nebraska, 59% practice in rural communities.<sup>16</sup>

## **Pharmacists**

Eighty-two percent of Nebraska's pharmacists in 2007 were graduates of Nebraska programs (Table 24). The use of distance learning models in pharmacy education has expanded and has contributed to the growth in existing training programs. Creighton University enrolls about 110 students each year on their main campus and an additional 55 students in a Web-based pathway. Creighton's distance learning program is unique in the nation in that it offers an almost entirely web-based program, allowing the students to earn their degree largely out of their home location (The Adequacy of Pharmacist Supply, 2008).

## **Allied Health Professionals**

There are only two PA programs in Nebraska, one at UNMC and the other at Union College in Lincoln. Table 23 includes data on the graduates of the UNMC distance education PA program and the IPAP (Inter-service PA Program) for the United States Military at Fort Sam Houston. The distance education PA program consists of practicing PAs from throughout the United States. The students in this program already hold a BA degree and take classes via distance education to obtain a master's degree. Few of the graduates of the distance learning program practice in Nebraska because they are already in practice elsewhere.<sup>17</sup> The PA program at UNMC has a contract with the IPAP to serve as the degree granting institution. All of the graduates of the IPAP program enter military practice.

## **Public Health Professionals**

In 2007, the Great Plains Public Health Leadership Institute (GPPHLI) assessed the governmental public health workforce. GPPHLI found that 78% of the employees in local health departments and 81% of employees in the state division of public health had an associate's degree or above. GPPHLI also learned that recruitment of individuals with specific public health training was considered a challenge by the majority of public health professionals interviewed. Retention of employees was not considered to be an issue by the majority (70%) of the public health professionals in management positions who were interviewed (Hahn & Svoboda, 2007).

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<sup>16</sup> Data obtained by personal communication from John Reinhardt, Dean, College of Dentistry, University of Nebraska Medical Center.

<sup>17</sup> Information obtained by personal communication from Kyle Meyer, Associate Dean, School of Allied Health Professions, UNMC.



**Table 23. Number of Graduates by Health Profession, Nebraska 2003 – 2008**

<b>Profession</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>Total</b>
<b>PHYSICIANS</b>							
Physician	233	215	215	236	240	237	1,376
Physician Assistant**	569	650	531	532	530	27*	2,839
<b>NURSING PROFESSIONALS</b>							
Registered Nurse, Associate of Science in Nursing	108	210	198	240	267	240	1,263
Registered Nurse, Bachelor of Science in Nursing	441	538	628	715	737	475	3,534
Certified Nursing Assistant	246	674	918	890	922	956	4,606
Licensed Practical Nurse	200	231	328	272	354	219	1,604
Nurse Anesthetist	6	8	9	8	0	9	40
Nurse Practitioner	28	24	21	32	33	39	177
Registered Nurse	136	125	128	133	86	51	659
<b>DENTAL HEALTH PROFESSIONALS</b>							
Dentist	125	128	131	126	127	82	719
Dental Hygienist	20	22	24	24	24	24	138
Dental Assistant	31	34	43	37	17	35	197
<b>PHARMACISTS</b>							
Pharmacist	180	174	223	239	226	232	1,274
<b>ALLIED HEALTH PROFESSIONALS</b>							
Emergency Medical Technician	9	15	13	12	15	1	65
Coding Technician	3	6	11	4	13	10	47
Invasive Card Tech	0	1	3	3	8	5	20
Medical Lab Tech	18	18	18	18	37	17	126
Medical Technology/Clinical Laboratory Science	2	1	2	2	2	0	9
Occupational Therapist	44	18	23	0	36	30	151
Physical Therapist	105	88	102	99	95	97	586
Physical Therapy Assistant	12	9	13	18	16	17	85
Radiography	88	109	114	125	111	119	666
Respiratory Therapist	39	43	48	48	37	49	264
Speech Language Pathology	18	10	10	13	14	16	81
Surgery Technology	30	32	50	52	32	32	228
Ultrasonography	12	14	19	19	21	29	114
<b>MENTAL HEALTH PROFESSIONALS</b>							
Counselor	105	113	113	144	161	58	694
Human Services	24	27	27	38	58	41	215
Human Services Worker	110	100	133	160	104	95	702
Social Work	51	46	57	56	70	61	341
<b>HEALTH CARE SERVICES AND ADMINISTRATION PROFESSIONALS</b>							
Health Care Administration	80	195	320	273	170	369	1,407
Health Information Management Services	11	8	21	15	16	16	87
Health Promotion Services	24	32	25	57	38	51	227
Medical Assistant	32	33	45	39	44	34	227
Medical Office Service	5	38	25	18	28	17	131
Medical Transcription	12	13	6	11	6	0	48
<b>OTHER</b>							
Athletic Trainer	5	11	19	14	19	12	80

Source: Personal communication with Nebraska colleges, universities, junior colleges, and other programs offering health profession training or degrees. \*Data were obtained from only one program. \*\* Includes graduates of the UNMC distance education PA program and the IPAP (Inter-service PA Program) for the United States Military at Fort Sam Houston.

**Table 24: Location of Professional School Attended by Selected Health Professions, Nebraska 2007-2008**

Profession	Nebraska	Other US State	Foreign	Unknown	Total for each Profession
<b>ALL PHYSICIANS</b>					
Allopathic Physicians <sup>1</sup>	2,058 (59.8%)	889 (25.8%)	422 (12.3%)	73 (2.1%)	<b>3,442</b>
Osteopathic Physicians <sup>1</sup>	0 (0.0%)	127 (99.2%)	0 (0.0%)	1 (0.8%)	<b>128</b>
Residents <sup>1</sup>	156 (29.0%)	141 (26.2%)	67 (12.5%)	174 (32.3%)	<b>538</b>
<b>TOTAL ALL PHYSICIANS</b>	<b>2,214 (53.9%)</b>	<b>1,157 (28.2%)</b>	<b>489 (11.9%)</b>	<b>248 (6.0%)</b>	<b>4,108</b>
<b>PRIMARY CARE</b>					
Allopathic Physicians	890 (71.5%)	236 (19.0%)	110 (8.8%)	9 (0.7%)	<b>1,245</b>
Osteopathic Physicians	0 (0.0%)	59 (98.3%)	0 (0.0%)	1 (1.7%)	<b>60</b>
Residents	105 (44.3%)	96 (40.5%)	36 (15.2%)	0 (0.0%)	<b>237</b>
Physician Assistants	222 (77.6%)	64 (22.4%)	0 (0.0%)	0 (0.0%)	<b>286</b>
Nurse Practitioners	170 (74.2%)	56 (24.5%)	0 (0.0%)	3 (1.3%)	<b>229</b>
<b>TOTAL ALL PRIMARY CARE</b>	<b>1,282 (70.4%)</b>	<b>415 (22.8%)</b>	<b>110 (6.0%)</b>	<b>13 (0.7%)</b>	<b>1,820</b>
<b>DENTISTS &amp; PHARMACISTS</b>					
Dentists <sup>1</sup>	904 (87.6%)	112 (10.9%)	3 (0.3%)	12 (1.3%)	<b>1,032</b>
Pharmacists <sup>1</sup>	1,424 (82.6%)	222 (12.9%)	5 (0.3%)	73 (4.2%)	<b>1,724</b>
<b>TOTAL DENTISTS &amp; PHARMACISTS</b>	<b>3,610 (78.9%)</b>	<b>749 (16.4%)</b>	<b>118 (2.6%)</b>	<b>98 (2.1%)</b>	<b>4,576</b>
<b>Total for each Location</b>	<b>16,750 (69.1%)</b>	<b>5,168 (21.3%)</b>	<b>1,514 (6.2%)</b>	<b>803 (3.3%)</b>	<b>4,813</b>

Source: Health Professions Tracking Service, 2007.

<sup>1</sup>Data updated February 2008.

## Primary Care Professionals

Seventy-one percent of allopathic primary care physicians, 74% of primary care nurse practitioners, and 77% of primary care physician assistants are graduates of schools in Nebraska (Table 24). About a third, (62.1%) of primary care allopathic physicians and 46.7% of primary care osteopathic physicians had their residency training in Nebraska (Table 25). Information on the location of residency training was not available for all of the primary care physicians.

**Table 25. Residency Training Location of Primary Care Physicians, Nebraska 2007**

Profession	Foreign	Nebraska	Other US State	Total
Allopathic Physicians	12 (1.1%)	697 (62.1%)	414 (36.9%)	1,123
Osteopathic Physicians	0 (0.0%)	21 (46.7%)	24 (53.3%)	45

Source: Health Professions Tracking Service, UNMC, 2007.

## Health Workforce Pipeline

The late Robert Waldman, M.D., dean of UNMC's College of Medicine, initiated a hub and spoke approach to the health workforce pipeline when he created the Rural Health Education Network (RHEN). The development of RHEN led to the development of the Rural Health Opportunities Program (RHOP), a joint effort of UNMC, Chadron State College, and Wayne State College that guarantees students from Nebraska rural high schools entrance to health professions training programs at UNMC upon successful completion of pre-professional requirements at Chadron or Wayne State. At Chadron, RHOP students can prepare for entry into programs in medicine, pharmacy, nursing, dentistry, dental hygiene, medical technology/clinical laboratory science, physician assistant, physical therapy and radiography; at Wayne State College, RHOP students can prepare for entry into programs in medicine, pharmacy, dentistry, and dental hygiene. The RHOP program has had a high success rate in retaining graduates in rural Nebraska (Table 26). A total of 374 Nebraskans have participated in RHOP since it began in 1992. More than 70% of graduates from the program have remained in the state, and approximately two-thirds have returned to rural areas to practice.<sup>18</sup>

UNMC received approval from the American Board of Family Practice in 1993 for an accelerated family practice training program. The program adds a one-year "rural procedures" fellowship to the usual program. Accelerated residents are required to commit to practice in rural Nebraska. The Nebraska Accelerated Rural Training Program has a high retention rate.<sup>19</sup>

Through the Area Health Education Centers (AHECs), medical schools and community health centers cooperate to recruit and train health care professionals to serve in rural areas. Nebraska

<sup>18</sup> Further information on RHOP programs is available on the RHOP Web site at [http://www.unmc.edu/Community/ruralmeded/model/medsch/rural\\_health\\_opportunities\\_progr.htm](http://www.unmc.edu/Community/ruralmeded/model/medsch/rural_health_opportunities_progr.htm)

<sup>19</sup> Information on the Nebraska Accelerated Training Program is available at <http://www.unmc.edu/Community/ruralmeded/model/gradu/Accel%20and%20underserved.htm>

has AHECs for the following five regions of the state: Central Nebraska, Northern Nebraska, Nebraska Panhandle, Omaha Urban, and Southeast Nebraska. Nebraska AHECs recruit students to health careers in Nebraska through career fairs, job shadowing programs, health career materials, student training opportunities in community-based settings, continuing education programs, and small community grants.<sup>20</sup>

**Table 26. Rural Health Opportunities Program (RHOP) Graduation Statistics by Selected Health Professions, Nebraska 2006**

<b>Graduates</b>	<b>Remain in Nebraska</b>	<b>Practice in a Rural Community – Nebraska</b>	<b>Practice in a Rural Community - Other State</b>
Residency Training Completed	67%	53%	10%
Physician Assistants	71%	64%	18%
Dentists	71%	63%	16%
Pharmacists	69%	44%	6%

Source: Swanson, C., Jokela, R., Mason, M., & Mueller, K. (September 2007). *Health Data Reporter: Examining the Rural Health Opportunities Program*. Omaha, NE: University of Nebraska Medical Center, Nebraska Health Information Project.

## **Recruitment and Retention Programs**

The Nebraska Department of Health and Human Services, Office of Rural Health and Primary Care, administers the J-1 visa waiver or State Conrad 30 program that places physicians in rural underserved areas of the state. In 2008, there were 82 state-sponsored J-1 visa waiver physicians who had remained in Nebraska or who were serving the three-year service obligation. Of these, 19 were primary care physicians, 7 were specialized in mental health, and 56 were specialized in other sub-specialty areas (Figure 126). These physicians practice in 18 counties. Of the total 82 physicians, 42 were currently serving their three-year service obligation, 29 remained at their original practice location, and 11 had moved to a different location in the state. Figure 127 shows the practice locations of the J-1 visa waiver physicians in the state.

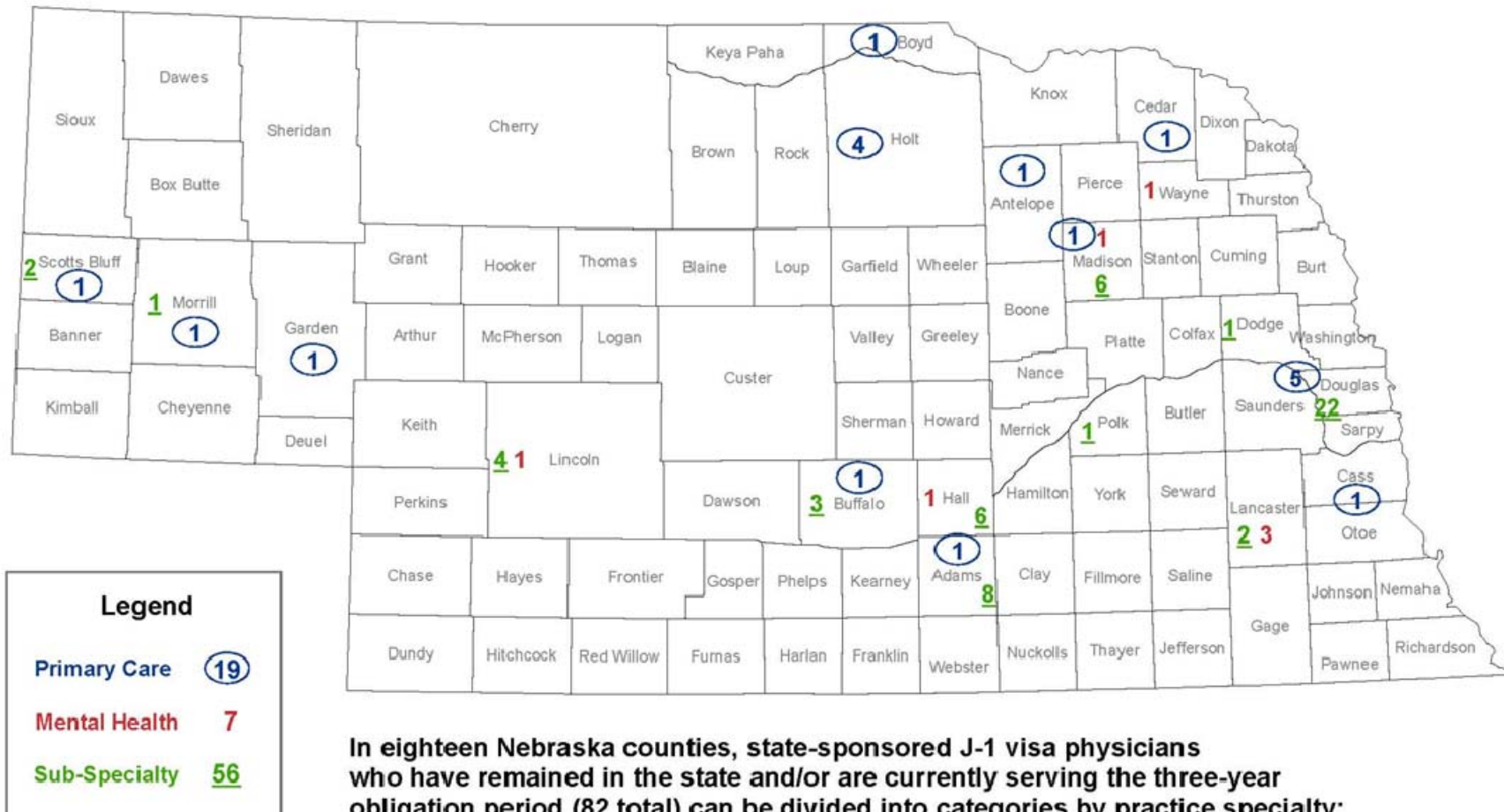
In addition, the Nebraska Office of Rural Health also administers the federal scholarship and loan repayment programs through the National Health Service Corps (NHSC). The NHSC places health professionals in rural and underserved areas. These clinicians include primary care providers, dental providers, and mental and behavioral health professionals.

The Nebraska Student Loan Program awards student loans to medical, physician assistant, dental and graduate-level mental health students attending school in Nebraska. The Nebraska Loan Repayment Program helps qualified health professionals pay their educational debts.

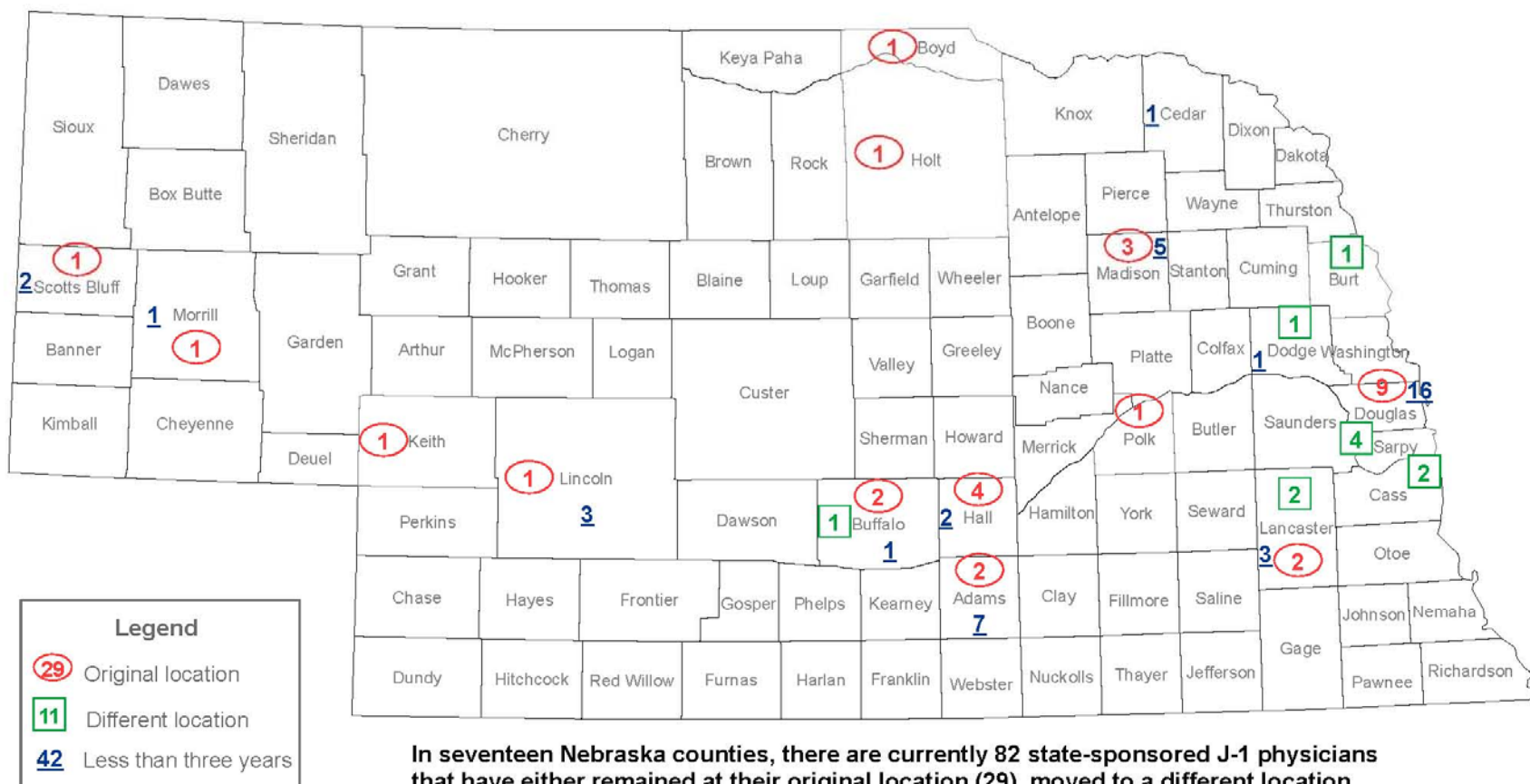
<sup>20</sup> Information on Nebraska AHECs is available at <http://www.unmc.edu/dept/ahec/>.

The Office of Rural Health also helps match candidates with community job opportunities. Complete information on these programs can be accessed at the Web site of the state's Office of Rural Health at <http://www.hhs.state.ne.us/orh/>.

**Figure 126. J-1 Visa Waiver Physicians by Specialty, Nebraska 2008**



**Figure 127. J-1 Visa Waiver Physicians by County Location, Nebraska 2008**



**In seventeen Nebraska counties, there are currently 82 state-sponsored J-1 physicians that have either remained at their original location (29), moved to a different location within the state (11), or are currently serving the three-year obligation period (42).**

Source: NDHHS, Office of Rural Health & Primary Care  
October, 2008

Cartography: Cassie Manhart, [cassie.manhart@dhhs.ne.gov](mailto:cassie.manhart@dhhs.ne.gov)

## **Best Practices**

We identified best practices in workforce development using evidence from other states and reviewing the literature on workforce development. Several strategies are being utilized by various states across the United States. Table 27 summarizes some of the strategies and some of the states that have implemented them. This is not an exhaustive list of all workforce development activities in the United States. Instead, these are examples of strategies that we identified from our review of the literature as having achieved success in workforce development. The majority of states have taken actions to address workforce development, and the reader is directed to a comprehensive report on state actions to address workforce shortages for further details (State Responses to Health Worker Shortages, 2002). The following are select generic strategies that states have used successfully in workforce development:

- Regulatory actions intended to require or encourage coordination of data collection across health professions
- Effective, health workforce data collection system
- Centralized and accessible information repository for state health care, specifically health workforce data
- State health workforce analytical and planning center
- Statewide summit to explore challenges associated with supply and demand of health care workforce and develop strategies to address these challenges
- Statewide health workforce advisory council to monitor and coordinate planning and strategies to address prioritized health workforce needs
- Financial incentives to encourage health professions to locate in underserved areas
- Effective career development and higher education training programs to encourage students to pursue health care professions



**Table 27. Best Practice Strategies for Workforce Development**

STRATEGY	STATE EXAMPLES
<ul style="list-style-type: none"> <li>Regulatory actions intended to require or encourage coordination of data collection across health professions</li> </ul>	<ul style="list-style-type: none"> <li>Minnesota public policy: 1993, mandated regular survey in conjunction with provider license renewal</li> <li>Kentucky Data Council: 2006, standardization of data collection among licensing boards</li> </ul>
<ul style="list-style-type: none"> <li>Effective, health workforce data collection system</li> </ul>	<ul style="list-style-type: none"> <li>North Carolina Health Professions Data System</li> <li>Nebraska Health Professions Tracking Service</li> </ul>
<ul style="list-style-type: none"> <li>Centralized and accessible information repository for state health care, specifically health workforce data</li> </ul>	<ul style="list-style-type: none"> <li>Texas Center for Health Statistics – Health Professions Resource Center</li> </ul>
<ul style="list-style-type: none"> <li>State health workforce analytical and planning center</li> </ul>	<ul style="list-style-type: none"> <li>Oregon Healthcare Workforce Center</li> <li>Michigan Center for Health Professions</li> </ul>
<ul style="list-style-type: none"> <li>Statewide summit to explore challenges associated with supply and demand of health care workforce and develop strategies to address these challenges</li> </ul>	<ul style="list-style-type: none"> <li>2006 North Dakota Healthcare Workforce Summit</li> <li>2002 Colorado Healthcare Workforce Summit</li> </ul>
<ul style="list-style-type: none"> <li>Statewide health workforce advisory council to monitor and coordinate planning and strategies to address prioritized health workforce needs</li> </ul>	<ul style="list-style-type: none"> <li>Montana Health Care Advisory Committee</li> <li>Ohio Health Care Advisory Council</li> </ul>
<ul style="list-style-type: none"> <li>Financial incentives to encourage health professions to locate in underserved areas</li> </ul>	<ul style="list-style-type: none"> <li>Nebraska Loan Repayment Program for Rural Health Professionals</li> <li>Arkansas Rural Medical Practice Student Loan &amp; Scholarship Program</li> <li>New Mexico Rural Health Care Practitioner Tax Credit Program</li> </ul>
<ul style="list-style-type: none"> <li>Effective career development and higher education training programs to encourage students to pursue health care professions</li> </ul>	<ul style="list-style-type: none"> <li>North Dakota Health Care Workforce Pipeline Model</li> <li>Nebraska Rural Health Education Network &amp; Rural Health Opportunities Program</li> <li>West Virginia Rural Health Education Partnership</li> <li>WWAMI: Student Providers Aspiring to Rural and Underserved Experiences (SPARX)</li> </ul>

## **CHAPTER V**

### **STRATEGIC PLAN FOR NEBRASKA’S HEALTH CARE WORKFORCE**

A second statewide meeting of stakeholders was convened in June 2009 and the findings of the study were presented. The stakeholder group was charged with discussing barriers and opportunities to workforce development and developing priorities and recommendations for the state’s workforce development efforts. The input from the state stakeholders’ group was incorporated in the recommendations of the project. Chapter V presents a strengths, weaknesses, opportunities, and threats (SWOT) analysis of Nebraska’s health workforce and workforce planning activities, the strategic plan, and final recommendations for Nebraska’s health workforce.

#### **SWOT Analysis**

Table 28 summarizes a SWOT analysis of Nebraska’s health workforce and workforce planning activities. The SWOT analysis was used as a planning tool to develop a strategic plan and recommendations for Nebraska’s health workforce.

#### **Strengths**

##### ***Workforce***

- The state’s ratio of health professionals to population is above the national average for the majority of health professions.
- For pharmacists, dental hygienists, allied health professionals and the auxiliary health workforce, aging of the workforce is not an issue

##### ***Workforce Planning Activities***

##### ***Assessment & Analysis***

- The Nebraska Center for Nursing regularly monitors the nursing workforce in the state and conducts biennial surveys of registered nurses and licensed practical nurses.
- The Health Professions Tracking Service (HPTS) at the College of Public Health, University of Nebraska Medical Center (UNMC), collects data yearly and tracks the workforce supply of physicians, physician assistants, nurse practitioners, dentists, pharmacists, and mental health professionals. This is a very reliable source of data.
- The Nebraska Hospital Association surveys vacancy and turnover rates for health care facilities.
- The Nebraska Medical Association surveys its members annually.

### *Workforce Development (Training, Pipeline, Recruitment, and Retention)*

- Nebraska ranks first in the nation in the percentage of physicians practicing in the state who are graduates of the state's medical schools (Nebraska 58% vs. the national median of 30%) (Association of American Medical Colleges, 2007).
- Nebraska ranks fourth in the number of students enrolled in medical schools per 100,000 population (Nebraska 55.9 vs. the national median of 25.9 (Association of American Colleges, 2007).
- A high proportion, between 70% and 80%, of primary care providers, dentists, and pharmacists practicing in the state are graduates of Nebraska educational institutions. Nebraska has lower than the national median of international medical graduates (Nebraska 12.6% vs. national median of 17.3%) (Association of American Medical Colleges, 2007).
- Retention data on UNMC dental graduates for the last 20 years are available and show that retention of UNMC dental graduates in the state has improved from 25% to 47% in the last 20 years.
- The RHOP UNMC/Wayne State/Chadron State program has a high retention rate.
- The Nebraska Accelerated Rural Training Program for family medicine has a high retention rate.
- The Nebraska Office of Rural Health administers National Health Service Corps, Conrad 30, and, in cooperation and direction from the Rural Health Advisory Commission, the state's rural incentive programs to recruit and retain health professionals in rural and underserved areas.

### **Weaknesses**

#### ***Workforce***

- The ratio of physicians, nurse practitioners, certified nurse midwives, and psychologists to 100,000 population is below the national average ratio (The United States Health Workforce Profile, 2006).
- Aging of the workforce is an issue for physicians, dentists, psychiatrists, and behavioral health professionals, although the proportion of physicians older than 60 years is below the national average proportion of older physicians (The United States Health Workforce Profile, 2006).
- Women are underrepresented among physicians, dentists, and nurse anesthetists.
- Although state ratios of providers to 100,000 population compare favorably with national average ratios, mal-distribution of physicians, primary care providers, dentists, pharmacists, psychiatrists, and behavioral health professionals is a problem. Several counties in Nebraska have no physicians, primary care providers, dentists, pharmacists, psychiatrists, or behavioral and allied health professionals.
- In several counties, more than 30% of physicians, dentists, and behavioral health professionals are in the pre-retirement age group, i.e., older than 55 years.
- Rural counties have a higher proportion of aging health professionals.
- It is estimated that the state will face projected shortages of physicians, nurses, and dentists through year 2020.

## ***Workforce Planning Activities***

### ***Assessment & Analysis***

- The first step in health workforce planning is enumeration or assessment of capacity. However, currently there are no data collection activities for dental hygienists, pharmacy technicians, allied health professionals, and auxiliary health professionals. This lack of data hampers planning efforts for these health professions.
- Although the licensure database is a source of data for assessment of capacity, there are limitations to the data currently being routinely collected at the time of licensure renewal. For example, the address field does not always reflect the practice location of the health professional. This limits the assessment of regional needs, as it is not possible to accurately locate the practice location of all health professionals and identify areas of high need.
- The licensure data does not have race/ethnicity information. The HPTS data also does not have complete data on race/ethnicity, as there is a 10% to 20% non-response rate for this question on the surveys.
- There is no centralized agency to analyze data on other health professions. Professional and trade associations collect data from various sources and consulting agencies.

### ***Workforce Development (Training, Pipeline, Recruitment, and Retention)***

- Nebraska ranks 37th nationally in the number of medical graduates of Nebraska medical schools who are practicing in the state (Nebraska 25%, national median 40%), indicating that the majority of medical graduates leave the state.
- Reliable data on the proportion of graduates of Nebraska's health professional programs (other than physicians and dentists) who are practicing in the state are not available. There is a need to collect these data in the future to assess the success of retention and pipeline programs.

## **Opportunities**

### ***Workforce***

- The rural residency track for family medicine could be a model for other specialties, such as psychiatry, that are historically in undersupply in rural areas.
- Nebraska's telehealth network could address the needs for dental and behavioral health professionals in rural underserved areas. However, reimbursement and scope of practice issues are likely to be barriers to the use of telehealth in health care delivery for rural, underserved areas in the state. Currently, the telehealth network is used mostly for videoconferencing and training activities.

## ***Workforce Planning Activities***

### ***Assessment & Analysis***

- The online survey of nurses at the time of licensure renewal could be a model for other professions.
- The Nebraska Center for Nursing model of biennial surveys could be extended to other professions.

### ***Workforce Development (Training, Pipeline, Recruitment, and Retention)***

- The Norfolk-UNMC partnership in nursing education could be a model for other health professions.
- State loan repayment programs could be extended to other health professions.

## **Threats**

### ***Workforce***

- The diversity of Nebraska's workforce does not reflect the diversity of the population (African Americans, Hispanics, and Native Americans are underrepresented). However, reliable race/ethnicity data are not available and this could hamper future workforce development activities.
- The decreasing interest of graduating medical students in family medicine residency programs could pose a threat to the future primary care provider workforce especially in rural areas.
- The aging of the cohort of health professionals is a greater challenge for rural areas than urban areas. This, along with earlier retirement patterns, could affect the future supply of health professionals in rural underserved areas.

## ***Workforce Planning Activities***

### ***Assessment & Analysis***

- The online survey at the time of licensure renewal is voluntary, not mandated by state law, and the respondents may consider it burdensome.
- The state Licensure Unit cannot analyze data even if collected for all health professions.

### ***Workforce Development (Training, Pipeline, Recruitment, and Retention)***

- There are limitations on increasing capacity by increasing enrollment, especially because of nursing faculty shortages.

**Table 28. SWOT Analysis: Strengths and Weaknesses**

	STRENGTHS	WEAKNESSES
<b>WORKFORCE - CURRENT SUPPLY</b>		
<b>Counts</b>	<ul style="list-style-type: none"> <li>The state's provider to population ratios are above the national average for the majority of health professions.</li> </ul>	<ul style="list-style-type: none"> <li>The provider-to-population ratios for physicians, nurse practitioners, certified nurse midwives, and psychologists are below the national average.</li> </ul>
<b>Aging Cohort</b>	<ul style="list-style-type: none"> <li>Pharmacist, dental hygienist, and auxiliary health professional workforces have no aging issue.</li> </ul>	<ul style="list-style-type: none"> <li>Aging of the workforce is an issue for physicians, dentists, psychiatrists, and behavioral health professionals</li> </ul>
<b>Gender Composition</b>		<ul style="list-style-type: none"> <li>Women are underrepresented among physicians, nurse anesthetists, dentists</li> </ul>
<b>WORKFORCE - REGIONAL NEEDS/ SHORTAGES</b>		
<b>Federal &amp; State Shortage Area Designations</b>		<ul style="list-style-type: none"> <li>Although state provider-to-population ratios compare favorably with national average ratios, physicians, primary care providers, dentists, pharmacists, and psychiatrists are unevenly distributed in the state.</li> </ul>
<b>County Profiles (Distribution)</b>		<ul style="list-style-type: none"> <li>Several counties have no physicians, primary care providers, dentists, pharmacists, psychiatrists, or behavioral and allied health professionals.</li> </ul>
<b>WORKFORCE - PROJECTED NEEDS</b>		
<b>Workforce Projections</b>		<ul style="list-style-type: none"> <li>Shortages of physicians, nurses and dentists are projected through 2020.</li> </ul>
<b>Aging Cohort by Health Planning Region</b>		<ul style="list-style-type: none"> <li>In several counties, 30% or more of physicians, dentists, and mental health professionals are 55 years or older.</li> <li>Rural counties have a higher proportion of aging health professionals.</li> </ul>

Continued on the next page

**Table 28. SWOT Analysis: Strengths and Weaknesses (continued)**

	STRENGTHS	WEAKNESSES
PLANNING ACTIVITIES - ASSESSMENT		
<b>Data Collection</b>	<ul style="list-style-type: none"> <li>The Health Professions Tracking Service collects data yearly and tracks workforce supply of physicians, physician assistants, nurse practitioners, dentists, pharmacists, and mental health professionals.</li> <li>The Nebraska Center for Nursing conducts biennial surveys of registered nurses and licensed practical nurses.</li> <li>The Nebraska Hospital Association surveys vacancy and turnover rates for health care facilities.</li> <li>The Nebraska Medical Association surveys its members annually.</li> </ul>	<ul style="list-style-type: none"> <li>No data is collected on the dental hygienist, pharmacy technician, allied health, and auxiliary health professional workforces.</li> <li>The licensure data address field does not always reflect the practice location of health professionals.</li> <li>Reliable data on the race/ethnicity of health professionals are not available.</li> </ul>
<b>Data Analysis</b>	<ul style="list-style-type: none"> <li>The Nebraska Center for Nursing analyzes nursing data.</li> </ul>	<ul style="list-style-type: none"> <li>The state has no centralized agency for data collection and analysis for health professions other than nursing.</li> </ul>
WORKFORCE DEVELOPMENT		
<b>Training</b>	<ul style="list-style-type: none"> <li>Nebraska ranks first in the percentage of physicians practicing in the state who are graduates of Nebraska medical schools (Nebraska 58%, national median 30%).</li> <li>Nebraska ranks fourth in the number of students enrolled in medical schools per 100,000 population (twice the national median).</li> <li>70% – 80% of primary care providers, dentists, and pharmacists are graduates of state programs.</li> <li>Nebraska's number of international medical graduates is lower than the national average.</li> </ul>	<ul style="list-style-type: none"> <li>Nebraska ranks 37th nationally in the number of graduates of Nebraska medical schools who are practicing in the state (Nebraska 25% vs. a national median of 40%).</li> <li>The proportion of graduates of Nebraska's other health professional programs (other than physicians and dentists) who are practicing in the state is not known except for UNMC dental graduates</li> </ul>
<b>Pipeline Programs</b>	<ul style="list-style-type: none"> <li>The Rural Health Opportunities Program has a high retention rate.</li> </ul>	
<b>Recruitment and Retention</b>	<ul style="list-style-type: none"> <li>Retention data on UNMC dental graduates for the last 20 years are available and show that retention of UNMC dental graduates in the state has improved from 25% to 47% in the last 20 years.</li> </ul>	

**Table 29. SWOT Analysis: Opportunities and Threats**

	OPPORTUNITIES	THREATS
<b>WORKFORCE CURRENT SUPPLY</b>		
<b>Race/ Ethnicity</b>		<ul style="list-style-type: none"> <li>The diversity of the workforce does not reflect the diversity of the population (African American, Hispanic, and Native American are underrepresented. However, reliable data are not available.</li> </ul>
<b>WORKFORCE REGIONAL NEEDS/ SHORTAGES</b>		
<b>Rural/ Urban Distribution</b>	<ul style="list-style-type: none"> <li>The rural residency track for family medicine could be a model for other specialties</li> </ul>	<ul style="list-style-type: none"> <li>Decreasing interest in family medicine residency could pose a threat to the rural primary care provider workforce.</li> </ul>
	<ul style="list-style-type: none"> <li>Nebraska's telehealth network could address the needs for dental and mental health professionals.</li> </ul>	
<b>WORKFORCE PROJECTED NEEDS</b>		
<b>Aging Cohort</b>		<ul style="list-style-type: none"> <li>A larger aging cohort of health professionals in rural areas along with earlier retirement could affect future supply.</li> </ul>
<b>PLANNING ACTIVITIES</b>		
<b>Assessment and Analysis</b>	<ul style="list-style-type: none"> <li>The online survey of nurses at the time of licensure renewal could be a model for other professions.</li> </ul>	<ul style="list-style-type: none"> <li>The state licensure survey is voluntary, not mandated by state law, and respondents may consider burdensome.</li> </ul>
	<ul style="list-style-type: none"> <li>The Center for Nursing model of biennial surveys could be extended to other professions.</li> </ul>	<ul style="list-style-type: none"> <li>The state Licensure Unit cannot analyze data, even if collected.</li> </ul>
<b>WORKFORCE DEVELOPMENT</b>		
<b>Training</b>	<ul style="list-style-type: none"> <li>The Norfolk-UNMC partnership for nursing could be a model for other professions.</li> </ul>	<ul style="list-style-type: none"> <li>There are limitations on increasing capacity by increasing enrollment, especially because of nursing faculty shortages.</li> </ul>
<b>Recruitment and Retention</b>	<ul style="list-style-type: none"> <li>State Loan repayment programs could be extended to other health professions.</li> </ul>	



## **A Strategic Plan by Health Planning Region**

As described in Chapter 2, although for the majority of health professions categories, the state's supply of health professionals compares favorably with that of the rest of the nation, there is a significant problem of rural/urban mal-distribution of health professionals in Nebraska.

Nebraska's rural counties face two main challenges. First, many counties, even those that are not frontier counties, have either no health professionals at all or have health professionals below benchmark ratios. For frontier counties, trying to recruit a health provider may not be a successful strategy, as these sparsely populated counties may not have the resources to support a health care provider. However, for the non-frontier counties that have either no providers or an insufficient number of providers, the effective strategy would be to target pipeline and recruitment and retention programs specifically to these counties. (See Appendix 8 for the number of counties without health professionals, by Health Planning Region (HPR) and Appendix 9 for a list of non-frontier counties that have no health professionals).

The second issue that several of Nebraska's counties, especially rural counties, face is having a high proportion of health professionals in the pre-retirement or 55 years and over age group. The recommended strategy to address this issue is to proactively take steps to recruit professionals to these counties. We identified the list of non-frontier counties by HPR that have no health professionals (Appendix 9) and those that have a high proportion of aging health professionals (Appendix 10) by health profession categories. Knowing which counties to target resources to will help policymakers take steps to address the state's current and future needs for health professionals (Table 30).

The problem of access to health professionals for frontier counties cannot be effectively addressed through conventional strategies such as pipeline and recruitment and retention programs. Therefore, frontier counties need innovative solutions to health care delivery, such as telehealth and mobile nursing and diagnostic units. Nebraska has an extensive telehealth network that is currently used primarily for videoconferencing and continuing education. Future research and policy should be directed towards exploring opportunities to address the health care needs of Nebraskans in frontier counties by the optimal utilization of Nebraska's existing telehealth infrastructure. In 2002, Grigsby found that "although telemedicine holds great promise for expanding rural health care access and addressing inefficiencies in the delivery of services, its potential is largely unrealized." Telehealth holds great promise for the delivery of dental and behavioral health services to geographically remote locations. School-based telehealth centers have the potential to improve access to psychiatric services for children (Young & Treson, 2003). Telehealth can also be used for preventive dental screenings in school settings (Patterson & Botchway, 1998). Currently, reimbursement and scope of practice issues are still to be resolved and probably account for the underutilization of telehealth in Nebraska. States like Iowa that face similar issues of geographically isolated communities have undertaken strategies to address these issues with telehealth (Kienzle et al, 1995). This is a promising model for Nebraska's frontier communities.

**Table 30. Health Workforce Issues and Strategies by Health Planning Region**

<b>Issue: No health professionals</b>		
<b>Strategy: Target pipeline and recruitment retention programs to these counties</b>		
<b>Health Planning Region</b>	<b>Health Profession</b>	<b>County</b>
<b>HPR 2</b>	Psychiatrist	Dawson
<b>HPR 3</b>	Mental Health	Clay, Howard, Kearney
	Physical Therapist	Kearney
<b>HPR 4</b>	Physician	Nance, Stanton
	Primary care provider	Stanton
	RN	Stanton
	Mental Health	Antelope, Burt, Cedar, Dixon, Stanton
	Dentist	Stanton
	Occupational Therapist	Colfax, Pierce, Stanton, Thurston, Wayne
	Physical Therapist	Knox
<b>HPR 5</b>	Psychiatrist	Cass, Gage, Saunders
	Occupational Therapist	Nemaha
	Physical Therapist	Polk
<b>Issue: High proportion of health professionals in the pre-retirement age group</b>		
<b>Strategy: Take steps to proactively recruit health professionals</b>		
<b>Health Planning Region</b>	<b>Health Profession</b>	<b>County</b>
<b>HPR 1</b>	Physician	Cheyenne, Garden, Scotts Bluff,
	Dentist	Box Butte, Scotts Bluff
	Nurse Practitioner	Scotts Bluff
	LMHP, LADC, CCGC, MSW	Box Butte, Cheyenne, Scotts Bluff,
	Pharmacist	Box Butte, Cheyenne
<b>HPR 2</b>	Physician	Dawson, Keith,
	Dentist	Dawson, Lincoln, Red Willow
	Psychiatrist	Lincoln
	Nurse Practitioner	Lincoln
	Psychologist	Lincoln
	LMHP, LADC, CCGC, MSW	Dawson, Lincoln, Red Willow
	Pharmacist	Dawson, Keith, Lincoln

Continued on the next page

**Table 30. Health Workforce Issues and Strategies by Health Planning Region (continued)**

<b>Issue: High proportion of health professionals in the pre-retirement age group (continued)</b>		
<b>Strategy: Take steps to proactively recruit health professionals</b>		
<b>Health Planning Region</b>	<b>Health Profession</b>	<b>County</b>
<b>HPR 3</b>	Physician	Adams, Buffalo, Kearney, Merrick, Nuckolls,
	Dentist	Adams, Buffalo, Hall, Hamilton, Kearney, Nuckolls, Phelps, Valley
	Psychiatrist	Adams, Buffalo, Hall,
	Nurse Practitioner	Adams, Buffalo, Hall
	Psychologist	Buffalo, Hall,
	LMHP, LADC, CCGC, MSW	Adams, Buffalo, Hall, Hamilton, Nuckolls, Valley
	Pharmacist	Adams, Hamilton, Howard, Merrick, Nuckolls, Phelps, Valley
<b>HPR 4</b>	Physician	Colfax, Dakota, Dixon, Dodge, Knox, Madison, Thurston, Wayne
	Dentist	Antelope, Boone, Cedar, Dakota, Dodge, Madison, Pierce, Platte, Washington, Wayne
	Psychiatrist	Dakota, Dodge, Madison, Platte
	Psychologist	Colfax
	LMHP, LADC, CCGC, MSW	Knox, Madison, Pierce, Platte, Thurston, Wayne
	Pharmacist	Antelope, Boone, Burt, Colfax, Dixon, Nance, Pierce, Thurston, Washington
<b>HPR 5</b>	Physician	Butler, Cass, Gage, Otoe, Phelps, Richardson, Saline,
	Dentist	Butler, Cass, Fillmore, Gage, Jefferson, Johnson, Lancaster, Nemaha, Otoe, Polk, Richardson, Saline, Saunders, Seward, Thayer, York
	Psychiatrist	Lancaster, Saline
	Psychologist	Gage, Jefferson, Lancaster, Madison, Saunders, York
	LMHP, LADC, CCGC, MSW	Butler, Cass, Dakota, Dodge, Fillmore, Gage, Jefferson, Johnson, Lancaster, Nemaha, Otoe, Saline, Seward, Thayer, York
	Pharmacist	Butler, Dakota, Fillmore, Gage, Jefferson, Johnson, Nemaha, Richardson, Saline, Thayer
<b>HPR 6</b>	Physician	Douglas,
	Dentist	Douglas, Sarpy
	Psychiatrist	Douglas, Sarpy
	Nurse Practitioner	Douglas
	Psychologist	Douglas, Sarpy
	LMHP, LADC, CCGC, MSW	Douglas, Sarpy

Abbreviations: LMHP – licensed mental health practitioner  
 LADC – licensed alcohol and drug counselor  
 CCGC – certified compulsive gambling counselor  
 MSW – master social worker

## **Recommendations**

The second statewide stakeholders meeting of the Nebraska Health Workforce Planning Project was held on Wednesday, June 17, 2009, at the Michael F. Sorrell Center for Health Science Education at UNMC. The meeting brought together researchers, educators, practitioners, and state government officials to discuss Nebraska's current and future health workforce needs.

The stakeholders participated in one of four breakout session groups to discuss the barriers and opportunities facing Nebraska's health workforce. The four breakout session groups were physicians and mental health professionals, dentists and pharmacists, allied health professionals and nurses, and primary care and public health professionals. The discussions were facilitated by experts representing each of the health professions in the breakout groups. Through discussion in these groups, the stakeholders developed recommendations to address the future health workforce needs of Nebraska with regard to the training and education, pipeline programs, and recruitment and retention of health care professionals across the state. .

During the breakout group discussions, some common themes emerged. For example, each of the health profession categories faces unique barriers and opportunities, but they share many of the same problems.<sup>21</sup> Policy makers must consider Nebraska's future health care delivery needs across all health professions to ensure that every Nebraskan, regardless of location, has access to quality health care services. Nebraska, like many other states, faces health care access issues as a result of being predominantly rural. The following recommendations take into consideration the context of rural health care delivery.

### **Recommendation 1**

#### ***I. Create a state health workforce center.***

Nebraska needs centralized workforce data collection and analysis for all professions. The workforce center would function as a central data repository that would enable the ongoing and comprehensive assessment and analysis of workforce data to monitor and project Nebraska's future health workforce needs. The center would also act as an advisory body for the development of public policy that addresses financial incentives and career development opportunities for health professionals.

### **Recommendation 2**

#### ***II. Support targeted, ongoing data collection to monitor the health workforce and future requirements.***

Currently, assessment, analysis, and workforce monitoring activities are hampered by the lack of good quality data on all health professions. The state licensure database is a good source of data, but it does not contain information on the practice location of health professionals or their

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<sup>21</sup> The summary and transcript of the proceedings of the second stakeholder meeting are available from the authors upon request.

race/ethnicity. Practice location and race/ethnicity information should be collected from all health professionals in the state at the time of licensure renewal. In addition, educational programs in the state should collect data on their graduates' practice locations to assess the effectiveness of programs aimed at retaining graduates in the state.

### **Recommendation 3**

#### ***III. Expand the role of pipeline programs aimed at provider shortage areas and primary care.***

Evidence has shown that pipeline programs for K-12 students positively influence enrollment and graduation rates among many health professions. There is an opportunity to expand the role of existing programs in an effort to dispel negative attitudes and beliefs regarding the provision of primary care in rural areas.

### **Recommendation 4**

#### ***IV. Increase funding for current debt relief programs aimed at recruitment and retention of health care professionals.***

Increasingly, high student loan debt can be the deciding factor for a new graduate's decision to practice in a particular location. Although this varies across health professions, the issue of high education debt is often the same. Debt relief programs, including loan repayment and tax reform at the state and federal levels, coupled with community-sponsored scholarship programs, can help to reduce the student loan burden.

### **Recommendation 5**

#### ***V. Establish new and streamline existing community partnerships aimed at health workforce development.***

New community partnerships with educational institutions, local and state government, and other community organizations will be needed as Nebraska's health care needs change. Duplication of efforts in existing partnerships often arises due to lack of awareness of ongoing workforce development activities. Interdisciplinary approaches to education and training may help to reduce the communication gap between individual partnerships and to develop collaborative efforts between those partnerships.

### **Recommendation 6**

#### ***VI. Support an enhanced focus on interdisciplinary, team-based approaches aimed at both education and the provision of services.***

In the current system, education and health care delivery function in silos. It is important to understand the unique contribution of each health profession to the overall delivery of health care

and to use that understanding to create interdisciplinary collaborations and partnerships, both in and out of the classroom.

### **Recommendation 7**

#### ***VII. Proactively address health provider shortages at the state level through the development of comprehensive health workforce criteria and shortage designations.***

These criteria and designations will be the basis for new and existing state legislation regarding shortage area guidelines. State government, together with the experts in the fields of education, research, and practice across the state, can utilize their knowledge and expertise to bridge the gap between policy and practice. Priorities for policy development are proactive approaches to placing new health professional graduates in rural counties with current shortages of health professionals and a higher proportion of aging health professionals.

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## TECHNICAL NOTES

The licensure data pertains to actively licensed health professionals. Actively licensed professionals may not be actively practicing.

The address field in the Nebraska DHHS licensure data may be office or home address and does not always reflect the provider's practice location.

The Nebraska DHHS licensure data does not have race/ethnicity information.

Age, gender and race/ethnicity information were not available for all providers. Hence, the total counts of providers in the tables may not match the counts in the figures depicting age, gender and race and Hispanic origin distributions.

The following health care professionals can hold more than one license type: mental health providers other than psychiatrists, nurse practitioners and physician assistants; auxiliary health professionals (nurse aides, medication aides and dining assistants); and emergency medical technicians.

Frontier counties were defined in this report using the conventional definition as counties having fewer than seven persons per square mile. The population density data were obtained from US Census Bureau Year 2007.

Metropolitan Counties are defined by the Office of Management Budget 2003 as counties having at least one city of 50,000 population.

In 2000, six of Nebraska's counties were designated as metropolitan, by the Federal office of Management and Budget. These were: Douglas, Sarpy, Lancaster, Cass, Washington and Dakota.

In 2003, three more counties: Dixon, Saunders and Seward were designated as metropolitan by the OMB.

For the maps depicting the geographical distribution of health professionals, the primary practice location of the provider was used. For providers with a primary practice location outside Nebraska and a satellite location in Nebraska, the satellite location was used for geo-coding the data.

The health care provider-to-population ratios were computed using 2007 population estimates for Nebraska from the U.S. Bureau of the Census.

Counts of physicians include active, non-federal patient care physicians.

Primary care providers were defined as medical doctors, doctors of osteopathy, nurse practitioners and physician assistants with specialties of general practice, family practice, general internal medicine, general pediatrics and obstetrics.



Data on residency location were not available for all primary care physicians.

Data on physician supply – active non-federal MDs for years 1980 to 2005 were obtained from the Area Resource File 2006 release.

Nebraska's population projections 2010 through 2025 were obtained from the U.S. Census Bureau.

U.S. Census Bureau Nebraska's 2008 population estimate is higher than Nebraska's 2008 and 2010 population projections.

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## APPENDIX

### Appendix 1. Inclusion Criteria

Those professions providing a high level of direct patient/client care or care delivery support services:

1. Professions/occupations in health care (not jobs such as office support, maintenance, etc., inside a clinic or hospital),
2. Health care professionals/occupations providing services directly to patients (excludes health care service administration) and
3. Health occupations requiring a professional degree or licensure

### Appendix 2. List of Health Professions and Data Sources

CLASS	CATEGORY	DATA SOURCE
Medicine	Physician (medical doctor, doctor of osteopathy, resident)	HPTC
Dentistry	Dentists/Oral Surgeon Dental Hygienist	HPTC DHHS Licensing Unit
Non-Physician Clinicians	Physician Assistant Nurse Practitioner (including nurse anesthetist and certified nurse midwife) Podiatrist Chiropractor Optometrist	HPTC HPTC DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit
Nursing	Registered Nurse Licensed Practical Nurses	Nebraska Center for Nursing
Allied Health	Physical Therapist Occupational Therapist Medical Nutrition Therapist Radiologic Technologist Respiratory Therapist Emergency Medical Service Audiologist Speech-Language Pathologist	DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit
Mental Health	Psychologist Licensed Mental Health Practitioner Certified Professional Counselors Certified Marriage & Family Therapist Masters, Social Worker	DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit DHHS Licensing Unit
Pharmacy	Pharmacist	HPTC
Public Health	Health Educator Environmental Specialist	State Health Department & Local Health department
Auxiliary Health	Nursing and medication aides, dining assistants	DHHS Licensing Unit

### Appendix 3. Nebraska Healthcare Workforce Data and Sources

Nebraska Healthcare Workforce Data		
Data Source	Data Available	Website/URL
Health Professions Tracking Service	<ul style="list-style-type: none"> <li>• Maintains data on several health care professions (2001 – 2009)</li> <li>• Provides data on Wyoming health care professions (2005 - 2007)</li> <li>• Posted healthcare opportunities across the state</li> </ul>	<a href="http://app1.unmc.edu/healthprof/">http://app1.unmc.edu/healthprof/</a>
Nebraska Department of Health and Human Services: Public Health	<ul style="list-style-type: none"> <li>• Provides geographic data on DHHS service areas, cancer rates, AIDs patients, etc.</li> <li>• Office of Rural Health maps on shortages</li> <li>• Provides licensure information such as rosters of health clinics, etc.</li> </ul>	<a href="http://www.hhs.state.ne.us/gis/">http://www.hhs.state.ne.us/gis/</a> <a href="http://www.hhs.state.ne.us/hew/orh/hcf.htm">http://www.hhs.state.ne.us/hew/orh/hcf.htm</a> <a href="http://www.hhs.state.ne.us/crl/crlindex.htm">http://www.hhs.state.ne.us/crl/crlindex.htm</a>
Nebraska Center for Nursing	<ul style="list-style-type: none"> <li>• Workforce data (RN) 2001 – 2007</li> <li>• Supply and demand (RN) 2006/07</li> <li>• Workforce data (LPN) 2001, 2004, 2006</li> <li>• Employer vacancy reports 2001, 2003 (Comparison '01 – '03), 2006</li> </ul>	<a href="http://www.center4nursing.com/nebraskanursingworkforce.shtml">http://www.center4nursing.com/nebraskanursingworkforce.shtml</a>
Nebraska Hospital Association	<ul style="list-style-type: none"> <li>• Turnover/Vacancy Rates</li> <li>• Hospital salary survey</li> <li>• Member Hospital websites</li> <li>• Staffing Shortage 2001</li> </ul>	<a href="http://www.nhanet.org/workforce/index.htm">http://www.nhanet.org/workforce/index.htm</a>
Rural Policy Research Institute	<ul style="list-style-type: none"> <li>• Maps showing communities with only one pharmacy</li> <li>• Data about Medicare Advantage enrollment/plans</li> <li>• Information on the Rural Hospital Flexibility Program</li> </ul>	<a href="http://www.unmc.edu/ruprihealth/">http://www.unmc.edu/ruprihealth/</a> <a href="http://www.unmc.edu/ruprihealth/RHFP_Tracking_Project.html">http://www.unmc.edu/ruprihealth/RHFP_Tracking_Project.html</a>
Nebraska Assisted Living Association	<ul style="list-style-type: none"> <li>• In process of collecting provider profiles and membership service needs</li> <li>• Types and numbers of assisted living inspections 2007</li> </ul>	<a href="http://www.nehca.org/NALA/research.htm">http://www.nehca.org/NALA/research.htm</a>
Nebraska Medical Association	<ul style="list-style-type: none"> <li>• Physician Finder</li> </ul>	<a href="http://www.nebmed.org/DirectorySearch.aspx">http://www.nebmed.org/DirectorySearch.aspx</a>
Nebraska Center for Rural Health Research	<ul style="list-style-type: none"> <li>• Demographics (2005/2003)</li> <li>• Health Professionals (2005/2003)</li> <li>• Health Care Facilities (2005/2003)</li> </ul>	<a href="http://www.unmc.edu/168nebraska/databooks/">http://www.unmc.edu/168nebraska/databooks/</a>

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### Appendix 3. Nebraska Healthcare Workforce Data and Sources (continued)

Nebraska Workforce/Educational Data and Projections		
Data Source	Data Available	Website/URL
Nebraska Department of Labor: Workforce Development	<ul style="list-style-type: none"> <li>Vacancy Report 4<sup>th</sup> Quarter 2007</li> <li>Workforce trends 2007 – 2008</li> <li>Population Projection per county (1980 – 2020)</li> <li>Wage estimates including percentage change (in what direction), number of openings, and job prospects (2007 estimates)</li> <li>Occupational projections 2004 – 2014</li> </ul>	<a href="http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C10&amp;action=nejvr">http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C10&amp;action=nejvr</a>  <a href="http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C5&amp;action=community">http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C5&amp;action=community</a>  <a href="http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C4&amp;APPCAT=4C4CC">http://www.dol.state.ne.us/nwd/center.cfm?PRICAT=4&amp;SUBCAT=4C&amp;APP=4C4&amp;APPCAT=4C4CC</a>
University of Nebraska-Lincoln: Institutional Research and Planning	<ul style="list-style-type: none"> <li>Trends, Career Level, Major, Retention/Graduation Rates at UNL 2007/08</li> </ul>	<a href="http://irp.unl.edu/data-index.html">http://irp.unl.edu/data-index.html</a>
Coordinating Commission for Postsecondary Education	<ul style="list-style-type: none"> <li>Data on student enrollments in Post-Secondary Institutions 1998</li> <li>Enrollment Profile 1989 – 1998</li> <li>Annual FTE Public Post Secondary Students / 1000 population</li> <li>Number of births and projected graduates from high school (1979 – 1997)</li> </ul>	<a href="http://www.ccpe.state.ne.us/PublicDoc/CCPE/Reports/Profile/Enrollment/default.asp?sect=Exec">http://www.ccpe.state.ne.us/PublicDoc/CCPE/Reports/Profile/Enrollment/default.asp?sect=Exec</a>
Nebraska Department of Education	<ul style="list-style-type: none"> <li>County membership by grade, race, gender (2007/08)</li> <li>District listing (2007/08)</li> <li>F.T.E. Teachers and F.T.E. Certified Staff (2007/08)</li> <li>Student membership projections to 2015/16</li> </ul>	<a href="http://ess.nde.state.ne.us/DataCenter/DataInformation/Default.htm">http://ess.nde.state.ne.us/DataCenter/DataInformation/Default.htm</a>
Nebraska Department of Economic Development	<ul style="list-style-type: none"> <li>2000 State Census Profile</li> <li>Population Projections for race and Hispanic origin 2000 -2030</li> <li>Population estimates for Nebraska counties by age groups 2000</li> <li>Population estimates for Nebraska townships 2001 – 2006</li> <li>Employment / place of work 2001 – 2005</li> <li>Male/Female employment 2000</li> </ul>	<a href="http://www.neded.org/content/view/22/698/">http://www.neded.org/content/view/22/698/</a>  <a href="http://www.neded.org/content/view/422/709/">http://www.neded.org/content/view/422/709/</a>  <a href="http://www.neded.org/files/research/stathand/bsect11.htm">http://www.neded.org/files/research/stathand/bsect11.htm</a>

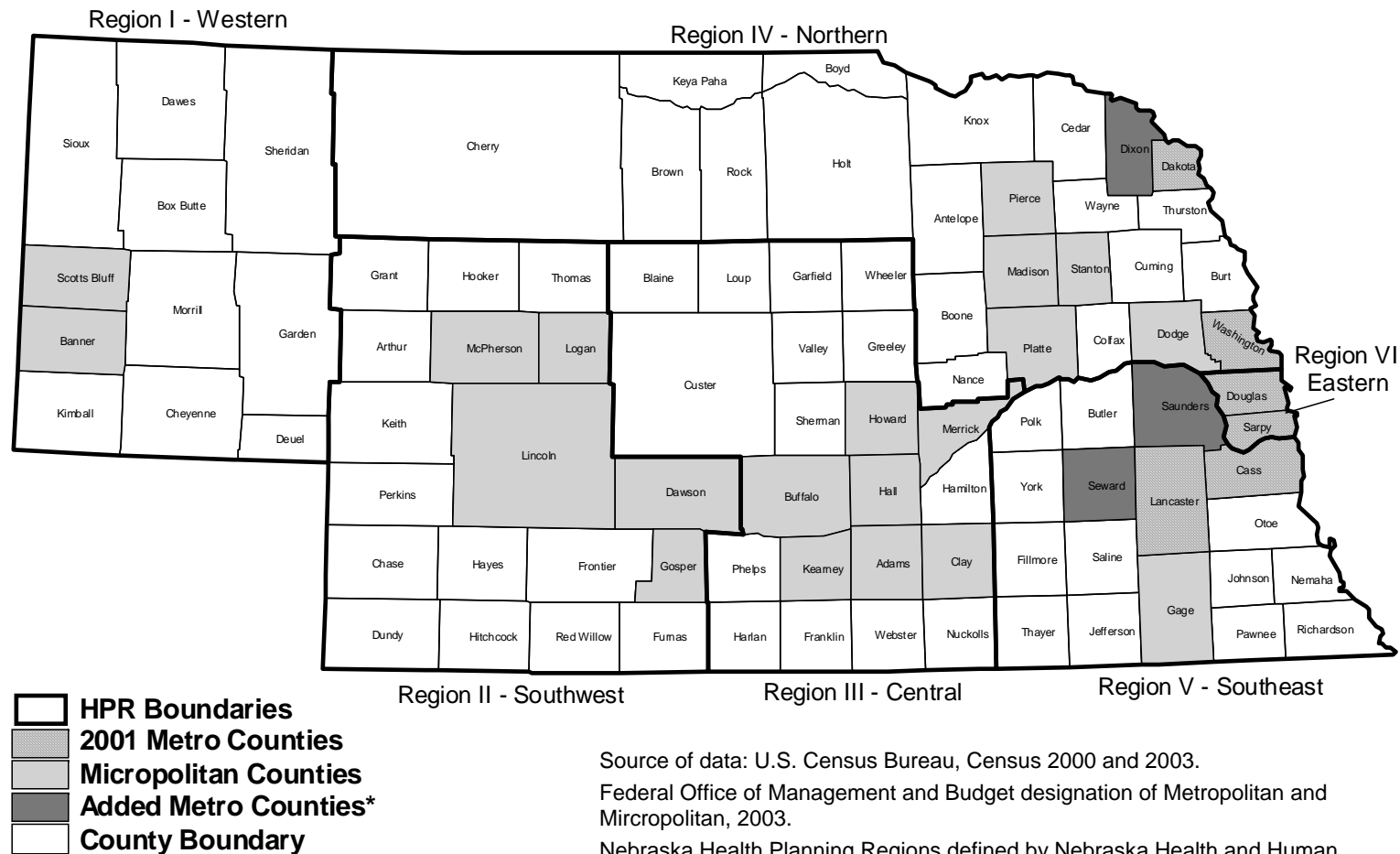
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**Appendix 3. Nebraska Healthcare Workforce Data and Sources (continued)**

National Data Compilations and Projections		
Data Source	Data Available	Website/URL
ACT	<ul style="list-style-type: none"><li>• College Readiness Indicators 2008</li><li>• Future Workforce Projections 2008</li></ul>	<a href="http://www.act.org/news/data/08/workforce.html">http://www.act.org/news/data/08/workforce.html</a>
Association of American Medical Colleges	<ul style="list-style-type: none"><li>• State Physician Workforce data book 2007</li><li>• Forecasting supply and demand for Oncologists 2007</li><li>• Physician Specialty Data 2006</li></ul>	<a href="http://www.aamc.org/workforce/dataandpub.htm">http://www.aamc.org/workforce/dataandpub.htm</a>
Bureau of Labor Statistics	<ul style="list-style-type: none"><li>• State unemployment rates 2008</li><li>• Total unemployed 2008</li><li>• Total employed 2008</li><li>• Total civilian labor 2008</li></ul>	<a href="http://www.bls.gov/">http://www.bls.gov/</a>
Health Resources and Services Administration	<ul style="list-style-type: none"><li>• State level and county level data on Workforce Shortages 2008 (updated regularly)</li><li>• Data on Primary Medical Care, Dental, and Mental Health Care Providers</li></ul>	<a href="http://datawarehouse.hrsa.gov/">http://datawarehouse.hrsa.gov/</a>

## Appendix 4. Health Planning Regions, Metropolitan Counties, and Micropolitan Counties, Nebraska, 2007



\*Designated Metropolitan in 2003

Source of data: U.S. Census Bureau, Census 2000 and 2003.

Federal Office of Management and Budget designation of Metropolitan and Micropolitan, 2003.

Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001.

Cartography: Nebraska Center for Rural Health Research, 2008.

Note: Retrieved from the Nebraska Health Information Project, April 2007.

### Appendix 5. List of Counties in Nebraska by Health Planning Region

HPR 1	HPR 2	HPR 3	HPR 4	HPR 5	HPR 6
Box Butte	Chase <sup>1</sup>	Blaine <sup>1</sup>	Boone	Cass <sup>2</sup>	Douglas <sup>2</sup>
Banner <sup>1</sup>	Arthur <sup>1</sup>	Adams	Antelope	Butler	Sarpy <sup>2</sup>
Cheyenne	Dawson	Buffalo	Boyd <sup>1</sup>	Fillmore	
Dawes <sup>1</sup>	Dundy <sup>1</sup>	Clay	Brown <sup>1</sup>	Gage	
Deuel <sup>1</sup>	Frontier <sup>1</sup>	Custer <sup>1</sup>	Burt	Jefferson	
Garden <sup>1</sup>	Furnas	Franklin <sup>1</sup>	Cedar	Johnson	
Kimball <sup>1</sup>	Gosper <sup>1</sup>	Garfield <sup>1</sup>	Cherry <sup>1</sup>	Lancaster <sup>2</sup>	
Morrill <sup>1</sup>	Grant <sup>1</sup>	Greeley <sup>1</sup>	Colfax	Nemaha	
Scotts Bluff	Hayes <sup>1</sup>	Hall	Cuming	Otoe	
Sheridan <sup>1</sup>	Hitchcock <sup>1</sup>	Hamilton	Dakota <sup>2</sup>	Pawnee <sup>1</sup>	
Sioux <sup>1</sup>	Hooker <sup>1</sup>	Harlan <sup>1</sup>	Dixon <sup>2</sup>	Polk	
	Keith	Howard	Dodge	Richardson	
	Lincoln	Kearney	Holt <sup>1</sup>	Saline	
	Logan <sup>1</sup>	Loup <sup>1</sup>	Keya Paha <sup>1</sup>	Saunders <sup>2</sup>	
	McPherson <sup>1</sup>	Merrick	Knox	Seward <sup>2</sup>	
	Perkins <sup>1</sup>	Nuckolls	Madison	Thayer	
	Red Willow	Phelps	Nance	York	
	Thomas <sup>1</sup>	Sherman <sup>1</sup>	Pierce		
		Valley	Platte		
		Webster <sup>1</sup>	Rock <sup>1</sup>		
		Wheeler <sup>1</sup>	Stanton		
			Thurston		
			Washington <sup>2</sup>		
			Wayne		

<sup>1</sup>Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001

<sup>2</sup>Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003

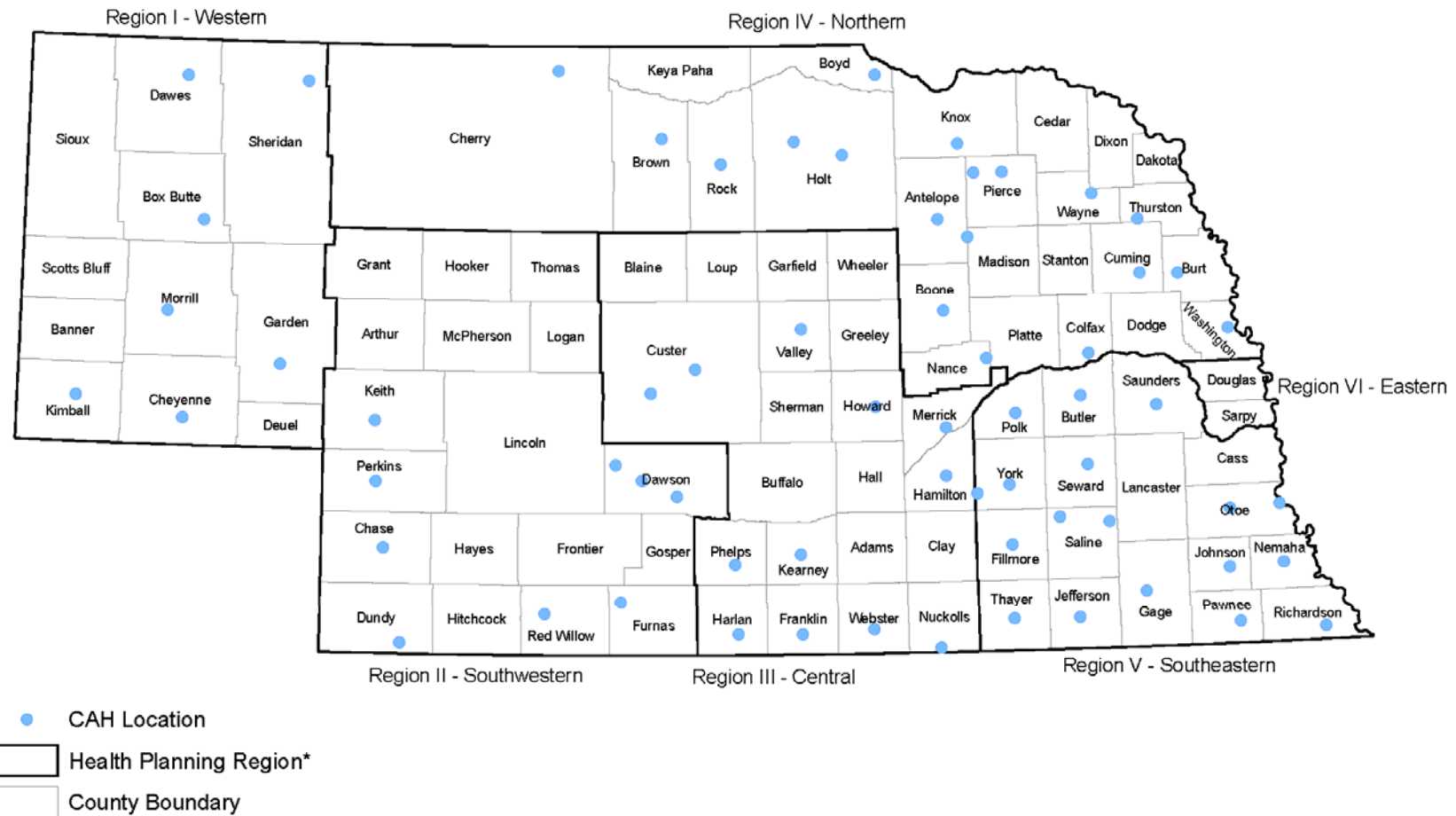
## Appendix 6. Nebraska Population by County, 2007 and 2008

County	2007	2008	County	2007	2008
Adams	32,869	33,238	Kearney	6,583	6,479
Antelope	6,743	6,679	Keith	8,012	7,821
Arthur	354	338	Keya Paha	851	836
Banner	732	735	Kimball	3,592	3,534
Blaine	440	428	Knox	8,645	8,498
Boone	5,505	5,446	Lancaster	274,725	278,728
Box Butte	10,974	11,043	Lincoln	35,435	35,582
Boyd	2,109	2,090	Logan	746	735
Brown	3,199	3,149	Loup	642	619
Buffalo	44,939	45,354	Madison	34,040	34,020
Burt	7,051	7,023	McPherson	504	514
Butler	8,380	8,326	Merrick	7,665	7,700
Cass	25,480	25,598	Morrill	5,019	4,989
Cedar	8,526	8,407	Nance	3,554	3,550
Chase	3,694	3,629	Nemaha	7,024	7,085
Cherry	5,691	5,609	Nuckolls	4,516	4,467
Cheyenne	9,942	9,965	Otoe	15,627	15,549
Clay	6,335	6,270	Pawnee	2,688	2,602
Colfax	9,902	9,989	Perkins	2,931	2,884
Cuming	9,322	9,306	Phelps	9,148	9,127
Custer	10,839	10,842	Pierce	7,261	7,231
Dakota	20,278	20,174	Platte	31,800	32,072
Dawes	8,811	8,724	Polk	5,191	5,122
Dawson	24,556	24,665	Red Willow	10,728	10,704
Deuel	1,887	1,880	Richardson	8,342	8,294
Dixon	6,219	6,293	Rock	1,515	1,508
Dodge	35,911	35,872	Saline	13,823	13,771
Douglas	495,947	502,032	Sarpy	146,315	150,467
Dundy	2,023	2,002	Saunders	20,119	20,034
Fillmore	6,026	6,001	Scotts Bluff	36,300	36,554
Franklin	3,152	3,103	Seward	16,523	16,758
Frontier	2,658	2,584	Sheridan	5,430	5,337
Furnas	4,704	4,645	Sherman	2,994	2,994
Gage	23,161	23,035	Sioux	1,345	1,287
Garden	1,827	1,765	Stanton	6,383	6,310
Garfield	1,714	1,710	Thayer	5,174	5,104
Gosper	1,975	1,926	Thomas	600	583
Grant	611	604	Thurston	7,181	7,102
Greeley	2,312	2,290	Valley	4,266	4,182
Hall	55,394	56,401	Washington	19,924	19,812
Hamilton	9,282	9,300	Wayne	9,301	9,274
Harlan	3,391	3,322	Webster	3,603	3,508
Hayes	978	1,005	Wheeler	806	807
Hitchcock	2,834	2,836	York	14,339	14,199
Holt	10,310	10,233	Nebraska	1,769,473	1,783,432
Hooker	729	736			
Howard	6,575	6,593			
Jefferson	7,505	7,405			
Johnson	4,467	4,499			

Source: US Census Bureau, 2007 & 2008 Population Estimates

## Appendix 7. Location of Health Care Facilities in Nebraska

### Appendix 7.1 Critical Access Hospital Locations, Nebraska 2009

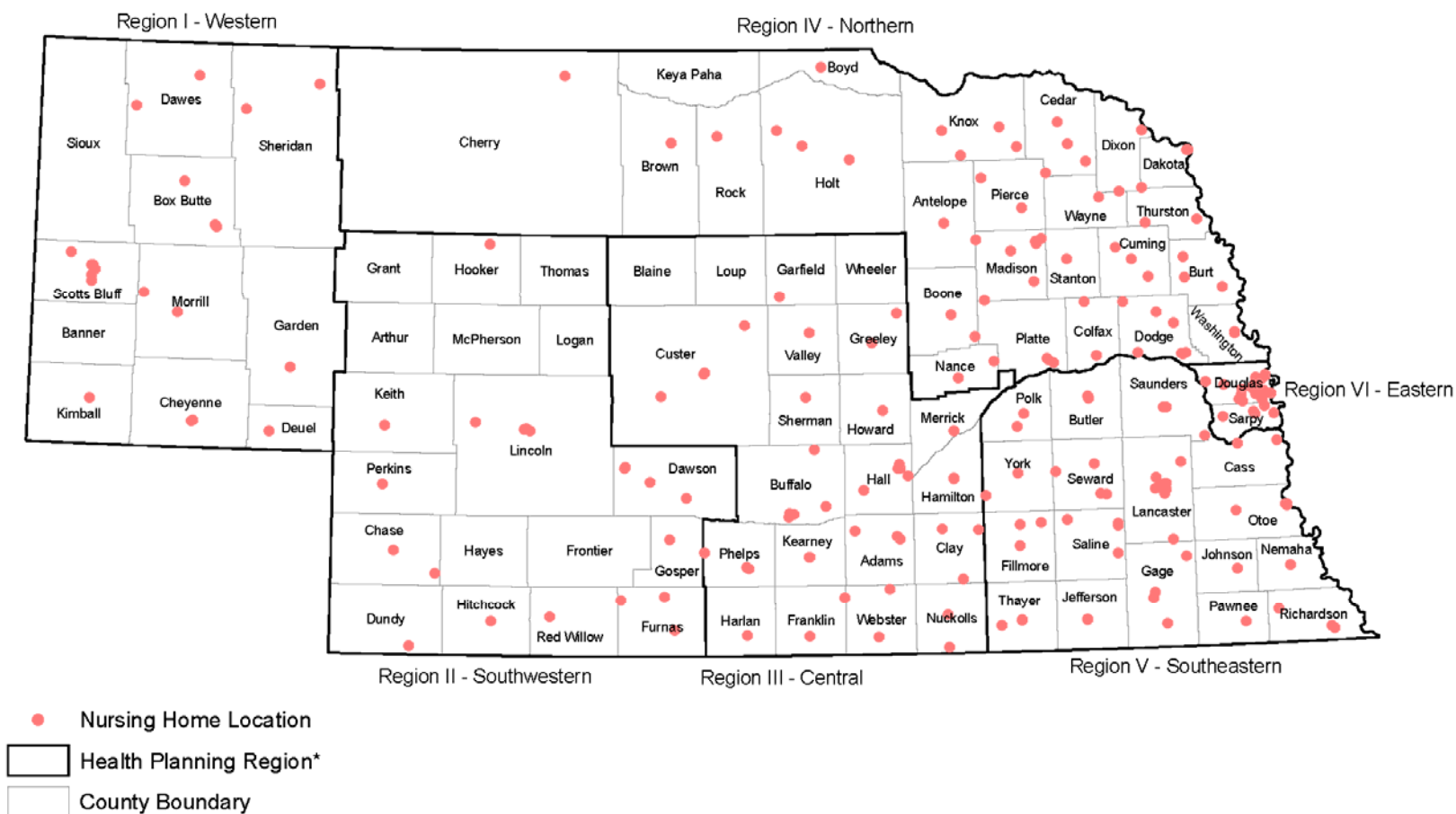


Source: Nebraska Health Professions Tracking Center, UNMC 2009.

\*Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001.

Cartography by Nebraska Center for Rural Health Research.

## Appendix 7.2 Nursing Home Locations, Nebraska 2009

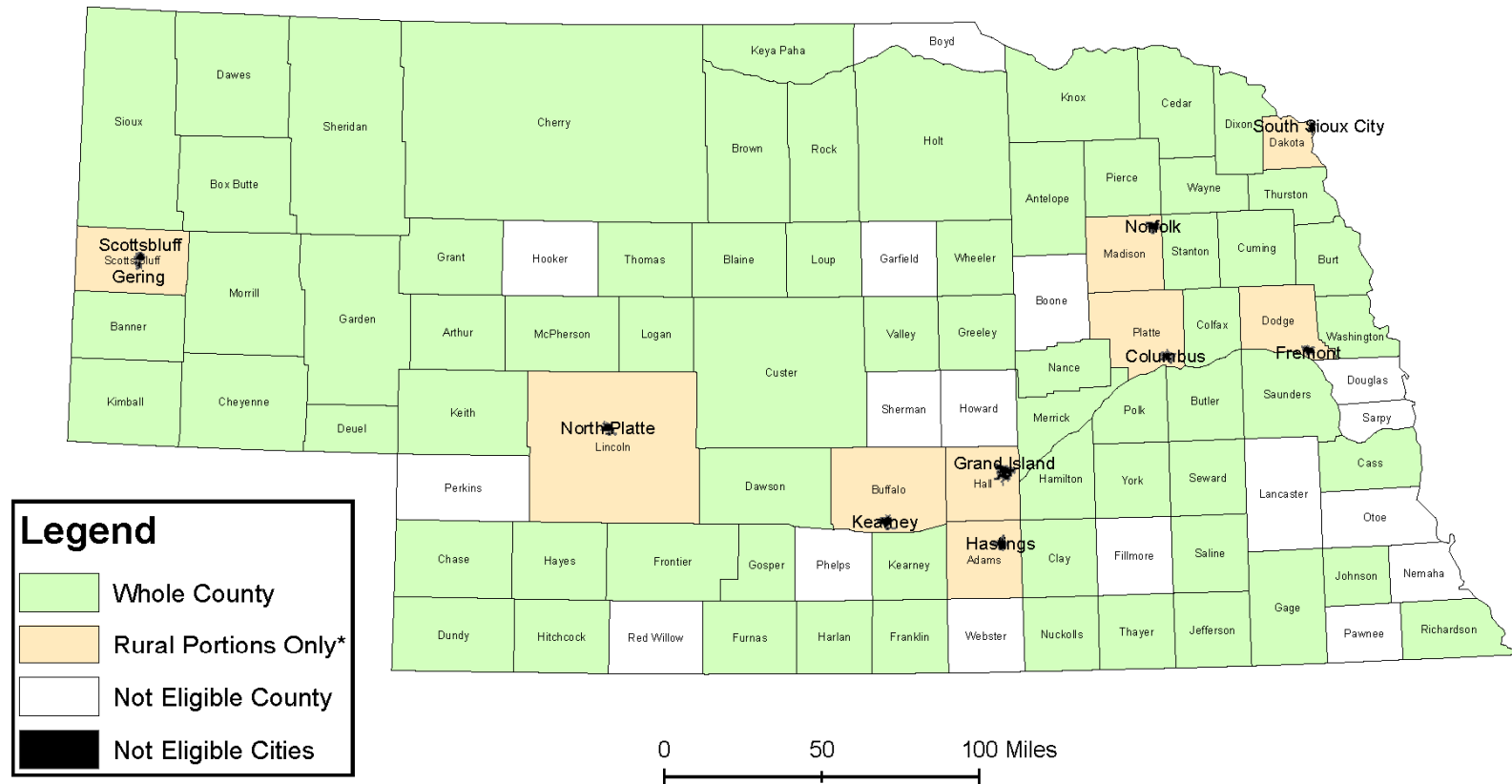


Source: Nebraska Health Professions Tracking Center, UNMC 2009.

\*Nebraska Health Planning Regions defined by Nebraska Health and Human Services System, 2001.

Cartography by Nebraska Center for Rural Health Research.

## Appendix 7.3 Governor Eligible Areas for Medicare Certified Rural Health Clinics, Nebraska 2007

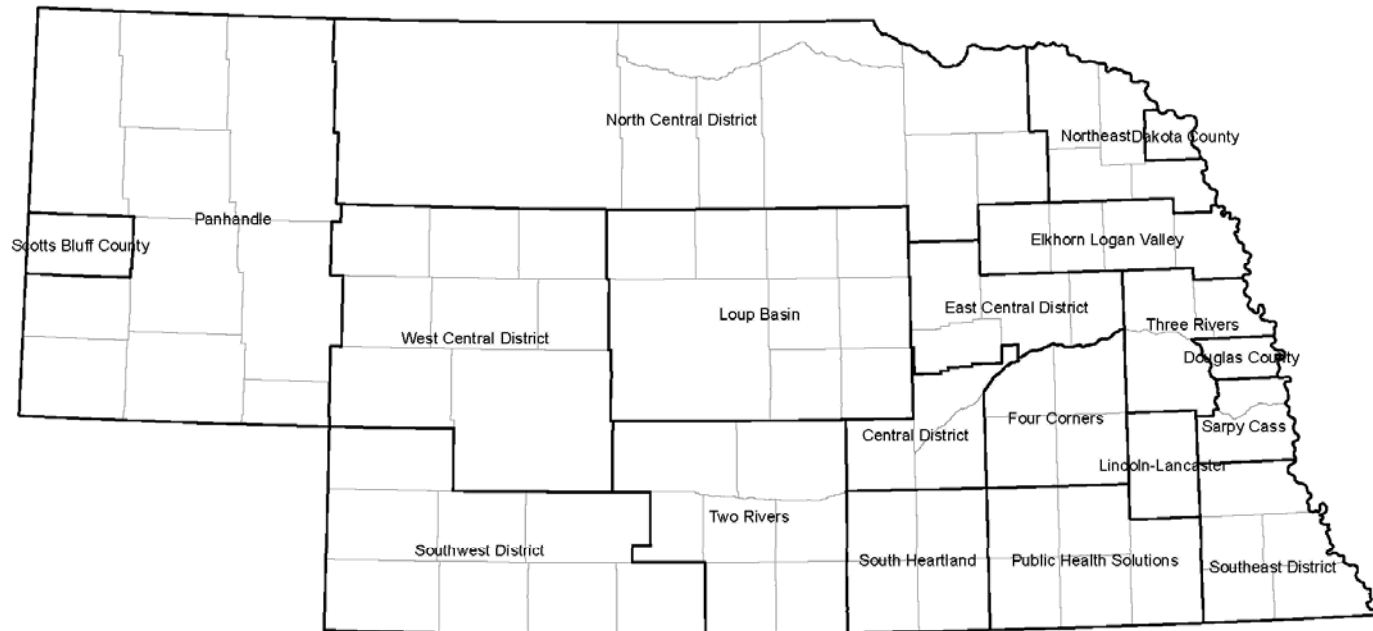


\* Columbus, Fremont, Grand Island, Hastings, Kearney, Norfolk, North Platte, Scottsbluff/Gering and South Sioux City are not eligible by definition.

Source: Nebraska Department of Health and Human Services, Office of Rural Health. Last Update June, 2009.

Cartography: Thomas Rauner, DHHS - Office of Rural Health. Phone: 402-471-2337, <http://www.dhhs.ne.gov>.

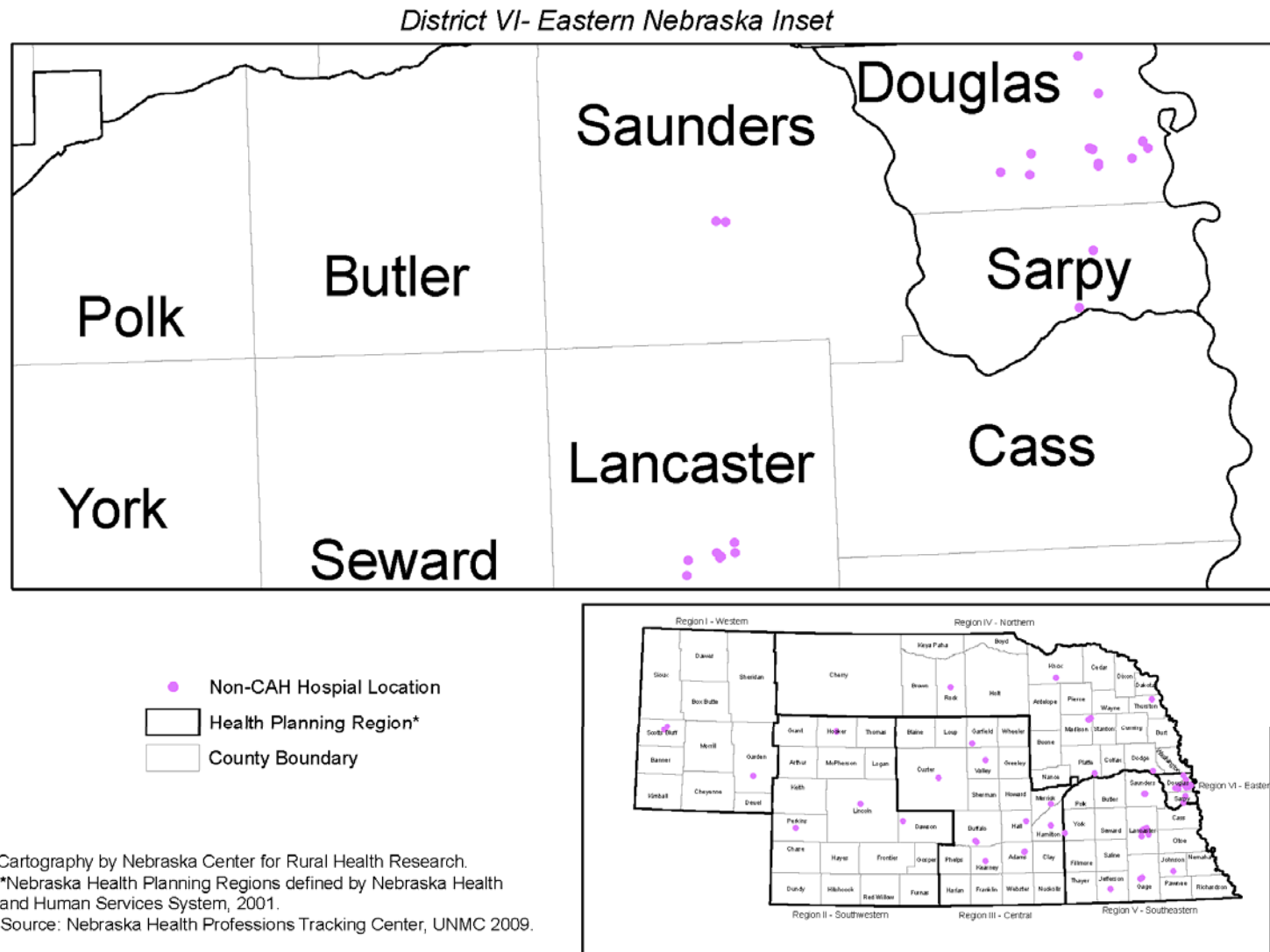
## Appendix 7.4 Public Health Departments, Nebraska 2009



\*Nebraska Public Health Departments defined by Nebraska Health and Human Services System, 2005.  
Cartography by Nebraska Center for Rural Health Research.



## Appendix 7.5 Non-Critical Access Hospital Locations, Nebraska 2009



## Appendix 8 Number of Counties Without Health Professionals, Nebraska 2007 -2008

### Appendix 8.1 Number of Counties Without Health Professionals, HPR 1, Nebraska 2007 -2008

Health Planning Region 1 (n = 11)		
Health Profession	Total	Frontier Total
Physician	2	2
Primary Care Providers	2	2
Physician Assistant	3	3
Nurse Practitioner	4	4
Registered Nurse	1	1
Licensed Practical Nurse	2	2
Dentist	3	3
Psychiatrist	10	8
All Mental Health Providers	5	5
Pharmacist	2	2
Non-Physician Clinician	3	3
Physical Therapist	4	4
Occupational Therapist	4	4
Medical Radiographer	2	2
Audiologist	10	8
Speech-Language Pathologist	7	6
Nutrition Therapist	6	6
Respiratory Care Practitioner	6	6

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

## Appendix 8.2 Number of Counties without Health Professionals, HPR 2, 2007 -2008

Health Planning Region 2 (n = 18)		
Health Profession	Total	Frontier Total
Physician	9	9
Primary Care Providers	7	7
Physician Assistant	9	9
Nurse Practitioner	13	12
Registered Nurse	4	4
Licensed Practical Nurse	5	5
Dentist	10	10
Psychiatrist	17	13
All Mental Health Providers	12	11
Pharmacist	10	10
Non-Physician Clinician	10	9
Physical Therapist	11	11
Occupational Therapist	12	12
Medical Radiographer	6	6
Audiologist	15	13
Speech-Language Pathologist	14	13
Nutrition Therapist	12	11
Respiratory Care Practitioner	10	10

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

### Appendix 8.3 Number of Counties without Health Professionals, HPR 3, 2007 -2008

Health Planning Region 3 (n = 21)		
Health Profession	Total	Frontier Total
Physician	4	4
Primary Care Providers	4	4
Physician Assistant	7	6
Nurse Practitioner	8	6
Registered Nurse	2	2
Licensed Practical Nurse	3	3
Dentist	5	5
Psychiatrist	18	10
All Mental Health Providers	10	7
Pharmacist	6	5
Non-Physician Clinician	5	5
Physical Therapist	5	4
Occupational Therapist	9	9
Medical Radiographer	3	3
Audiologist	18	10
Speech-Language Pathologist	9	8
Nutrition Therapist	8	6
Respiratory Care Practitioner	6	6

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

#### Appendix 8.4 Number of Counties without Health Professionals, HPR 4, 2007 -2008

Health Planning Region 4 (n = 24)		
Health Profession	Total	Frontier Total
Physician	3	1
Primary Care Providers	2	1
Physician Assistant	5	4
Nurse Practitioner	6	3
Registered Nurse	1	1
Licensed Practical Nurse	0	0
Dentist	2	1
Psychiatrist	20	6
All Mental Health Providers	9	3
Pharmacist	4	3
Non-Physician Clinician	4	3
Physical Therapist	3	2
Occupational Therapist	9	3
Medical Radiographer	2	2
Audiologist	18	6
Speech-Language Pathologist	10	3
Nutrition Therapist	11	4
Respiratory Care Practitioner	4	2

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

## Appendix 8.5 Number of Counties without Health Professionals, HPR 5, 2007 -2008

Health Planning Region 5 (n = 17)		
Health Profession	Total	Frontier Total
Physician	0	0
Primary Care Providers	0	0
Physician Assistant	0	0
Nurse Practitioner	6	1
Registered Nurse	0	0
Licensed Practical Nurse	0	0
Dentist	0	0
Psychiatrist	14	1
All Mental Health Providers	1	1
Pharmacist	0	0
Non-Physician Clinician	3	1
Physical Therapist	2	1
Occupational Therapist	2	0
Medical Radiographer	0	0
Audiologist	13	1
Speech-Language Pathologist	3	1
Nutrition Therapist	1	0
Respiratory Care Practitioner	4	0

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

### Appendix 8.6 Number of Counties without Health Professionals, HPR 6, 2007 -2008

Health Planning Region 6 (n = 2)		
Health Profession	Total	Frontier Total
Physician	0	0
Primary Care Providers	0	0
Physician Assistant	0	0
Nurse Practitioner	0	0
Registered Nurse	0	0
Licensed Practical Nurse	0	0
Dentist	0	0
Psychiatrist	0	0
All Mental Health Providers	0	0
Pharmacist	0	0
Non-Physician Clinician	0	0
Physical Therapist	0	0
Occupational Therapist	0	0
Medical Radiographer	0	0
Audiologist	0	0
Speech-Language Pathologist	0	0
Nutrition Therapist	0	0
Respiratory Care Practitioner	0	0

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007 & 2008; Nebraska Department of Health and Human Services, 2008; Center for Nursing, Nebraska Center for Nursing, 2007 & 2008

Note: Primary care providers includes physicians, NPs, & PAs specialized in primary care; Non-physician clinicians include optometrists, podiatrists, & chiropractors

## Appendix 9. Non-Frontier Counties without Health Professionals

### Appendix 9.1 Non-frontier Counties without Physicians and Behavioral Health Professionals

Physicians and Mental Health Providers					
Physician	Physician Assistant	Mental Health Providers			Primary Care Providers
		Psychiatrist		All Mental Health Providers	
Nance	Clay	Antelope	Knox	Antelope	Stanton
Stanton	Stanton	Boone	Merrick	Burt	
		Box Butte	Nance	Cedar	
		Burt	Nemaha	Clay	
		Butler	Nuckolls	Dixon*	
		Cass *	Otoe	Furnas	
		Cedar	Phelps	Howard	
		Cheyenne	Pierce	Kearney	
		Clay	Polk	Nance	
		Colfax	Red Willow	Stanton	
		Cuming	Richardson		
		Dawson	Saunders*		
		Fillmore	Seward*		
		Furnas	Stanton		
		Gage	Thayer		
		Hamilton	Thurston		
		Howard	Valley		
		Jefferson	Wayne		
		Kearney	York		
		Keith			

Source: Health Professions Tracking Service, University of Nebraska Medical Center 2007

\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

Note: Physician includes all MDs & DOs; excludes residents & house officers. All mental health providers include physicians, physician assistants, nurse practitioners, psychologists, licensed mental health practitioners, licensed alcohol and drug counselors, certified compulsive gambling counselors, master social workers. Primary care providers include physicians, physician assistants, and nurse practitioners with specialties including family practice, general internal medicine, general pediatrics, and OBGYN.



## Appendix 9.2 Non-frontier Counties without Nursing Professionals

Nursing Providers		
Registered Nurse	Licensed Practical Nurse	Nurse Practitioner
<i>None</i>	<i>None</i>	Butler
		Dixon*
		Fillmore
		Howard
		Jefferson
		Merrick
		Nance
		Pierce
		Polk
		Red Willow
		Seward*

Sources: Registered Nurses and Licensed Practical Nurses, Nebraska Center for Nursing, 2007 and 2008; Source: Nurse Practitioners, Health Professions Tracking Service, University of Nebraska Medical Center, 2008

\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

### Appendix 9.3 Non-frontier Counties without Allied Health Professionals

Allied Health Providers						
Physical Therapist	Occupational Therapist	Medical Radiographer	Audiologist	Speech-Language Pathologist	Medical Nutrition Therapist	Respiratory Care Practitioner
Kearney	Colfax	None	Antelope Knox	Burt	Antelope	Dakota*
Knox	Johnson		Boone Merrick	Butler	Cedar	Fillmore
Polk	Nance		Box Butte Nance	Cedar	Dixon*	Johnson
	Nemaha		Burt Nuckolls	Cheyenne	Keith	Polk
	Pierce		Butler Otoe	Colfax	Merrick	Stanton
	Stanton		Cass* Phelps	Cuming	Nance	Thayer
	Thurston		Cedar Pierce	Furnas	Nuckolls	
	Wayne		Cheyenne Polk	Howard	Pierce	
			Clay Red Willow	Nance	Polk	
			Colfax Richardson	Pierce	Stanton	
			Dakota* Saline	Polk	Wayne	
			Fillmore Seward*	Stanton		
			Furnas Stanton			
			Hamilton Thayer			
			Howard Thurston			
			Jefferson Valley			
			Johnson Wayne			
			Kearney York			

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008

\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

#### **Appendix 9.4 Non-frontier Counties without Dentists, Pharmacists and Non Physician Clinicians**

<b>Dental, Pharmacy, and Non-Physician Clinician Providers</b>		
<b>Dentist</b>	<b>Pharmacist</b>	<b>Non-Physician Clinician</b>
Stanton	Clay	Furnas
	Stanton	Polk
		Thayer
		Thurston

Sources: Dentists and pharmacists, Health Professions Tracking Service, 2007; Non-physician Clinicians, Nebraska Department of Health and Human Services, Licensure Unit, 2008

\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

Note: Non-physician clinicians include optometrists, podiatrists, chiropractors.

## Appendix 10. Counties with ≥ 30% Health Professionals in Pre-Retirement Age Group, Nebraska, 2007 – 2008

### Appendix 10.1 Counties with ≥ 30% Physicians and Behavioral Health Professionals in Pre-Retirement Age Group, Nebraska, 2007 – 2008

Physicians and Mental Health Providers									
Physician		Physician Assistant	Mental Health Providers					LMHP, LADC, CCGC, MSW	
			Psychiatrist	Physician Assistant	Nurse Practitioner	Psychologist			
Adams	Kimball*	Cherry*	Adams	Douglas**	Adams	Buffalo	Adams	Johnson	
Boyd*	Knox	Dakota**	Buffalo	Lancaster**	Buffalo	Colfax	Box Butte	Knox	
Brown*	Madison	Dawes*	Dakota**	Madison	Custer*	Douglas**	Buffalo	Lancaster**	
Buffalo	Merrick	Dawson	Dodge		Douglas**	Gage	Butler	Lincoln	
Butler	Morrill*	Deuel*	Douglas**		Hall	Hall	Cass**	Madison	
Cass**	Nuckolls	Dundy*	Hall		Lincoln	Holt*	Cherry*	Nemaha	
Cherry*	Otoe	Franklin*	Lancaster**		ScottsBluff	Jefferson	Cheyenne	Nuckolls	
Cheyenne	Pawnee*	Frontier*	Lincoln			Lancaster**	Custer*	Otoe	
Colfax	Perkins*	Jefferson	Madison			Lincoln	Dakota**	Pierce	
Dakota**	Phelps	Kearney	Platte			Madison	Dawes*	Platte	
Dawson	Pierce	Nance	Saline			Sarpy**	Dawson	RedWillow	
Dixon**	Richardson	Pierce	Sarpy**			Saunders**	Dodge	Saline	
Dodge	Saline	Sheridan*				York	Douglas**	Sarpy**	
Douglas**	ScottsBluff	Wayne					Fillmore	ScottsBluff	
Dundy*	Sheridan*						Gage	Seward**	
Gage	Sherman*						Gosper*	Thayer	
Garden	Thurston						Hall	Thurston	
Kearney	Wayne						Hamilton	Valley	
Keith	Webster*						Holt*	Wayne	
							Jefferson	York	

Source: Mental health providers, physicians, and physician assistants, Health Professions Tracking Service, University of Nebraska Medical Center, 2007 and 2008

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

Note: Physicians include all MDs & DOs; excludes residents & house officers;

## Appendix 10.2 Counties with $\geq 30\%$ Primary Care Providers in Pre-Retirement Age Group, Nebraska, 2007 – 2008

Primary Care Providers			
Physician		Physician Assistant	Nurse Practitioner
Adams	Kimball*	Box Butte	Antelope
Box Butte	Knox	Cass**	Brown*
Boyd*	Lincoln	Cherry*	Franklin*
Brown*	Merrick	Dakota**	Hall
Butler	Nuckolls	Dawes*	Knox
Cass**	Otoe	Deuel*	Perkins*
Cherry *	Pawnee*	Dundy*	Saunders**
Cheyenne	Perkins*	Frontier*	
Colfax	Phelps	Jefferson	
Dawson	Pierce	Kearney	
Dixon**	Richardson	Pierce	
Dodge	Saline	Saline	
Gage	Sheridan*	Sheridan*	
Hall	Sherman*	Wayne	
Johnson	Thurston		
Kearney	Wayne		
Keith	Webster*		

Source: Health Professions Tracking Service, University of Nebraska Medical Center, 2008.

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001.

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

Note: Primary care specialties include: Family Practice, General Internal Medicine, General Pediatrics, and OBGYN. Physician includes all MDs & DOs; excludes residents & house officers;

### Appendix 10.3 Counties with $\geq 30\%$ Nursing and Allied Health Professionals in Pre-Retirement Age Group, Nebraska, 2007 – 2008

Allied Health Providers						
Medical Nutrition Therapist	Audiologist	Medical Radiographers	Occupational Therapist	Physical Therapist	Respiratory Care Practitioners	Speech-Language Pathologist
Boone	Adams	Harlan*	Hamilton	BoxButte	Antelope	Antelope Nemaha
Buffalo	Buffalo	Perkins*	Kearney	Dakota**	Burt	BoxButte Nuckolls
Burt	Gage		Perkins*	Dawes*	Butler	Buffalo Otoe
Cheyenne	Hall			Furnas	Cherry*	Clay Phelps
Cuming	Lancaster**			Jefferson	Dixon**	Custer* RedWillow
Custer*	Madison			Keith	Dodge	Deuel* Richardson
Dawes*				KeyaPaha*	Harlan*	Dodge Saline
Dawson				Morrill*	Holt*	Gage ScottsBluff
Gosper*				Pierce	Howard	Hamilton Seward**
Hall				Saline	Knox	Jefferson Thurston
Hamilton					Nemaha	Kearney Valley
Howard					Nuckolls	Keith Washington**
Johnson					Perkins*	Merrick
Madison					Pierce	
Pawnee*					Platte	
Phelps					Richardson	
Saline					ScottsBluff	
ScottsBluff					Wayne	
Seward**						
Valley						

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001.

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

# **Appendix 10.4 Counties with $\geq 30\%$ Dental Professionals and Pharmacists in Pre-Retirement Age Group, Nebraska, 2007 – 2008**

Dental Providers and Pharmacists					
<i>Dental Providers</i>					
Dentist			Dental Hygienist	Pharmacist	
Adams	Fillmore	Phelps	None	Adams	Hamilton
Antelope	Franklin*	Pierce		Antelope	Howard
Boone	Gage	Platte		Boone	Jefferson
Box Butte	Garden	Polk		Box Butte	Johnson
Boyd*	Hall	Red Willow		Brown*	Keith
Brown*	Hamilton	Richardson		Burt	Kimball*
Buffalo	Holt*	Saline		Butler	Lincoln
Butler	Jefferson	Sarpy**		Chase*	Merrick
Cass**	Johnson	Saunders**		Cherry*	Nance
Cedar	Kearney	Scotts Bluff		Cheyenne	Nemaha
Cherry*	Lancaster**	Seward**		Colfax	Nuckolls
Custer*	Lincoln	Sheridan*		Custer*	Pawnee*
Dakota**	Madison	Sherman*		Dakota**	Phelps
Dawes*	Morrill*	Thayer		Dawes*	Pierce
Dawson	Nemaha	Valley		Dawson	Richardson
Deuel*	Nuckolls	Washington**		Deuel*	Saline
Dodge	Otoe	Wayne		Dixon**	Sheridan*
Douglas**	Pawnee*	York		Fillmore	Thayer
Dundy*	Perkins*			Franklin*	Thurston
				Gage	Valley
				Garden*	Washington**
				Garfield*	Webster*

Source: Dentist and pharmacists, Health Professions Tracking Service, University of Nebraska Medical Center, 2008; dental hygienists, Nebraska Department of Health and Human Services, Licensure Unit, 2008.

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001.

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003

### Appendix 10.5 Counties with $\geq 30\%$ Non Physician Clinicians in Pre-Retirement Age Group, Nebraska, 2007 – 2008

Non-Physician Clinicians		
Chiropractor	Podiatrist	Optometrist
Dakota**	Buffalo	<i>None</i>
Dawes*		
Gage		
Keith		
Nemaha		
Red Willow		
Stanton		
Valley		
York		

Source: Nebraska Department of Health and Human Services, Licensure Unit, 2008.

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001.

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.



### Appendix 10.6 Counties with $\geq 30\%$ Nursing Professionals in Pre-Retirement Age Group, Nebraska, 2007 – 2008

Nursing Providers			
Nurse Practitioner	Registered Nurse		Licensed Practical Nurse
Adams	Antelope	Hitchcock*	Merrick
Antelope	Boyd*	Howard	Morrill*
Boone	Burt	Keith	
Brown*	Cass**	Merrick	
Burt	Cedar	Morrill*	
Cheyenne	Chase*	Nuckolls	
Dawson	Clay	Pierce	
Franklin*	Custer*	Sheridan*	
Hall	Dawes*	Thayer	
Kearney	Dundy*	Thurston	
Knox	Fillmore	Valley	
Nemaha	Hamilton		
Perkins*			
Saunders**			
ScottsBluff			
Stanton			
Valley			

Source: Nurse practitioner, Health Professions Tracking Service, University of Nebraska Medical Center, 2008; registered nurses and licensed practical nurses, Nebraska Center for Nursing, 2007 and 2008.

\*Frontier County (<7 persons per square mile), US Census Bureau, frontier definition, 2001.

\*\*Metropolitan County, Federal Office of Management and Budget designation of Metropolitan, 2003.

## Appendix 11. Health Profession Training/ Degree Programs and Licensure in Nebraska

Profession	Training or Degree Program	License Required
Acupuncturist	N	Y
Advanced Practice Nursing	Y	Y
Alcohol and drug Counseling	Y	Y
Alcohol or Drug Abuse Counselor (Human Services Worker)	Y	Y
Athletic Trainer	Y	Y
Audiology	Y	Y
Biomedical Engineer	N	N
Case Management Aide (Human Services Worker)	Y	N
Certified Master Social Worker (CMSW)	Y	Y
Certified professional counselor	Y	Y
Child Abuse Worker (Human Services Worker)	Y	N
Child Life Specialist	N	N
Chiropractic	N	Y
Clinical Perfusion	Y	Y
Coding Technician	Y	N
Community Outreach Worker (Human Services Worker)	Y	N
Cytotechnology	Y	N
Dental Assistant	Y	N
Dental hygienists	Y	Y
Dentist	Y	Y
Dietary Manager	Y	N
Dietetic Technician	Y	N
Emergency Medical Services/Technology	Y	Y
Funeral directing and embalming	Y	Y
Genetic Counselor	N	N
Gerontologist	Y	N
Gerontology Aide (Human Services Worker)	Y	N
Health Care Administration	Y	N
Health Promotion Services	Y	N
Invasive Cardiovascular Technologist	Y	N
Licensed Clinical Social Worker (LCSW)	Y	Y
Licensed Marriage and Family Counselor (LMFT)	Y	Y
Licensed Practical Nurse	Y	Y
Licensed Professional Counselor (LPC)	Y	Y
Master Social Worker (MSW) (non-mental health)	Y	Y
Medical Assistant	Y	N
Medical Interpreting	Y	N
Medical Laboratory Technician/Clinical Laboratory Science	Y	N
Medical Office Services	Y	N

<b>Profession</b>	<b>Training or Degree Program</b>	<b>License Required</b>
Medical Research Scientist	Y	N
Medical Transcription	Y	N
Mental Health Practitioner (LMHP)	Y	Y
Mental Health Technician (Human Services Worker)	Y	N
Nuclear Medicine Technology	Y	N
Nurse Aide	Y	N
Nurse Practitioner	Y	Y
Nursing	Y	Y
Nursing Home Administration	Y	Y
Occupational therapy	Y	Y
Optician	N	N
Optometric Assistant/Tech	N	N
Optometrist	N	Y
Orthotist/Prosthetist	N	N
Osteopathy (DO)	N	Y
Pharmacy	Y	Y
Pharmacy Technician	Y	N
Physical Therapist Assistant	Y	Y
Physical therapy	Y	Y
Physician	Y	Y
Physician Assistant	Y	Y
Podiatrist	N	Y
Psychology	Y	Y
Public Health	Y	N
Radiation Therapy Technology	Y	N
Radiography (Medical radiography, Medical Imaging PACS)	Y	Y
Recreational Therapy	Y	N
Registered Dietitian (Medical nutrition therapy)	Y	Y
Registered environmental health specialist	Y	Y
Registered Health Information Technician (Health Information Management)	Y	N
Registered Nurse	Y	Y
Residential Counselor (Human Services Worker)	Y	N
Respiratory Therapy/Respiratory Care Practitioner	Y	Y
Social Service Technician (Human Services Worker)	Y	N
Social Work Assistant (Human Services Worker)	Y	N
Social Worker (non-mental health)	Y	Y
Speech Language Pathology	Y	Y
Surgery Technologist/Assistant	Y	N
Ultrasonography	Y	N

Source: Careers in Health Care, 2008 and Nebraska Department of Health and Human Services, Licensure Unit (<http://www.hhs.state.ne.us/crl/profindex1.htm>).

## Appendix 12. Health Profession Certificate and Degree Programs in Nebraska

Profession	Degrees/ Certificates Offered	Profession	Degrees/ Certificates Offered
Athletic Trainer	B, M	Medical Transcription	C, P
Audiology	D	Nuclear Medicine Technology	B
Clinical Laboratory Science/Medical Technology	B	Nurse Aide	C
Clinical Perfusion	M	Nurse Practitioner	M, D
Coding Technician	A, B, C, P	Occupational Therapy	M, D
Counseling	B, M, D	Pharmacy	D
Cytotechnology	PBC	Pharmacy Technician	P
Dental Assistant	A, C, P	Physical Therapist Assistant	A
Dental Hygienists	A, B	Physical Therapy	D
Dentist	D	Physician	D
Dietary Manager	C	Physician Assistant	M
Dietetic Technician	A	Psychology	M, D
Emergency Medical Technology	A, B, C	Public Health	M
Health Care Administration	B, M	Radiation Therapy Technology	B
Health Information Management	A, B, C, P	Radiography	A, B, C
Health Promotion Services	M	Recreational Therapy	B
Human Services Worker	A, B, C, P	Registered Dietitian	B, M, PBC
Invasive Cardiovascular Technologist	A	Registered Nurse	A, B, M, D
Licensed Practical Nurse	C, P	Respiratory Therapy	A, B
Medical Assistant	A, C, P	Social Work	B, M
Medical Imaging PACS	C	Speech Language Pathology	B, M, D
Medical Interpreting	C	Surgery Technologist	A, C
Medical Laboratory Technician	A	Ultrasonography	A, B
Medical Office Services	A, C, P		

**A** = Associate Degree **B** = Baccalaureate Degree **C** = Certificate **D** = Doctorate **M** = Master's Degree **P** = Diploma **PBC** = Post-Baccalaureate Certificate

Source: Careers in Health Care, 2008.

### **Appendix 13. Health Professions with no Training or Degree Programs in Nebraska**

**Acupuncturist** - Practices a form of traditional Chinese medicine, which involves the insertion of fine needles into precise locations on the body to stimulate the body's own healing processes.

**Biomedical Engineer** - Uses engineering techniques to solve medical problems. Designs and develops medical equipment and instruments such as artificial limbs, pacemakers, or imaging equipment.

**Child Life Specialist** - Works with children and families in hospitals and other health care settings; uses play and other forms of communication to reduce the stress of the hospital/treatment experience.

**Chiropractor** - Practices a drug-free, hands-on approach to health care that includes patient examination, diagnosis, and treatment emphasizing the spine and its relationship to the joints.

**Genetic Counselor** - Provides information and support to families who have members with birth defects or genetic disorders, and to families at risk for a variety of inherited conditions.

**Gerontologist** - Studies the process of aging; may also work directly with the elderly by developing programs, providing care, or administering services to the elderly population.

**Optician** - Makes prescription eyeglasses and contact lenses according to the specifications of optometrists or ophthalmologists.

**Optometric Assistant/Tech** - Works directly for a doctor of optometry, performing a variety of tasks which may include record-keeping, assisting with frame selection, dispensing contact lenses and operating eye testing equipment.

**Optometrist** - Diagnoses and treats eye conditions; evaluates vision and determines if corrective lenses are needed.

**Osteopathy (DO)** - Fully licensed osteopathic physicians specialize in all areas of medicine; DOs use their hands to diagnose injury and illness and to encourage the body's natural tendency toward good health<sup>1</sup>.

**Orthotist/Prosthetist** - The orthotist designs and fits devices for patients who have disabling conditions of the limbs and spine. The prosthetist designs and fits devices for patients who have partial or total absence of a limb.

**Podiatrist** - Diagnoses and treats disorders of the foot and ankle, using medical, surgical and biomechanical techniques.

Source: Careers in Health Care, 2008.

<sup>1</sup>American Osteopathic Association – <http://www.osteopathic.org>

#### Appendix 14. Medical Residency and Fellowship Programs in Nebraska

Residency and Fellowship (*)				Residency and Fellowship (*)			
Programs	Years	Institution		Programs	Years	Institution	
Anesthesia	4	UNMC		Ophthalmology	4	UNMC	
* Pain Management	1	UNMC		* Retina	1	UNMC	
Emergency Medicine	3	UNMC		* Glaucoma	1	UNMC	
Family Medicine	3	UNMC	CUMC	Oral Surgery	5	UNMC	
Internal Medicine	3	UNMC	CUMC	Orthopedics	5	UNMC	
* Allergy/Immunology	2		CUMC	Otolaryngology	5	UNMC	
* Cardiovascular Disease	3	UNMC	CUMC	Pathology	4	UNMC	CUMC
* Electrophysiology	1	UNMC		* Hematopathology	2	UNMC	
* Endocrinology & Metabolism	2	UNMC	CUMC	* Surgical Pathology	1	UNMC	
* Gastroenterology	3	UNMC		Pediatrics	3	UNMC	CUMC
* Geriatrics	1	UNMC		* Allergy/Immunology	2		CUMC
* Hematology/Oncology	3	UNMC		* Pediatric Gastroenterology	3	UNMC	
* Hepatology	2	UNMC		* Pediatric Infectious Diseases	3	UNMC	
* Infectious Diseases	2		CUMC	Plastic Surgery	2	UNMC	
* Interventional Cardiology	1	UNMC	CUMC	Psychiatry	4		CUMC
* Nephrology	2	UNMC		* Addiction Psychiatry	1		CUMC
* Pulmonary/Critical Care	3	UNMC	CUMC	* Child Psychiatry	2		CUMC
* Rheumatology	3	UNMC		* Geriatric Psychiatry	1		CUMC
* Sleep Medicine	1	UNMC		Diagnostic Radiology	5	UNMC	CUMC
Internal Medicine/Pediatrics	4	UNMC	CUMC	* Interventional Radiology	1	UNMC	
Neurology	4	UNMC		Surgery	5	UNMC	CUMC
Neurosurgery	6	UNMC		* Colon/Rectal Surgery	1		CUMC
Nuclear Medicine	2	UNMC		* Minimally-Invasive	1	UNMC	
Obstetrics/Gynecology	4	UNMC	CUMC	* Transplantation	2	UNMC	
				Urology	6	UNMC	

\*Indicates a fellowship program

Source: Careers in Health Care, 2008.

## Appendix 15. Specialties of Actively Practicing Physicians, Nebraska

Specialty	Number	Percent	Specialty	Number	Percent
Abdominal Surgery	1	0.0	Forensic Pathology	1	0.0
Addiction Medicine	1	0.0	Forensic Psychiatry	1	0.0
Adult Reconstructive Orthopedics	1	0.0	Gastroenterology	43	1.2
Aerospace Medicine	1	0.0	General Practice	12	0.3
Allergy	4	0.1	General Surgery	116	3.2
Allergy & Immunology	16	0.4	Geriatric Medicine (Family Medicine)	2	0.1
Anatomic Pathology	10	0.3	Geriatric Medicine (IM)	11	0.3
Anatomic/Clinical Pathology	71	2.0	Geriatric Psychiatry	9	0.3
Anesthesiology	173	4.8	Gynecological Oncology	5	0.1
Blood Banking/Transfusion Medicine	2	0.1	Gynecology	4	0.1
Cardiothoracic Surgery	4	0.1	Hand Surgery	3	0.1
Cardiovascular Disease	128	3.6	Head & Neck Surgery	4	0.1
Cardiovascular Surgery	2	0.1	Hematology (IM)	3	0.1
Child & Adolescent Psychiatry	27	0.8	Hematology (Pathology)	9	0.3
Child Neurology	7	0.2	Hematology/Oncology	49	1.4
Clinical Cardiac Electrophysiology	6	0.2	Hospitalist	54	1.5
Clinical Genetics	1	0.0	Infectious Disease	32	0.9
Clinical Pathology	8	0.2	Internal Medicine	244	6.8
Colon & Rectal Surgery	9	0.3	Internal Medicine/Pediatrics	11	0.3
Critical Care Medicine (IM)	1	0.0	Interventional Cardiology	3	0.1
Cytopathology	2	0.1	Legal Medicine	1	0.0
Dermatology	34	1.0	Maternal & Fetal Medicine	6	0.2
Dermatopathology	2	0.1	Medical Genetics	2	0.1
Developmental-Behavioral Pediatrics	5	0.1	Medical Management	27	0.8
Diabetes	3	0.1	Medical Microbiology	1	0.0
Diagnostic Radiology	99	2.8	Medical Oncology	14	0.4
Emergency Medicine	134	3.8	Musculoskeletal Oncology	1	0.0
Endocrinology, Diabetes and Metabolism	20	0.6	Musculoskeletal Radiology	2	0.1
Facial Plastic Surgery	5	0.1	Neonatal-Perinatal Medicine	16	0.4
Family Medicine	729	20.4	Nephrology	37	1.0
Foot and Ankle, Orthopedics	1	0.0	Neurological Surgery	29	0.8

Continued on the next page

### Appendix 15. Specialties of Actively Practicing Physicians, Nebraska (continued)

Specialty	Number	Percent	Specialty	Number	Percent
Neurology	50	1.4	Pediatric Otolaryngology	2	0.1
Neurology/Diagnostic Rad/Neuroradiology	1	0.0	Pediatric Pathology	1	0.0
Neuropathology	1	0.0	Pediatric Pulmonology	7	0.2
Neuroradiology	3	0.1	Pediatric Radiology	5	0.1
Neurotology (Otolaryngology)	1	0.0	Pediatric Surgery (Neurology)	1	0.0
Nuclear Medicine	5	0.1	Pediatric Surgery (Surgery)	4	0.1
Obstetrics & Gynecology	156	4.4	Pediatric Urology	1	0.0
Occupational Medicine	13	0.4	Pediatrics	200	5.6
Ophthalmology	98	2.7	Physical Medicine & Rehabilitation	25	0.7
Oral & Maxillofacial Surgery	11	0.3	Plastic Surgery	23	0.6
Orthopedic Surgery	113	3.2	Preventive Medicine	1	0.0
Orthopedic Surgery of the Spine	9	0.3	Psychiatry	116	3.2
Orthopedic Trauma	2	0.1	Public Health and General Preventive Med	4	0.1
Otolaryngology	60	1.7	Pulmonary Critical Care Medicine	22	0.6
Pain Management	10	0.3	Pulmonary Disease	31	0.9
Pain Medicine	6	0.2	Radiation Oncology	26	0.7
Pain Medicine (Anesthesiology)	4	0.1	Radiology	69	1.9
Palliative Medicine	1	0.0	Reproductive Endocrinology & Infertility	3	0.1
Pediatric Allergy	2	0.1	Rheumatology	26	0.7
Pediatric Anesthesiology (Anesth)	9	0.3	Sleep Medicine	1	0.0
Pediatric Cardiology	7	0.2	Sports Medicine (Family Medicine)	1	0.0
Pediatric Cardiothoracic Surgery	2	0.1	Sports Medicine (Orthopedic Surgery)	16	0.4
Pediatric Critical Care Medicine	10	0.3	Surgery of the Hand (Orthopedics)	5	0.1
Pediatric Emergency Med (Pediatrics)	9	0.3	Surgical Critical Care (Surgery)	1	0.0
Pediatric Endocrinology	4	0.1	Surgical Oncology	5	0.1
Pediatric Gastroenterology	5	0.1	Thoracic Surgery	11	0.3
Pediatric Hematology/Oncology	8	0.2	Transplant Surgery	9	0.3
Pediatric Infectious Disease	2	0.1	Urgent Care Medicine	9	0.3
Pediatric Nephrology	2	0.1	Urology	51	1.4
Pediatric Ophthalmology	3	0.1	Vascular Surgery	19	0.5
Pediatric Orthopedics	5	0.1	Vascular and Interventional Radiology	4	0.1

Source: Health Professions Tracking Service, UNMC, 2008