

# SIXTH BIENNIAL REPORT | 2021 HEALTH ISSUES FOR THE STATE OF NORTH DAKOTA

SCHOOL OF MEDICINE & HEALTH SCIENCES  
ADVISORY COUNCIL



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### Disclaimer

This *Biennial Report* represents the good-faith effort of the UND School of Medicine and Health Sciences and its Advisory Council to provide current and accurate information about the state of healthcare in North Dakota. Numerous sources were used in gathering the information found in this *Report*. We welcome corrections, which we will incorporate in subsequent editions of the *Biennial Report*.

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## INTRODUCTION AND UPDATE

The *First Biennial Report: Health Issues for the State of North Dakota* was prepared in the fall of 2010 by the University of North Dakota School of Medicine and Health Sciences (SMHS) Advisory Council, a legislatively mandated group of 15 stakeholders in the North Dakota healthcare enterprise. It was published in 2011 to coincide with the 62nd Legislative Assembly of North Dakota and was produced with the cooperation of the senior leadership team of the SMHS. The primary stimulus for the preparation of the Report was a revision in the North Dakota Century Code (NDCC) that was instituted in 2009 by the 61st Legislative Assembly in which the duties of the SMHS Advisory Council were modified. The modified duties included a requirement to submit a report biennially. The duties of the SMHS Advisory Council as specified in NDCC Section 15-52-04 are as follows:

1. *The advisory council, in consultation with the school of medicine and health sciences and the other agencies, associations, and institutions represented on the advisory council, shall study and make recommendations regarding the strategic plan, programs, and facilities of the school of medicine and health sciences.*
2. *Biennially, the advisory council shall submit a report, together with its recommendations, to the agencies, associations, and institutions represented on the advisory council, to the University of North Dakota, and to the legislative council.*
- 3.a. *The report must describe the advisory council's recommendations regarding the strategic plan, programs, and facilities of the school of medicine and health sciences as developed under subsection 1. The recommendations for implementing strategies through the school of medicine and health sciences or other agencies and institutions must:*
  - (1) *Address the healthcare needs of the people of the state*
  - (2) *Provide information regarding the state's healthcare workforce needs*
- b. *The recommendations required under subdivision 3a may address:*
  - (1) *Medical education and training*
  - (2) *The recruitment and retention of physicians and other healthcare professionals*
  - (3) *Factors influencing the practice environment for physicians and other healthcare professionals*
  - (4) *Access to healthcare*
  - (5) *Patient safety*
  - (6) *The quality of healthcare and the efficiency of its delivery*
  - (7) *Financial challenges in the delivery of healthcare*
4. *The council may consult with any individual or entity in performing its duties under this section.*

The *First Biennial Report* provided the first comprehensive analysis of the existing state of health in North Dakota and its healthcare delivery enterprise. The

Report found that rural depopulation, out-migration of the young from the state, an increasingly older adult population, low population density, and localized population growth in the major cities and in the Oil Patch would result in an increasing imbalance between the demand for healthcare and the supply of providers that would necessitate the need for more physician and nonphysician providers in North Dakota and better healthcare delivery systems.

The *Report* concluded that North Dakota had a paradox regarding its healthcare workforce, characterized as shortages amid plenty. The size of the physician workforce in North Dakota was found to be at or better than national norms for most specialties, including all the primary-care disciplines. Despite this, there was a significant distribution problem, with the greatest number of providers located in the urban regions of the state and a shortage (especially primary-care providers) in the rural areas.

The *Report* also offered an analysis of what the future was likely to hold, and concluded that the current shortage of physicians was only going to increase as the population aged and grew in the future. It also found that the shortage of workers in the healthcare field over the next 15 years would not be limited to physicians. The *Report* determined that an entire cadre of additional healthcare providers - from nurses to physician assistants to occupational and physical therapists to medical laboratory specialists and others - would be needed to ensure that effective, efficient, and appropriate healthcare would be available to all North Dakotans.

The *Report* concluded with a proposal for a multifaceted plan to address the healthcare needs of North Dakota, emphasizing necessary steps to reduce disease burden, increase the healthcare workforce through enhanced retention of graduates as well as expansion of class sizes, and improve the state's healthcare delivery system through more cooperation and coordination of the various healthcare delivery facilities.

Coincident with the release of the *Report*, the SMHS Advisory Council prepared and released its plan for addressing the identified healthcare workforce needs of North Dakota. Called the Healthcare Workforce Initiative (HWI), the plan identified specific steps to reduce disease burden and increase the provider workforce through programs designed to increase provider retention for practice within the state as well as expand the provider network through class size increases. The HWI received strong support from University of North Dakota leaders, the SMHS Advisory Council, and a wide variety of constituencies around the state. During the subsequent 62nd session of the North Dakota Legislative Assembly, it was determined that the HWI would be implemented in two phases. The first phase was implemented immediately following the end of the 62nd Legislative Assembly in the summer of 2011, and consisted of a variety of programs to reduce disease burden (including the initiation of a Master of Public Health training program as a joint undertaking by the University of North Dakota and North Dakota State University, and a program to address geriatric patient needs), increase retention of healthcare professional graduates, and partially increase class sizes.

*The Second Biennial Report: Health Issues for the State of North Dakota* was an update on the developments and changes that occurred between 2011 and 2013. It reanalyzed the health of the citizens of North Dakota and the status of our healthcare delivery systems, utilizing updated data and more refined projection tools. The *Report* was similar to the first report in its organizational approach—analysis of the current state of affairs, projections for the future, and proposed plans to deal with the identified healthcare delivery challenges. The *Report* summarized the most up-to-date statewide healthcare data available, and it carefully analyzed the data to extract the most salient and informative implications regarding healthcare and healthcare delivery within the state. The *Report* contained a more robust analysis of the healthcare challenges associated with the oil boom, and proposed approaches to ensure that adequate healthcare was available not only in the Red River Valley but particularly in the rapidly growing and challenging areas in the western part of the state that were most affected by the oil boom. The *Report* contained a more complete analysis of the status of nonphysician healthcare workers, and a greatly expanded section analyzing quality and value indicators in the state. The *Report* concluded with a reemphasis of the importance of fully adopting the HWI by the 63rd Legislative Assembly, along with a call to adequately address the associated physical plant needs of the SMHS to accommodate the attendant growth in the number of healthcare students.

Following the release of the *Second Biennial Report*, North Dakota's 63rd Legislative Assembly endorsed full implementation of the second phase of the HWI. Authorization and funding were forthcoming to permit complete implementation of the four core strategies of the HWI: reduce disease burden, retain more graduates for direct patient care in North Dakota, increase class sizes, and improve the efficiency of healthcare delivery in the state. Accordingly, medical student class size subsequently was increased by 16 students per year, health sciences students by 30 students per year, and a variety of rural-focused residencies added. Coincident with the growth in class sizes, construction began on a new SMHS building designed to accommodate the increased class sizes. The building was completed on time and on budget, and opened during the summer of 2016 to welcome the incoming medical school Class of 2020 and the health sciences classes that started later that fall.

The *Third Biennial Report: Health Issues for the State of North Dakota*, released in 2015, used updated data to assess the status of health and healthcare delivery throughout North Dakota. It incorporated the results of a statewide survey of all major healthcare providers that was completed during 2014 to assess healthcare workforce needs. The *Report* provided updated information on healthcare needs and delivery in the Oil Patch in particular. It also analyzed in greater depth the use of nonphysician providers throughout the state. And it looked in greater detail than prior reports at a variety of related healthcare challenges, including oral health, and behavioral and mental health needs.

*The Fourth Biennial Report: Health Issues for the State of North Dakota*, released in 2017, updated the previous three editions with the latest available

demographic and census data and incorporated the results of several healthcare workforce surveys, especially a comprehensive study of nursing facility workforce in North Dakota that was compiled and completed in September 2016. The study analyzed the responses obtained from 81 rural and urban nursing facilities and assessed such issues as vacancy rates, recruitment issues, and retention strategies. Along with a study of the hospital workforce in North Dakota that was completed in September 2014, the two studies provide a comprehensive overview of the status of the nonphysician healthcare workforce throughout the state that complements the updated data available in the latest Report regarding the physician workforce.

The *Fifth Biennial Report: Health Issues for the State of North Dakota*, released in 2019, updated the previous four editions with a comprehensive examination of healthcare workforce licensure data. Data were gathered in January 2018 and examined number of licensed professionals, locations, specialties, and demographics. The result of this informed two new chapters including a comprehensive chapter on nursing workforce in North Dakota and a second chapter on psychiatrists, behavioral health, and non-physician workforce. A second study of hospital workforce in North Dakota was completed in July 2018, this study updated the previous 2014 study and is presented alongside the nursing facility study of 2016 to provide an updated comprehensive overview of health facility workforce in North Dakota.

The latest version, the *Sixth Biennial Report: Health Issues for the State of North Dakota*, updates the previous five editions with a comprehensive examination of healthcare workforce licensure data. Data were gathered in January 2020 and examined number of licensed professionals, locations, specialties, and demographics. The result of this informed a new chapter on social determinants of health which serves to tie the population and socioeconomic influences of the state on health outcomes.

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## EXECUTIVE SUMMARY

*Preface – This Executive Summary and the full Biennial Report are based on data largely collected before the SARS-CoV-2 (COVID-19) pandemic emerged in the United States. As such, the data represented here reflect what one would consider a “normal” biennium for the state of North Dakota and do not reflect changes that are a result of the public health crisis. The resulting effect that may be seen likely will be fully represented in the data over at least the next biennium and will require careful consideration. The current information represents a good-faith effort of the contributors to provide the most representative data at the time collected.*

North Dakota, like the rest of the country, is facing a major healthcare delivery challenge—how to meet a burgeoning need for healthcare services now and especially in the future with a supply of physicians and other healthcare providers that has not always kept pace with the growing demand. The problem is particularly important in rural and western parts of North Dakota, where there has been a chronic shortage especially of primary care providers dating back many decades. The data reviewed for this report illustrate two major problems in North Dakota. One problem is an inadequate number of healthcare providers. The second and larger problem, however, is a maldistribution of providers. The data show that healthcare providers are disproportionately located in the larger urbanized areas of the state, leaving many rural areas with a healthcare workforce shortage. Without direct intervention, the difficulty of providing adequate healthcare in North Dakota will worsen over the coming decades, due primarily to the aging of the population (including aging and eventual retirement of the healthcare workforce), which will increase the demand for healthcare services.

However, unlike much of the rest of the country, North Dakota is directly addressing its healthcare delivery challenges through the implementation of a well-vetted plan for healthcare workforce development and improved healthcare delivery. That plan, the Healthcare Workforce Initiative (HWI), was an outgrowth of the First and Second Biennial Report on Health Issues for the State of North Dakota. The HWI, which began by increasing medical and health sciences class sizes along with increasing residency (post- MD degree training) slots, has been fully implemented. The HWI should, in the future, decrease North Dakota’s healthcare delivery challenges through attainment of its four goals: 1) reducing disease burden, 2) retaining more healthcare provider graduates for care delivery within the state, 3) training more healthcare providers, and 4) improving the efficiency of the state’s healthcare delivery system through an emphasis on team-based care delivery approaches. To accommodate the substantial class size expansions associated with the HWI, a new University of North Dakota (UND) School of Medicine and Health Sciences (SMHS) facility was completed in 2016 and is fully functional on UND’s Grand Forks campus. The largest government-funded building construction project in the state’s history, it was completed on time and on budget.

In accordance with the expectations specified in the North Dakota Century Code (NDCC 15-52-04), this Sixth Biennial Report on Health Issues for the State of North Dakota (Report) updates the first five Reports with an assessment of the current state of health of North Dakotans and their healthcare delivery system, along with an analysis of the steps that need to be taken to ensure that all North Dakotans have access to high-quality healthcare at an affordable cost now and in the future.

**The Population of North Dakota:** The Report begins with an updated analysis of the population demographics in North Dakota, utilizing the most recently available data. Standardized definitions are used to define the state's population—metropolitan to denote areas with a core population of 50,000 or more; micropolitan (or large rural) to denote areas with core populations of 10,000 to 49,999; and rural to denote areas with a population of less than 10,000. Half of North Dakota's current population resides in metropolitan areas, with a little more than a quarter (26%) located in rural areas. This represents a dramatic change compared with a few decades ago when more than half of the state's population was located in rural areas. North Dakota is one of the least densely populated states in the country, ranking 48th in population density and tied for fourth in the country in the percentage of its state population that is 85 years of age or older. Because demand for healthcare increases proportionally with age, demand for healthcare services is especially pronounced in North Dakota. Such needs will only increase as the state's citizens grow older. People in rural regions of North Dakota are generally older, poorer, and have less or no insurance coverage than people in non-rural areas, all of which are challenges to providing adequate healthcare. Rural regions continue to experience depopulation, which will only exacerbate the current problem of healthcare access and delivery.

**Social Determinants of Health in North Dakota:** Various external factors, referred to as social determinants of health (SDOH), can affect health status and explain why some Americans are generally healthier than others are. SDOH include conditions where people live, work, learn, and socialize. SDOH consider the various circumstances in which people are born, live, learn, work, socialize, play, and age that affect a range of health outcomes. Circumstances that may affect health outcomes of individuals include the current social structure, economic factors, and physical aspects of a person's environment. Environments include home, school, workplace, neighborhood, city, and other community settings where a person spends a significant amount of time. Resources that contribute to an enhanced quality of life for a given population are likely to have a significant influence on positive health outcomes of that population. Examples of quality of life enhancing resources include safe and affordable housing, access to education, public safety, availability of healthy foods, local health services, and environments free from life-threatening toxins. Six factors are recognized as core social determinants of health. They are individuals' economic circumstances, their education, food access, the physical infrastructure of their environment, the social and community context in which they live, and their overall health and access to healthcare.

**The Health of North Dakota:** The health of North Dakotans, in comparison with the rest of the United States, is good in general. North Dakotans have a slightly lower prevalence of diabetes than the rest of the United States and are less likely to report fair or poor health. However, North Dakotans tend to have a higher risk of some types of cancer and a mortality rate that exceeds the national average. Behavioral risks tend to increase as population density decreases; rural areas have the worst behavioral risk, with an increased frequency of obesity, smoking, and drinking, especially in males.

**Physician Workforce:** The physician workforce in North Dakota has fewer physicians per 10,000 population than the United States as a whole or the Midwest comparison group. Although the gap had narrowed over the past three decades, it has widened again recently. Our physicians are older and more likely to be male than elsewhere in the United States. About one-fourth of the physicians in North Dakota received some or all of their medical training (medical school or residency or both) in-state. The patient-to-physician ratio is not equally distributed across the state. Micropolitan areas have about twice as many patients per physician as metropolitan areas, while rural areas have about five times as many. Predictions of an inadequate future physician supply has helped garner support for the HWI. Without the effects of the HWI, estimates indicate a shortage of some 260 to 360 physicians by 2025, the consequence of a heightened need for healthcare services as the Baby Boomer generation ages but also from retirements in the physician workforce (one-third of physicians in North Dakota are 55 years of age or older).

**Primary Care Workforce:** The state's primary care physicians include family medicine, general internal medicine, and general pediatrics. Compared with the rest of the country, North Dakota has more primary care physicians when normalized to the population size. Their density is significantly higher than either comparison group in metropolitan regions; it is only in rural areas where North Dakota significantly lags the Midwest comparison group. Although primary care physicians in North Dakota are more likely to practice in rural areas compared with specialist physicians, they still are twice as likely to be found in urban regions rather than rural areas. Residency training in North Dakota is an especially important conduit of primary care physicians, since nearly half (45%) of them have completed a residency within the state; almost three-quarters of family medicine physicians went to medical school at UND, completed an in-state residency, or did both.

North Dakota has relatively fewer specialists than the Midwest or the rest of the United States in certain specialties, including obstetrics-gynecology. We have about the same relative number of psychiatrists as other Midwest states, although two-thirds of them work in the eastern part of the state, leaving the western parts of North Dakota with a relative shortage.

**Nursing Workforce:** A majority of hospital nurses are licensed practical nurses (LPNs) or registered nurses (RNs). A majority of RNs and LPNs were trained in-state, with a

majority working in an in-patient setting. A majority of nurse practitioners were trained in North Dakota with a majority working in primary care.

**Behavioral Health and Non-Physician Healthcare Workforce in North Dakota:** Most behavioral health professionals are found in urban areas. This includes psychiatrists, psychologists, counselors, licensed addiction counselors, and social workers. More than half of all social workers were trained in North Dakota. Almost threequarters of the state's physical therapists and physical therapist assistants trained in North Dakota, with half receiving training at UND. Of the physician assistants trained in North Dakota, half practice in rural areas and almost half (46%) practice in rural primary care.

**Healthcare Facility Workforce:** Nursing facilities and hospitals typically rely on external contract employees, with physical therapists, occupational therapists, and speech therapists as the most common external contract employees. The highest turnover rate was found with nurse assistants, which are the most difficult positions to fill.

**Healthcare Organization and Infrastructure:** Healthcare in North Dakota is delivered through more than 300 ambulatory care clinics, 52 hospitals, 80 skilled-nursing facilities, 68 basic-care facilities, and 72 assisted-living facilities, supported by an array of emergency medical services (EMS) providers, trauma centers, 28 public health units, oral health providers, behavioral health providers, and pharmacies. Generally, the further a facility is from a metropolitan area, the more its operation is threatened by financial and other pressures, including staff recruitment and retention. Rural health organizations tend to be small in size but have a significant impact on both the health of individuals and the economic base of the community in which they are situated.

**Healthcare Policy:** Nationally, the health delivery system is going through profound change. Improvements in population health and a realignment of provider payments to incorporate those improvements is a new and fundamental reality. The quality and safety of care delivered in a healthcare system is directly associated with improving and maintaining overall health status. In a complex healthcare system, there are a number of concerns, such as the availability of providers; access to care and health services, technology, and treatment advancement; and the financial dimensions of affordability and payment. Each of these is a contributing factor in the overall strategy to be considered when reforming or redesigning the health system. In addition, the quality of care provided to the population and the patient outcomes produced are equally important facets of reform.

The statewide problem of unmet mental and behavioral health needs, especially related to the ongoing opioid abuse issue, is highlighted in the current Report. One approach already implemented through the HWI is to bring the often rural patient to the provider through the use of telepsychiatry. The UND Department of Psychiatry and Behavioral Science has implemented training in telepsychiatry for all of its residents so they will be able to utilize this technology effectively in clinical practice.

The quality of healthcare delivered in North Dakota is as good as or better than much of the United States, but there appears to have been a decline in several measures in the past few years, particularly in the delivery of certain acute-care services. North Dakota (along with other upper-Midwest states) generally provides high-quality care at relatively lower cost than other states in the U.S. North Dakota ranked 22nd in the country in a recent assessment of healthcare quality undertaken by the Commonwealth Fund (down from 9th in 2009).

The Report concludes with a strong ongoing endorsement of the HWI and a recommendation to continue its funding by the 67<sup>th</sup> Legislative Assembly. One component of the HWI—the RuralMed medical school scholarship program—is cited in particular for its positive results in rural physician recruitment. An important issue for consideration by the 67th Legislative Assembly is the effect of the state’s current financial status on funding for the HWI. The budget submitted by the UND SMHS for the 2021–2023 biennium and endorsed by both UND and the State Board of Higher Education has been structured to permit full funding of the HWI and a continuation of the various vital healthcare educational programs of the UND SMHS. Thus, it will be up to the 67th Legislative Assembly to weigh the merits of full funding of the HWI in relation to the other funding priorities. The UND SMHS Advisory Council strongly supports continuing funding of the HWI as detailed in the budget request.

An important additional consideration for the 67th Legislative Assembly will be the Strategic Plan for Health that has been developed by the Health Strategies Planning Group with extensive input from thought leaders from both within and outside of the state. The aspirational goal of the Plan is to make North Dakota the healthiest state in the country by improving the health and wellbeing of all North Dakotans. It is based on three foundational goals:

- To support state and local data-driven health-conscious policy and decision-making
- To develop public health expertise and leadership statewide
- To enhance cross-sector collaboration and integration

The Plan is to be finalized in time for review and consideration by the 67th Legislative Assembly that convenes in January 2021. Legislative support for and initial implementation of the Plan during the 2021-2023 biennium, along with continued funding for the HWI, will be essential to address the health challenges that lie ahead. Taken together, the Plan and the HWI form an exciting framework for improving health and well-being statewide and ensuring an adequate healthcare delivery workforce for the citizens of North Dakota for years to come, eventuating in the citizens of North Dakota becoming the healthiest people in the country.

## **CHAPTER ONE: The Population of North Dakota and Attendant Healthcare Needs**

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## **INTRODUCTION: STRUCTURAL DESIGN AND PUBLIC POLICY**

The U.S. healthcare system is a complex structure. It can be characterized as an array of national, regional, and local systems that provide access to healthcare services. The healthcare provider arrangements and structures follow a variety of options from a single provider in a clinic to a multistate, managed-care structure. Reimbursement and payment methods rely on both private market forces including individual and employer health insurance purchases, as well as public instruments that can both complement and conflict with private insurance. Healthcare delivery is a multifaceted and intricate system that can be difficult to navigate, understand, and improve.

The healthcare workforce is influenced by a number of contextual or environmental factors that shape the scope of the supply and demand for healthcare providers. These factors include: public policy (federal, state, and sometimes local); demographic and economic factors; quality of care, healthcare outcomes, and health information technology; state and national certification and oversight boards; and healthcare reform intended to improve the delivery of care, health status, and funding and payment systems. According to the U.S. Department of Health and Human Services, health status refers to one's medical conditions (both physical and mental health), claims experience, receipt of healthcare, medical history, genetic information, evidence of insurability, and disability.

Public policy sets the ground rules governing much of the organization, payment methods, and formalized structure of the U.S. healthcare system. Public payments also influence the educational framework for the training of health professionals (e.g., federal graduate medical education payments, support of Area Health Education Centers, and state and federal support for scholarships and loan repayment).

Healthcare providers rely on both public payment mechanisms and private health insurance. The most common private health insurance is employer-sponsored insurance financing which has remained relatively stable over time.<sup>1</sup> The delivery of healthcare through predominantly private markets is affected by public payment structures such as Medicare and Medicaid. While Medicare is a federal initiative, Medicaid receives both federal- and state-based funding. Federal and state policymakers set the rules for Medicaid with regard to eligibility, covered services, and provider reimbursement. There is a give-and-take between the federal government and individual states concerning Medicaid policy.

Medicare is a significant payer for hospitals, healthcare centers, clinics, and healthcare professionals. Medicaid constitutes a smaller level of funding for some providers but is still very important. In January of 2014, North Dakota adopted the new Medicaid expansion. Medicaid now may increase coverage for those earning incomes up to 133% of the federal poverty level, which could make Medicaid more important as both a provider funding source and as a public policy platform to increase insurance coverage. Rural hospitals in North Dakota commonly have a Medicare inpatient base of about 60% compared to urban hospitals which are closer to 50%.<sup>2</sup> Medicaid's base is significantly less; however, it is still important. Policies affecting payers such as Medicare and Medicaid have a profound effect on the financial bottom line of healthcare organizations. This is a factor that affects healthcare workforce issues. Public and private reimbursement streams create the foundation for the ability of a health system to

provide and even expand services to meet local needs, hire and pay employees, and secure the continuation of a system of care. In rural North Dakota, the viability of many local health systems is tenuous, which creates an environment in which it is more difficult to recruit, pay, and retain providers, and offer a sense of employment security for employees.

***“Rural hospitals in North Dakota commonly have a Medicare inpatient base of about 60% compared to urban hospitals which are closer to 50%.”***

Healthcare delivery systems such as hospitals and clinics increasingly operate in either informal or formalized provider networks, and further consolidation of healthcare provider organizations is likely in the future. These networks afford providers the opportunity to better meet local healthcare needs, address operational concerns, and secure greater cooperation.

Overall, Critical Access Hospitals (CAHs) in North Dakota have formed collaborative relationships with other providers (urban hospitals, rural hospitals, clinics, emergency medical services, public health units, and long-term care facilities) to address common organizational and community needs to achieve greater efficiencies, standardize cost structures, share resources and skills, and improve organizational performance. Networks, partnerships, or collaborative efforts affect the healthcare workforce because they can contribute to a stronger, more viable health system; they can be mechanisms to address recruitment and retention; and they can operate as educational and skill development platforms. While all CAHs work in collaborative arrangements with area tertiary hospitals, they also created the North Dakota CAH Quality Network in 2007. Through this network arrangement, staff training opportunities, process tools and protocols, patient outcome records for benchmarking data, and practice experience and best practices are shared within the network. The CAH Quality Network contributes not only to the development of rural-based solutions and systems, but also to optimizing health professional staff skills and resources.

Payment incentives and disincentives have been gradually introduced to influence patient decision-making and provider treatment decisions to improve quality and outcomes. Over time, they will emphasize outcome-based payment over fee-for-service (or a system based principally on encounters). A national focus developed in the early 2000s to address quality of care improvement and patient safety issues followed a study and report of shortcomings in the U.S. health delivery system. A developing interest and need within the healthcare community to address system inequities and inefficiencies, combined with public policy incentives to identify and implement approaches to improve care quality and to assure a higher level of patient safety, have come to dominate much of the discussion associated with healthcare reform. A rapidly developing health information technology (HIT) infrastructure has been considered an essential element to address quality of care concerns, improve health provider communication (both within the provider community and with patients), and develop a higher level of patient awareness and control in matters concerning their own health involvement and status. However, the demonstrated success of HIT to date has been modest at best in achieving these goals. Prospective Payment System (PPS) hospitals

are hospitals that receive a flat-rate-per-case Medicare payment based on a payment schedule associated with a set of diagnosis-related groups. In North Dakota, the largest and prospective payment system hospitals located in Bismarck, Fargo, Grand Forks, and Minot receive Medicare payment incentives to measure and record quality metrics specified by the Centers for Medicare and Medicaid Services (CMS). CAHs do not receive such incentives and are reimbursed on an allowable cost basis. However, many CAHs collect and report quality-related data.

One of the focal points of the North Dakota CAH Quality Network is to facilitate an understanding of how to improve medical outcomes for patients. Thus, in 2012, North Dakota became one of the few states where all of the CAHs report some quality-performance measures to the national CMS quality database called Hospital Compare. By improving the health delivery system both in terms of addressing quality of care issues and incorporating HIT tools, particularly in rural areas, North Dakota is engaged in a process that should result in higher-quality and lower-cost care as well as produce an environment that is more conducive and attractive for healthcare systems and medical providers.

Educational institutions and their associated academic health centers respond to the needs of healthcare providers in the health delivery system. Academic centers are also subject to supply based on demand change. New organizational arrangements such as Accountable Care Organizations (ACOs) will begin to operate and be combined with outcome-based payment through value-based purchasing, bundling payments, or both to align with patient-centered care.

***“In North Dakota, the PPS hospitals located in Bismarck, Fargo, Grand Forks, and Minot receive Medicare payment incentives to measure and record quality metrics specified by the Centers for Medicare and Medicaid Services (CMS). CAHs do not receive such incentives and are reimbursed on an allowable cost basis.”***

## **DEMOGRAPHICS**

Population characteristics influence healthcare workforce as well as the overall healthcare delivery system. Demographic changes can help frame policy discussions and decisions. Health policy at both national and state levels responds to changes in the socioeconomics that affect the ability of individuals and employers to purchase health insurance, which can influence health status. As demographics and socioeconomics change, the demands for certain types of health services are impacted. Likewise, the ability of the health delivery system to respond is affected and the relationship between the community (individuals, organizations, employers, and others) and health systems and provider groups can be transformed.

A geographic area that experiences the aging of its population will see more demand for chronic care services, home care, and geriatric-focused care, with related concerns for transportation services and housing options. The payer-mix for providers will become more dependent upon public payers, particularly Medicare. The demand for health professionals may be modified by attracting professionals with a natural inclination to serve a geriatric population, but it may be more difficult to attract

professionals with an interest in a multigenerational population. Healthcare systems must contend with keeping up with demand for more services, including more diversified services, than previously provided. There are economic impacts on healthcare systems to secure capital improvements for physical plant expansion and technology improvements, and to meet salary demands. Such an upturn in population and economic conditions will likely affect individuals, families, and employers as it relates to the purchasing of healthcare insurance. This can be positive for local health systems and providers if the growth in income and economic conditions translates into a higher rate of insurance coverage; however, if it does not expand coverage, then the negative consequences for the provider base can threaten the survivability of area providers.

Areas weathering depopulation must contend with conditions that threaten the ability of the local health system to maintain existing services, where the overall demand may decline but for which there still is a need. Even in remote areas, there are legitimate needs for access to primary and emergency care as well as public health functions, and reasonable access to acute and specialty services. Areas of population decline tend to see a loss in families with children and adolescents, as well as younger working-age populations, with an older adult population staying in the area. This results in rural areas simultaneously experiencing a loss of population coupled with a relatively larger older-adult population.

The overall population decline affects the local health system with corresponding service demand change (declining for some services while expanding for others, which in turn affects the financial conditions of the system and influences the payer-mix). Some rural health systems respond to such changes by offering satellite clinic services in more remote communities in their service area in which the clinic may be open only two or three days a week as opposed to offering a full-week clinic. Population decline and the growing presence of an aged patient base places many rural health systems at financial risk because as overall service demand declines, demand for more specialized services related to an older adult population increases, and the reliance on Medicare and Medicaid increases. In much of rural America—including North Dakota—concerns exist regarding the survivability of local health systems given these conditions.

Demographic factors, economic conditions, and public policy decisions have combined to create a complicated and, in many cases, inhospitable environment for maintaining access to essential healthcare services. A series of community dialogues and meetings conducted by the Center for Rural Health (CRH) at the University of North Dakota (UND) School of Medicine and Health Sciences (SMHS) found concern among rural North Dakotans on measures associated with community dynamics such as local population, local economics, community growth, ability to retain or recruit youth, housing access, and health system factors. Health system factors include financial issues facing rural hospitals, health system reform, healthcare workforce, access and availability of care, and emergency medical services.<sup>3</sup> Rural North Dakotans recognize the barriers and threats to community institutions and to the very community or town itself. The maintenance of rural institutions and organizations is essential to solidify a healthcare service base, a foundation that is necessary to meet local access-to-care needs, improve population health status, and contribute to local economic and community development.

***“Population decline and the growing presence of an aged patient base places many rural health systems at financial risk as overall service demand declines, demand for more specialized services related to an older adult population increases, and the reliance on Medicare and Medicaid increases.”***

## **Metropolitan, Micropolitan, Rural, and Frontier Counties**

North Dakota is comprised of a mixture of several densely populated larger cities, many smaller towns, and large areas with low population density. The distribution of North Dakota’s population is another challenging issue for efficient healthcare delivery. Figure 1.1 shows the population per square mile for metropolitan, micropolitan, and rural counties in the state. Since its inception, the state has experienced low population density overall. North Dakota ranks 48th in population density when compared nationally, with 10.7 people per square mile. As a reference, the District of Columbia, has approximately 10,205.5 people per square mile.<sup>4</sup>

Until recently, North Dakota experienced muted population growth. North Dakota is unique in the nation in experiencing negative population growth for four of the last 10 decennial censuses.<sup>5-8</sup> However, the growth of the Oil Patch in western North Dakota, with the resultant increase in population, has healthcare delivery implications. According to the 2010 national census, North Dakota experienced a 4.7% population growth after years of slow decline or trivial growth. The growth has continued with the population increasing by 11.7% from 2010 to 2019, based on the 2019 U.S. Census estimate.<sup>4</sup> North Dakota had the third-fastest growth rate in the country over that period, primarily from the rapid growth in the energy sector. The national growth rate from 2010-2019, in comparison, was 5.9%.<sup>4</sup> North Dakota’s growth mainly occurred in three locations: the cities (Fargo, Dickinson, and Bismarck), and western counties. This rapid population growth has abated with the downturn in the Oil Patch, but continues to affect healthcare delivery. None of the six major hospital systems are located in the western counties, although several are expanding their outreach to the region. Most of the current healthcare in the western counties is delivered through clinics and CAHs. This is creating a problem in those areas because the region is already experiencing a disproportionate shortage of physicians and other healthcare workers.

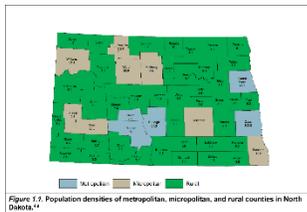
To better define the population dispersion across North Dakota, standardized descriptions are used to facilitate comparison with other regions of the country:

- ***Metropolitan*** describes a population cluster or area with a core population of 50,000 or greater. The state’s three largest cities (Fargo, Bismarck, and Grand Forks) are located in metropolitan areas as are their surrounding areas.
- ***Micropolitan*** (or large rural) describes areas with a population core from 10,000 to 49,999. This includes Minot, Dickinson, Williston, and Jamestown.
- ***Rural*** constitutes areas with a population cluster of fewer than 10,000. Both micropolitan and rural areas are considered nonmetropolitan. Historically, more than 50% of North Dakota’s population has been designated as rural.<sup>8-9</sup>

Depending on the definition of rural, North Dakota is among the five states with the largest component of rural areas.<sup>9</sup>

- **Frontier** is defined as a county with a population density of six or fewer people per square mile. Thirty-six of the state's 53 counties are classified as frontier. Only nine of 53 counties have population densities above the state's average density of 10.7 people per square mile. The lowest density is found in Slope County (0.6 people per square mile), and the most densely populated is Cass County (99.4 people per square mile). The average population density of the United States, as a point of comparison, is 91.5 people per square mile.<sup>5</sup>

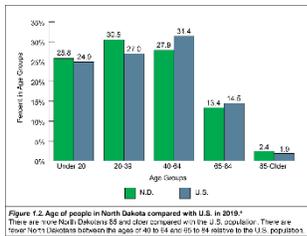
It should be noted that Metropolitan, Micropolitan, and Rural are a combined set of definitions from the Federal Office of Management and Budget, while Frontier is a designation that is based on separate criteria.



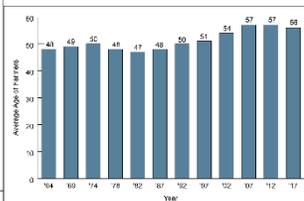
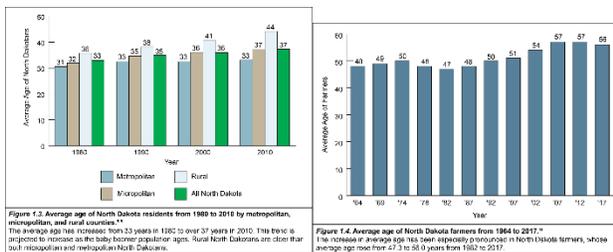
## Age

Older populations use dramatically more healthcare resources than do younger populations. North Dakota's population is among the oldest in the nation. It is tied for fourth in the country in the percentage of its state population that is 85 years or older. This greatly influences the need for providers. For example, nationally in 2016, 15- to 24-year-olds on average generated 153 ambulatory office visits annually per 100 persons, while Americans age 75 or older made 546.8 annual visits per 100 persons (over 3.5 times as many).<sup>10</sup> If we assume that a family physician provides 5,500 office visits a year, 1,000 15- to 24-year-olds would take up 35% of one physician's practice, while it would take 1.4 family physicians to treat a similar number of older patients. Thus, simply comparing the number of North Dakota physicians per 100,000 persons can be misleading unless the age of the populations being compared is taken into account. Figure 1.2 shows specific age ranges across North Dakota, as compared to the U.S. North Dakota has more individuals under the age of 20, between 20-39 years, and 85 and older than the U.S.

***“Older populations use dramatically more healthcare resources than do younger populations. North Dakota’s population is among the oldest in the nation. This greatly influences the need for providers.”***



As shown in Figure 1.3, rural North Dakotans are significantly older than their counterparts in micro- or metropolitan areas, and that disparity is increasing over time. The higher average age in rural North Dakota likely is the consequence of the continuing depopulation of the rural areas, with younger people moving elsewhere. This effect is evident in the agrarian sector, where the increase in average age has been particularly apparent in North Dakota farmers (Figure 1.4). Since most rural counties have continued to see a decline in overall population, that decline is commonly associated with a loss of young individuals and families or difficulty in recruiting and retaining young individuals and young families. Older adults are less likely to leave an area where they have spent their entire lives. The effect is one where the overall population declines, and the average age of the area increases.



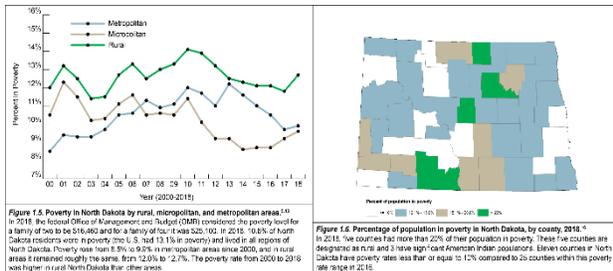
## INCOME FACTORS

### Poverty

People in poverty tend to have a lower health status. Poor housing, sanitation, and water supply can contribute to disease and ill health, and access to adequate and quality food sources is limited. Poverty is associated with greater rates of illness and shorter life spans. People with incomes at 200% below the federal poverty level (or less) are more likely to have only fair or poor health status, and to have sought care through the emergency room as opposed to a clinic setting. Access to health services is affected by income level in other ways. Lower-income households have a lower rate of health insurance coverage and less frequent contact with a health provider.<sup>12</sup>

Poverty rates vary based on age, race, household composition, and geography (Figure 1.5). Poverty has been increasing in urban areas, but still remains lower than rural rates (9.9% compared with 12.7%).<sup>9,13</sup> About 7.6% of people in the state who are 65 years and older are in poverty compared to 9.5% nationally.<sup>14</sup> Children up to four years of age living with single mothers in rural areas are more likely to be affected by poverty than those in urban areas of the state. Three-fourths of children from newborn to four years old living with single mothers in rural North Dakota were living in poverty in

2008, compared with 55% of children living with single mothers in urban areas.<sup>15</sup> The distribution of poverty across the counties of North Dakota in 2018 is shown in Figure 1.6. The highest poverty rates are in rural counties and counties with a higher proportion of American Indians.



***“The highest poverty rates are in rural counties and counties with a higher proportion of American Indians.”***

## DEMOGRAPHICS SUMMARY

Demographic characteristics contribute to rural health disparities and highlight the access-to-care and health status issues found in rural North Dakota. In general, those in the most rural areas of North Dakota are older, poorer, and have less insurance coverage than those in metropolitan- and micropolitan areas (Table 1.1). Each of these factors has been shown to influence the ability of a person to seek care when it is necessary, maintain a regular relationship with a physician or other health professional, better manage health conditions, and ultimately realize a higher status of health. Sociodemographic factors such as poverty, income disparity, insurance coverage, education, and culture, including rural culture, can serve as social determinants of health, which will be discussed in Chapter 2.

Table 1.1  
 Summary of demographics in North Dakota's population by metropolitan, micropolitan, and rural areas.<sup>17</sup>

	Metropolitan		Micropolitan		Rural	
	N	%	N	%	N	%
Total - 2018	598,233	63	182,806	24	189,439	28
Gender - 2018						
Male	302,225	51	95,561	52	102,246	51
Female	188,069	45	87,039	48	86,893	49
Age - 2018						
Under 20	87,336	26	25,003	27	33,435	27
20-39	126,222	33	37,087	31	44,890	22
40-54	102,512	27	42,711	27	50,697	30
55-64	45,416	12	21,503	12	24,134	17
65 and Older	8,126	2	4,206	2	6,389	3
In Poverty - 2018						
Yes	37,590	11	17,381	10	25,310	13
No	341,338	80	192,862	80	175,576	87

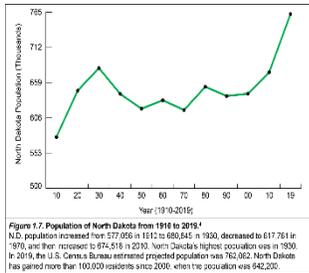
Nationally, rural residents tend to be poorer, older, and have less insurance coverage than those residing in non-rural regions. North Dakota data reflects the national data.

## POPULATION

### Historical Changes

North Dakota has been significantly influenced by its agricultural history and the role agriculture has played economically, socially, and culturally. Historically, North Dakota has benefited from federal statutes such as the Homestead Act, a rich productive land base, early immigration, the proliferation of railroad expansion to move

out agricultural products (and move in settlers), and changes in agricultural technology. The state’s population growth from 1910 to 1930 (Figure 1.7) was likely influenced by the continuing development and growth in agriculture. The full effect of the Depression in the 1930s and World War II precipitated a population decline in North Dakota. At one point in 1934, one-third to one-half of North Dakotans were “on relief” and receiving government assistance. During the 1930s, there was an out-migration of more than 120,000 people. Even during this period, there was a rural-urban dichotomy with population shifts where farm and small-town populations declined and larger, more urban areas of the state grew.<sup>17</sup>



***“The ND counties with the most significant population increases from 2000 to 2019 were McKenzie, Williams, and Mountrail. The data indicate unique trends in county population: gradual urbanization, decline in the most rural areas, growth in the American Indian population, and a resurgence of population associated with energy development.”***

From 1930 to 1950, the state’s population declined from about 681,000 to 620,000, then increased to 632,000 in 1960, and dipped again to 618,000 in 1970. By 1980, the population increased to 653,000. The rapid increase in the late 1970s likely was a result of significant energy expansion (oil and coal) during that period and a trend toward urbanization. Following the ‘oil bust’ in the 1980s, the state’s population once again declined and was accompanied by continuing rural depopulation. Since 2003, the population has rebounded.

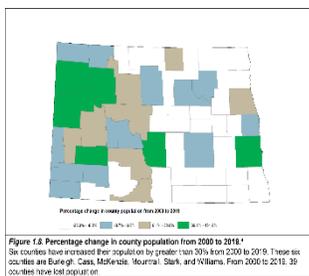


Figure 1.8 shows the change in population by county from 2000 to 2019. The counties with the most significant population increases from 2000 to 2019 were McKenzie, Williams, and Mountrail. The data indicate unique trends in county

population: gradual urbanization, decline in the most rural areas, growth in the American Indian population, and a resurgence of population associated with energy development.

***“The healthcare industry accounted for eight of the 10 largest employers in the state in 2010, and these private businesses were headquartered in the three largest cities, demonstrating the growing importance of health as a business activity and underscoring the diversification of the state’s economy, particularly when it is associated with the continuing urbanization of the state.”***

The three most urban counties, Burleigh, Cass, and Grand Forks, home to the state’s three largest cities have had consistent growth dating back to 1930. The two fastest-growing cities through births and migration over the past decade, West Fargo and Horace, demonstrate that urban expansion is not solely concentrated within the geographical boundaries of the major cities.<sup>8,9</sup> This is also an indicator that while the state may still rely economically on land-based economies (agriculture and energy), there is a more diversified economic structure under development (health infrastructure, regional service and retail, government, manufacturing, and education). The healthcare industry accounted for eight of the 10 largest employers in the state in 2010, and these private businesses were headquartered in the three largest cities, demonstrating the growing importance of health as a business activity and underscoring the diversification of the state’s economy, particularly when it is associated with the continuing urbanization of the state.<sup>19,20</sup>

While the more urbanized areas continued to grow, the most rural and remote areas declined in population. About one-third of the rural counties, had experienced average decennial population losses of 10% or greater since 1930. Sheridan County, in the central part of the state, has actually lost 53% of its population since 1980.<sup>5,8</sup> The changing economic face of the state has spurred much of this change. In 1960, agriculture accounted for 17% of the state’s gross domestic product (GDP), but declined to about 6% in 2010.<sup>20</sup> In 2013, agriculture, combined with forestry, fishing, and hunting, had increased and accounted for 13% of the state’s GDP.

***“In much of rural North Dakota, the health sector is a significant driver of the local economy; communities with hospitals, clinics, or nursing homes report that the local health industry is the largest area employer.”***

In 2010, healthcare accounted for 8.6% of the state’s economic activity and had shrunk slightly to 6% in 2013, likely a consequence of the growth in the oil-related economy.<sup>20</sup> In much of rural North Dakota, the health sector is a significant driver of the local economy; communities with hospitals, clinics, or nursing homes report that the local health industry is the largest area employer. However, while the importance of the healthcare sector to the rural economy increases, changes in agriculture (fewer farms but with more acreage) and other economic conditions, including the outmigration of young adults and young families, have helped to shift population to the more urban centers. The economic importance of agriculture is unquestioned; however, today it is

performed with a smaller number of farmers and farm employees, which has an effect on out-migration.

Growth of the American Indian population has been a positive indicator for the state, particularly during periods of slower overall population growth. For example, the 2000 census indicated that the Caucasian population of North Dakota declined by 2% from 1990 to 2000; however, the American Indian population of the state increased by about 21%. During that period, North Dakota's population increased by a trivial 0.05% and was the smallest state increase recorded for any of the 50 states.<sup>6-7</sup> The 2010 census found that the Caucasian population increased by 2%, while the American Indian population grew by about 17% (nationally, the American Indian population increased by more than 18%). North Dakota's Hispanic population, while small at only about 13,400, witnessed a significant increase over the decade of about 73% (nationally, the Hispanic population increased by 43%).<sup>8</sup>

### Changes in Population by County and Age

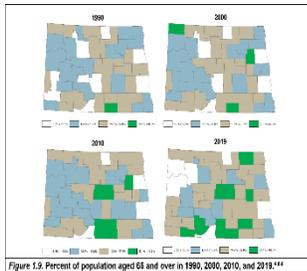
Figure 1.9 shows the progression of population change for people age 65 and older at four census periods (1990, 2000, 2010, and 2019). There has been a continual increase in the proportion of older adults in the rural counties. In 2010, the eight counties with 27% or more of their population age 65 or older were all rural; in fact, they are some of the most remote counties because all are classified as frontier. North Dakota's median age has steadily increased over the past 50 years. The state's median age was 26.2 in 1960, 26.4 in 1970, 28.1 in 1980, 32.4 in 1990, 36.2 in 2000, and 37 in 2010.<sup>8</sup> Thirty-four counties had a median age of 45 and older, while Sheridan County had a median age of over 53 years.<sup>8</sup>

There has been a significant increase in the number of people aged 85 and older, and it is the state's second most rapidly growing sector. They constitute 2.4% of the state's population. North Dakota is tied for fourth in the country for states with the highest percentage of older adults and nationally, 1.8% of Americans are age 85 and older.<sup>8</sup> However, the most rapidly growing age group is the 45 to 64-year-old group, which is experiencing a 28% increase in growth.

***“By 2020, the majority will be people 65 and older. The implications for rural areas are compelling: the ability of communities to plan for and pay for services for an aging population will present challenges for community and state leaders. It will have a significant effect on health status, healthcare delivery structures, healthcare costs and payment structures, and healthcare workforce.”***

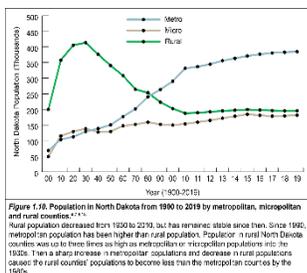
The dependency ratio is the number of individuals (less than 16 years of age or older than 65) who are economically inactive, divided by the number of individuals who are of working age (16 to 65 years old). A ratio of greater than 1.0 indicates that the number of economically inactive workers exceeds the number of active workers. This ratio helps define workforce participation. The 2010 census found a dependency ratio of 0.53 in North Dakota, meaning for every 100 working-age residents there were 53 nonworking-age residents. It was predicted that by 2020 the dependency ratio would

increase to 71.<sup>8</sup> It was anticipated that there would be 18 counties (all rural) with more people in a nonworking category than working-age residents. In 1990, a majority of nonworking-age residents were children younger than 16; however, by 2020, the majority were people 65 and older. The implications for rural areas are compelling: the ability of communities to plan for and pay for services for an aging population will present challenges for community and state leaders. It will have a significant effect on health status, healthcare delivery structures, healthcare costs and payment structures, and healthcare workforce.



## Change in Population by Metropolitan Status

Changes in the state's economy, and the number of people engaged in agriculture, account for some of the change in rural population. The number of North Dakota farms has declined by about 50,000 since the 1920s. Since that time, there has been a progressive urbanization of the state (Figure 1.10). The out-migration from rural to urban has resulted in a decline in younger adults and families in those rural areas. While the 18-to-24 age cohort grew overall by about 11% from 2000 to 2010, 24 counties saw a decline in this cohort. The 25-to-44 age group saw a decline of 5%, with 47 counties experiencing a population loss of this economically vital age group. All of the 24 counties losing 18- to-24-year-olds were rural; all of the 47 counties losing 25- to-44-year-olds were rural with the exception of Grand Forks County. A recent survey conducted by the UND SMHS Center for Rural Health found that a high number rural North Dakotans were concerned about their ability to retain or recruit young people and about population issues in general.



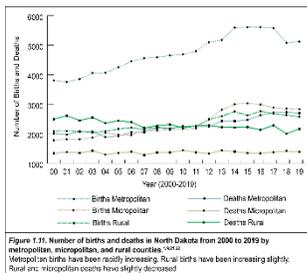
## Change in Population by Births and Deaths

A large part of the increase in metropolitan population is the result of an increase in birth rate in metropolitan areas. The number of births in North Dakota has increased

from 7,676 in 2000<sup>21</sup> to 10,536 in 2019.<sup>22</sup> Although the number of deaths also increased from 5,846<sup>22</sup> in 2000 to 6,250 in 2019,<sup>22</sup> in 2019 the birth rate exceeded the death rate by 4,286. Metropolitan areas have experienced the largest number of births. Although rural areas have the lowest number of births, there is a trending increase in the birth rate (Figure 1.11). One reason for the gradual increase in rural births, despite an aging population, is the higher fertility rate (number of births per 1,000 women) in rural areas compared with metropolitan areas. In 2019, there were 83 births per 1,000 females of childbearing age in rural areas, compared to 63 births in metropolitan areas.

Metropolitan areas had 2,457 more births than deaths on average from 2000 to 2019. Micropolitan areas had on average 972 more births than deaths. As a consequence of these two factors alone (apart from any migration effect), metropolitan population has increased more than micropolitan population has. Rural areas, in contrast, had a much lower rate than metropolitan and micropolitan areas with on average 43 more births than deaths; however, the higher fertility rate in rural areas helps account for the increasing birth rates in rural counties.

Another factor that affects rural North Dakota is the American Indian fertility rate. Roughly 55% to 60% of North Dakota American Indians live in rural areas. The American Indian birth rate is 1.8 times greater than the rate for the United States as a whole.<sup>23</sup> Thus, some of the change in the rural fertility rate is attributable to the American Indian population. However, the number of rural births to Caucasian females is below the national average for all of North Dakota.



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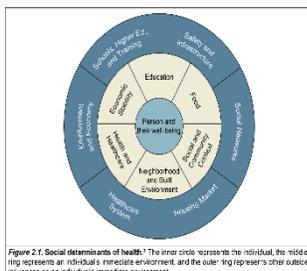
## **CHAPTER TWO: Social Determinants of Health in North Dakota**

*Click on the chapter title to return to the table of contents*

## INTRODUCTION

Various external factors, referred to as social determinants of health (SDOH), can affect health status and explain why some Americans are generally healthier than others. SDOH include conditions where people live, work, learn, and socialize.<sup>1,2</sup> SDOH consider the various circumstances in which people are born, live, learn, work, socialize, play, and age which affect a range of health outcomes. Circumstances that may affect health outcomes of individuals include the current social structure, economic factors, and physical aspects of a person's environment. Environments include home, school, workplace, neighborhood, city, and other community settings where a person spends a significant amount of time. Resources that contribute to an enhanced quality of life for a given population are likely to have a significant influence on positive health outcomes of the population. Examples of quality of life-enhancing resources include safe and affordable housing, access to education, public safety, availability of healthy foods, local health services, and environments free from life-threatening toxins.<sup>2</sup> Six factors are recognized as core social determinants of health. They are individuals' economic circumstances, their education, food access, the physical infrastructure of their environment, the social and community context in which they live, and their overall health and access to healthcare (Figure 2.1).<sup>2</sup> There is little consensus on how much impact each factor has on an individual but each does have some level of impact.

***“Six factors are recognized as core social determinants of health. They are individuals' economic circumstances, their education, food access, the physical infrastructure of their environment, the social and community context in which they live, and their overall health and access to healthcare.”***



As discussed in Chapter 1, population characteristics influence healthcare delivery systems and should inform local health policy. When the demographics or socioeconomic of an area change, it is also possible that the healthcare delivery system will change. For example, when an area experiences the aging of its population one would more likely see increased demand for long-term care services, home care, transportation services, and alternative housing options. If an area were to experience depopulation, then it is likely those conditions would make it more difficult for the healthcare delivery system to maintain services in that area. The rurality of North Dakota is another factor that can influence healthcare delivery and local health policy. The majority of North Dakota counties are designated as rural and some healthcare services such as specialty care services may not be readily available in more rural

areas of the state. All of these factors and more are a part of social determinants of health and can affect the health of North Dakota residents.

## SOCIAL DETERMINANTS OF HEALTH

### Economic Stability

Economic stability can encompass numerous factors, including the overall health of the economy for an area in which an individual lives, employment, poverty, and opportunities in various industries.

### Employment

Unemployment rate is typically used as an indicator of an area's economic stability, and an individual's employment status is a key indicator of their personal economic stability. The Bureau of Labor Statistics reports unemployment rates on a monthly basis. In December 2019, North Dakota had an unemployment rate of 2.4%.<sup>4</sup> A low rate such as this typically indicates a healthy economy for the state. However, the unemployment rate can change rapidly due to external factors that affect various industries. Some examples pertinent to North Dakota include changes in crop prices that may affect agricultural sales/exports or if there is a down turn in the oil market subsequently affecting prices. When there is prolonged economic stability, it is more likely that the unemployment rate will be lower; but the unemployment rate can increase based on outside economic influences. We saw a sharp increase in the unemployment rate during the spring of 2020. In March 2020, North Dakota reported an unemployment rate of 2.0% but this rate jumped to 9.1% in April of 2020 (Figure 2.2) due almost exclusively to the novel coronavirus pandemic.<sup>4</sup> About 4.9% of individuals, aged 16-19, living in North Dakota are not attending school and are not employed compared to the national level of 6.8%.<sup>5</sup> The largest employers in North Dakota include healthcare and social assistance, educational services, public administration, and retail trade.<sup>6</sup> Although these industries employ the largest number of people in North Dakota, other sectors of the economy contribute the most to North Dakota's overall Gross Domestic Product (GDP).

***“The largest employers in North Dakota include healthcare and social assistance, educational services, public administration, and retail trade.”***

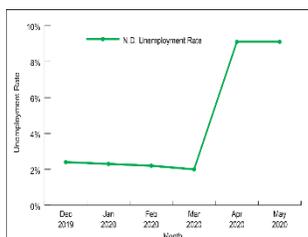
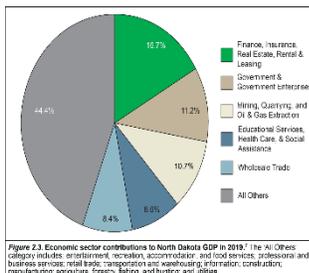


Figure 2.2. North Dakota unemployment rate by month. North Dakota had an increase in the unemployment rate in the spring of 2020 after a period of having a stable unemployment rate.

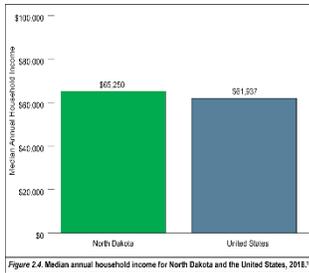
## Economy

In 2019, the industry contributing the most to the GDP in North Dakota was finance, insurance, real estate, rental, and leasing, which accounted for 16.7% of GDP. The next largest industry was government and government enterprises, contributing 11.2% to the state GDP, followed by mining, quarrying, and oil and gas extraction at 10.7% contribution to GDP. Education services, healthcare, and social assistance contributed 8.6% to state GDP and wholesale trade contributed 8.4% to state GDP. These five industry sectors accounted for over half of North Dakota's GDP in 2019 (Figure 2.3).<sup>7</sup> Another economic measure to consider would be the Gini Index value, which is a summary value of income inequality. The Gini Index ranges from 0 to 1, with 0 indicating perfect income equality (everyone receives an equal amount) and 1 indicating perfect income inequality (one person or group receive all of the income).<sup>8</sup> North Dakota has a Gini Index value of 0.46 compared to the overall value in the U.S. of 0.48.<sup>5</sup>



## Poverty

While employment and the health of the overall economy are important indicators, it is also important to consider an individual's income when examining their economic stability. The median household income in North Dakota is \$65,250.00 while the median income for the U.S. is about \$61,937.00 (Figure 2.4).<sup>9</sup> Poverty can have a significant impact on an individual's health as it can limit access to services and resources, including healthy foods, good housing, and healthcare. The Federal Poverty Level (FPL) is often used as a measurement of economic hardship for individuals and families. In 2020, the FPL is \$12,760 for individuals, \$17,240 for a family of two, \$21,720 for a family of three, and \$26,200 for a family of four.<sup>10</sup> It is estimated that 10.6% of the total population of North Dakota is living in poverty while 11.0% of children under the age of 18 are living in poverty.<sup>9</sup>



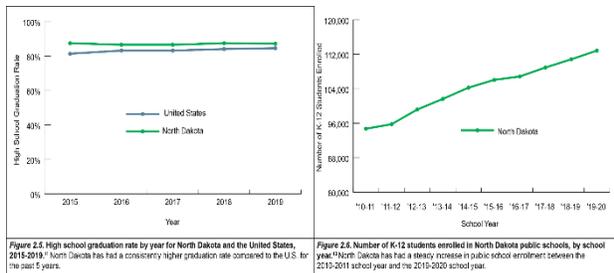
## Education

Education is an important facet of the social determinants of health since obtaining an education can lead to increased employment and other economic opportunities. Some level of training or education is typically required for most jobs in today's market.

### Public Education

Public schools are an important aspect of the education system in the U.S. and North Dakota, and a high school diploma is a standard requirement for most jobs and higher education opportunities. In North Dakota, the cohort graduation rate was 87.2% in 2019, which exceeds the national number of 84.6% (Figure 2.5).<sup>11</sup> About 7.5% of North Dakotans age 25 or older have no high school diploma, which is far lower than the national number of 12.3%.<sup>5</sup> There are certain programs available that support school readiness in young children and support children as they progress through school. One such program is the Head Start Program, which supports school readiness for children up to age 5 that come from low-income families. There were 74 Head Start programs in North Dakota in 2019 or about 16.6 head start programs per 10,000 children.<sup>12</sup> North Dakota has seen an increase in enrollment in public schools over the past decade. During the 2019-2020 school year, there were 112,858 K-12 students enrolled in North Dakota public schools. This is a 19.1% increase compared to enrollment in the 2010-2011 school year (Figure 2.6). During the 2019-2020 school year there were a total of 112,858 K-12 students enrolled in public schools and 8,353 K-12 students enrolled in non-public schools.<sup>13</sup>

***“During the 2019-2020 school year, there were 112,858 K-12 students enrolled in North Dakota public schools. This is a 19.1% increase compared to enrollment in the 2010-2011 school year.”***



There are instances where schoolwork or classroom activity would need to be completed online at home or out of the traditional school environment, making internet access is very important. Based on the 2010 population estimate, about 97.4% of the population of North Dakota has access to download speeds of greater than 25 MBPS per second.<sup>14</sup> While broadband may be available, some individuals may experience barriers to using the service. For some, internet service may be too expensive or the service might be unreliable. The Federal Communications Commission finds that about 24.7 million Americans lack access to high speed internet with roughly 19 million of those individuals living in rural areas.<sup>15</sup> In another study, Microsoft found that it is likely that 162.8 million Americans do not use broadband internet. This indicates a difference between availability of a service and its use.<sup>16</sup>

## Higher Education

Generally, obtaining a college degree provides more opportunities for employment. College degrees allow individuals to gain more specialized skills and knowledge within their chosen field, as well as learn the most up to date techniques and information. In North Dakota, 29.5% of individuals aged 25 or older have obtained a bachelor's degree or higher.<sup>5</sup> North Dakota has a number of institutions of higher education that offer a variety of degrees and programs. There are five 2-year public colleges, four 4-year private colleges, five tribal colleges, four 4-year public colleges, and two research universities.<sup>17</sup> Overall, the North Dakota higher education system has a retention rate of 75% and graduation rate of 51%.<sup>18</sup> Community colleges can be a key component of the higher education system as they are a potentially affordable way for individuals to receive higher education or start their journey into higher education. In 2019, there were 16,350 students enrolled in community colleges across the state. Of those students, 14,271 were degree seeking, while 2,079 were non-degree seeking.<sup>18</sup>

***“In North Dakota, 29.5% of individuals aged 25 or older have obtained a bachelor’s degree or higher.”***

## Food Access

Lack of access to fresh, healthy foods is associated with poor diets and higher levels of obesity, diabetes, and other negative health outcomes. Thus, access to healthy food and food security are important components of social determinants of health.<sup>19,20</sup> Referring to an individual or household as food insecure means they do not have the resources to provide enough food to live a healthy and active life.<sup>21</sup>

## Assistance Programs

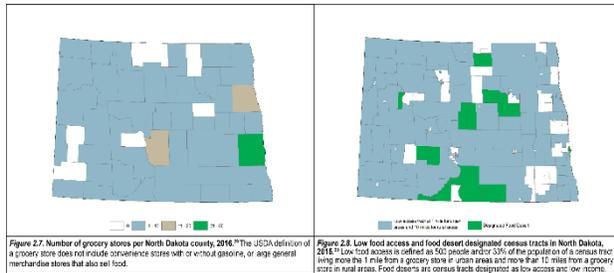
Food insecurity in children is an area of concern as it may worsen the onset and persistence of adverse health conditions, such as cognitive developmental deficits, obesity, weakened immunity, and increased risk of serious illnesses. Programs that provide healthy, affordable food result in fewer negative health outcomes and chronic illnesses among the population, especially when targeted towards children in need.<sup>22</sup> One program available for students is the Free/Reduced Price Lunch program in schools. In North Dakota about 30.9% of students were eligible for a free/reduced lunch in 2017.<sup>23</sup> Based on the school year 2017-2018 income eligibility requirements, children in families at or below 130% of the FPL were eligible for free lunches at school and children in families at or below 185% of the FPL were eligible for reduced price lunches at school. These income eligibility requirements are adjusted every school year.<sup>24</sup> Children of individuals that receive Supplemental Nutrition Assistance Program (SNAP) benefits that attend school automatically qualify for free school meals.<sup>25</sup> SNAP – the Supplemental Nutrition Assistance Program (formerly called food stamps) is a federal nutrition program helping individuals and families in need access healthy food. SNAP participation is associated with lower overall health care expenditures and Medicaid/Medicare costs for states. Early access to SNAP is also associated with improved birth outcomes and long-term health for children and adults.<sup>26</sup> Based on 2017 data, 7.0% of the population in North Dakota was receiving SNAP benefits.<sup>27</sup>

## Food Environment

Access to healthy food does not depend only on one's income, but also the food environment in which a person lives. Ahern, Brown, and Dukas (2011) investigated the relationship between food availability and county-level health outcomes. In non-metro counties, more grocery stores and direct farm sales per capita were associated with lower mortality rates. Fewer fast food restaurants and convenience stores per capita were associated with lower rates of diabetes.<sup>28</sup> Fast food establishments do not always offer healthy food options that grocery stores and other food markets may offer. In North Dakota, there are about 2.4 grocery stores per 10,000 North Dakota residents but some counties have no grocery stores at all (Figure 2.7). The U.S. Department of Agriculture (USDA) defines grocery stores as supermarkets and smaller grocery stores primarily selling food, such as canned and frozen food; fresh produce; and fresh and prepared meats, fish, and poultry. They do not include convenience stores with or without gasoline, or large general merchandise stores that also sell food.<sup>29</sup> According to the Food Access Research Atlas (2015), there are 112 census tracts in North Dakota where residents have low access to retail outlets selling healthy foods, with 373,109 residents living in those census tracts. For a census tract to be designated as low access, 500 people and/or 33% of the population in that census tract must be living more than 1 mile away from a grocery store in urban areas or more than 10 miles away from a grocery store in rural areas.<sup>30</sup> Another way to view the issue of food environments is by looking at food deserts. The U.S. Department of Agriculture (USDA) defines food deserts as geographical areas with limited access to a variety of healthy and affordable food. The

USDA examines food desert at the census tract level and those census tracts that are considered low access and designated as low income are considered food deserts.<sup>31</sup> There are 17 census tracts in North Dakota that are considered food deserts, with 56,724 North Dakota residents living in these census tracts (Figure 2.8).<sup>30</sup>

***“According to the Food Access Research Atlas (2015), there are 112 census tracts in North Dakota where residents have low access to retail outlets selling healthy foods, with 373,109 residents living in those census tracts.”***



## Physical Infrastructure

The physical environment in which individuals live can also affect their overall health. Factors such as roads, air quality, and access to both outdoor and indoor recreation can vary significantly between communities. There are also significant environmental differences between rural and urban areas, which is particularly salient to North Dakota, as a majority of the state is designated rural.

## Access to Recreation

Weather can be a hindrance to outdoor recreation activities. North Dakota typically experiences a variety of weather conditions throughout a given year. The state can experience extreme heat during the summer and extreme cold in the winter, as well as both floods and droughts. Depending on weather conditions, individuals may not be able to enjoy outdoor activities and may need to use indoor recreational facilities for physical activities. One study found that fewer recreational facilities per capita was a predictor of obesity in non-metro settings.<sup>28</sup> Based on the 2010 population, there are about 14.4 recreation/fitness facilities per 10,000 residents in North Dakota.<sup>32</sup> Some of these recreational facilities may require a paid membership for use and not every community is able to support a fitness gym or larger recreational facility. Smaller communities in North Dakota have a variety of ways of providing for recreational opportunities in the community. They might have postings about community recreation groups or classes (whether free or paid), or even open/extra hours at available recreational facilities such as high school gyms or a community pool. Announcements regarding recreational classes or events can often be found in the local newspaper, a town newsletter, town websites or social media pages, or on bulletin boards in community spaces such as at post offices, community centers, grocery stores, clinics, or city office buildings.

## **Social and Community Context**

Access to community and social supports also influences an individual's overall health. Having access to supports, different community activities, and social groups/clubs/organizations can play a role in physical, mental, and emotional well-being. Studies have shown that loneliness and social isolation are associated with an increase in all-cause mortality. Social isolation has also been linked to cardiovascular disease. Lack of social supports not only affects physical health but also has also been shown to affect mental health, as social isolation was also associated with poorer mental health outcomes.<sup>33</sup> The Mayo Clinic and the American Psychological Association consider social support an important tool in mitigating stress and offers tips on how to build social networks, including being proactive through volunteering or community classes, and taking advantage of technology by staying in touch through text, email, or social network websites.<sup>34,35</sup>

## **Community Social Supports**

Some communities work on building social networks for individuals living in their community. Oftentimes these efforts take the form of community events such as citywide rummage sales, community potlucks, or art and entertainment fairs. Many cities will have event calendars or event announcements on their city websites or social media pages. For example, Devils Lake, Dickinson, and Garrison all have community event listings on their city websites, including listings for music, camps for kids, boating events, and other activities. There are communities that also work towards encouraging individuals and families to move to their town or city and offer up support to new residents. One example is Carrington's New Resident Guide. It not only provides information on utilities and city hall, but it also has information on local realtors, TV providers, employment opportunities, and local media.<sup>36</sup>

## **Community Health Workers**

There are a number of different ways to maintain the health and social connectedness of a community. One model that has been used more widely in the past decade is community health workers (CHWs). This model uses community members who work in conjunction with the local healthcare system and public health officials, providing support for individuals seeking healthcare. CHWs can help patients navigate the local healthcare system, connect people to healthcare and healthcare resources, provide culturally competent health education and information, serve as patient advocates, and provide numerous other services. A key benefit of the community health worker model is that these professionals provide services in a culturally competent manner. Typically, CHWs reside in the communities they serve and share the same language, similar socioeconomic status, ethnicity, and life experiences as patients.<sup>37</sup>

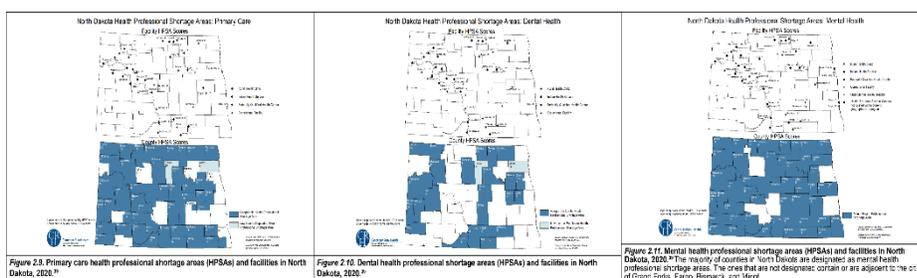
## Health and Healthcare

This category for the social determinants of health may be the most obvious factor contributing to an individual's overall health, but it is influenced by all the other social determinants. Access to healthcare and healthcare resources can be affected by where an individual lives, their economic status, their ability to navigate the health system, and other social determinants. Access to and availability of healthcare resources and healthcare providers is an important aspect to consider when looking at an individual's overall health.

### Access and Availability

One way to examine access to and availability of healthcare services and providers is through Health Professional Shortage Area designations or HPSAs. These are designations defined by the Health Services and Resources Administration (HRSA) and indicate health care provider shortages for primary care providers, dental health providers, and mental health providers. These designations can be for a geographical area, a specific population within an area, or for a facility.<sup>38</sup> As of June 2020, about 94% of counties in North Dakota are fully or partially designated for primary care, 49% of counties are fully or partially designated for dental health, and 91% of counties are fully or partially designated for mental health (Figure 2.9, Figure 2.10, Figure 2.11).<sup>39</sup> Individuals located in an HPSA may have increased travel time and distance to healthcare services and/or they may have to wait longer periods of time to access healthcare services.

***“As of June 2020, about 94% of counties in North Dakota are fully or partially designated for primary care, 49% of counties are fully or partially designated for dental health, and 91% of counties are fully or partially designated for mental health.”***



When a facility is designated as HPSA, this indicates that the facility likely serves as a safety net facility and provides healthcare services to underserved populations. As of May 2020, there are 35 healthcare facilities in North Dakota designated for primary care including 10 Indian Health Service, Tribal, and Urban Indian Health (ITU) facilities, 4 Federally Qualified Health Centers (FQHCs) and their satellite locations, 19 Rural Health Clinics (RHCs), and 2 correctional facilities. There are 40 facilities designated for mental health in North Dakota, including 10 ITU facilities, 4 FQHCs and their satellite locations, 19 RHCs, 2 correctional facilities, the state mental health hospital, and 4

human service centers that are not located in an already designated area. Finally, there are 35 healthcare facilities designated for dental health including 10 ITU facilities, 4 FQHCs and their satellite locations, 19 RHCs, and 2 correctional facilities.<sup>39</sup> Federally Qualified Health Centers (FQHCs) are a key safety net facility for low-income and other underserved populations. In North Dakota, there are a total of 22 FQHCs or about 3.27 FQHCs for every 100,000 North Dakota residents.<sup>40</sup>

Another way to look at access to healthcare is to consider the types of providers available and how many there are to serve a given population. While a community may have a healthcare facility, that facility may not be fully staffed or may not be able to offer a complete range of healthcare services based on available providers. According to the Area Health Resource File, there were 57.7 dentists per 100,000 residents in North Dakota and 76.7 primary care physicians per 100,000 residents in North Dakota in 2017. When compared to other states the rate of dentists and the rate of primary care physicians in North Dakota are both in the mid-range rather than being on the higher or lower ends of the spectrum.<sup>41</sup>

## Insurance Coverage

Availability of healthcare services is not the only factor to consider when examining an individual's access to healthcare services. Insurance coverage or lack of insurance coverage is also a factor. Some healthcare services can be costly or unexpected, such as being injured in a car accident. There are a number of ways for an individual to pay for healthcare services, including out-of-pocket or through insurance. The majority of the population of North Dakota has some form of health insurance coverage, but in 2018, about 8.1% of the population was uninsured. In 2009, the percent of the population in North Dakota with no insurance was 11.5% so the number of uninsured individuals in North Dakota has decreased between 2009 and 2018 (Figure 2.12).<sup>42</sup>

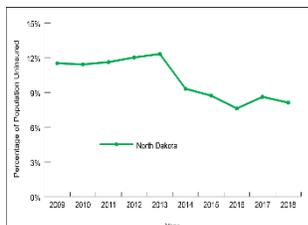


Figure 2.12. Percent of population with no health insurance coverage in North Dakota from 2009-2018.<sup>42</sup> Between 2013 and 2016 North Dakota had a notable drop in the uninsured rate, and since 2013 the uninsured rate has not gone above 12%.

## SUMMARY

Together, all of these social determinants affect an individual's health. The kind of work they do, the type of education they receive, their living situation, their economic stability, access to food, social norms, social supports, and access to healthcare services all influence health. All these factors are linked and influence one another. For example, a lack of access to healthy food may lead to a poor diet, which could contribute to other health concerns. Certain health concerns may require more frequent medical intervention and could include increased cost or even increased travel time

depending on where an individual lives. Disparity in one area of the social determinants of health could affect other areas of an individual's life. Some of the goals when addressing social determinants of health include increasing healthy equity and reducing disease prevalence.<sup>43</sup> Health equity refers to everyone having the opportunity to achieve their full health potential and not facing barriers to this possibility due to socially determined circumstances. Reducing disease prevalence includes making efforts towards reducing obesity, cardiovascular disease, diabetes, cancer, and other conditions, all of which can be influenced by social determinants of health.<sup>44</sup>

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## **CHAPTER THREE: The Health of North Dakota**

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## INTRODUCTION

Health disparities can be defined as significant differences between populations, including the incidence, prevalence, mortality, and burden of disease, as well as other adverse health effects.<sup>1</sup> Determinants of health disparities include individual behaviors or characteristics (smoking); biology and genetics (family history, gender, race, and high blood pressure); social environment (income, education, and discrimination); physical environment (distance to care, transportation, and weather); and the health system (access, availability, quality, and insurance).<sup>2</sup>

Health disparities have public policy implications. The federal government's "Healthy People" initiative has for three decades created national 10-year objectives designed to improve the health of all Americans. In each of those decades, health disparities were a primary focus. For Healthy People 2020, health disparity is one of four principal health measures that serve as progress indicators in meeting national goals. The others are general health status, health-related quality, and determinants of health.<sup>3,4</sup>

The condition of individual health is of concern to the individual, family, and insurers; however, the aggregate of health concerns for individuals and families has significant implications for the overall healthcare system and its ability to design a model of delivery to improve health status.

Health policy and the healthcare system must contend with a number of key factors associated with population health. These factors shape the environment in which healthcare is delivered, how it is delivered and paid for, and how it is structured for future generations. The factors influencing population health and health disparities include: access, cost, quality and outcomes, and availability of healthcare and health services.

***“North Dakota has been described as a low-cost, high-quality state in which the cost of care, relative to other states, is lower; importantly, the quality of care delivered is considered high.”***

*Access to care* refers to the ability to gain entry into the health system. This can include the availability of health professionals and institutional access points such as hospitals, public health units, clinics, and services for emergency medical care, long-term care, behavioral and mental health, oral health, pharmacies, and other factors. Access is a core issue because it directly addresses the ability of people to maintain or improve their health status. First, in order to address any health concern, people need to be able to meet and talk with health and medical providers and have physical access to a clinic or hospital. Limitations on access can lead to unmet health needs and medical outcomes, and can add to healthcare costs. Numerous factors can restrict access to care, including an individual's ability to purchase health services (e.g., level of income, insurance coverage, employer-sponsored health insurance, and current health); the supply of health professionals and the types of providers and medical specialties available; financial viability of health organizations and health systems; and the location of health facilities. In North Dakota, natural barriers such as distance, weather, road conditions, and ethnicity or race also are important. Later chapters will

address, in more detail, specific North Dakota access issues (i.e., healthcare organization and infrastructure).

The *cost of care* is another influence on individual health. North Dakota has been described as a low-cost, high-quality state in which the cost of care, relative to other states, is lower; importantly, the quality of care delivered is considered high. It thus is a higher-performing state.<sup>5</sup> Even in a relatively low-cost state like North Dakota, cost has been and remains a concern within public policy discussions. For example, the Community Health Needs Assessments (CHNA) that are required of all nonprofit hospitals under the Affordable Care Act (ACA), found that the high costs of healthcare to consumers was the fifth-most common health need identified by community members out of a list of 21 items. The finding was based on data from 39 of the 42 hospitals in North Dakota (2014–2016), providing strong evidence of concern. The number one health issue was behavioral health, followed by mental health, and health workforce.<sup>6</sup> In general, healthcare costs in the United States are high in comparison with other well developed countries, accounting for about 17.2% of gross domestic product (GDP), which is a common and accepted measure of economic production and activity.<sup>7</sup> In comparison, healthcare in the next most expensive countries, Switzerland and Germany, accounts for approximately 12.4% and 11.3% of GDP, respectively. In looking at the average for the 34 countries of the Organization for Economic Cooperation and Development (OECD), the United States is about 9 percentage points higher than the OECD average of only 8.9%. Healthcare spending in the United States is expected to top 20% of GDP by 2021. Regarding per-capita spending, in 2016 the United States spent \$9,892 versus Switzerland (\$7,919) and Norway (\$6,647). Per capita health spending in the United States is roughly 2.5 times greater than the OECD average (\$4,003).<sup>8</sup> At the same time, our high costs do not necessarily translate into the best health outcomes, because the United States ranked 43rd in life expectancy (224 countries compared) and 55th in infant mortality (225 countries compared).<sup>9</sup> In comparison with 1970, when the United States had a life expectancy rate that was one year above the OECD average, in 2017 the United States had a life expectancy that was more than two years below the OECD countries.<sup>10</sup> Life expectancy rankings have remained the same and infant mortality has improved in the United States since 2016.

***“As a country, we spend a great deal of money that does not seem to contribute positively to key health outcomes.”***

The United States consumes more health care services than other countries. For example, 25% of Americans take four or more prescription drugs regularly compared with a median of 17% for residents of OECD countries.<sup>11</sup> Thus, the subject of healthcare costs is germane to a general discussion of population health and health disparities. As a country, we spend a great deal of money that does not seem to contribute positively to key health outcomes.

The *quality of care* that is delivered in a healthcare system relates directly to population health. According to the Institute of Medicine (IOM), there are six principal aims to improving health that should be followed: safety, effectiveness, patient centeredness, timeliness, efficiency, and equity.<sup>12</sup> In general, by making improvements within each of the six aims, the healthcare system performs better by being more

responsive to patients' needs, improving patient safety, basing care on the science of best practices in order to be more effective, reducing delays in the delivery of care, and increasing the degree of equity to provide adequate access and improved quality to patients regardless of socioeconomic status, geographical location, race, and gender. Each of these is a challenge in the current arrangement of care access and delivery. While some healthcare systems have national reputations (Mayo Clinic and the Geisinger Medical Center) for how they provide quality care in more seamless structures, other systems are less developed with regard to system transformation. Elements of national health reform (patient centeredness, research-driven best practices, prevention focus, and outcomes) were based on the experiences of the more developed healthcare systems that were motivated to restructure their delivery systems to ultimately improve performance and quality. A number of pivotal publications called attention to the need for change in the U.S. healthcare system. The IOM in its seminal work, *To Err is Human: Building a Safer Health System*, found that each year somewhere between 44,000 and 98,000 people die in U.S. hospitals as a result of medical errors.<sup>13</sup> This groundbreaking document, along with a subsequent work entitled *Quality Through Collaboration: The Future of Rural Health*, signaled a challenge to healthcare providers, health sector industries, and policymakers to seriously rethink the U.S. health system to address the systemic issues plaguing our country.<sup>14</sup>

The fourth primary driver of health policy for improved population health is the *availability of healthcare providers*. This issue is a central subject of this *Sixth Biennial Report* and will be discussed in more detail in Chapters 4–6. The supply and demand of healthcare professionals and providers is fundamental to health improvement. There is a long-standing maldistribution of most provider disciplines, particularly in medicine, and particularly in rural areas of North Dakota. Patient-centered coordinated-care models under the ACA are dependent upon a well-prepared and adequate supply of healthcare professionals. In addition, the ACA supports the training of 16,000 new primary care providers over five years and calls for a number of either new or expanded policy instruments to address the healthcare workforce.<sup>15</sup> For example, there is a significant expansion of the National Health Service Corps (NHSC); creation of state healthcare workforce development grants and rural physician training grants; support for additional nursing training, allied health recruitment and retention, and public health training; mental and behavioral health support; and a number of other initiatives.<sup>16</sup> All of these efforts are intended to increase the availability of health providers.

The remainder of this chapter will look at specific issues associated with behavioral risk factors and population health. It is intended to help the reader better understand the issues that affect not only the population at hand but also to serve as a general context for subsequent discussions of access to care, availability of providers, quality of care, and cost factors.

## **BEHAVIORAL RISKS**

Table 3.1 shows the percentage of adults in North Dakota who have in common the behavioral risk factors of smoking, drinking alcohol, binge drinking, drinking and driving, not wearing a seat belt, and not exercising at least moderately from 2013 to 2018. Improvements over time can be seen in the rate of adults smoking, seatbelt use,

and physical activity. All measures related to alcohol use showed an overall decreasing trend from 2013 to 2018 with some variance between years. Along with the decrease in percent of persons who drink alcohol or binge drink, the number of DUI arrests have decreased. This is evidenced by the number of DUI arrests which decreased by 6.2% from 2018 to 2019 (5,148 to 4,828), according to the North Dakota Attorney General's office.<sup>17</sup>

## BEHAVIORAL RISK TRENDS

Table 3.1  
Percent of adults reporting behaviors<sup>18</sup>

	2013 (558,995)	2014 (583,766)	2015 (590,343)	2016 (591,299)	2017 (588,563)	2018 (590,621)
Smokes	22.7	18.6	17.9	18.9	NA	18.6
Drinks Alcohol	59.0	57.2	57.9	60.2	NA	57.6
Binge Drinks	22.3	22.5	22.6	23.3	NA	21.1
Drinks & Drives	NA	3.2	NA	3.8	NA	2.7
Doesn't Always Wear a Seatbelt	26.6	28.4	26.6	26.2	NA	27.5
No Physical Activity/Exercises Other Than Job	29.3	21.3	24.6	22.1	23.6	22.2

Behavioral risk factors are an important aspect of any health discussion. They have components that operate at the most basic individual, social, and global public policy levels. According to the World Health Organization (WHO), the 10 leading behavioral causes of death worldwide (factors such as high blood pressure, tobacco use, high blood glucose, physical inactivity/overweight, alcohol use, and high cholesterol) account for 33% of all deaths. Global healthy life expectancy would be extended by five to 10 years if individuals, communities, health providers and health systems, and the private and public sectors initiated processes to better address, influence, and control global disease burden risk factors.<sup>20,21</sup>

***“For eight of 10 general health measures, North Dakotans are relatively healthier than the country as a whole, however North Dakota scores slightly worse on overweight/obesity.”***

## GENERAL HEALTH

Table 3.2 shows the percentage of adults in North Dakota who have common general health issues of disability, overweight/obesity, fair/poor general health, one or more days in the past month with poor health, poor physical health, and poor mental health.

Table 3.2  
Percent of adults reporting general health conditions<sup>19</sup>

	2013 (558,995)	2014 (583,766)	2015 (590,349)	2016 (591,299)	2017 (588,563)	2018 (590,621)
Disabled	16.5	15.4	16.6	17.0	NA	NA
Overweight/Obese	64.3	63.7	61.5	62.8	NA	55.6
General Health Fair/Poor	14.7	14.0	13.9	14.8	15.3	13.9
1+ Days Poor Health	18.1	16.4	19.4	19.0	21.0	20.7
1+ Days Poor Phys. Health	34.1	31.2	34.8	33.1	34.6	33.1
1+ Days Poor Mental Health	30.4	30.5	33.0	32.5	34.3	36.2

## Comparison with National Benchmarks

Part of the explanation for the relative good health and health outcomes in North Dakota may relate in part to more healthful lifestyles. For eight of 10 general health measures, North Dakotans are relatively healthier than the country as a whole (e.g., fair/poor health, high cholesterol, high blood pressure, diabetes, cholesterol screen, influenza immunization, asthma, and sigmoidoscopy/colonoscopy). Recently, in North Dakota, the number of people who are overweight and obese was reported greater (65.8% versus 58.9%), and the state has a lower pneumonia immunization rate than the U.S. overall (32.5% versus 30.5%). In the *Fifth Biennial Report*, it was reported that North Dakota scored slightly worse on overweight/obesity by having 62.8% of the population so classified versus a national rate of about 60%. Thus, for both the state and the nation the obesity rate is increasing; however, the rate for the country as a whole is increasing at a faster rate. Obesity/overweight status is a health problem that contributes to many health conditions, including cancer, diabetes, and heart disease. The percentage of North Dakotans viewing themselves as having only fair or poor health has decreased over the past two years: 14.8% in 2016 to 13.9% in 2018; however, the U.S. rate in 2016 (17.7%) was higher than the state rate.<sup>22</sup>

## Health Promotion

Although generally less of a problem in North Dakota than nationally, obesity rates have been increasing over time. The primary goals of the Healthy People 2020 initiative are to (1) attain high-quality, longer lives free of preventable disease, disability, injury, and premature death; (2) achieve health equity, eliminate disparities, and improve the health of all groups; (3) create social and physical environments that promote good health for all; and (4) promote quality of life, healthful development, and healthful behaviors across all life stages. The Centers for Disease Control and Prevention (CDC) uses Health-Related Quality of Life (HRQOL) process metrics to better determine the burden of preventable diseases, injuries, and disabilities. This involves both self-reported chronic diseases such as diabetes, arthritis, breast cancer, and hypertension; and risk factors such as body mass index, physical inactivity, and smoking status. According to the CDC, the measurement of HRQOL indicators can assist in establishing the relationship between the burden of preventable diseases, injuries, and disabilities with risk factors. The measurement also is part of the national process in achieving national health objectives such as those found in Healthy People 2020. A related set of measures are Healthy Days metrics, which assess an individual's perceived sense of well-being (self-rated health, number of recent days when physical health was not good, number of recent activity limitation days because of poor health). Although these are proxy measures, they are an accepted means to establish a measure of health status. Health organizations and public programs use Healthy Days metrics to identify health disparities, track population trends, and build coalitions or health-provider and community-based networks around ideas to solve health disparities. The analysis of HRQOL data can be used to determine public policy options for community solutions affecting both individuals and society. These data do not isolate

race, but considering that American Indian reservations are rural, one can assume this distinct subpopulation should be considered when evaluating policy options associated with HRQOL or Healthy Days-related data.

## HEALTH CONDITIONS

Health conditions that are not directly tied to behavioral risk factors have showed varied trends from 2013 to 2018. It is likely that obesity is a common, but indirect, cause of many of these associations. For example, high cholesterol, high blood pressure, arthritis, and diabetes all are more common in obese patients. Thus it should come as no surprise that many of these conditions show similar prevalence gradients as does overeating with obesity.

Compared with national benchmarks, North Dakotans have a lower prevalence of various non-behavioral related health conditions than in other states, no doubt contributing to our better state of overall health. In 2015, North Dakotans had a lower prevalence of high cholesterol (34.8% compared with 36.1%), high blood pressure (30.3% compared with 31.8%), asthma (12.7% compared with 13.5%), and diabetes (8.7% compared with 10.7%) than nationally. Table 3.3 shows the percentage of North Dakotans reporting various health conditions since 2013.

Table 3.3  
Percent of adults reporting chronic health conditions.\*

	2013 (591,919)	2014 (593,716)	2015 (590,346)	2016 (591,239)	2017 (588,683)	2018 (590,821)
High Cholesterol	36.1	NA	34.8	NA	26.0	NA
High Blood Pressure	29.6	NA	30.3	NA	28.5	NA
Arthritis	25.9	NA	22.7	23.2	24.1	25.9
Asthma	12.3	12.1	12.7	12.8	12.9	13.6
Cardiovascular Disease	4.0	4.0	3.6	4.1	3.8	4.2
Diabetes	9.9	8.6	8.7	8.6	9.0	9.4

## Chronic Disease

An important issue when examining the dynamics of health status is chronic disease. Chronic disease is commonly associated with aging, but people of all ages can experience it. Common chronic diseases include the following: cancer, heart disease, stroke, diabetes, chronic obstructive pulmonary disease (COPD), and arthritis. Significant health risk factors include smoking, lack of physical activity, and poor nutrition. Engaging in healthful behavior reduces the risk for illness. Chronic disease causes 7 in 10 deaths each year in the United States, and heart disease and cancer together account for about 48% of all deaths. About 117 million Americans (roughly half of all adults) live with at least one chronic condition. About one-fourth of the people with a chronic disease have experienced significant limitations in daily activities. More than 86% of the cost of healthcare in the United States is related to chronic disease.<sup>23,24</sup>

High blood pressure, a risk factor for cardiovascular disease, is a highly prevalent condition that contributes to premature death, heart attack, stroke, diabetes, and renal disease.<sup>25</sup> High cholesterol, a risk factor for cardiovascular disease, diabetes, and other diseases, can be controlled to some degree by diet, exercise, and weight. High blood pressure and high cholesterol found together in the same patient create more medical

problems, placing that patient at even greater risk. The ACA requires new health plans to cover preventive services for certain populations, including testing for high blood pressure and cholesterol.<sup>26</sup> Newer concepts such as patient-centered medical homes and health system delivery and payment channels such as accountable care organizations (ACOs), bundled payment models, and pay for performance will be used to facilitate better care coordination and disease management (Chapter 7 has more on health reform and ACOs).

Chronic disease is a concern both nationally and statewide. Under the ACA, all nonprofit hospitals must conduct a community health needs assessment (CHNA) every three years and develop an action or implementation plan. In the *Fourth Biennial Report*, discussion focused on the identification of obesity and physical inactivity and chronic disease management as high priorities at the community level. That covered the 2011–2013 period. At this time, a second round of assessments are being completed. Analysis of 41 rural communities finds that obesity and physical inactivity are still identified as community health issues. The most prevalent issue is related to behavioral and mental health. Throughout the state, community coalitions have been initiated to develop solutions to address CHNA needs, such as obesity and physical inactivity and related issues. Some of these have been supported through funding from the Medicare Rural Hospital Flexibility Program or the Blue Cross Blue Shield of North Dakota Rural Health Grant Program. The focus of the Blue Cross Blue Shield of North Dakota grants is on physical activity and wellness.

## **Children’s Health**

Children’s health (birth to 18 years) is critically important because what we experience growing up can affect our health, attitudes about health, and our ability to change or manage our behavior. There are family genetic traits that can either act as barriers or serve to steer our health in positive directions; however, our attitudes and behavior as we mature are significant factors as well. Our early experiences as we mature have been shown to affect healthful development cognitively, socially, emotionally, and physically. How a child behaves, learns, and adjusts in school and society is affected by health. How they interact with others and learn to interact relates to their health. How they move through life—education, work, having children—has a connection to their health status when they were in early and middle childhood. All of this can be referred to as “pre-disease pathways,” which can manifest as medical conditions and adult health issues later.<sup>3</sup> Healthy People 2020 developed seven topic areas covering more than 60 adolescent health objectives. One of the topic areas is prevention of adult chronic diseases. This includes the following:<sup>3</sup>

- Reduce the proportion of adolescents ages 13–15 years with untreated dental decay in their permanent teeth.
- Reduce tobacco use by adolescents (9th- through 12<sup>th</sup>-grade students).
- Reduce the proportion of children and adolescents who are obese (12- to 19-year-olds).
- Increase the proportion of adolescents who engage in daily school physical activity.

- Reduce pregnancies among adolescent females (ages 15–19).
- Reduce the proportion of adolescents engaging in binge drinking (ages 12–17).

As shown in Table 3.4, adolescent females have a generally poorer behavioral risk profile than do adolescent males for drinking alcohol, having long-term health problems, and not exercising moderately; however, adolescent males have greater issues with tobacco use, drinking and driving, not wearing a seat belt, and being overweight and obese.

Table 3.4  
Percent of youth risk behaviors<sup>a</sup>

	Total (43,335)	Female (21,335)	Male (22,000)
Smokes	15.2	14.4	15.6
Drinks	29.1	31.9	26.4
Drinks & Drives	6.5	4.5	8.1
Doesn't Always Wear a Seat Belt	7.1	2.3	10.6
Doesn't Always Exercise Moderately	48.7	57.1	40.7
Overweight/Obese	28.6	25.2	31.6
Has Long-Term Health Problems	17.1	19.5	14.4

## Cancer

Cancer is the second-leading cause of death among adults in the United States (second only to heart disease and stroke) and affects an estimated one in three individuals in their lifetime, either through their own diagnosis or that of a loved one. Increasing innovations in medical technology have led to earlier diagnoses and improved treatment of many cancers, resulting in more people diagnosed with cancer surviving each year. Currently, approximately 16.9 million Americans with a history of cancer were alive in 2019.<sup>28</sup>

According to the American Cancer Society, about 30% of cancer deaths are caused by smoking cigarettes.<sup>28</sup> In other words, approximately 181,956 out of an estimated 606,520 cancer deaths were attributed to the use of tobacco in 2020. Overweight and obesity have been found to contribute to about 14% to 20% of all cancer deaths. There is also evidence that being overweight increases the risk for cancer recurrence and decreases the likelihood of survival. Some researchers have postulated that the continuing public health problem of obesity will actually contribute to either a leveling off or actual decline in life expectancy in the United States. These deaths could be prevented. The five-year relative survival rates for cancer have improved significantly over the past 30 years, from 49% between 1975 and 1977 to 68% between 2003 and 2009.<sup>28,29</sup> This improved survival rate clearly is a consequence of earlier diagnosis. Yet it should be noted that earlier diagnosis does not necessarily change the natural history of the disease. Thus, while the survival rate (people alive despite a diagnosis of cancer) has gone up substantially, the cancer mortality rate has fallen only a little.<sup>24</sup> The American Cancer Society estimated that there would be 1.8 million new cancer cases diagnosed in 2020 in the United States.<sup>28</sup>

Age is a primary risk factor for most cancers, with about 86% of all cancers diagnosed among individuals aged 55 or older. Men have about a 1 in 2 lifetime risk of developing cancer whereas for women the risk is about 1 in 3. Although virtually anyone

can experience cancer, some groups are more likely than others to be diagnosed with certain types of cancer; cancer incidence varies by race and ethnicity.<sup>28</sup>

According to the American Cancer Society, the disparities in the cancer burden among racial and ethnic minorities are the results of obstacles to prevention, early detection, and high-quality treatment. In addition, poverty is a serious factor. African Americans are more likely than any other group in the United States to develop and die from cancer. Hispanics have the lowest incidence and mortality rates for lung cancer; however, for uterine or cervical cancers, they have the highest incidence. The American Indian and Alaska Native populations have the highest kidney cancer incidence and mortality rates.<sup>28</sup> Available data indicate that cancer incidence for American Indians is lower than the U.S. population as a whole; however, the American Indian population is much younger (about 28 years on average versus 36 years for the United States overall) and cancer tends to be more prevalent in older populations. Over the past 30 years, the incidence and death rates have been rising; cancer survival rates for American Indians are the lowest of any ethnic group.<sup>30</sup>

As the second-leading cause of death in the country, cancer and cancer control command a place in U.S. health objectives. Healthy People 2020 presents 20 separate cancer targeted objectives. For example, one objective is to reduce the overall cancer death rate by 10% (from 179.3 deaths per 100,000 to 161.4 deaths per 100,000).<sup>3</sup>

***“Digestive system cancer, including colorectal, is the most commonly diagnosed cancer in North Dakota, followed by breast cancer. For reasons that are unexplained, North Dakota also has the highest incidence rate of colorectal cancer of any state.”***

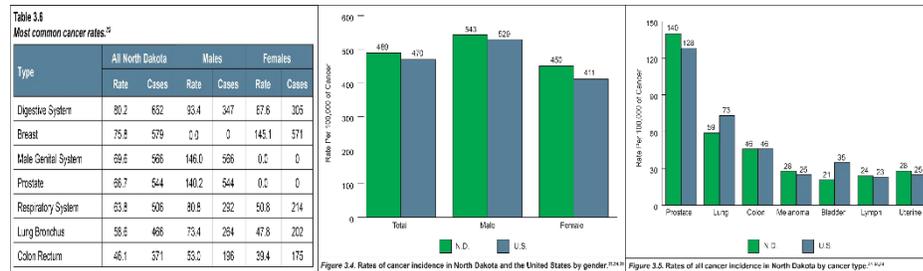
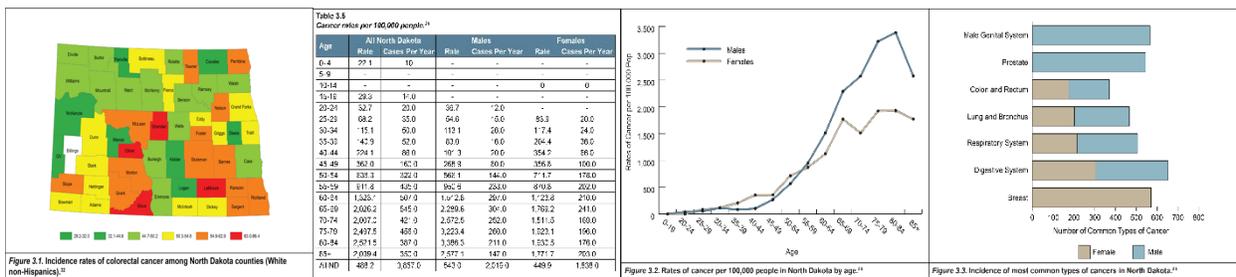
In North Dakota, females are more likely to develop cancer than men up to the age of 55, but thereafter the incidence of cancer in men markedly increases relative to women (Table 3.5 and Figure 3.2). Digestive system cancer, including colorectal, is the most commonly diagnosed cancer in North Dakota (Table 3.6 and Figure 3.3), followed by breast cancer. Conversely, lung cancer is the most common cause of cancer death, and although prostate cancer is more common in men, it causes fewer deaths since many men die with their prostate cancer, rather than from it. Importantly, the risk of cancer incidence in North Dakota is somewhat higher than in the rest of the nation overall (Figure 3.4), although it is higher for bladder and lung cancer nationally (Figure 3.5).

It is noteworthy that North Dakota leads the nation in the incidence of some cancers. For example, the incidence of chronic lymphocytic leukemia (CLL), a disease of the elderly, is more common in North Dakota than in any other state. This is a particularly unusual occurrence because most cases of CLL are diagnosed “incidentally” during routine medical exams performed for other reasons. The relative scarcity of health care professionals in North Dakota, discussed in subsequent chapters, would act to underestimate the true burden of CLL, which often is not the cause of death (and thus would not appear in mortality statistics). One possible reason for the high rates of CLL in North Dakota is the high exposure to radon. Radon, a naturally occurring gas, is a by-product of uranium, which is common in soils in the upper Plains, and is a cause of several types of leukemia. Research at the University of North Dakota has shown that

CLL rates by county, in many states (including North Dakota), is positively correlated with levels of radon measured in homes.<sup>31</sup>

**“North Dakota leads the nation in the incidence of some cancers. For example, the incidence of chronic lymphocytic leukemia (CLL), a disease of the elderly, is more common in North Dakota than in any other state.”**

For reasons that are unexplained, North Dakota also has the highest incidence rate of colorectal cancer of any state and shows a three-fold variation in colorectal cancer rates among North Dakota counties. The cause of the majority of colorectal cancers is unknown. Because colorectal cancer is the third most common cancer in the U.S. in terms of incidence and mortality, a better understanding of colorectal cancer in North Dakota could improve the health of North Dakotans and of the U.S. overall. Colorectal cancer incidence rates among North Dakota counties are shown in Figure 3.1.



## Screenings and Immunizations

Table 3.7 shows the percentage of adults in North Dakota who have had screenings for high cholesterol (past five years), prostate-specific antigen (PSA), home blood stool test (ever), sigmoidoscopy/colonoscopy (ever), mammogram (ever), Pap smear (ever), flu vaccine (past year), or pneumonia vaccine (ever).

Table 3.7  
Screenings,<sup>32</sup>

	2013 (558,965)	2014 (593,765)	2015 (590,348)	2016 (697,299)	2017 (588,663)	2018 (580,621)
Cholesterol	67.8	NA	69.2	NA	77.7	NA
FSA	NA	52.4	NA	52.1	NA	NA
Blood Stool	NA	32.5	NA	29.3	NA	NA
Sigmoid/Colonoscopy	NA	64.6	NA	69.4	NA	NA
Mammogram	NA	62.3	NA	60.7	NA	59.2
Pap	NA	90.5	NA	89.6	NA	84.2
Flu	41.3	40.2	43.6	41.9	NA	38.6
Pneumonia	28.2	27.5	31.5	32.5	32.3	NA

According to Healthy People 2020, people in the United States continue to develop diseases that are preventable. The increase in life expectancy (from about 49 years in 1900 to 78.8 years in 2012) is the result, in part, of a significant reduction in infectious disease mortality associated with the development of immunizations.<sup>3</sup>

The development of a public health infrastructure has also played a major role in improved life expectancy (focusing on water safety, infectious disease control, safer and more healthful foods, healthier mothers and babies, family planning, tobacco control, vaccinations, motor vehicle safety, more healthful and safer workplaces, and the decline in deaths from coronary heart disease and stroke).<sup>29</sup>

Vaccines are among the most cost-effective clinical preventive services and are a core component of any preventive service package. Childhood immunization programs provide a particularly high return on investment. According to the CDC, for children born between 1994 and 2013, vaccination will prevent an estimated 322 million illnesses, 21 million hospitalizations, and 732,000 deaths during their lifetime.<sup>36</sup>

Health screenings are an important way to evaluate risk factors for disease (cancer, cardiovascular, diabetes). Baseline data are acquired that can assist physicians and other providers to track measures of blood pressure, cholesterol, blood sugars, weight and height, and body fat. It provides the evidence needed both for prevention and disease management. Health screenings also aid the patient in being more proactive in their own care, and adequate baseline data can spur heightened interest and involvement on the part of the patient.

The importance of various health screenings is discussed in Healthy People 2020. For example, the monitoring and management of weight, blood pressure, and cholesterol can reduce adults' risk for heart disease and diabetes; routine screening can detect certain cancers (breast, colorectal, and skin) at earlier stages that are then treatable; and regular check-ups for adults 65 and older can help to screen for age-related conditions such as eye disease and hearing loss.<sup>3</sup>

## Mortality

Nationally, premature mortality is higher in rural areas than urban areas. In North Dakota, Figure 3.6 shows the expected number of deaths for each age group among metropolitan, micropolitan, and rural areas. The North Dakota data indicate that the state's mortality rates have exceeded the national rates from 2000 through 2017, but were lower than the U.S. rates in 2018 and 2019 (Figure 3.7). The most recent national data indicate that mortality can vary for rural and urban areas by age. For example, the age-adjusted death rates for people from one to 24 years of age indicated that rates for those living in most rural counties was nearly half as much in this age cohort than for

those living in most urban counties, and 36% higher than people in suburban areas. For the 25-to-64 age cohort, age-adjusted death rates in suburban areas was roughly 15% lower than urban counties and over 30% lower than rural counties. In the oldest age cohort, 65 and older, the rural rate exceeded the urban death rate by about 13%.<sup>37,38</sup>

U.S. mortality rates have trended lower since the 1960s for both urban and rural areas, although there is an upward trend since 2009. But since the early 1990s, mortality rates in urban and rural areas have diverged somewhat. From 1969 to about 2009 (most recent data), male rural mortality has declined at an average annual rate of 1.09%, which was significantly slower than the 1.40% decline noted for men in urban areas. Similar trends are seen among women in rural and urban areas, 0.68% and 0.98%, respectively.<sup>39</sup>

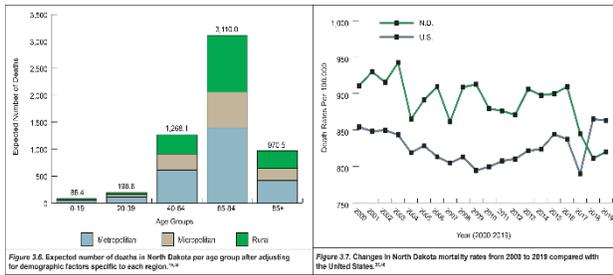
Death rates from unintentional injuries, suicide, and chronic obstructive pulmonary disease were higher in rural areas than in urbanized counties and suburban areas. The rural rate exceeded the suburban rate by 86% for unintentional injuries.

***“Despite the recent increase in the opioid problem, North Dakota has the lowest rate of drug deaths in the country.”***

Since 2016, there has been an increased awareness of the growing problem of opioid addiction and deaths.<sup>40</sup> Drug overdose is now the leading cause of accidental death in the United States with an estimated 46 people in the country dying from overdose of prescription opioids per day.<sup>41</sup> Drug overdose deaths now exceed motor vehicle crashes. Heroin-related mortality rates increased by roughly 19 percent from 2014 to 2015. In 2016, 475,000 people age 12 or older were current heroin users and 3.4 million people who were 12 or older were nonmedical users of prescription pain relievers.<sup>42</sup> Research establishes that the rural opioid problem is disproportionately greater. Nevertheless, despite the recent increase in the opioid problem, North Dakota has the lowest rate of drug deaths in the country. Some research indicates that rural adolescents are more likely to abuse prescription pain-killers than urban adolescents.<sup>43</sup> Other research studies have found the misuse of nonmedical prescription opioids is concentrated in states with large rural areas.<sup>44</sup>

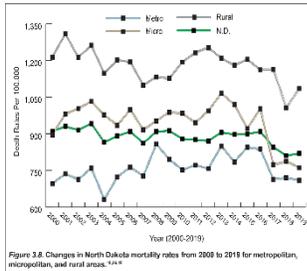
Motor vehicle crashes are a form of unintentional death and would likely be a contributing factor in geographical comparisons. Between the years 2013 and 2015, the United States age-adjusted suicide rate for rural counties (19.74 per 100,000 people) was higher than both medium/small metropolitan counties (16.77) and large metropolitan counties (12.72).<sup>44</sup> Rural males have a 32% higher mortality rate from suicide than males nationally. The lower respiratory disease death rate also was higher in rural areas. The rate for rural males was 47% higher than for urban males.<sup>35</sup>

The rural maternal mortality rate is higher than in urban areas. Likely contributing factors are rural women have less adequate prenatal care, are more likely to be on public health insurance or have no insurance, and have less access to adequate primary care. The latter issue is related to the general lower supply of rural-based primary care combined with less direct access to obstetricians because of fewer obstetricians practicing in rural areas – likely due to malpractice and liability concerns.<sup>38,45</sup>



## Changes in Mortality

Although U.S. mortality rates have shown a steady increase since 2009, mortality rates in North Dakota have been more variable (Figure 3.7) as they slightly trend up or down depending on the year. However, there has been an overall decline from the year 2000 (910.3) to the year 2019 (820.0).<sup>37</sup> Figure 3.8 shows changes in mortality rates for metropolitan, micropolitan, and rural areas, as well as North Dakota overall.



## Neurodegenerative Diseases

Neurodegenerative diseases are a range of illnesses that cause the death of nerve cells. These include Alzheimer’s disease (AD), Parkinson’s disease, motor neuron diseases (the most common of which is amyotrophic lateral sclerosis), as well as relatively rare genetic disorders such as Huntington’s disease. Statistics for most of these diseases are generally less reliable than those for cancer, as cancer is a reportable disease (a disease for which statistics on incidence and mortality are mandated by federal law), whereas mortality data for other diseases must rely on death certificates and other passive means of reporting. However, it is important to note that one in 10 Americans suffers from AD. This is both an important medical and financial issue as dementia care is among the most expensive conditions for society to manage. Death certificate data indicate that North Dakota has the nation’s highest death rate from AD.<sup>47</sup> This is likely due, at least in part, to the facts that AD is strongly age-dependent and that ND has the second-highest proportion of seniors age 85 and older in the nation. For example, individuals 65 and older comprised greater than 14.0% of the population of the state in 2011 and this population is projected to increase by 50% by 2025. For reasons that are unknown, Midwestern and Plains states also have significantly higher mortality rates of amyotrophic lateral sclerosis, a progressively paralyzing disorder that is usually fatal within 3-5 years of diagnosis.

***“Death certificate data indicate that North Dakota has the nation’s highest death rate from Alzheimer’s Disease.”***

## **SUMMARY**

There are a number of factors that influence health status of individuals and communities that are tied to socioeconomic, geography, workforce supply, and health policy. These factors can contribute to behavioral risks, chronic conditions, preventive care, and mortality. In recent years North Dakota has improved in the behavioral risk areas of smoking, alcohol use, and physical activity; however, seatbelt use decreased for North Dakota adults. The general health of North Dakotans has shown an increase in overweight/obese persons and in one or more poor health days, and remained relatively stable in the number of disabled persons. The percentage of adults reporting chronic health conditions has shown variance in recent years with fluctuating trends showing similarities between 2013 and 2018. Similar to adults, children’s risk behaviors in recent years have shown increases in trends related to alcohol and being overweight/obese, but a decrease in smoking. North Dakota has a much higher incidence rate of both chronic lymphocytic leukemia and colon cancer when compared to the U.S. North Dakota has the highest rates of death from Alzheimer’s disease, as well as plains states having significantly higher mortality rates of amyotrophic lateral sclerosis. Health screenings have also shown variances in some areas in recent years. Lastly, mortality rates in North Dakota have decreased in the past few years.

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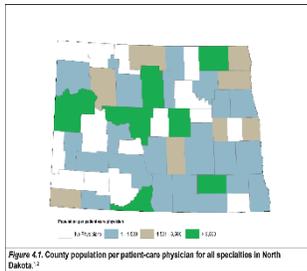
## **CHAPTER FOUR: Physician Workforce in North Dakota**

*Click on the chapter title to return to the table of contents*

## PHYSICIAN DISTRIBUTION IN NORTH DAKOTA

### Distribution by Geography

Physician distribution in North Dakota varies significantly by geography, with a higher population to physician ratio in rural counties than in counties with larger cities (Figure 4.1). Fifteen of North Dakota's 53 counties, with a combined population of 28,939 (4% of North Dakota's population), have no practicing patient-care physicians.



### Distribution of North Dakota Physicians Compared to the Upper Midwest and the Nation

When comparing the availability of physicians to provide healthcare services in North Dakota with regional and national benchmarks, it is important that the comparisons are of similar designations. There are a number of ways to select physicians for analyses, and analyses often are not clear about the criteria applied. The following are examples of the criteria that can be used for analysis: patient care, specialty, resident training status, age, Doctor of Medicine (MD)/ Doctor of Osteopathy (DO) status, federal/nonfederal status, practice geography, gender, primary care status, specialty status, patient-care status, practice type status, medical school of origin, and international medical school status.

***“North Dakota has the lowest number of residency slots per medical school student in the country, there are significantly fewer residents on a proportional basis than any other state in the nation.”***

Differences in employment criteria can result in significant differences in physician counts and in workforce analysis results. Table 4.1 shows the allopathic physicians (MDs) in North Dakota and the United States for the years 1985, 1990, 1995, 2000, 2012, and 2017. This table includes all U.S. MD physicians except for those from U.S. territories. The table shows that across the years, North Dakota has trailed the United States in all physicians per 10,000 people. However, the disparity between the number of North Dakota physicians per 10,000 population and the U.S. average has generally remained consistent. North Dakota has the lowest number of residency slots per medical school student in the country, there are significantly fewer residents on a proportional basis than any other state in the nation.

Table 4.1  
All medical doctors (MDs) per 10,000 population in North Dakota and the United States by year.

	N.D.	U.S.	% ND of U.S.
1985	17.6	22.8	77.2
1990	19.5	24.2	80.9
1995	23.0	27.0	85.2
2000	25.0	28.4	88.0
2012	28.4	32.3	87.9
2017	23.9	26.1	85.1

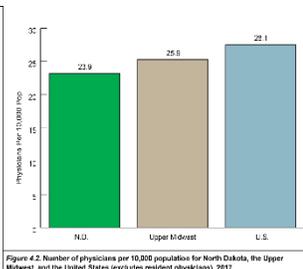


Figure 4.2. Number of physicians per 10,000 population for North Dakota, the Upper Midwest, and the United States (excludes resident physicians), 2017.

It is difficult to reconcile differences between data from different sources. Thus, exact numbers, ratios, and text can vary somewhat from one place in *this report* to another, though the differences are not significant. To minimize differences, data for *this report* have been carefully garnered from the same source in an effort to be sure that the comparisons are as accurate as possible.

In 2017, North Dakota had more than 1,600 practicing patient-care physicians. Of those physicians, 44% graduated from the University of North Dakota (UND) School of Medicine and Health Sciences (SMHS) or from a UND residency program, or both.<sup>2</sup> The difference in 2017 physician-to-population ratios per 10,000 population is illustrated in Figure 4.2. The ratio for North Dakota is 14.9% lower than for the United States as a whole and 7.7% lower than in the comparative Upper Midwest states (Iowa, Minnesota, Montana, Nebraska, South Dakota, Wisconsin, and Wyoming).

## Distribution by Gender

North Dakota had fewer female physicians per 10,000 population than the Midwest and United States during 2017 (Table 4.2). North Dakota has 27.2% fewer female physicians than the United States and 17.6% fewer female physicians than the Upper Midwest. Although not as dramatic, the ratio of male physicians per 10,000 is also lower than both the Upper Midwest and the United States. The UND SMHS, like most medical schools in the country, currently graduates about equal numbers of men and women, so it could be anticipated that the relative number of female physicians in North Dakota will increase over time.

Table 4.2  
Gender of physicians per 10,000 population in North Dakota with comparisons, 2017.

	N.D.	Upper Midwest	U.S.
Women	7.5	9.1	10.4
Metropolitan	11.5	11.9	11.6
Microspolitan	5.2	4.8	3.8
Rural	1.8	2.4	2.0
Men	16.5	16.9	17.9
Metropolitan	25.4	21.0	19.6
Microspolitan	11.2	11.2	9.7
Rural	4.1	5.8	5.0

The overall ratio of female physicians in North Dakota in metropolitan areas (per 10,000 population) is lower than the ratio for the Upper Midwest and United States; the ratio of female physicians was slightly higher in micropolitan areas. The North Dakota male physicians per 10,000 population ratio is higher in metropolitan counties than in

the Upper Midwest and all U.S. counties. Regardless of gender, the ratio of physicians in rural areas is below that for the Upper Midwest and the Nation.

***“The deficit of North Dakota physicians is in rural areas where we fall behind both the Upper Midwest and the nation in the number of physicians per 10,000 population.”***

### Distribution by Geography

Figure 4.3 shows that North Dakota has a higher ratio of physicians (per 10,000) in metropolitan areas than either the Upper Midwest or the Nation. By the same measure, the ratio of North Dakota physicians in micropolitan areas is nearly equal to that of the Upper Midwest and is higher than that of the Nation. The deficit of North Dakota physicians is in rural areas where we fall behind both the Upper Midwest and the nation in the number of physicians per 10,000 population.

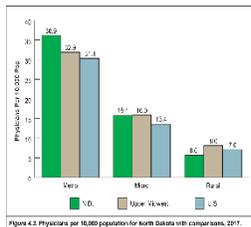


Figure 4.3 Physicians per 10,000 population for North Dakota with compar areas, 2017.

Table 4.3 shows the percentage of differences between the rate (per 10,000 population) of office-based physicians in North Dakota, the Upper Midwest physicians, and the United States in general. North Dakota has 17.1% fewer office-based physicians (per 10,000 population) than the United States and 8.9% fewer office-based physicians than the Upper Midwest overall. Compared to Upper Midwest and U.S. rates, North Dakota has higher rates for metropolitan counties, approximately the same rates for micropolitan, and lower rates in rural counties.

Table 4.3  
Physician primary practice per 10,000 population in North Dakota with comparisons, 2017.

	N.D.	Upper Midwest	% diff	U.S.	% diff
Office	15.8	17.2	-8.9	18.5	-17.1
Metropolitan	23.8	21.0	11.8	20.1	15.5
Micropolitan	12.7	12.4	-15.9	10.3	3.7
Rural	4.3	6.5	-46.5	5.4	-25.5
Hospital	6.9	6.6	4.3	6.7	2.9
Metropolitan	12.6	8.7	17.9	7.5	29.2
Micropolitan	4.7	2.8	40.4	2.5	46.8
Rural	1.4	1.5	-7.1	1.2	14.3

Negative numbers indicate that the N.D. rate is below that of the Midwest or U.S. rate. Positive numbers indicate that the N.D. rate is above the Midwest or U.S. rate.

Regarding hospital-based physicians, North Dakota metropolitan counties have more physicians per 10,000 population than the Upper Midwest and United States by 17.9% and 29.2%, respectively. For micropolitan areas, North Dakota similarly has more by 40.4% and 46.8%, respectively. In rural counties, North Dakota has 7.1% fewer physicians than the Upper Midwest and 14.3% more physicians than the United States. The data indicates that North Dakota physicians in metropolitan and micropolitan

counties are more likely to be in a hospital-based practice than the comparison groups. This likely is a reflection of North Dakota’s emphasis on family medicine and primary care, which are clinic and office-based practices.

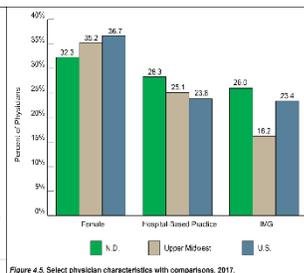
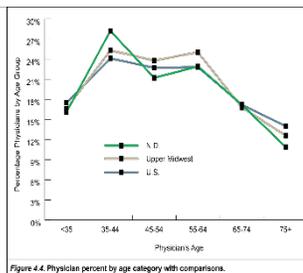
## Distribution by Age

Table 4.4 shows the age of physicians distributed by geographic areas. Overall, North Dakota has fewer physicians in all age groups (per 10,000 population) than does the Upper Midwest and U.S. comparison groups, except in the 35-44 age group where N.D. has more physicians than the Upper Midwest. However, North Dakota has more physicians in metropolitan counties across all age categories except for the 75 and older group. North Dakota has fewer physicians in rural counties in all age categories than does the Upper Midwest and United States comparison groups except for the younger than 35 and 75 and older age groups. Table 4.4 indicates a maldistribution of physicians in N.D., the Upper Midwest, and the U.S., where the lowest number of physicians are in rural areas and the highest ratio of physicians is in metropolitan areas by a large factor. Figure 4.4 shows that the North Dakota physician age structure is similar to that of the Upper Midwest states and U.S. comparison groups, though North Dakota’s physicians are a little less likely to be 75 and older. It is important to note that North Dakota has the highest percentage of physicians in the 35 to 44 age group, which would suggest that they will be in the physician workforce for a number of years. Figure 4.5 shows that North Dakotan physicians are slightly less likely to be female compared to physicians in the Upper Midwest and U.S. However, North Dakota has a greater percentage of IMG physicians and physicians working in a hospital-based practice.

***“There is a maldistribution of physicians in N.D., the Upper Midwest, and the U.S., where the lowest number of physicians are in rural areas and the highest ratio of physicians is in metropolitan areas by a large factor.”***

**Table 4.4**  
Physician age groups per 10,000 population with comparisons, 2017.

	N.D.	Upper Midwest	U.S.
<b>&lt;35</b>	3.8	4.3	4.9
Metropolitan	6.7	6.0	6.6
Metropolitan	2.9	1.4	1.1
Rural	0.7	0.0	0.5
<b>35-44</b>	23.9	8.9	13.0
Metropolitan	11.2	8.0	7.0
Metropolitan	5.9	3.8	2.8
Rural	0.8	1.6	1.2
<b>45-54</b>	8.2	8.2	8.4
Metropolitan	9.7	7.8	7.1
Metropolitan	3.4	4.0	3.3
Rural	1.2	2.0	1.0
<b>55-64</b>	8.5	8.9	8.6
Metropolitan	8.0	7.8	8.9
Metropolitan	1.1	1.0	1.2
Rural	1.7	2.7	2.3
<b>65-74</b>	4.1	4.1	4.3
Metropolitan	6.6	6.0	6.7
Metropolitan	3.6	4.0	3.4
Rural	1.9	2.4	2.2
<b>75+</b>	2.8	3.3	3.9
Metropolitan	3.2	3.8	3.2
Metropolitan	2.9	2.7	2.8
Rural	1.8	1.9	1.0



## Distribution by Origin

Medical school graduates are dispersed widely across the nation with their location strongly influenced by such factors as the location of their residency training, specialty choice, opportunities, home origins, and their spouse’s origins. The smaller or more specialized the medical residency training, the greater the nationwide market is for their graduates. For example, the market for primary care physicians is more regional, while the market for neurosurgeons is more national and international.

**Table 4.5**  
**Percent of ND physicians who graduated from medical school in different states and where physicians who graduated medical school in ND currently practice, 2019.**

Region/State	Medical Schools that ND CPC Physicians Graduated From		Where UND SMHS Graduates are Currently Practicing		Net ND Migration Balance
	N	%	N	%	
ND	680	47	879	32	-
MI	106	7	436	21	-330
WI	22	2	122	5	-80
IA	48	3	47	2	+2
MO	67	5	25	1	-42
CA	33	2	54	3	-21
SD	26	3	94	3	-16
WV	28	2	37	2	-33
TX	35	2	34	2	+1
NE	48	3	35	2	-13
IL	44	3	30	1	+14
Other	286	21	466	19	-157
<b>Total</b>	<b>1,438</b>	<b>100</b>	<b>2,122</b>	<b>100</b>	<b>-684</b>

***“North Dakota is a net medical school graduate physician exporter. That is, more UND SMHS graduates practice in other states than other states’ graduates are practicing in North Dakota.”***

Table 4.5 shows that of the 1,438 physicians currently practicing in North Dakota that were trained in the United States, 680 (47%) of them graduated from the UND SMHS. However, of the 2,122 MD graduates from the UND SMHS only 32% are currently practicing in North Dakota. Minnesota supplies the largest number out-of-state trained physicians to North Dakota (106 or 7%), however North Dakota has exported 436 (21%) of its graduates to Minnesota. In 2019, the balance of migration into and out of North Dakota by physicians based on medical school state location varied widely with respect to where the physicians were practicing. This can be thought of as an interstate balance of trade in medical school training and practice destination (excluding IMG graduates).

North Dakota is a net medical school graduate physician exporter. That is, more North Dakota UND SMHS graduates practice in other states than other states’ graduates are practicing in North Dakota. For the UND SMHS, 1,443 medical school graduates practice outside North Dakota versus 758 graduates of medical schools outside of North Dakota who are practicing in North Dakota. The resulting interstate balance of trade between North Dakota and the rest of the nation is -684 to North Dakota’s disadvantage. This number has increased since 2013, when the balance of trade was -370.

This out migration can be partly explained by the fact that UND graduates who want to specialize in any specialty other than family medicine, internal medicine, psychiatry, general surgery, and transitional have to go out of state for their residencies because the residency program they chose does not exist within North Dakota (for example, cardiology). In 2019, of the 1,438 U.S. medical school graduates practicing in North Dakota (excluding graduates from Canada and other countries), 758 or 53% graduated from medical schools outside of North Dakota. Overall, North Dakota benefits from the influx of physicians who trained in other parts of the nation.

***“The out migration of physicians can be partly explained by the fact that UND graduates who want to specialize in any specialty other than family medicine, internal medicine, psychiatry, general surgery, and transitional have to go out of state for their residencies because the residency program they chose does not exist within North Dakota.”***

The most important predictor of eventual practice location for physicians is where physicians obtain their residency training. Other predictors include location of medical school, where they grew up, and geographic origin of spouse when applicable. Many physicians, especially those in primary care, start practicing in the general vicinity of where they completed their post-medical school residency training. The beneficial effects of North Dakota residencies are readily apparent as 49.5% of physicians graduating from those residencies stay in North Dakota.<sup>2</sup>

Of the 1,772 physicians practicing direct patient care in North Dakota in 2019, 488 (28%) completed at least one residency within North Dakota while 1,284 (72%) did not. Of the 1,428 physicians who completed at least one residency in North Dakota, 64.2% (917) practice in other states and 35.8% (511) practice in North Dakota (Table 4.6).

Table 4.6  
Percent of ND physicians who graduated from residencies in different states and where physicians who completed a residency in ND currently practice, 2019.<sup>2</sup>

Region/State	Where ND Practicing Physicians Completed Their Most Recent Residency		Where Physicians Who Completed at Least One Residency in ND Currently Practice		Migration into ND
	N	%	N	%	
ND	488	28	511	36	-
MIN	180	12	224	16	44
MICH	127	7	15	1	+112
CAL	47	3	67	5	-20
WIS	78	4	47	3	+31
TEX	51	3	45	3	+6
NY	113	6	12	1	+101
OH	48	3	19	1	+29
IA	67	2	15	1	+52
IL	69	4	27	1	+42
SD	49	3	19	1	+30
NE	43	2	17	2	+20
Other	438	24	411	29	-27
Total	1772	100	1428	100	344

Among current practicing physicians in North Dakota, approximately 27.5% (488) completed their most recent residency in North Dakota. Other common state residencies were located in Minnesota (10.2%, 180), Michigan (7.2%, 127), New York (6.4%, 113), Wisconsin (4.4%, 78), Texas (2.9%, 51), Ohio (2.7%, 48), and California (2.7%, 47). In addition to the individual states listed, North Dakota physicians frequently completed their most recent residency in various other states across the U.S. (24.7%, 438).

***“Among current practicing physicians in North Dakota, approximately 27.5% completed their most recent residency in North Dakota.”***

In contrast, the current practice locations of physicians who completed at least one residency in North Dakota were also examined. Here, 35.8% (511) of physicians who currently practice in North Dakota completed at least one residency in the state as well. Approximately 224 (15.7%) of N.D. residency graduates currently practice in Minnesota; 4.7% (67) practice in California; 3.2% (45) practice in Texas; 3.3% (47) practice in Wisconsin; and 1.1% (15) are currently working in Michigan. In addition to the specific states listed in Table 4.6, 28.8% (411) of those who completed a N.D. residency now work in other states across the U.S.

In examining both the balance of trade among physicians and residencies, this translates into both gains and losses for North Dakota. For example, North Dakota lost 44 physicians to Minnesota, but gained 112 from Michigan. It lost 20 physicians to California, but gained 31 from Wisconsin. Additional gains include six from Texas, 101 from New York, and 29 from Ohio. Moreover, North Dakota received 27 physicians from

other states across the U.S. Together, this results in a total net influx of 344 physicians into North Dakota.

North Dakota has a positive balance of physicians who completed their residency training in other states and who are now practicing in North Dakota. There are 1,095 physicians with no North Dakota residency training currently practicing in North Dakota and 917 North Dakota residency graduates practicing out of state. The net influx of residents trained outside of North Dakota and now working in North Dakota is 344. This makes North Dakota a large net importer of other states' residency graduates.

***“One of the most important predictors of whether physicians establish a clinical practice in North Dakota is if the physician attends the UND SMHS and completes at least one residency in-state.”***

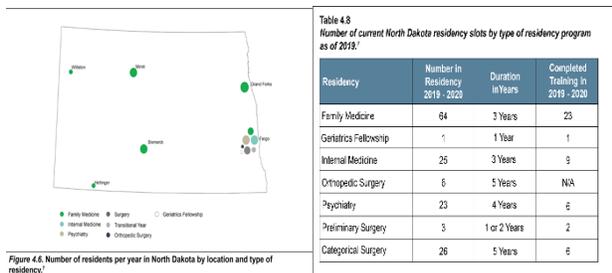
One of the most important predictors of whether physicians establish a clinical practice in North Dakota is if the physician attends the UND SMHS and completes at least one residency in-state. Table 4.7 shows that the majority of family medicine physicians practicing in North Dakota either graduated from UND SMHS or completed a residency in North Dakota. This same trend is also noted for other specialties.

**Table 4.7**  
Percent of North Dakota specialty physicians who graduated from the UND SMHS and/or completed at least one residency in North Dakota as of 2019.<sup>7</sup>

Residency	Percent
Family Medicine	74
Internal Medicine	41
Obstetrics & Gynecology	66
Pediatrics	41
Psychiatry	41

## Residency Training in North Dakota

Figure 4.6 shows the location and relative number of trainees in North Dakota's physician residencies. The number of different specialties where a residency can be performed within North Dakota was limited to family medicine, internal medicine, psychiatry, general surgery, and transitional.<sup>7</sup> Recently added residencies are available in hospitalist medicine, rural surgery, telepsychiatry, hospital medicine, and rural family medicine. Transitional residencies are a yearlong program designed to introduce graduates to a wide range of medical and surgical specialties with the goal of building a broad foundation of clinical skills as a base for future training in a medical specialty. Table 4.8 shows the current numbers of residents in the programs.



***“Through the funding of the Healthcare Workforce Initiative (HWI), the North Dakota Legislature provided support to permit expansion of graduate healthcare provider class sizes, with the addition of 16 medical students per year (total 64) and 30 health sciences students per year (total of 90).”***

As will be discussed in greater detail in Chapter 12, approval and state funding for 17 additional residency slots per year (total of 51) has been provided in North Dakota. New positions have been awarded since 2012 to UND’s Center for Family Medicine in Bismarck (rural family medicine, in conjunction with West River Health System in Hettinger); UND’s Center for Family Medicine in Minot (rural family medicine in conjunction with Mercy Medical Center in Williston); UND Department of Surgery (rural general surgery); UND Department of Psychiatry and Behavioral Science (rural psychiatry); Catholic Health Initiatives-St. Alexius Medical Center (hospitalist and geriatrics); Sanford Health in Fargo (family medicine); and Sanford Health in Bismarck (geriatrics fellowship).

Through the funding of the Healthcare Workforce Initiative (HWI), the North Dakota Legislature provided support to permit expansion of graduate healthcare provider class sizes, with the addition of 16 medical students per year (total 64) and 30 health sciences students per year (total of 90).

## Physician Specialty and Rural Location

North Dakota’s patient-care physicians practice in many different specialties. Of the direct patient care physicians practicing in North Dakota in 2019, the most prevalent physician specialties included family medicine at 364 (22.6%); general internal medicine at 162 (10.1%); general surgery at 110 (6.8%); internal medicine specialties (5.8%); radiology (5.3%); anesthesiology (5.1%); psychiatry at 76 (4.7%); and general pediatrics at 78 (4.8%). These specialties account for nearly half of the practicing physicians (49.0%) in the state. None of the remaining specialties account for more than 5% of North Dakota’s practicing physicians.<sup>2</sup>

The geographic distribution of physicians is discussed in Chapter 5 in the context of primary care physicians. The more specialized areas of practice are centralized in the state’s larger cities where the populations are sufficient enough to support them and they have the necessary threshold populations whose reimbursements make their practices viable.

## International Medical Graduates

International Medical Graduates (IMGs) play a crucial role in the U.S. healthcare system.<sup>8</sup> Currently, IMGs account for approximately 25% of the practicing physician workforce in the United States and is expected to grow in the future.<sup>9</sup> They are expected to fill needed positions in family medicine, internal medicine, surgery and pediatrics that are not being filled by U.S. medical school graduates. Forty one percent of IMGs of practicing IMGs are in primary care disciplines, with internal medicine having the highest number of IMGs.<sup>1</sup> In addition, they are more likely to practice in rural areas or in areas that serve socioeconomically disadvantaged populations.

IMGs make up about one-fourth of the North Dakota physician workforce, which was similar to the situation across the country in 2015. In 2015, 26.3% of all physicians were IMGs, compared to 16.2% for the upper Midwest and 23.5% for the U.S. IMGs are a critically important component of the professional workforce in North Dakota and throughout the country. They are defined as medical school graduates from any country outside of the United States and Canada.

All three geographic areas of North Dakota have relatively more IMG physicians per 10,000 population than does the Upper Midwest and United States (Table 4.9). The distribution of IMG physicians in North Dakota is similar to the distribution of U.S. Medical School Graduates, in that the highest density is in the metropolitan areas and lowest density is in rural areas.

***“International Medical Graduates are more likely to practice in rural areas or in areas that serve socioeconomically disadvantaged populations.”***

The demographic characteristics of IMGs compared to USMGs in North Dakota is similar. In 2017 the gender breakdown for IMGs compared to USMGs was 74% male compared to 70%, respectively. The average age of IMGs was 49.4 compared to 51.2 for USMGs. When examining physician specialty, IMGs were slightly more primary care-oriented than USMGs with 38.7% and 37.1%, respectively. IMG Surgeons represented less than half the rate of USMGs with 8.4% and 20.5%, respectively. IMGs were in Internal Medicine at four times the rate of USMGs with 25.1% and 6.4%, respectively.

Of the 444 IMGs in North Dakota, 171 practice in primary care. Of those 171, 74 (43.3%) practice in general internal medicine. Of those 74 general internal medicine IMGs, 45 (61%) completed a general internal medicine residency in the state of North Dakota. Comparatively, of the 111 internal medicine specialty IMGs, 15 (13.5%) completed a residency in North Dakota while the rest were trained out-of-state.

**Table 4.9**  
Rate of IMGs and USMGs with comparisons, 2019<sup>1,2,4</sup>

	N.D	Upper Midwest	U.S.
<b>IMG</b>	6.2	4.2	6.4
Metropolitan	9.5	5.4	7.3
Microropolitan	4.9	2.5	2.6
Rural	1.2	1.0	1.2
<b>USMG</b>	16.7	21.3	20.4
Metropolitan	25.7	26.3	22.4
Microropolitan	10.9	14.5	11.9
Rural	4.9	8.0	6.7

The largest numbers of IMGs practicing in North Dakota come from India, Pakistan, and Dominica (West Indies) (Table 4.10). There was a higher percentage of IMGs practicing in North Dakota in 2017 from India (7% of North Dakota’s practicing physicians) than in any other state (Minnesota having the next highest percentage at 6%).

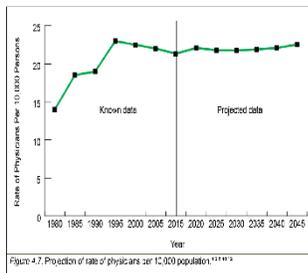
**Table 4.10**  
Country of origin of IMG physicians practicing in North Dakota, 2017<sup>1</sup>

Country of origin	Country	End Number	Pct/County	
Continental Europe	France	15	0.1	
	Germany	15	0.1	
	Italy	10	0.1	
East Asia	China	10	0.1	
	Japan	10	0.1	
	South Korea	10	0.1	
	Taiwan	10	0.1	
	Thailand	10	0.1	
	Vietnam	10	0.1	
	South America	Argentina	10	0.1
		Brazil	10	0.1
		Colombia	10	0.1
		Cuba	10	0.1
Ecuador		10	0.1	
Peru		10	0.1	
Venezuela		10	0.1	
South Asia		India	10	0.1
		Pakistan	10	0.1
		Sri Lanka	10	0.1
	United Arab Emirates	10	0.1	
	Other	Canada	10	0.1
		Denmark	10	0.1
		Finland	10	0.1
		France	10	0.1
		Germany	10	0.1
		Italy	10	0.1
Japan		10	0.1	
Spain		10	0.1	
United Kingdom		10	0.1	
United States		10	0.1	

***“If not for the HWI, the combination of the aging of the state’s population, increased healthcare coverage, and the increase in the Oil Patch’s population would result in the demand for physicians outpacing the supply.”***

### Projection of Physicians in North Dakota

If not for the HWI, the combination of the aging of the state’s population, increased healthcare coverage, and the increase in the Oil Patch’s population would result in the demand for physicians outpacing the supply. All other things being equal, if the population of North Dakota does not expand at an increased rate but at the slower historical rate, the rate of physicians per 10,000 population will increase slightly until 2020 and then remain stable through 2045. As shown in Figure 4.7, the standard projection of population growth shows a relatively steady supply of physicians relative to the population, but only if the HWI measures continue to be implemented in full. Full and continuing implementation of the HWI will help ensure that adequate healthcare delivery teams will be available throughout the state. Note that with the recent North Dakota State Government’s budgetary challenges, two approved residencies are having their implementation delayed.



One important variable in projecting the future supply of physicians in North Dakota is when they decide to retire. Recent projections by his, Inc., in conjunction with the Association of American Medical Colleges, have shown a nearly 10% predicted difference in eventual workforce levels that occur if retirement is accelerated or delayed by as little as two years.<sup>13</sup> Because physician burnout and job dissatisfaction appear to be increasing (at least in part because of the burden of dealing with the electronic health record),<sup>14</sup> the frequency of early retirement may increase. The estimated average age of physician retirement at present is 67 years, but it is uncertain that this will continue to be the case in the future. For example, over one-third of surveyed physicians have indicated that they plan to accelerate their retirement plans because of frustration with the healthcare system, but there is little evidence so far that they actually are doing so.<sup>13</sup> Nevertheless, it is possible that one-third (or even more) of all currently active physicians might retire within the next decade.<sup>13</sup> If this were to occur, it clearly would exacerbate the existing physician shortage and distribution problem.

## SUMMARY

The supply of North Dakota physicians lags behind the nation, especially in rural counties (6.0 physicians per 10,000 citizens compared with 8 in other Upper Midwest states and 7.0 for the United States). Aging is a problem because more than half of North Dakota's physicians (61.3%) are 45 to 74 years old. Though a large proportion of North Dakota's physicians were IMGs and Canadian physicians (29.2%) in 2015, the state lacks large numbers of physicians from other states.

As the physician population in the state continues to age, a large number will be retiring and will need to be replaced. As the North Dakota population also ages, there will be an increased need for physician care. The Oil Patch's recent growth in population has the potential to reduce the number of physicians to serve people by nearly one-half. Low oil prices can potentially reduce this problem in so far as lower oil process tend to result in fewer people moving to western North Dakota counties.

The supply of physicians within North Dakota is not only influenced by the above circumstances, but by others external to it. U.S. medical schools are increasing their output of graduates, which should be helpful for filling the growing need for more physicians in North Dakota. However, there are trends that are changing the national and international playing field for North Dakota regarding its ability to attract more physicians. With more demand for healthcare across the country, more physicians produced by medical schools and residency programs will likely remain in their training states, and North Dakota could experience fewer physicians moving from those states and programs into North Dakota to practice. Likewise, the increases in the number of

U.S. medical school graduates could reduce the numbers of IMGs from U.S. residency programs, and North Dakota may experience a reduction in the number of IMG physicians coming to North Dakota to practice.

Thus, now is not time for a business-as-usual approach in the face of all the specifics addressed in this chapter. These influences are likely to lead to fewer physicians within North Dakota to serve its growing population and significant growing number of older adult citizens. North Dakota is vulnerable to various trends and circumstances over which it has little control. In the face of all this, it is critical that North Dakota continues to control its own fate by appropriately continuing to invest in and support the HWI to train healthcare professionals, including physicians, who will practice within North Dakota. Finally, it is important to provide opportunities for young adult North Dakotans to train to be physicians.

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## **CHAPTER FIVE: Primary Care and Specialty Provider Workforce in North Dakota**

*Click on the chapter title to return to the table of contents*

## PRIMARY CARE PHYSICIANS

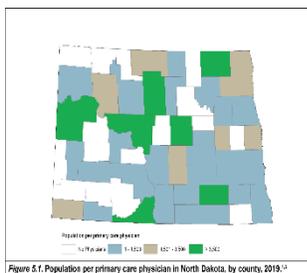
Primary care physicians are the foundation of the North Dakota healthcare delivery system, and access to them by all of North Dakota's population is an overarching goal. Primary care physicians are defined as physicians in the specialties of family medicine, general internal medicine, and general pediatrics. Specialist physicians can provide some primary care services but focus on specific medical areas. The specialist physicians addressed in this chapter are psychiatrists, general surgeons, general pediatricians, and obstetrics/gynecology.

***“Primary care physicians are the foundation of the North Dakota healthcare delivery system, and access to them by all of North Dakota’s population is an overarching goal.”***

## PRIMARY CARE PHYSICIAN DISTRIBUTION IN NORTH DAKOTA

### Distribution by Geography

The North Dakota population per primary care physician is shown in Figure 5.1. There are no primary care physicians in 16 counties which have a combined population of 42,275.<sup>1,2</sup> Counties with greater than 2,500 people per physician also may have primary-care-physician shortages. Even in counties with the lowest population-per-primary-care-physician rates there may be primary-care-physician shortages because of travel distances to alternative care and high needs for care.



## DISTRIBUTION OF NORTH DAKOTA PRIMARY CARE PHYSICIANS COMPARED TO THE UPPER MIDWEST AND THE NATION

### Distribution by Geography

The ratio of primary care physicians (including residents who are medical graduates undergoing a period of advanced training in their medical specialty before practice as a physician) in North Dakota per 10,000 population is similar to the United States but higher than for the Upper Midwest (Figure 5.2).

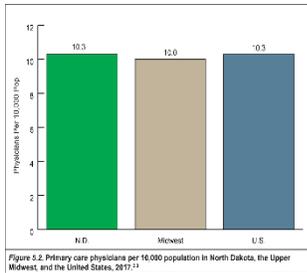
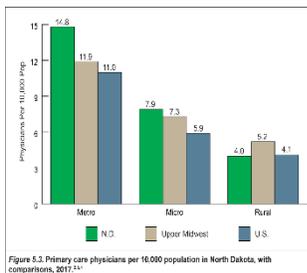


Figure 5.3 shows that across North Dakota, the Upper Midwest, and the United States, the practicing-primary-care-physician-to-10,000-population ratios are lower for rural counties. For metropolitan and micropolitan counties, North Dakota's rate per 10,000 population is higher than for the Upper Midwest and for the United States. Regarding rural counties, North Dakota trails the Upper Midwest (4.0 versus 5.2) and the United States (4.0 versus 4.1) in the number of physicians per 10,000 population.



Of the 627 primary care physicians practicing in North Dakota in 2019, 63.0% (395) were family physicians, 25.5% (160) were general internists, and 11.5% (72) were general pediatricians.<sup>1</sup>

### Distribution by Selected Characteristics

Table 5.1 shows the percentage of primary care physicians broken down by gender, hospital-based practice, and international medical graduate (IMG) status. Of the 627 primary-care, direct patient care physicians practicing in North Dakota, 57.8% are located in metropolitan counties, 12.1% in micropolitan counties, and 30.0% in rural counties. Rural counties have a lower percentage of physicians who are female than metropolitan or micropolitan counties (38.8% rural versus 46.0% micropolitan and 41.2% metropolitan). The percentage of hospital-based physicians in metropolitan areas is 63.4% versus 26.0% in rural counties. That is, metropolitan based primary care physicians are more likely to practice in conjunction with a hospital rather than other settings. As shown in Table 5.1, the percentage of North Dakota physicians who are IMGs varies by metropolitan status (10.8% up to 52.9%). In North Dakota, 16.3% of all primary-care, patient-care physicians are IMGs, with an additional 2.5% having received their medical degrees in Canada. Approximately 1 in 4 practicing primary care physicians in North Dakota did not graduate from a U.S. medical school. Currently, IMGs account for approximately 25% of the practicing physician workforce in the United States.

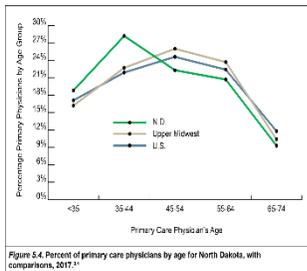
***“Rural based primary care physicians are more likely to practice in conjunction with a hospital rather than other settings.”***

Table 5.1  
Percent of primary care physicians in North Dakota who are female, have hospitable-based practices, and are IMGs, 2019.<sup>12</sup>

	N	Area (%)	Female (%)	Hospital-Based (%)	IMG (%)
Metropolitan	367	57.8	41.2	63.4	52.9
Micropolitan	76	12.7	46.0	10.6	10.8
Rural	168	30.0	38.6	26.0	55.3
Total	625		41.1	40.5	16.3

### Distribution by Age

A comparison of the age structure of North Dakota’s primary care physicians compared with those of the Upper Midwest states (Iowa, Minnesota, Montana, Nebraska, South Dakota, Wisconsin, and Wyoming) and the United States is depicted in Figure 5.4. North Dakota’s primary care physicians are more likely to be in the under 35 group and more likely to be in the 35 to 44 age group in comparison to the Upper Midwest and U.S. as a whole. In the 45 and older group, North Dakota shows the same trends as in the other comparison regions.



The age distribution of North Dakota primary care physicians is shown by metropolitan status in Table 5.2. The percentage of primary care physicians for rural counties is dramatically higher for the 65–74 age category than for the micropolitan and metropolitan county categories (20.5% versus 9.3% and 7.8%, respectively). The micropolitan and metropolitan county categories are similar in their age structures. Rural counties have the lowest percentages of physicians in the less than 35 and 35–44 age categories. The implication of this finding is the susceptibility of rural counties in North Dakota to the impending retirement of a relatively large portion of their primary-care-provider workforce. Similarly, the small number of younger physicians, especially those under 35 years of age, in rural counties indicates the difficulty of attracting recent graduates to rural North Dakota’s counties.

**Table 5.2**  
Percent of primary care physicians in North Dakota by age and area, 2019.<sup>14</sup>

	N	<35	35-44	45-54	55-64	65-74	>74
Metropolitan	362	11.9	32.9	19.3	20.7	14.6	0.6
Micro-politan	76	7.9	27.6	15.8	26.3	21.0	1.3
Rural	188	12.2	27.7	20.7	21.8	15.4	2.1
Total	626	11.5	30.7	19.3	21.7	15.7	1.1

Table 5.3 shows that North Dakota has comparatively more primary care physicians in the less than 35 and the 35–54 age categories, and fewer or the same in the older age categories when compared to the upper Midwest and the U.S. The rates of primary care physicians are much higher for metropolitan and micropolitan areas than for rural areas in North Dakota, the Upper Midwest, and the United States, shown in Table 5.3.

**Table 5.3**  
Age and area of primary care physicians per 10,000 population in North Dakota with comparisons, 2017.<sup>14</sup>

	N.D.	Upper Midwest	U.S.
<b>Age</b>			
Metropolitan	2.7	2.1	2.0
Micro-politan	1.9	0.6	0.5
Rural	0.6	0.4	0.3
<b>Area</b>			
Metropolitan	2.5	2.3	2.2
Micro-politan	1.8	0.8	0.4
Micro-politan	1.8	1.5	1.1
Rural	0.6	1.0	0.7
<b>Age and Area</b>			
Metropolitan	2.5	2.2	2.2
Micro-politan	3.5	2.1	2.7
Micro-politan	1.6	1.0	1.4
Rural	0.8	1.4	1.0
<b>Age and Area</b>			
Metropolitan	2.1	2.4	2.3
Micro-politan	2.7	2.7	2.4
Micro-politan	2.0	2.1	1.7
Rural	1.1	1.2	1.2
<b>35-54</b>			
Metropolitan	1.9	1.1	1.3
Micro-politan	0.7	0.5	0.5
Rural	0.0	0.0	0.7
<b>Age and Area</b>			
Metropolitan	0.1	0.1	0.2
Micro-politan	0.0	0.1	0.1
Rural	0.1	0.1	0.1

Table 5.4 shows that North Dakota has a slightly higher percentage of its primary care physicians practicing in office-based practice than in the Upper Midwest or the United States. North Dakota has a slightly higher percentage of its primary care physicians practicing in hospital-based practice than in the two geographic comparison groups. The ratios for all three groups are lower as the counties become more rural.

**Table 5.4**  
Practice base and area of primary care physicians per 10,000 population in North Dakota with comparisons, 2017.<sup>14</sup>

	N.D.	Upper Midwest	U.S.
<b>Office</b>			
Metropolitan	11.2	11.0	10.0
Micro-politan	15.0	12.1	10.4
Micro-politan	9.2	9.2	7.3
Rural	5.5	8.1	6.0
<b>Hospital</b>			
Metropolitan	1.6	1.5	1.1
Micro-politan	2.0	1.6	1.2
Micro-politan	1.2	1.2	0.8
Rural	1.5	1.2	0.9

## Distribution by Origin

Four out of 10 (43.7%) primary care physicians in North Dakota graduated from the UND School of Medicine and Health Sciences (Figure 5.5). Figure 5.6 shows that over half (53.1%) of North Dakota’s primary care physicians obtained their residency training from a residency program based in North Dakota. Taking the locations of both medical school and residency training into account, more than half (68.3%) of the

primary care physicians currently practicing in North Dakota received one or both types of training within North Dakota (not shown in figures).

**“Four out of 10 (43.7%) primary care physicians in North Dakota graduated from the UND School of Medicine and Health Sciences”**

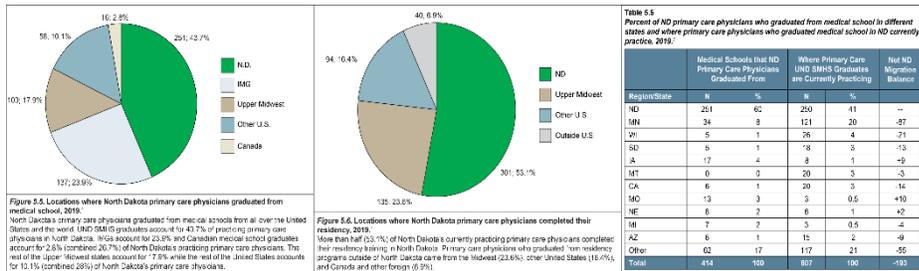


Table 5.5 shows the states from which North Dakota’s primary care physicians graduated from medical school on the left side, and where past graduates of UND SMHS now practice on the right side. This analysis permits a comparison of physician migration patterns.

The balance of migration into and out of North Dakota by primary care physicians based on medical school state location varied widely with respect to where the physicians were practicing. Specifically, 357 of the 607 graduates of the UND SMHS are primary care physicians practicing outside of North Dakota. However, 163 graduates of medical schools outside of North Dakota are practicing primary care within North Dakota. That means that North Dakota has a net loss of 193 SMHS graduates to other parts of the United States. The largest number of SMHS graduates lost is to Minnesota.

An important predictor of eventual practice location is where physicians obtain their residency training. Many physicians start practicing in the general vicinity of where they completed their post-medical-school residency training. Table 5.6, using 2017 data, shows the states where North Dakota’s practicing physicians completed their residency training on the left side, and where graduates of North Dakota’s residency programs now practice on the right side. Of 585 North Dakota primary care physicians practicing in 2013, 280 (47.8%) completed their residency within North Dakota while 299 (51.1%) did not.

**“An important predictor of eventual practice location is where physicians obtain their residency training. Many physicians start practicing in the general vicinity of where they completed their post-medical-school residency training.”**

North Dakota is a net importer of other states’ residency graduates. Of the 625 total North Dakota-trained residency graduates who are practicing, 358 (57%) practice in other states and 267 (43%) practice in North Dakota. Of North Dakota’s total primary care physicians in 2019, 53% completed residency training in North Dakota.

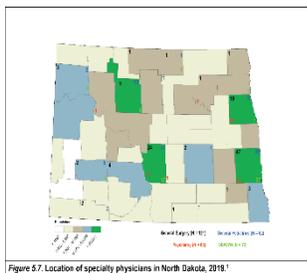
**Table 5.6**  
Residency locations for ND primary care physicians and current practice state for physicians who completed a ND residency, 2019.

Region/State	Where ND Practicing Physicians Completed Their Most Recent Residency		Where Physicians Were Credentialed At Least One Residency in ND Currently Practice		Migration into ND
	N	%	N	%	
ND	301	83	387	43	+37
MN	41	7	101	16	60
WI	10	3	22	4	4
CA	0	1	25	1	-17
NY	11	2	3	0.5	-9
SD	5	1	17	3	11
MI	19	3	3	1	-19
TX	8	1	10	2	-4
NE	12	2	4	1	+8
MO	11	2	3	1	+5
IA	10	3	8	1	+5
Other	88	16	160	23	-72
Missing	0	0	2	0.5	+20
Total	374	100	626	100	-61

## SPECIALTY CARE PHYSICIANS

### Distribution by Geography

As can be seen in Figure 5.7, most of North Dakota's practicing specialists are located in Fargo, Bismarck, Grand Forks, and Minot. Given the specialist geographic distribution and the generally low numbers of specialists per population, a significant portion of North Dakota's population is a long distance from specialists, with long travel times to their nearest specialist physician. Note that in this analysis, general pediatrics is considered a specialty and not part of primary care.



### Distribution by Selected Characteristics

Within North Dakota, rural counties have a lower percentage of their psychiatry and OB-GYN specialist-care physicians who are female than metropolitan counties (Table 5.7). Overall, the majority of pediatricians and obstetrics and gynecology specialists are female. In contrast, only about 11% of general surgeons in North Dakota are female. However, the very small number of rural county general pediatricians (two) renders any meaningful analysis problematic. Micropolitan counties have lower percentages of female specialists as do metropolitan counties for general surgery and pediatrics and higher percentage of female specialists for psychiatry and OB-GYN. For all four specialties, the number of rural county specialists are so few that meaningful comparisons with metropolitan and micropolitan areas are not prudent. Clearly, there is a significantly lower percentage of female specialists in general surgery (10.9%) than in psychiatry (47.4%), general pediatrics (57.7%), and OB-GYN (61.9%).

**Table 5.7**  
Percent of specialist physicians in North Dakota who are female, have hospital-based practices, or are IMGs, 2019.<sup>14</sup>

Specialty	N	Female (%)	Hospital-based (%)	IMG (%)
<b>General Surgery</b>	121	9.9	33.9	12.4
Metropolitan	64	10.8	33.0	9.6
Microropolitan	17	0.0	36.3	11.8
Rural	10	10.0	40.0	40.0
<b>Psychiatry</b>	62	43.2	32.3	33.5
Metropolitan	50	44.0	24.0	34.0
Microropolitan	11	36.4	27.3	45.5
Rural	2	0.0	50.0	0.0
<b>Gen Peds</b>	62	61.0	25.0	17.1
Metropolitan	61	63.9	23.0	13.1
Microropolitan	10	50.0	11.1	33.3
Rural	3	0.0	66.7	0.0
<b>OB-GYN</b>	71	62.0	19.7	6.5
Metropolitan	51	61.7	23.6	2.0
Microropolitan	16	61.1	11.1	22.2
Rural	2	0.0	0.0	50.0

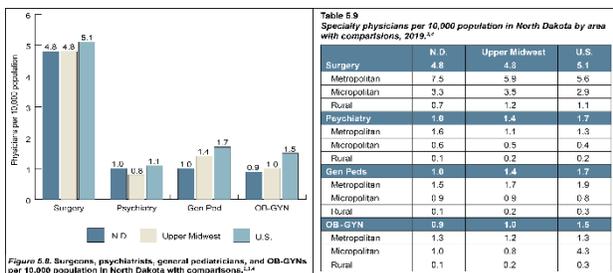
Approximately 23% - 29% of specialty physicians work in hospital-based practice (Table 5.7). The majority of those physicians are located in metropolitan areas, the smallest number in rural areas. While IMGs account for a quarter of North Dakota's practicing physicians, they account for substantially lower percentages of general surgeons (10%), general pediatricians (14.1%), and OB-GYNs (4.8%), but more for psychiatrists (32.9%).

The percentage of specific specialty physicians by age and the three geographic categories is portrayed in Table 5.8. General surgeons (57.3%) and psychiatrists (57.9%) are more likely to be in the 45-64 age category, whereas general pediatricians (62.8%) and OB-GYNs (60.3%) are more likely found in the 35-54 age category.

**Table 5.8**  
Percent of specialists in North Dakota by age and area, 2017.<sup>14</sup>

Specialty	N	<35	35-44	45-54	55-64	65-74
<b>General Surgery</b>	121	1.7	26.4	25.6	29.8	17.4
Metropolitan	64	2.1	27.7	26.5	28.7	14.9
Microropolitan	17	0.0	35.3	5.9	23.5	35.3
Rural	9	0.0	2.0	10.0	50.0	10.0
<b>Psychiatry</b>	62	6.3	13.3	27.0	30.2	15.3
Metropolitan	50	6.0	20.2	24.0	22.0	16.0
Micro Metropolitan	11	0.0	18.2	36.4	18.2	27.3
Rural	2	0.0	0.0	50.0	50.0	0.0
<b>Gen Peds</b>	62	4.9	30.6	26.8	17.1	20.7
Metropolitan	61	4.9	37.7	26.2	11.5	19.7
Micro Metropolitan	15	6.6	6.6	27.6	38.9	22.2
Rural	3	0.0	33.3	0.0	33.3	33.3
<b>OB-GYN</b>	71	11.4	42.0	12.5	19.7	14.3
Metropolitan	67	2.0	43.1	15.7	23.5	15.7
Micro Metropolitan	15	0.0	44.4	15.7	11.1	22.2
Rural	2	0.0	0.0	0.0	0.0	50.0

North Dakota's specialists-per-10,000-population ratios for general pediatricians and OB-GYNs are lower than for the Upper Midwest and U.S. ratios (Figure 5.8). The North Dakota ratio for general surgeons is the same as the Upper Midwest but lower than the United States, and its ratio for psychiatrists is slightly lower than for the nation.



The specialists-per-10,000-population ratios by rural or urban status for 2019 are shown in Table 5.9. Across North Dakota and for each specialty, the rural counties have lower ratios than the micro metropolitan and metropolitan counties.

***“Most of North Dakota’s population is located within a federally designated shortage area for primary care. About 1 in 20 people live in a county that does not have any primary care physicians.”***

## **SUMMARY**

Most of North Dakota’s population is located within a federally designated shortage area for primary care. About 1 in 20 people live in a county that does not have any primary care physicians. Primary care physicians in metropolitan counties are more likely to be female than in rural counties. Primary care physicians in rural counties are more likely to be older. In 2019, there were 627 direct-patient-care primary care physicians in North Dakota (395 family medicine, 160 general internal medicine, and 72 general pediatrics). North Dakota has a slightly higher ratio of primary care physicians to population than other Midwest states, but same ratio as the United States when resident-physicians are included in the comparison. More than half of all primary care physicians in North Dakota graduated from the UND SMHS or completed a residency in North Dakota or both.

Of North Dakota’s total primary care physicians in 2019, 53.1% completed residency training in North Dakota. Of North Dakota’s total primary care physicians (including IMGs), 43.7% received their medical degree from the UND SMHS. Considering both North Dakota residency graduates and UND SMHS medical school graduates, 68.3% of North Dakota practicing primary care physicians received at least some of their training in North Dakota.

In 2019, there were 121 general surgeons, 62 psychiatrists, 82 pediatricians, and 72 OB-GYNs in North Dakota. As with other physicians in North Dakota, these specialists are generally more likely to be older, male, IMGs, and in hospital-based practice when compared with other Midwest states and the United States. North Dakota has lower ratios of general pediatricians and OB-GYNs per 10,000 population than the comparison groups, and about the same ratio of psychiatrists as the other states.

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## **CHAPTER SIX: Nursing Workforce in North Dakota**

*Click on the chapter title to return to the table of contents*

## INTRODUCTION

The nursing workforce chapter for the *Sixth Biennial Report* has been a successful collaboration between the UND College of Nursing and Professional Disciplines, the UND School of Medicine and Health Sciences (SMHS) as well as the SMHS Advisory Board, and the North Dakota Center for Rural Health. It is of utmost importance that we, as healthcare professionals, attempt to provide a complete picture of the status of healthcare. There have been and will continue to be increased blurring of lines between health professions. For an accurate account of the healthcare workforce and the potential health outcomes associated, the overlapping roles need to be taken into consideration. North Dakota is a unique state in that the rural nature of our healthcare systems provides more opportunity for progressive innovation of healthcare workforce roles.

To demonstrate the nursing roles as clearly as possible in this biennium, we have used multiple data sources. Licensure data from the ND Board of Nursing (NDBON), dated January of 2020, provides an account of all nurses licensed in ND as of that date.<sup>1</sup> ND nurses renew licensure every other year by December 31. This licensure data encompasses licensed practical nurses (LPN), registered nurses (RN), and Advanced Practice Nurses (APRN) in the state. This data provides basic demographic information such as age, location of employment, and specialty information. This information was supplemented with data from the *ND Board of Nursing's annual education report* from the academic year of 2018-19, which provides information on ND nursing school numbers of applicants and graduates, among other information. The ND Nursing Facility Workforce Survey from September of 2016 was also used, allowing inclusion of specific information from long-term care facilities in ND. The ND Hospital Workforce Survey from December of 2017 rounded out the datasets affording information from both Critical Access Hospitals (CAH) and Prospective Payment System (PPS) facilities on the nursing workforce.

## AGGREGATE NURSING RESULTS

Data was extracted from the NDBON licensure data as of January 2020. The NDBON has open licensure renewal from October through December yearly, with most nursing types renewing every other year. This data is obtained via electronic submission by the individual applicant or renewing nurse and aggregated by the NDBON for reporting purposes. All available demographic information was used as well as certification type, practice type, and educational program attended. Zip codes were used for determination of Rural-Urban Commuting Area (RUCA) codes. These are a widely applied national geographic taxonomy based on city/town population (Census Bureau designation as an urban place/cluster) and on work commuting patterns. This taxonomy classifies locations into one of four categories: urban, large rural, small rural, and isolated rural. Urban areas are defined as those with a core city population of 50,000 or greater. Large rural areas have a population between 10,000 and 49,999; small areas are between 2,500 and 9,999; and isolated small rural areas have populations smaller than 2,500.<sup>2</sup>

Limitations with the licensure data include the self-reporting of information. Individuals did not always enter their educational information appropriately. Employer setting and employer practice area may have been misinterpreted by the individual as there are no clear definitions given in the document. Setting is defined as outpatient clinic versus inpatient facility, for example. Practice area is the specialty area in which the applicant might work such as family practice or cardiology. Zip codes were calculated in order to determine RUCA coding, as this was not available directly from the data.

The information reported in this section combines all roles and license types of nursing within the state. North Dakota has 18,396 licensed nurses<sup>1</sup>. There was a slight increase in total number of nurses (17,906) reported in the last biennial report. Those included LPN, RN, and the four APRN roles: Nurse Practitioner (NP), Certified Registered Nurse Anesthetist (CRNA), Certified Nurse Midwife (CNM), and Clinical Nurse Specialist (CNS). Total numbers for each role are delineated in Figure 6.1. The roles are all reported separately in later sections of this document.

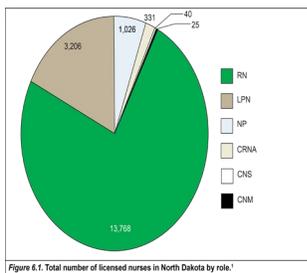


Figure 6.1. Total number of licensed nurses in North Dakota by role.<sup>1</sup>

Most (72%) of the nursing workforce in ND is employed full-time. Approximately 13% of nurses are employed part-time, about 10% are unemployed, 4% are per diem, and 1% are retired<sup>1</sup> (Figure 6.2). Per diem nurses are defined as nurses who are on the payroll, but who may not be regularly scheduled, are working flex-time or in an on-call status.

***“Most (72%) of the nursing workforce in ND is employed full-time.”***

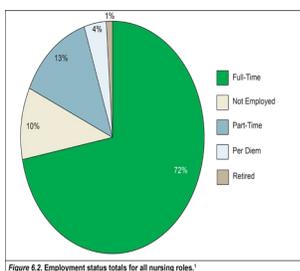
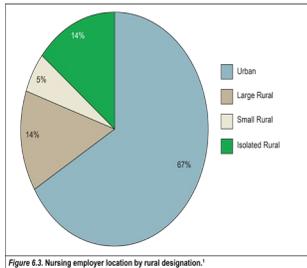


Figure 6.2. Employment status totals for all nursing roles.<sup>1</sup>

North Dakota is a very rural state with only four areas, encompassing six counties, in the urban classification. Approximately two-thirds of nurses licensed in North Dakota are employed in an area classified as urban. The remaining third are in rural areas. More nurses are employed in isolated or large rural areas than in areas with

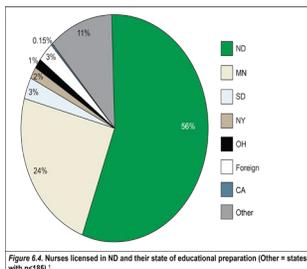
a small rural designation<sup>1</sup> (Figure 6.3). The distribution of the population of ND is 67% urban, 14% large rural, 14% isolated rural, and 5% small rural.

***“Approximately two-thirds of nurses licensed in North Dakota are employed in an area classified as urban. The remaining third are in rural areas.”***



Overall, North Dakota nursing programs have educated 56% of nurses currently licensed in the state. Minnesota nursing programs are a distant second with 24%. About 83% of ND nurses are educated regionally, defined as ND, MN, or SD (Figure 6.4).

***“Overall, North Dakota nursing programs have educated 56% of nurses currently licensed in the state.”***



## HOSPITAL AND NURSING FACILITY WORKFORCE SURVEY RESULTS

For this *Sixth Biennial Report*, the North Dakota Hospital Workforce Survey<sup>3</sup> results were included. It provides information on many aspects of the rural and urban hospital workforce as of December 2017. For the Fourth Biennial Report, the North Dakota Nursing Facility Workforce Survey<sup>4</sup> was performed. It provided new information on many aspects of rural and urban nursing facility workforce during September 2016. In this section, the results of the North Dakota Hospital Workforce Survey and the North Dakota Nursing Facility Workforce Survey are presented as related specifically to the nursing workforce. Information obtained from both surveys on other healthcare workforce types can be found in other chapters of this Biennial Report. An attempt was made in 2020 to repeat similar surveys to obtain and analyze more current workforce data. Due to the demands of the COVID 19 pandemic, it was difficult to obtain updated data from nursing facilities and hospitals due to a poor survey response rate. Efforts will

continue on resurveying North Dakota Nursing Facilities and Hospitals so that more current nursing workforce data can be reported in future *Biennial Reports*.

## **NORTH DAKOTA HOSPITAL WORKFORCE SURVEY**

North Dakota has 41 licensed and certified general acute care hospitals. There are currently 36 Critical Access Hospitals (CAHs) and 6 large urban-tertiary Prospective Payment System (PPS) hospitals. In December 2017, the Center for Rural Health performed a workforce survey of all of ND's CAHs and all but one PPS hospital. The Center for Rural Health staff modeled the questionnaire after one previously used in the state of Washington. The questionnaire was modified based on feedback from North Dakota key informants. The paper survey was emailed to all 41 hospital chief executive officers (CEOs) of hospitals who met the eligibility criteria. A response rate of 100% was received from the CAHs and 83% from the PPS hospitals.

The questionnaire included items regarding physicians, nurses, and hospital administrators. Additional questions were asked about workforce related issues. From the Survey, workforce information was calculated such as current provider-type-specific FTE employees; FTE positions being recruited; and provider-type-specific vacancy rates. Because of the abundance of North Dakota hospital workforce information garnered from the Survey responses, only a portion of it can be included in this Report. In this section, only nursing workforce information is presented.

### **Hospital Workforce Survey Limitations**

While the findings from the North Dakota Hospital Workforce Survey tell us much about the short-term general hospital nursing workforce, they may not be generalizable to all North Dakota nurses who may work in other settings such as nursing homes and physician offices.

Significant nursing shortages for the hospitals can be ominous for other employment situations because the hospitals are often able to provide higher wages and better job conditions than other employers. Systemic shortages of nurses across North Dakota hospitals are significant in and of themselves because of how they influence the provision of timely and quality healthcare. Caution needs to be taken in interpreting the data because some vacancy rates are based on small numbers of nurses, and many factors influence vacancy rates. For instance, nursing staff vacancy rates are influenced by hospital need, the salary hospitals are willing to pay, the availability of employed and unemployed nurses looking for positions, local community conditions and opportunities, the physical condition of the hospital, and working conditions. If a facility unsuccessfully recruits for an extended length of time, it may stop recruiting for the position and limit its services, and the vacancy rate may appear lower than it would be if there were an adequate supply of nurses.

Employees' information was requested in FTEs. Generally, this means that an FTE of 1.0 represents an employee working 40 hours a week. The actual number of individuals working for the nursing facility will be higher than the FTE count reported. For example, if two RNs are each working 20 hours a week (0.5 FTE each), it would

work out to one FTE, while the number of unadjusted individual employees would be two.

## Survey Findings

Figure 6.5 is a depiction of the number of FTE employees for each of the nursing staff types at North Dakota’s CAHs and PPS hospitals (both internal employees and external contract employees) in December 2017. By far, RNs (662.6/2861.6) and CNAs (276/740.3) are the most numerous types of nursing employees for CAHs and PPS hospitals. CAHs are located in rural areas, whereas, the PPS hospitals are located in urban cities. Overall, when compared to the other 35 CAHs, the 6 PPS hospitals together have a larger number of employees in all nursing staff types. The difference is due to the fact that CAHs provide fewer healthcare services, and average facility size is smaller than PPS hospitals. As a result, CAHs employ fewer nursing staff than PPS hospitals.

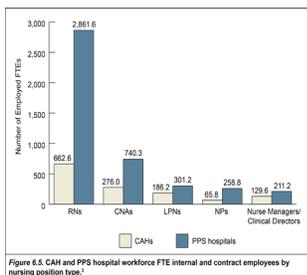
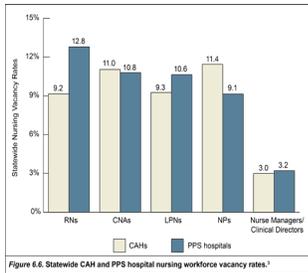


Figure 6.5. CAH and PPS hospital workforce FTE internal and contract employees by nursing position type.

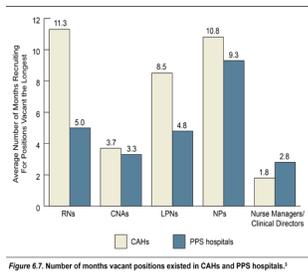
North Dakota’s December 2017 statewide vacancy rates for the nursing workforce at the CAH and PPS hospitals are presented in Figure 6.6. The statewide rates are calculated by dividing the FTEs currently being recruited for by the sum of the FTEs currently being recruited plus the currently employed FTEs for each nursing role. Generally, vacancy rates between 11% and above are considered high. Rates below 5% can indicate a tight and balanced labor market situation.

As seen in Figure 6.6, vacancy rates for some of the nursing workforce could be considered high at or above 11% including: RNs (12.8%) for PPS hospitals; CNAs (11%); and NPs (11.4%) for CAHs. Clearly, the large number of RN, CNA, LPN, and NP vacancy rates are concerning for the clinical care provided at the facilities. Vacancy rates are costly to both types of facilities because they may hire more expensive contracted nursing staff and pay current employees’ overtime to fill the vacant positions. CEOs were asked a general question whether or not vacant positions are regularly staffed by contract employees. Overall, most PPS hospitals and CAHs use contract RNs, CNAs, and LPNs to help fill vacant positions.

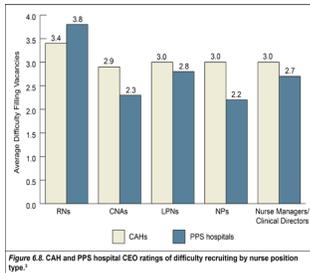
***“Clearly, the large number of RN, CNA, LPN, and NP vacancy rates are concerning for the clinical care provided at the facilities.”***



The CAH and PPS hospital CEOs were asked the number of months the facility spent recruiting for vacant nursing workforce positions that were vacant the longest. Figure 6.7 presents the average number of months spent recruiting for RNs, CNAs, LPNs, NPs, and Nurse Managers/Clinical Directors. For both CAHs and PPS hospitals, RN and NP vacancies are open the longest. Overall, CAHs located in rural areas have a greater problem recruiting for all positions, except for Nurse Managers/Clinical Directors. One reason could be that rural areas are less populated and therefore have fewer nursing personnel in the areas. Another reason could be that there are fewer nurses employed at each of the CAHs as compared to each of the PPS hospitals. Most likely some nurses in PPS hospitals after initial hire and over time transfer to open positions located in the same or other departments within the same PPS hospital. In addition, PPS hospitals are located in highly populated areas that are better located to recruit new graduates from the state’s nursing education programs. Most of the state’s nursing education programs with the largest number of graduates are located in urban areas.



CAH and PPS hospital CEOs were asked to rate the difficulty of recruiting each of their employee types along a four-point Likert-type scale (1-very easy, 2-somewhat easy, 3-somewhat difficult, and 4-very difficult). In Figure 6.8, nursing types are included wherein the mean ratings are shown comparing CAHs and PPS hospitals (on a four-point scale where 1 = very easy, 2 = somewhat easy, 3 = somewhat difficult, and 4 = very difficult). For both CAHs and PPS hospitals, CEOs reported that RN vacancies were the most difficult to fill.



## MEETING ND'S PRIMARY CARE NEEDS

***“A focus on recruiting of NPs should be emphasized by healthcare facilities to help meet the primary care needs of North Dakota’s residents.”***

All CAH and PPS hospital CEOs were asked to rate the difficulty of filling primary care physician vacancies along a four-point Likert-type scale (1-very easy, 2-somewhat easy, 3-somewhat difficult, and 4-very difficult). Out of the 26 CAHs (n=25/26 reporting) that employed physicians, the average difficulty was 3.72. The six PPS hospitals (n=4/6 reporting) that employ physicians reported an average difficulty of 3.5. As presented in Figure 6.8, both have less difficulty recruiting NPs. NPs can provide primary care and are an important member of the interprofessional healthcare team as they can assess and order diagnostic tests, diagnose, initiate, coordinate, and evaluate treatment plans and prescribe medications.<sup>5</sup> NPs can work independently under the exclusive licensure authority of North Dakota’s State Board of Nursing.<sup>5</sup> Therefore, a focus on recruiting of NPs should be emphasized by healthcare facilities to help meet the primary care needs of North Dakota’s residents.

### Survey Results Summary

The North Dakota Hospital Workforce Survey provides a snapshot of hospital workforce as of December 2017 that included data from all of North Dakota’s CAHs and five of six PPS hospitals. The findings show that vacancy rates are not excessively high. Rates are at 9.1 and higher for RNs, CNAs, LPNs, and NPs. Clearly, the higher vacancy rates can impact clinical care delivered at hospitals. CEOs reported some difficulty in filling vacant nursing staff positions; however, RN vacant positions are the most difficult to fill. Overall, the hospitals reported they currently employ 5693.3 nursing staff FTEs (not counting the vacancies). Many times, hospitals are one of the largest employers in North Dakota’s rural towns. In 2020, an attempt was made to survey North Dakota’s hospitals’ workforce. Due to the impact of the COVID – 19 pandemic, a poor completion rate was received impacting the results. As a result, the decision was made not to share those results in this report. In the future, North Dakota’s hospitals will be surveyed again. Future *Biennial Reports* are likely to include results from these updated survey results.

## **NORTH DAKOTA NURSING FACILITY WORKFORCE SURVEY**

In September 2016, the Center for Rural Health, in collaboration with the North Dakota Long Term Care Association, performed a workforce survey of all North Dakota nursing facilities. Please note there are other terms used in place of “nursing facilities” such as “nursing homes” and “long term care facilities.” The Center for Rural Health staff modeled the questionnaire after one previously used in the state of Washington. The questionnaire was modified based on feedback from North Dakota nursing facility CEOs, North Dakota Long Term Care Association staff, and the Center for Rural Health staff. The questionnaires were sent to all 81 rural and urban nursing facility CEOs who met the eligibility criteria. All 81 CEOs were asked to participate by filling out a mailed paper workforce questionnaire. The questionnaire included 20 questions, one of which involved asking for staffing information (e.g., number of full-time equivalent internal employees and contract employees, longest vacant position by employee types, and difficulty in recruiting by employee type for 24 nursing facility employee types). Other questions inquired about CEO turnover, employee turnover rates, difficulty recruiting and retaining nurses, external service contracting, and overtime and salary information. The data included in this *report* are for 95.1% of the nursing facility locations (78 of 81 locations).

### **Limitations**

While the findings from the 2016 North Dakota Nursing Facility Workforce Survey tells us much about the nursing facility workforce, they may not be generalizable to all North Dakota nurses such as RNs working in short-term hospitals, physician clinics, and other settings. Caution should be taken in interpreting the data findings because some vacancy rates are based on small numbers of employees (e.g., regional rates for employee types that are not numerous even at the state level). For example, regional and rural/urban vacancy rates for NPs should be viewed with caution because the North Dakota nursing facilities only employ 21.1 FTEs of NPs. Rates based on these small numbers may be misleading, but they do represent close to the North Dakota population of such nursing facility staff and vacancies.

Many internal and external factors influence vacancy rates. For instance, a nursing facility nurse vacancy rate is influenced by the salaries that other nursing facilities pay and the salaries being paid by other types of healthcare entities, which in turn influence the abundance and shortage of specific nurses along with many other factors. If a facility unsuccessfully recruits for a specific type of employee for an extended length of time, the facility may stop recruiting for the position and limit its services. This situation can result in misleadingly low vacancy rates.

### **Survey Findings**

North Dakota’s September 2016 statewide vacancy rates for the nursing workforce at the nursing facilities are presented in Figure 6.9. The statewide rates are calculated by dividing the FTEs currently being recruited for by the sum of the FTEs currently being recruited plus the currently employed FTEs for each nursing role.

Generally, vacancy rates between 11% and above are considered high. Rates below 5% can indicate a tight and balanced labor market situation.

As seen in Figures 6.9, vacancy rates for some of the nursing workforce are considered high at or above 11% including: NPs (19.2%) and RNs (13.1%). Vacancy rates for CNAs (8.9%), LPNs (10.5%), and Nurse Managers (4.1%) are not considered high. These vacancy rates translate into the following number of FTE vacancies (Figure 6.10): RNs (88.5), NPs (5), LPNs (86.1), Nurse Managers (10.9), and CNAs (299). Clearly, the large number of RN, LPN, NP, and CNA vacancy rates are concerning for the clinical care provided at nursing facilities. Furthermore, the nursing facility CEOs were asked about the duration in months of their longest vacant positions for which they were recruiting at the time of the survey for each of the employment types. The longest open vacancies of the employee categories were six months for RNs followed by LPNs at five months and CNAs at four months.

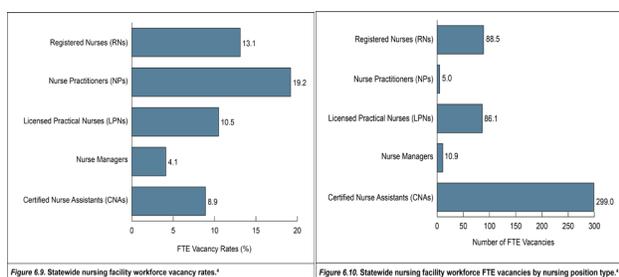


Figure 6.11 shows the number of FTE employees for each of the nursing staff types at the nursing facilities including both internal employees and external contract employees. By far, CNAs are the most numerous type of nursing facility employee with 3,077.1 FTEs. CNAs are a valuable member of the healthcare team because of their roles and responsibilities. CNAs provide the majority of the individualized personnel care to each nursing facility's resident.

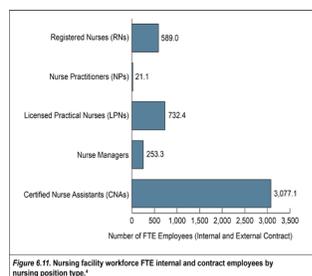
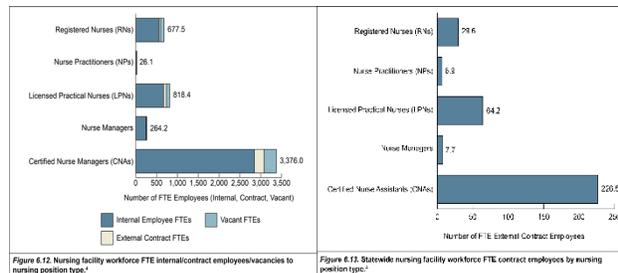


Figure 6.12 is more complex than the first three figures as it shows FTEs for the nursing staff types across three categories: 1) internal employees, 2) external contract employees, and 3) vacancies for which nursing facilities are recruiting nursing candidates to fill. External contract nurses are of special significance for two major reasons: 1) there is a near consensus among nursing facility CEOs that external contract nurses are often considerably more expensive than comparable internal nursing staff, and 2) they play an important role, especially for rural nursing facilities. For the nursing employee categories, not counting the external contract nurses as

vacancies understates the vacancy rates and potential local supply of employees. The FTE numbers of external contract nursing employees are listed in Figure 6.13. By far, the 226.5 FTEs of CNAs is the most numerous employee category. The nursing shortage financially impacts rural and urban nursing facilities. Even with the contract nursing employees, urban CEOs indicated that 4.9% of their salary expenditures for all employees were for overtime, while rural CEOs reported a much higher percentage at 8.3%. Most of the extra cost of overtime is associated with shortages of needed employees including nursing staff.

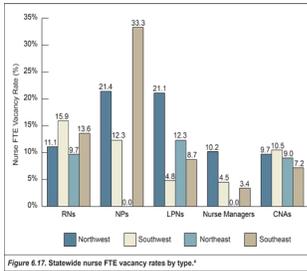
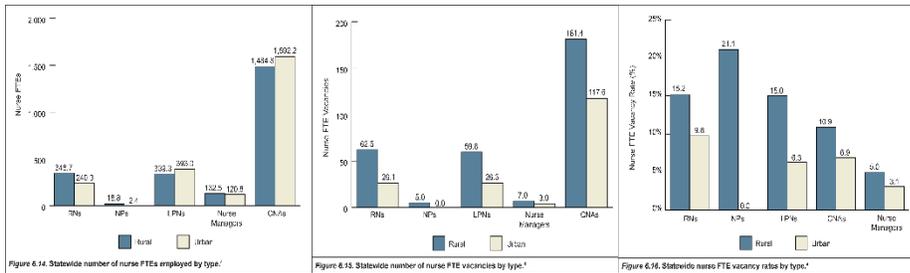


Examining the nursing facility workforce at the aggregated state level misses many of the important intrastate variations in factors such as vacancy rates. Figure 6.14 shows rural and urban differences in the numbers of employed FTEs for four types of nurses: NPs, RNs, LPNs, and CNAs. Neither rural nor urban nursing facilities employed many NPs, while both employ large numbers of CNAs. Fewer NPs than CNAs are required to provide clinical care at the nursing facilities. Overall, there were 2324.1 FTE nursing staff employed in rural facilities and 2,348.7 FTE nursing staff in urban facilities. The vacancies for the nurse staff types are illustrated in Figure 6.15. There were 489.6 FTE vacancies for the four types of nurses. There were far more FTE vacancies for rural nursing facilities (315.7 FTEs) than for their urban counterparts (173.9 FTEs). In fact, for each of the four nurse types, there were more rural vacancies than there were urban vacancies. The largest number of vacancies were for rural CNAs (181.4 FTEs).

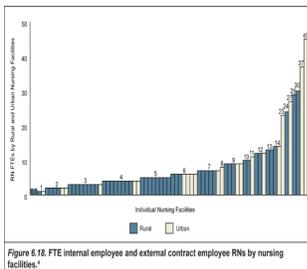
The FTE vacancy rate percentages for the nurse categories are displayed in Figure 6.16. For each of the four nurse types, the rural FTE vacancy rates were higher than for urban. The LPN FTE rural rate of 15% was more than twice as high as the associated urban rate. Clearly, rural nursing facilities are having a more difficult time recruiting and retaining the various types of nurses than is true for the urban facilities.

***“The largest number of vacancies were for rural CNAs.”***

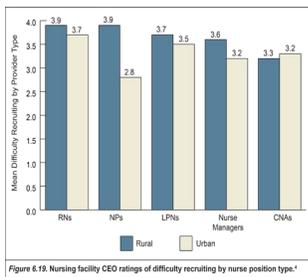
In Figure 6.17, North Dakota’s regional variations in vacancy rates for types of nurses are presented. The NP results in Figures 6.15, 6.16, and 6.17 should be considered with caution because of their low numbers (Figure 6.14). However, as compared to other nursing types, fewer NPs are necessary for providing clinical care at the nursing facilities. NP vacancy rate is highest in the southeast region and lowest in the northeast region. However, any rate of NP vacancies can greatly impact care. NPs are qualified to provide primary care to nursing facility residents. The lowest vacancy rate was found for LPNs in the Southwest and the highest vacancy rate was found for LPNs in the Northwest when disregarding vacancy rates for NPs and Nurse Managers.



Another way of assessing RN rural and urban FTE employment is illustrated in Figure 6.18. RN FTEs are shown for each of the nursing facilities and by their rural/urban status. The number of facility RN FTEs varies from 1 through 45. Urban facilities tend to employ more RNs, but there are some that are smaller and have relatively few RNs. The figure is a reminder that nursing facilities vary greatly in the number of RNs they employ.



All nursing facility CEOs were asked to rate the difficulty of recruiting each of their employee types along a four-point Likert-type scale (1-very easy, 2-somewhat easy, 3-somewhat difficult, and 4-very difficult). In Figure 6.19, nursing types are included wherein the mean ratings are shown comparing rural with urban. Nurses of various types were listed by urban CEOs as the most difficult to recruit 84.3% of the time, and they were listed among the three most difficult to recruit 90.5% of the time (the comparable percentages for rural are 84.3% and 100%). In another question, 84% of the rural CEOs reported that CNAs had the highest turnover rates of their employee types (urban 71.4%). In addition, when asked about their most significant recruitment problems, rural CEOs indicated, in order, the characteristics of their location, a small pool of local candidates, and low wages. Urban responses were predominantly related to a small pool of local candidates. Rural and urban CEOs agreed that wages were the most important obstacle to retaining personnel, including nursing staff.



## Survey Results Summary

The North Dakota Nursing Facility Workforce Survey provides a snapshot of nursing facility workforce as of September 2016 that includes data from nearly all of North Dakota’s nursing facilities. Nursing staff, including RNs, LPNs, NPs, Nurse Managers, and CNAs, are the largest group of employed healthcare workforce in North Dakota’s nursing facilities. Overall, CNAs are the largest nursing staff type employed by rural and urban nursing facilities. The findings show that the vacancy rates across the nursing position types are not excessively high. However, the vacancy rates for CNAs, RNs, LPNs, and NPs are concerning. Furthermore, these vacancy rates are higher in North Dakota’s rural areas than in the state’s urban areas. Higher nursing workforce vacancy rates can greatly impact clinical care received by residents at rural and urban nursing facilities. Nursing workforce shortage is also costly to nursing facilities because of the need to hire contract nursing staff and pay current nursing staff overtime to fill vacant positions necessary to provide care.

In 2020, an attempt was made to survey North Dakota’s nursing facilities. However, due to impact of the COVID – 19 pandemic, a poor completion rate was received impacting the results. As a result, the decision was made not to share those results in this report. In the future, North Dakota’s nursing facilities will be surveyed again. Future *Biennial Reports* are likely to include results from this updated survey.

Combining the 2016 North Dakota Nursing Facility Workforce Survey and the 2017 North Dakota Hospital Workforce Survey results, there are approximately 10,366.2 FTEs (4113.2 RNs, 1219.8 LPNs, 4093.4 CNAs, 345.7 NPs, and 594.1 Nurse Managers) employed at these hospitals and nursing facilities. Of interest to note is that overall there are more CNA FTEs employed than RN FTEs.

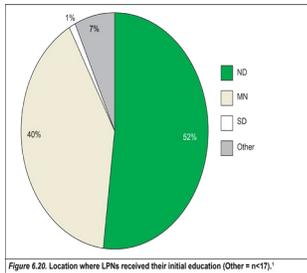
## NORTH DAKOTA’S LICENSED NURSING WORKFORCE BY ROLE

This section presents an overall view of North Dakota’s nursing workforce: Licensed Practical Nurses (LPN), Registered Nurses (RN), Nurse Practitioners (NP), Certified Registered Nurse Anesthetists (CRNA), Certified Nurse Midwives (CNM), Clinical Nurse Specialists (CNS), and Certified Nursing Assistants (CNA). Data is presented, summarized, and analyzed from the North Dakota Board of Nursing Licensure Data, and the 2018-2019 *North Dakota Board of Nursing Education Annual Report*.

## Licensed Practical Nurses (Licensed Vocational Nurses)

Licensed Practical Nurses or Licensed Vocational Nurses (LPNs/LVNs) work at North Dakota's various healthcare facilities, such as hospitals, clinics, assisted living and nursing facilities, including long term care and nursing homes. LPNs are important members of the interprofessional health care team and have certain roles and responsibilities while providing patient care. North Dakota's Standards of Practice Law states: each LPN is responsible and accountable to practice according to the standards of practice prescribed by the board and the profession. It is not the setting or the position title that determines a nursing practice role, but rather the application of nursing knowledge.<sup>6</sup> The LPN practices nursing dependently under the direction of the registered nurse, advanced practice registered nurse, or licensed practitioner through the application of the nursing process and the execution of diagnostic or therapeutic regimens prescribed by licensed practitioners.<sup>6</sup> The administration and management of nursing by the licensed practical nurse includes assigning and delegating nursing interventions.<sup>6</sup> Unlicensed assistive persons complement the licensed nurse in the performance of nursing interventions but may not substitute for the licensed nurse.<sup>6</sup> The licensed practical nurse practices within the legal boundaries for practical nursing through the scope of practice authorized in the Nurse Practices Act and rules governing nursing.<sup>6</sup> Due to a more limited scope of practice, LPNs are able to work in fewer areas of clinical practice than RNs. However, an adequate supply of LPNs is critical to providing care in certain settings such as clinics, ambulatory care centers, nursing facilities, and rural facilities that coincide with the LPN's scope of practice. As of December 2019, there were a total of 3,206 LPNs in North Dakota<sup>1</sup>. The number of North Dakota LPNs has decreased from 3,351 reported in the 2019 *Biennial Report*. In order to practice as an LPN, an individual must graduate from a practical nursing education program, pass the National Council Licensure Examination for Practical Nursing (NCLEX-PN) exam, and apply for licensure in the state. Most practical nursing graduates have earned either a certificate or an associate degree. The state's LPNs have obtained their initial education in several states. However, the majority of North Dakota's LPNs achieved their initial practical nursing education from North Dakota (52%) or Minnesota (40%)<sup>1</sup> (Figure 6.20). There are fewer LPNs than Registered Nurses (RNs) in the state since many LPNs continue their education to become RNs. Each year there are more students graduating from nursing education programs that are eligible to take the RN exam rather than the LPN exam. Increased salary, career advancement, and the desire to work in more areas of practice are reasons why an LPN may choose to become an RN. LPNs are an important member of the healthcare team, especially in rural areas and at nursing homes. More measures and policies must be implemented to retain more LPNs from other states such as Minnesota.

***“LPNs are an important member of the healthcare team, especially in rural areas and at nursing homes.”***



## North Dakota's Practical Nurse Education Programs

North Dakota currently has seven NDBON-approved practical nurse education programs.<sup>7</sup> One of these programs is located at a tribal college (i.e., Sitting Bull College). Four of the state colleges collaborate and are part of the Dakota Nursing Program (Bismarck State College, Dakota College at Bottineau, Lake Region State College in Devils Lake, Williston State College). In addition, the Dakota Nursing Program has several distance sites located throughout the state. The remaining two programs are located at Dickinson State University and North Dakota State College of Science. Graduates earn either an associate degree or certificate in practical nursing specific to the program.<sup>7</sup> Graduates from all programs can apply to take the NCLEX-PN examination to become LPNs. Table 6.1 provides information on total enrollment, admissions, and graduates for these programs over the past 5 years.<sup>8</sup> Most of these programs are located in rural areas with the goal of increasing access to individuals for obtaining their practical nursing education. Overall, the programs have attempted to increase enrollment and admissions to assist in decreasing the state's and their rural community's nursing shortage (Table 6.1). A possible explanation for a decrease in graduates was the closing of the practical nursing programs at Fort Berthold Community College in fiscal year 2014-2015, Turtle Mountain Community College in fiscal year 016-2017, and United Tribes Technical College in fiscal year 2018-2019.<sup>8</sup>

Efforts to alleviate the rural and urban nursing shortage must include support for the state's practical nursing programs. High school students and community members should be encouraged to pursue a practical nursing education and remain in the state after graduation to practice as an LPN. The state's nursing education programs could consider giving priority to the state's residents for admission to their programs thereby increasing enrollment numbers in these programs to meet the current demand. Providing incentives for graduates to practice as LPNs in the state could have a positive impact on the state's LPN vacancies. For example, in fiscal year 2018-2019, the state's nursing programs graduated 199 practical nursing graduates which was a decrease from the 225 graduates in fiscal year 2017-2018 (Table 6.1). Based on the 2016 North Dakota Nursing Facility Workforce Survey, the facilities reported 86.1 LPN FTE vacancies (Figure 6.10) and the remaining graduates could help fill the CAHs and PPS hospital LPN vacancies (Figure 6.6).

**Table 6.1**  
North Dakota's practical nurse program 5 year trends.<sup>1</sup>

Practical Nursing Program Trends	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018	FY 2018-2019
Program Admissions	223	267	275	300	305
Total Enrollment	346	358	379	419	417
Graduate Certificate Program Graduates	97	91	92	132	138
Associate Degree Program Graduates	78	79	55	93	61
Total Graduates	175	170	147	225	199

Information provided is from the 2018-2019 NDSN Nursing Education Annual Report

## LPN Employment Settings

North Dakota's LPNs have identified several areas where they currently practice (Figure 6.21). Practice areas are a part of the healthcare facility or employment setting and a facility can have several practice areas. The largest number of LPNs (1,321) identified the area "other" as their main practice area. The area of geriatrics was identified as the second most common area of practice (733 LPNs).<sup>1</sup> A large number of LPNs practice in geriatrics since many are employed at nursing facilities. It is difficult to determine what practice areas make up the "other" areas.

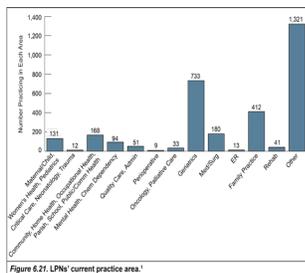
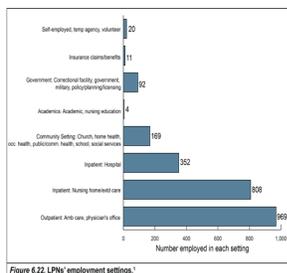
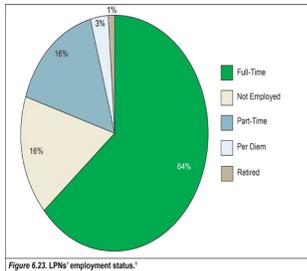


Figure 6.22 illustrates the employment setting for North Dakota's LPNs. Employment setting is related to the specific type of healthcare facility. The majority of LPNs practice at inpatient facilities – nursing homes and hospitals (1,160) with nursing homes being the highest employer at 808 LPNs with the remaining 352 LPNs employed at hospitals. Outpatient facilities were second to inpatient facilities at 969 LPNs, followed by community settings at 169.<sup>1</sup>

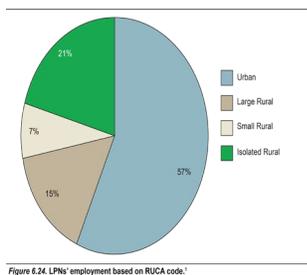


The state's LPNs vary in employment status as either full-time, part-time, not employed, retired, or per diem. (Figure 6.23). Most indicated that they are working full-time (64%) in their current practice. However, 16% LPNs are not employed (same as those employed part-time), adding further to the nursing shortage. Retired LPNs include

1% of nurses who are not working, but still maintain their license.<sup>1</sup> Further studies should explore the reasons why the LPNs choose not to be employed and/or maintain a license as a retired LPN. Reemployment of these licensed LPNs could help decrease the state's LPN vacancies



LPNs identified the city in which they are employed. Based on this information, the LPNs were assigned a rural-urban commuting area (RUCA) code classification to identify which category (urban, large rural, small rural, or isolated rural) they are employed in practice. The majority of LPNs (57%) are working at a facility that is considered urban based on the assigned RUCA code and 43% of the LPNs are employed in a rural area (Figure 6.24).<sup>1</sup>



LPNs can apply for licensure in more than one state so that they can concurrently practice in several states. The LPN may choose to have more than one license because he or she lives on a state border, works under contract, or maintains a residence in more than one state. As of December 2019, the majority of the state's LPNs (94.36%) are licensed exclusively in North Dakota<sup>1</sup> (Table 6.2). LPNs that maintain multiple licenses could be contract nurses working at various rural and urban healthcare facilities. Rural and urban facilities often hire contract LPNs to help fill vacant positions.

Number of States Licensed	Frequency	Percent
1	3,027	94.4
2	159	5.0
3	13	0.4
4	4	0.1
5 or more	5	0.2

## Other LPN Demographics

Although the majority (13.1%) of the North Dakota's LPNs are in the 25-29 age group, the average age of the state's LPNs is 44 years old (Figure 6.25). The state's LPNs are aging, with 20.5% of LPNs reporting their age at 60 years and older.<sup>1</sup> It appears some LPNs are working during their retirement years, but their retirement could be further contributing to the state's nursing shortage. Further studies are needed to explore reasons LPNs continue to work when they are eligible for retirement and find ways to meet the workforce needs of the older LPN so that they can maintain employment as long as possible and assist with filling vacant positions.

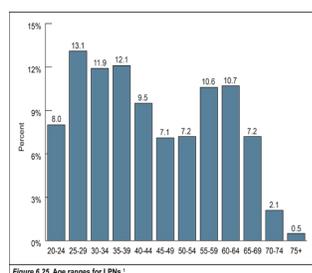


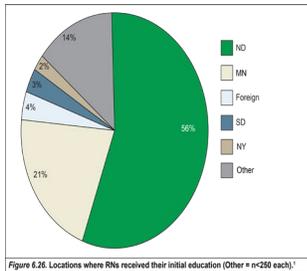
Figure 6.25 Age ranges for LPNs.<sup>1</sup>

## Registered Nurses

Registered Nurses (RNs) work at North Dakota's various healthcare facilities, such as hospitals, clinics, assisted living and nursing (long term care, nursing homes) facilities. RNs are important members of the interprofessional health care team and have certain roles and responsibilities when providing patient care. North Dakota's Standards of Practice Law states: each RN is responsible and accountable to practice according to the standards of practice prescribed by the board and the profession.<sup>9</sup> It is not the setting or the position title that determines a nursing practice role, but rather the application of nursing knowledge.<sup>9</sup> Through the application of the nursing process, the RN practices nursing independently and interdependently.<sup>9</sup> RNs also practice nursing dependently through the execution of diagnostic or therapeutic regimens prescribed by licensed practitioners.<sup>9</sup> The administration and management of nursing by RNs includes assigning and delegating nursing interventions that may be performed by others.<sup>9</sup> The RN practices within the legal boundaries for nursing through the scope of practice authorized in the Nurse Practices Act and rules governing nursing.<sup>9</sup>

As of December 2019, there were a total of 13,768 licensed RNs in North Dakota.<sup>1</sup> This is an increase from 13,306 RNs reported in the *2019 Biennial Report*. In order to practice as an RN, an individual must graduate from an approved nursing education program, pass the National Council Licensing Examination for Registered Nurses (NCLEX-RN) exam, and apply for licensure in the state. Several initial registered nursing education degree options exist. Most nursing graduates eligible to take the NCLEX-RN exam have initially earned either a diploma, associate degree, or a bachelor's degree prior to licensure. Some RNs, after receiving an associate degree, will continue their education and earn a bachelor's degree. After becoming licensed as

an RN they can pursue additional education necessary for their area of practice such as earning a master’s degree and doctorate degrees (PhD – Doctor of Philosophy, DNP – Doctor of Nursing Practice). North Dakota’s RNs have obtained their initial nursing education in many states. The majority of the state’s RNs earned their degrees in North Dakota (56%) followed by Minnesota (21%), and various other states. In addition, some of the states in which larger numbers of RNs were initially educated include a foreign country (4%), South Dakota (3%), New York (2%), and Other (14%) states<sup>1</sup> (Figure 6.26).



### North Dakota’s Registered Nurse Education Programs

North Dakota currently has 14 NDBON-approved registered nurse education programs.<sup>10</sup> All graduates are eligible to take and pass the RN NCLEX exam required for initial RN licensure. Four of the state colleges collaborate and are part of the Dakota Nursing Program (Bismarck State College, Dakota College at Bottineau, Lake Region State College, and Williston State College) in which students graduate with an Associate Degree. In addition, the Dakota Nursing Program has distant sites located throughout the state in mostly rural areas associated with each of the four colleges. The North Dakota State College of Science also offers an Associate Degree. Other state universities offer a Bachelor of Science (BSN) (Baccalaureate) degree and include Dickinson State University, Minot State University, North Dakota State University (NDSU), NDSU Nursing at Sanford Health, and the University of North Dakota. Concordia College, located in Moorhead, MN, offers a Bachelor of Science (Baccalaureate) degree. There are three private universities/colleges that offer a Bachelor of Science (Baccalaureate) degree: University of Jamestown, University of Mary, and Rasmussen College.<sup>10</sup> Table 6.3 provides information on total enrollment, admissions, and graduates for these programs over the past 5 years. Fort Berthold Community College closed its Associate Degree nursing program fiscal year 2014-2015.

***“Efforts to alleviate the rural and urban nursing shortage must include support for the state’s registered nursing programs.”***

The Baccalaureate graduate data (Table 6.3) includes some RNs already practicing who earned a previous diploma or Associate Degree prior to their initial RN licensure. While total enrollment overall has varied in the Baccalaureate and Associate Degree programs the past 5 years, the total number of graduates has steadily



Figure 6.28 illustrates the employment setting for North Dakota’s RNs. Employment setting is related more to the actual type of healthcare facility. Like LPNs, the largest employer for the state’s RNs is the inpatient facilities (hospitals and nursing homes) at 6,551.<sup>1</sup> However, unlike the LPN workforce most RNs identified that they work in hospitals (5,496) with nursing homes (1,055) included in the rest of the inpatient facility total.<sup>1</sup> One reason that more RNs are employed in hospitals versus nursing homes is that the overall patient acuity is found to be higher in hospitals. The RN legal scope of practice/license allows them to care for higher acuity patients compared to LPNs. Of interest is that outpatient settings (ambulatory care, clinics) (1,926) were identified by RNs as the second most common employment setting.<sup>1</sup> These findings are expected because of the increased utilization of clinics and outpatient settings for patient care.

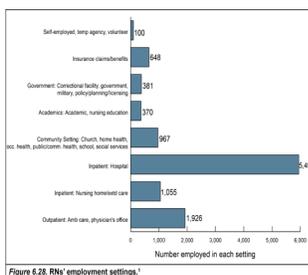


Figure 6.28: RNs' employment settings.<sup>1</sup>

The state’s RNs vary in employment status as either full-time, part-time, not employed, retired, or per diem (Figure 6.29). Most indicated that they are working full-time (73%) in their current practice. More RNs are working full-time as compared to LPNs (64%). Of interest to note is that 9% of the state’s RNs are not employed and 13% are working part-time exacerbating the nursing shortage. Retired RNs include 1% of nurses who are not working, but still maintain their license.<sup>1</sup> Further studies should explore reasons why the RNs choose to not be employed, work part-time, volunteer, and maintain a license as a retired RN.

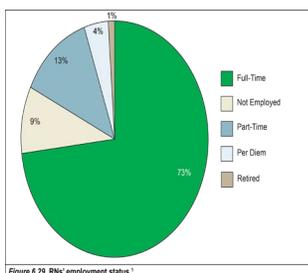
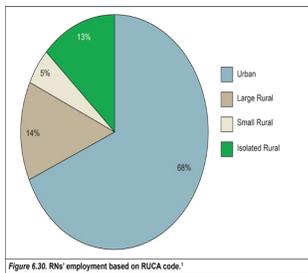


Figure 6.29: RNs' employment status.<sup>1</sup>

RNs identified the city in which they are employed. Based on this information, the RNs were assigned RUCA codes classification to identify which category they are employed in practice. The majority of RNs (68%) are working at a facility that is considered urban based on the assigned RUCA code. The remainder work in one of the rural areas (32%)<sup>1</sup> (Figure 6.30).

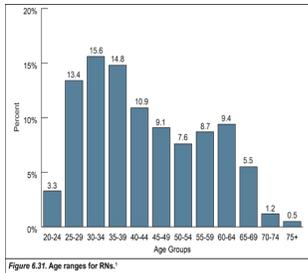


RNs can apply for licensure in more than one state so that they can concurrently practice in several states. The RN may choose to have more than one license because he or she lives on a state border, works under contract, or maintains a residence in more than one state. As of December 2019, the majority of state RNs (85.71%) are licensed exclusively to practice in ND (Table 6.4). 1,074 RNs are licensed to practice in two states which may represent nurses located on ND's borders. Note that 4.54% RNs maintain a license in 5 or more states.<sup>1</sup> RNs that maintain multiple licenses could be contract nurses hired and working at various rural and urban ND healthcare facilities. There is a movement toward RN licensure compact agreements. This would require RNs to be licensed in their home state but could practice in any state included in the compact agreement. Currently, there are thirty-four states signed into the compact agreement. This trend could eventually contribute to less RNs with multiple state licenses and may provide a better picture of the RN's "home state." North Dakota is one of the current compact members.<sup>11</sup>

Number of States Licensed	Frequency	Percent
1	11,316	85.7
2	1,074	7.8
3	203	1.5
4	62	0.5
5 or more	331	4.5

## Other RN Demographics

The majority of state's RNs are in the age range of 30 - 34 years (15.6%) (Figure 6.31). The average age of the state's RNs is 43.3 years old. The state's RNs are aging with 16.6% of RNs reporting their age at 60 years and older.<sup>1</sup> It appears RNs are working in their retirement years, but could retire soon, further contributing to the state's nursing shortage. Further studies are needed to explore the reasons RNs continue to work when they eligible for retirement and ways to entice the older RN to maintain employment as long as possible to help fill vacant nursing positions.

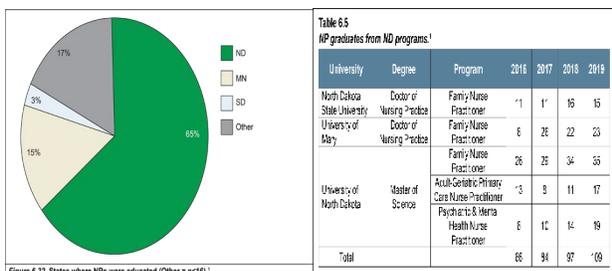


## Nurse Practitioners

Nurse Practitioners (NP) have been recognized as providing care to patients in the United States since 1965. Currently, NPs must have the following: a bachelor's degree in nursing, pass state RN licensing exams, have a minimum of one-year experience as an RN, and then complete either a Masters or Doctorate of Nursing Practice degree. Upon completion of this degree, the RN must pass a national certification exam to be licensed and practice as an NP. According to the American Association of Nurse Practitioners, "NPs assess patients, order and interpret diagnostic tests, make diagnoses, and initiate and manage treatment plans, including prescribing medications."<sup>14</sup> NPs can work in primary care, specialty care, inpatient, outpatient, and many other practice areas. NPs can work independently in many states, including North Dakota, and are a significant addition to many interprofessional healthcare teams.

There are currently 290,000 NPs licensed in the U.S.<sup>12</sup> Approximately 30,000 new NPs complete their graduate degrees per year. 90% of NPs are certified in a primary care area, 83% accept Medicare patients, and 80% accept Medicaid patients.<sup>12</sup> NPs hold prescriptive authority, including controlled substances in all 50 states and Washington, D.C.<sup>12</sup> NPs provide increased access to primary care, especially with rural and underserved populations.

There are currently 1,016 NPs licensed in ND, an increase of 163 since the 5<sup>th</sup> biennial report. North Dakota has three schools with accredited NP programs, two with Family Nurse Practitioner (FNP) and one with Adult-Geriatric Primary Care Nurse Practitioner (AGPCNP) and Psychiatric Mental Health Nurse Practitioner (PMHNP) programs in addition to an FNP program (see Table 6.5). Of the currently licensed NPs in ND, 65% were educated within the state, a 1% decline from the last report. 85% of NPs licensed in ND were educated regionally – including ND, SD, MN, MT, NE, WY, and IA, again a 1% decline from the last report. Only 2 NPs were listed as educated outside the U.S. (see Figure 6.32).



University	Degree	Program	2016	2017	2018	2019
North Dakota State University	Doctor of Nursing Practice	Family Nurse Practitioner	1	1	16	15
University of Mary	Doctor of Nursing Practice	Family Nurse Practitioner	6	26	22	23
		Family Nurse Practitioner	26	25	34	35
University of North Dakota	Master of Science	Adult-Geriatric Primary Care Nurse Practitioner	3	3	11	17
		Psychiatric & Mental Health Nurse Practitioner	6	10	14	19
Total			66	94	97	109

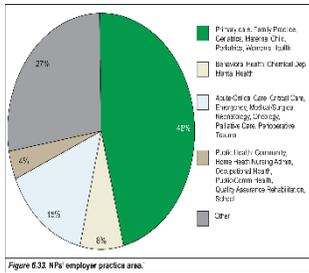
Evidence has shown that RNs who are established in a rural area and return to school to become NPs tend to go back to their home areas to practice after graduation.<sup>16</sup> North Dakota currently has three colleges or universities that offer the nurse practitioner graduate degree. Limitations on enrollments to NP educational programs are a nationwide problem. This is primarily due to lack of qualified faculty and availability of clinical preceptors.

***“In ND currently 40% of nursing faculty are over age 51, with 18% over age 61.”***

Retirements in the next ten years will compound an already detrimental faculty shortage. The shortage is also impacting future nursing workforce with 35% of RNs seeking NP training out of state. Many of these who attend school out of state may then be recruited by out of state facilities. Some of these RNs will attend primarily online schools, but still need to have a preceptor near their home to meet requirements of their NP program. The availability of preceptors, and the willingness of healthcare facilities to accept students will limit the number of NP graduates.

Healthcare facilities across the nation are constantly overwhelmed with healthcare students needing preceptors and clinical hours. This has led to the necessity of forming internal processes or even departments for management of student scheduling within many healthcare systems. In turn, this creates a bottleneck for enrollment and progression of NP students through their curriculum. This occurs in ND as well; primarily in our larger urban centers. Programs not associated with a medical system are reliant upon the good will and voluntary efforts of providers and their institutions to allocate time for student experiences as NP programs do not have the funding to pay preceptors. In some areas of the U.S., the healthcare facilities require payment, this can fall to the NP program or the student which can be prohibitive.<sup>17</sup> Some states have started providing monies or incentives to preceptors and healthcare facilities. Ultimately, the NP programs are limited in how many students can be placed in certain areas of the state at any given time due to these parameters set by healthcare facilities.

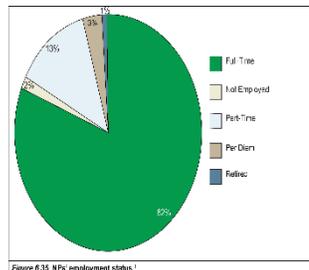
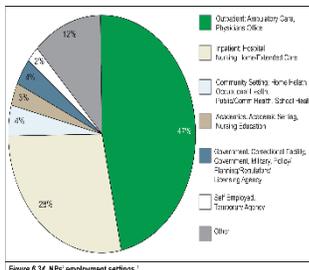
The NP role was originally developed to increase the numbers of primary care providers. Several specialties of NPs have evolved over the past 50 years so registered nurses could be trained in a particular NP specialty area. Additionally, many primary care NP designations such as Family Nurse Practitioner or Adult and Geriatric Nurse Practitioner may also lend themselves to specialty practice. This occasionally depends on job availability within the NP's home area. Many primary care NPs are either choosing or are involuntary taking positions outside of primary care due to lack of NP primary care positions. This trend is most seen in more urban areas, both in North Dakota and in the U.S.<sup>18</sup>



46% of NPs licensed in ND are working in primary care areas such as family practice, geriatrics, maternal/child, pediatrics, or women’s health. This is a significant decrease since the last biennial report (drop of 21%), however, there was not an “other” category reported in the last report. Certification in primary care has also dropped from 93% to 85%.

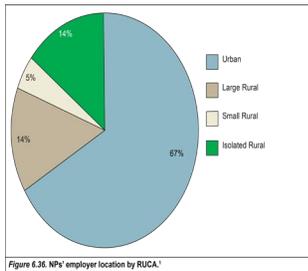
***“Interestingly, though 85% of NPs in ND are certified in a primary care population, just over half of those report working in a primary care practice area.”***

Again, this may be due to a change in data collection but there is no definitive answer at this time. However, larger healthcare systems across the state tend to employ primary care certified NPs in specialty areas more frequently than in primary care areas, so this may be contributing. NPs in acute specialty care comprise 15% of ND licensed NPs, 8% work in behavioral health, and 4% in a public health practice (see Figure 6.33). Additionally, 47% of NPs practice in an outpatient setting (decrease by 6% since last report), 28% inpatient or long-term care (3% decrease), and the remainder in a community, government, academic setting, or other (see Figure 6.34). These changes can be partially attributed to the change in data gathering by the ND Board of Nursing that now includes an “other” category for the employment setting.

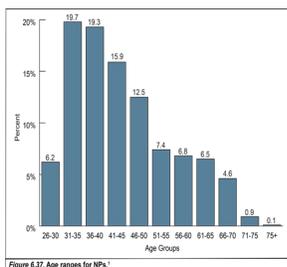


NPs in ND are primarily (82%) employed full-time, an increase of 3% from the last report, 16% are part-time or per diem (flex time), and 3% are unemployed or retired (see Figure 6.35). With such a high demand for NPs, especially in rural primary care areas, it is not uncommon to see such a large component of NPs employed full-time. With the dataset as is, the NPs can only allot for their primary position. The part-time and per diem NPs could likely have multiple positions potentially equivocal to full-time status yet not have the ability to specify at this time. Retired and unemployed NPs were included here as they are still maintaining their license and certification.

Many times, these NPs may still contribute through short-term assignments, volunteer status, or other means of providing care.

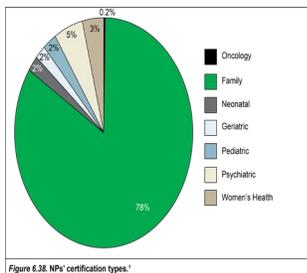


North Dakota NPs are largely urban (67%) as most large healthcare facilities are in the four urban hubs of ND (see Figure 6.36). There was a slight shift in percentage of NPs in the rural/urban areas of ND. Isolated rural decreased from 16% to 14% and small rural increased by 1%. This could be as much related to fluctuations in rural/urban designations as to numbers of NPs. Nationwide, states with full practice authority for NPs demonstrate 21.4 NPs per 100,000 population in rural areas and 13.9 NPs per 100,000 population in the urban areas of these states.<sup>19</sup> North Dakota deviates from this pattern showing 88 NPs per 100,000 population in rural areas and 177 per 100,000 population in urban areas.<sup>20</sup> With ND being an extremely rural state, even NPs practicing in urban areas are rural serving. The National Sample Survey of Nurse Practitioners showed 74.2% of NPs practice in urban areas, 7.42% in large rural, 3.34% in small rural, and 2.1% in isolated rural.<sup>19</sup> North Dakota's percentages in rural areas are about double. North Dakota NPs are leading the nation in their service to our rural communities. NPs can practice independently and do so in their rural home areas.<sup>16</sup>



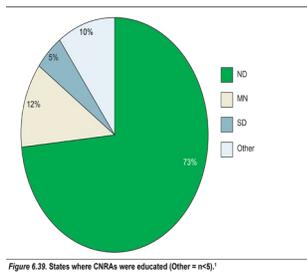
The average age of the ND NP is 44 years, a decrease by .5 from the last report (see Figure 6.37). This is just slightly above the aggregate of 43.9 years. As with other nursing roles, NPs have a higher percentage of licensed providers in the younger age groups with 55% between the ages of 31 and 45. There are a few possible explanations for this, such as the NP profession was not officially recognized until 1965 and is still working on becoming mainstream with only 22 states having a full scope of practice. The lower numbers of less than 30-year-old NPs could be due to the fact that in addition to the BSN at least one year of experience is required for most NP educational programs. Typically, the youngest any NP could be, if following a traditional path and moving quickly through the process would be 25.

Most ND NPs are certified as Family Nurse Practitioners (78%) (see Figure 6.38). The heavy reliance on family NPs in ND is likely due to the ability to care for patients across the lifespan, and it is most cost effective to employ one provider who can care for all ages than multiple limited scope providers. However, the adult-geriatric certification is becoming more of a necessity as are the psychiatric-mental health NPs. The numbers of each certification type are relatively stable with just a 1% decrease in family and neonatal, and 1% increase in psych-mental health certified NPs. Adult and geriatric NPs tend to care for patients with more chronic issues and residents in long-term care facilities. PMHNPs can work with patients having behavioral health issues both inpatient and outpatient, and typically children through elderly. While Family NPs can certainly care for all ages with chronic and acute illnesses as well as prevention, the adult-geriatric and psych NPs are needed for the high-acuity patients and to consult with our primary care providers in ways to best treat these types of patients.



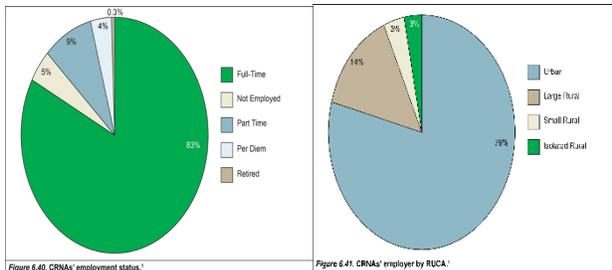
### Certified Registered Nurse Anesthetists (CRNAs)

CRNAs are advanced practice registered nurses who administer anesthetics to patients undergoing procedures needing anesthesia and/or pain management. These services include pre-anesthesia evaluation, administering the anesthetic, monitoring and interpreting the patient's vital signs, and managing the patient throughout the procedure.<sup>21</sup> CRNAs practice in multiple settings including hospitals, ambulatory surgical centers, and outpatient offices.<sup>21</sup> CRNAs are oftentimes the sole anesthesia providers in rural settings. North Dakota currently has 331 licensed CRNAs. 73% of the CRNAs licensed in ND were educated at the University of North Dakota, in the state's sole anesthesia education program. Overall, 90% of CRNAs are educated within the region including ND, SD, and MN (see Figure 6.39)

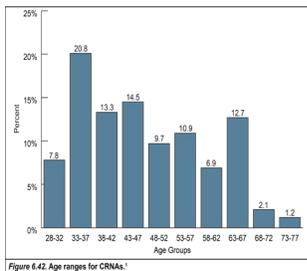


The University of North Dakota has the state's sole CRNA educational program. This program transitioned to the Doctorate of Nursing Practice (DNP) degree, with the first cohort of DNP prepared CRNAs graduating in 2021. The program typically graduates 12-15 new CRNAs yearly, as reflected in the most recent NDBON education report.<sup>8</sup> Per the licensure data gathered from the NDBON, 92% of CRNAs licensed in ND are currently working in anesthesia, the remainder reported critical care, mental health, or other for practice area. 85% of the CRNAs licensed in ND work in a hospital setting, 4% are in ambulatory care, 3.6% are self-employed, the remainder are in an educational setting or "other." Most CRNAs are employed full-time (83%), 13% are employed part-time or per diem, and 3% were unemployed at the time of licensure renewal (see Figure 6.40).

Most CRNAs are hospital-based with the majority located in an area designated as urban (79%) (see Figure 6.41). However, CRNAs are typically the sole anesthesia provider in rural locations throughout the U.S. 18.6% of CRNAs nationwide practice in rural counties whereas only 8.4% of anesthesiologists do so.<sup>22</sup> As compared to the nation, a higher percentage (20%, 2% decrease from last report) of the CRNA workforce is in rural locations of ND, access to anesthesia services are still a possibility at some rural facilities.



As with other APRN types, RNs need experience and additional education prior to being eligible to practice as a CRNA. This is likely the reason that there are no CRNAs under the age of 28 in ND. The average CRNA age is 47 currently, a decrease by .5 from last report (see Figure 6.42). There is slightly less variability in the lifespan of the CRNA as compared to the overall RN or NP workforce. This may be due to the higher percentage of male nurses that move into the CRNA ranks who continue employment throughout their careers versus women who tend to stop working or go to part-time status for parts of their careers due to childbirth and child rearing.



## **Certified Nurse Midwives (CNMs)**

CNMs are licensed, independent health care providers with prescriptive authority in all 50 states, they are designated as primary care providers under federal law.<sup>23</sup> As with all APRN types, CNMs are RNs with additional didactic and clinical education and a national certification. CNMs attend births, provide reproductive care, and primary care for the childbearing woman. CNMs attend births in hospital settings, stand-alone birthing centers, and in the home setting.<sup>23</sup> There are currently only 30 CNMs licensed in ND (40% increase since last report), 13 are employed in an ambulatory setting or physician's office, 10 are hospital-based, the remaining 7 are employed in nursing education, community health, or a government setting. All but two of the CNMs are currently employed, 80% full-time, 13% part-time. It is important to note that, though CNMs are qualified and licensed to attend labor and deliveries, it is estimated that only 1/3 of the state's CNMs are in positions that include this privilege. 11 of 30 CNMs list ND as the state where they received their education. Overall, 87% were educated in the region for some part of their nursing training including ND, SD, MN. There is currently no CNM educational program available in ND. 35% of the CNMs are employed in an area designated as rural, this is the highest rural percentage of all APRN types in ND. The average age of CNMs licensed in ND is 48, a decrease of two years from the last report.

While it is true that obstetricians and some family practice physicians also provide perinatal care and assist with deliveries, it is a detriment to the women of this state to not have more CNMs available. CNMs provide holistic care during pregnancy and the labor/delivery process. They are known for less invasive techniques and innovative methods of pain management during labor and delivery. There are currently 40 obstetricians in ND, all in the major urban centers.<sup>24</sup> As the numbers of family practice physicians providing obstetric services in rural areas continues to dwindle, women will be faced with difficulties such as driving an hour or more to see a provider during their pregnancy, or even the need to re-locate during the later stages of pregnancy to be nearer a delivering facility. If rural areas are to sustain a younger population, then pregnancy and delivery care is a definite need area in ND.

## **Certified Nurse Specialists (CNS)**

CNSs are APRNs who are certified in a specific area. This could be a population such as adult/geriatric or pediatric, a setting such as ER or critical care, a disease/type of problem/type of care like diabetes, pain, or psychiatry. CNSs work in three spheres of influence, clinical expertise, nursing practice, and system innovation. They can provide direct patient care, teach nurses and staff, act as a consultant for nurses/staff/other providers, lead evidence-based projects, and assist other providers with direct patient care. CNSs can prescribe either independently or collaboratively in 39 states.<sup>25</sup> North Dakota has 45 licensed CNSs, over half of whom are employed in a mental health practice setting. Roughly half of the CNSs in ND work in a hospital or ambulatory care setting, with the remainder in academics, government facility, or "other." 71% of CNSs are employed full-time, 24% part-time or per diem, the remainder are unemployed. CNSs are largely employed in urban areas of the state (67%), this is roughly reflective of the aggregate. 34 of the 45 CNSs were educated in ND. There is

no longer a CNS educational program in ND, the UND adult-geriatric CNS program having closed within the past 6 years. CNSs can be certified in multiple areas, as can NPs. In ND 58% of the licensed CNSs are certified as psychiatric, providing much needed behavioral health care, many at the human service centers and inpatient facilities. 29% of CNSs in ND are certified as adult or geriatric providers. Most of these providers work in hospital settings and/or long-term care. The average age of CNSs in ND is 59, an increase by 1 from the last report. The CNS role is also under-utilized in ND. With the aging population and dire shortage of behavioral health providers, the state could benefit from increasing CNSs in these specialties. Primary care providers are over-burdened and not always able to provide the level of care needed for these two populations. CNSs could fill this gap.

### **ND Nurses Compared with Nationwide Statistics**

North Dakota is one of the top six states for the ratio of nurses per 100,000 working-age population at 1450-1820.<sup>26</sup> North Dakota currently has between 441-603 LPNs per 100,000 working-age population.<sup>26</sup> Nationwide numbers are difficult to obtain, the most recent being reported during the 2008-2010 timeframe. During this time there were 921 RNs per 100,000 and 225 LPNs per 100,000 in the U.S. This data does not consider FTEs (e.g., includes RNs licensed but not working or working part-time). In addition, differences between the needs of rural and urban areas of the states are not considered.

APRNs are typically looked at separately from RNs and LPNs and also by the particular type of APRN when assessing workforce. The Bureau of Labor Statistics identifies that North Dakota is among the states with the lowest total number of employed CRNAs, however there is no comparison for population ratios. There are over 42,000 CRNAs spread throughout the U.S., with heavier distributions in the southeast and urban areas.<sup>20</sup> Unfortunately, there are only 6,530 CNMs employed throughout the U.S. This data is not entirely accurate, however, as there are none listed as employed in ND. Again, unequal distribution is seen with heaviest employment of CNMs on the coasts.<sup>20</sup> CNSs are not currently measured by the Bureau of Labor Statistics, so there is not a current means of comparison.

The data on NPs from the BLS is not complete when compared to other sources. There has been more updated data collection from the American Association of Nurse Practitioners, as used here for comparison purposes. As of 2020, there were 290,000 certified NPs in the U.S. with a mean age of 49.<sup>12</sup> Family NPs make up 65.4% of the overall NP population. Overall, 89.7% of NPs are certified in an area of primary care and 69% of all NPs practice in a primary care area.<sup>12</sup> There continues to be a maldistribution of NPs in the U.S. Although NPs practice in rural areas in greater numbers as compared to other provider types, the southeastern U.S. and the West coast have higher overall numbers of NPs.<sup>18</sup> States with full practice authority also tend to have higher numbers of NPs in rural areas.<sup>18</sup> In ND there are 1016 NPs with an average age of 44, a smaller number but significantly younger group than nationwide.

***“ND has dropped below that national average in NPs certified in primary care with 85% compared to 89.7%. ND NPs also report a significant decrease in primary care practice employment at 46%, compared to 69% nationwide.”***

Again, this may be partially attributed to data collection processes or to the larger health systems using more NPs in specialty areas versus primary care.

## **SUMMARY**

An attempt was made to extract and analyze as much pertinent nursing workforce data as possible from primary sources. However, some important data is missing and therefore cannot be analyzed. Efforts are being made for the North Dakota Board of Nursing to soon begin using a Minimum Nurse Supply Data Set that will provide a more comprehensive data collection upon licensure and re-licensure of the state's nursing workforce. Use of this data set will better allow the state to compare the state's nursing workforce trends with other states using the same data collection tool. In addition, a Governor's Nursing Shortage Taskforce has been implemented to further study the state's nursing workforce supply and demand issues.

The findings show that the vacancy rates across the nursing position types are not excessively high. However, the vacancy rates for CNAs, RNs, LPNs, and NPs are concerning. Furthermore, these vacancy rates are higher in ND's rural areas than in the state's urban areas. Rural facilities have a greater difficulty filling vacant positions. RNs are the most difficult to recruit for both urban and rural facilities. Higher nursing workforce vacancy rates can greatly impact clinical care received by patients at rural and urban facilities. In addition, the nursing workforce shortage is also costly to facilities because of the need to hire contract nursing staff and pay current nursing staff overtime to fill vacant positions necessary to provide patient care. All hospitals and nursing facilities must implement effective nursing workforce recruitment and retention strategies.

There are numerous practical nursing and registered nursing education programs in the state. Some programs are in rural areas. In the last few years, several tribal colleges have closed their nursing programs. Nursing programs must strive to recruit diverse students, including Native American students, to assist in efforts to increase the nursing workforce diversity. Overall, the programs have attempted to increase the number of graduates each year to decrease the state's nursing workforce shortage. If the graduates would remain practicing in the state, then they could more positively impact the number of vacant nursing positions. Most of the state's nursing workforce receive their initial education in the state. However, many receive their initial education from outside the state. Future studies should explore reasons why the state's nursing education program graduates remain or leave the state to practice. More incentives should be provided by the state and healthcare facilities to keep nurses practicing in the state and to recruit nurses from other states.

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## **CHAPTER SEVEN: Behavioral Health and Non-Physician Healthcare Workforce**

*Click on the chapter title to return to the table of contents*

## **INTRODUCTION**

This chapter will address specific health occupations that are related to currently funded activities in the state as well as those health professionals trained within the state who are not addressed in other chapters. A majority of the data used here were obtained through the professional licensure boards in North Dakota.

## **DEFINING BEHAVIORAL HEALTH WORKFORCE**

There are a variety of ways to define behavioral health workforce. The definition should include the providers who treat individuals with behavioral health disorders and should examine their education, scope of practice, and level of independence in the treatment environment. In North Dakota, a simple method for defining the behavioral health workforce is to utilize the tiered classification system established in 2017 by the North Dakota Legislature. This classification system for mental health professionals was based on a thorough review of education and statutory guidelines along with scope of practice, to ensure that professionals are being fully utilized within their scope of practice.<sup>1</sup> Behavioral health educational programs available in North Dakota, including those that meet licensure requirements, are listed in Table 7.1 and Table 7.2 below.

### **The Tiered System**

Determining which professions are included in the behavioral health workforce is challenging due to varying education requirements, scopes of practice, and levels of responsibility. A broad definition of behavioral health workforce includes providers of substance abuse and mental health services, as well as those providing services in supportive roles. Established in 2017 by the North Dakota Legislature, the tiered classification system is a simple way of defining the behavioral health workforce. This system classifies the various professions based on the required level of education and scope of practice. There are four tiers within this system.<sup>1</sup>

#### **Tier 1**

Professionals in Tier 1 are those with the greatest responsibility, scope of practice, education/training, and ability to practice autonomously. This tier is further broken down into two subsections. Tier 1a are the professionals with expertise in behavioral health (i.e., psychiatrists and psychologists) and Tier 1b are the professionals without expertise in behavioral health but may interact and work with aspects of the behavioral health field (i.e., physician assistants, advanced practice registered nurses).<sup>1</sup>

#### **Tier 2**

Professionals in Tier 2 are those that are able to work as independent clinicians. This tier is also further broken down into two subsections. Tier 2a are the professionals with comprehensive training in the diagnosis and treatment of a broad array of



Medicine or other state board of medicine. There are 114 licensed psychiatrists working in North Dakota or 1.5 psychiatrists per 10,000 North Dakota residents.<sup>2</sup>

## Demographics

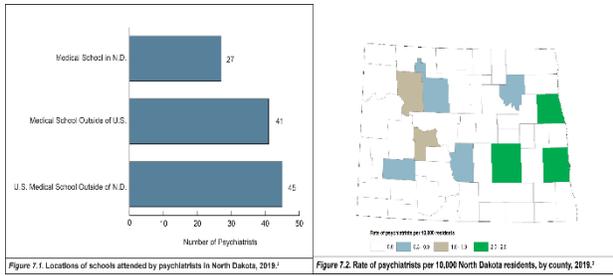
The average age of psychiatrists in North Dakota is 50 years and 7 months ( $SD = 14$  yrs, 3 mos). This is slightly younger than the average age of direct patient care physicians in North Dakota which is 52 years and 5 months. Fifty-eight (50.9%) are men and 56 (49.1%) are women. This gender distribution is dissimilar to the direct patient care physicians in North Dakota which includes 69.8% men and 30.1% women.<sup>2</sup>

## Education

Psychiatrists are required to have a Doctor of Medicine (MD) degree or a Doctor of Osteopathy (DO) degree in order to be licensed as a psychiatrist in North Dakota. As part of their medical school education, psychiatrists are also required to have specialized training in the behavioral health field through postdoc work in a psychiatry residency program. The University of North Dakota is home to North Dakota's only medical school which is accredited by the Liaison Committee on Medical Education (LCME), the Accreditation Council for Graduate Medical Education (ACGME), and the Accreditation Council for Continuing Medical Education (ACCME).<sup>1</sup> The UND School of Medicine and Health Sciences also has a psychiatry residency program with 16 residency slots. This allows North Dakota to fully train psychiatrists in state. The majority ( $n = 104$ , 91.2%) of psychiatrists in North Dakota hold a Doctor of Medicine (MD) degree while 10 (8.8%) hold a Doctor of Osteopathic Medicine (DO) degree. Most of the psychiatrists who work in North Dakota graduated from US medical schools outside of North Dakota ( $n = 45$ , 39.5%), followed by those who graduated from medical schools outside the US ( $n = 41$ , 35.9%), and those who graduated from the University of North Dakota ( $n = 27$ , 24.3%) (Figure 7.1). Psychiatrists working in North Dakota graduated from medical school, on average, 22 years and 6 months ago ( $SD = 13$  yrs and 6 mo).<sup>2</sup>

## Practice Characteristics

Of the psychiatrists working in North Dakota, 19 (16.7%) work in residential settings, 85 (74.6%) work in direct patient care settings, and 10 (8.8%) work in other settings. Most psychiatrists ( $n = 89$ , 78.1%) in North Dakota list psychiatry as their primary specialty followed by child psychiatry ( $n = 23$ , 20.2%). Only 1 lists addiction psychiatry as their specialty. The majority of psychiatrists in North Dakota work in urban settings ( $n = 98$ , 86%) (Figure 7.2).<sup>2</sup>



## PSYCHOLOGISTS

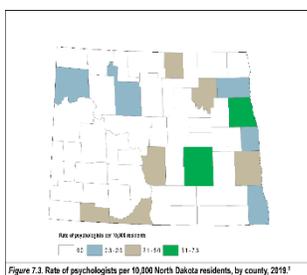
Psychologists are licensed mental health professionals who can treat mental illnesses through therapy, as well as administer and interpret psychometric tests/assessments to assist in diagnoses. Psychologists hold a doctoral degree in clinical or counseling psychology, usually a PhD or PsyD, from an American Psychological Association (APA) or Canadian Psychological Association (CPA) accredited program in order to be eligible for licensure in North Dakota. There are no other approved accrediting bodies. To be licensed in North Dakota, psychologists must adhere to the standards and ethics of the APA, complete at least two years of supervised professional experience, and complete written and oral examinations.<sup>1</sup> There are 211 licensed psychologists working in North Dakota or about 3 psychologists per 10,000 residents.<sup>3</sup>

### Educational Programs in North Dakota

The University of North Dakota is the only school in North Dakota with psychology training programs accredited by the APA. UND offers doctoral programs in both clinical and counseling psychology. These programs allow North Dakota to fully train psychologists in state and prepare individual practitioners for licensure after program completion.<sup>1</sup>

### Practice Characteristics

Psychologists in North Dakota have been licensed for an average of 14 years and 8 months (*SD* = 10 yrs and 10 mo). The majority of psychologists who work in North Dakota work in an urban setting ( $n = 158, 74.9\%$ ). Of the 211 licensed psychologists, 159 are located within three counties with urban areas, including Burleigh County, Cass County, and Grand Forks County (Figure 7.3).<sup>3</sup>



## **COUNSELORS**

Counselors are licensed behavioral health professionals who treat behavioral health conditions through individual, family, or group therapy. Counselors provide assessments, diagnoses, and therapeutic interventions to individuals, couples, families, and groups to achieve more effective emotional, mental, and social development and adjustment.<sup>1</sup> There are 439 licensed counselors working in North Dakota, including 81 licensed associate professional counselors (LAPC), 137 licensed professional counselors (LPC), and 221 licensed professional clinical counselors (LPCC).<sup>4</sup>

### **Education**

Counselors are required to obtain a master's degree or higher within the field of counseling from an accredited school in order to be eligible for licensure in North Dakota. North Dakota State University (NDSU) offers a master's degree in clinical mental health counseling and one in school counseling. The Council for Accreditation of Counseling and Related Educational Programs (CACREP) accredited both programs at NDSU. The University of North Dakota, University of Jamestown, and University of Mary also offer master's degrees in counseling. UND offers four areas of specialization for the MA counseling degree including addiction counseling, community mental health counseling, child adolescent counseling, and rehabilitation. The clinical counseling program at the University of Jamestown is an online program. The University of Mary also offers areas of specialization including addiction counseling, clinical mental health counseling, and school counseling. The masters level programs at UND, University of Jamestown, and University of Mary are not listed with any accreditation bodies for counseling education.<sup>1</sup>

### **Licensure Requirements**

#### **LAPC & LPC**

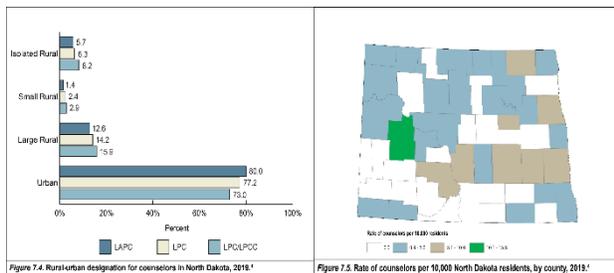
In order to receive LAPC licensure in North Dakota, counselors must have a master's degree in counseling from an accredited institution that meets the standards of the Board of Counselors Examiners, provide recommendations stating they will adhere to the standards of the profession, and write a plan to acquire supervised experience. LAPC is the preliminary licensure that is given before obtaining the full LPC licensure, and these professionals must acquire experience supervised by an LPC or LPCC. After obtaining at least two years of experience (and at least half of that being supervised), licensure as a LPC in North Dakota requires that the counselor write a statement of professional intent to practice in the state and the proposed use of the license, the intended population, and the procedures they intend to use, as well as complete an examination prescribed by the board.<sup>1</sup>

## LPCC

To receive LPCC licensure, in addition to the requirements of the LPC, the counselor must complete: a total of 60 graduate semester credits, 12 of which may be obtained in documented training, clinical experiences, or courses consistent with the North Dakota Century Code clinical education guidelines; graduate clinical coursework including abnormal psychology and psychopathology, appraisal and diagnostic evaluation (DSM-IV), and clinical counseling skills; 700 hours of training in supervised practica and/or internships relevant to the practice of counseling; two years (3000 hours) of post-master supervised clinical experience in a clinical setting, 100 of those hours must include supervision by a licensed professional clinical counselor; and a passing score on the National Clinical Mental Health Counseling Examination.<sup>1</sup>

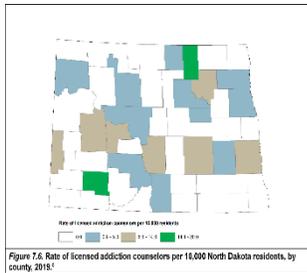
### Practice Characteristics

Most counselors in North Dakota work in an urban setting with 73.0% of LPCCs ( $n = 151$ ), 77.2% of LPCs ( $n = 98$ ), and 80% of LAPCs ( $n = 56$ ) all working in an urban setting (Figure 7.4, Figure 7.5).<sup>4</sup>



## LICENSED ADDICTION COUNSELORS

Licensed addiction counselors (LAC) are behavioral health professionals who specialize in assessing and counseling individuals with substance related or addictive disorders through individual and/or group therapy. To be licensed as a LAC in North Dakota, one must have a bachelor's or higher degree in addiction studies, complete course work set forth by the North Dakota State Board of Addiction Counseling Examiners, complete written and oral examinations, complete a clinical training program, and adhere to the code of ethics.<sup>1</sup> There are 322 LACs working in North Dakota, which is equal to 4.6 LACs per 10,000 North Dakota residents. The majority of licensed addiction counselors working in North Dakota work in urban areas ( $n = 208$ , 64.9%), followed by large rural areas ( $n = 75$ , 23.4%), isolated rural areas ( $n = 24$ , 7.5%), and finally small rural areas ( $n = 15$ , 4.7%) (Figure 7.6).<sup>5</sup>



## Educational Programs in North Dakota

In North Dakota there are four institutes of higher education that offer degrees or classes focused on addiction studies. The University of North Dakota offers a specialization in addiction counseling within the master’s degree in counseling program and the Department of Social Work also offers a chemical dependency minor. The University of Mary offers a master’s degree in addiction counseling as well as a minor in addiction counseling that can be combined with other degree programs they offer, such as a degree in social work or psychology. Minot State University offers a bachelor’s degree in addiction studies and the National Addiction Studies Accreditation Commission (NASAC) accredits their program. In addition, the University of Jamestown offers a bachelor’s degree in psychology with a concentration in addiction counseling.<sup>1</sup>

***“The majority of psychiatrists, psychologists, counselors, and licensed addiction counselors work in urban settings.”***

## LICENSED MARRIAGE AND FAMILY THERAPISTS

Marriage and family therapists (LMFT) are behavioral health professionals who specialize in marriage and family systems. They are able to diagnose and treat mental and emotional disorders within couples or families. Licensed associate marriage and family therapist (LAMFT) is the preliminary licensure before the full licensure of licensed marriage and family therapist (LMFT). In order to be eligible for licensure in North Dakota, these practitioners must have a master’s degree from an educational program approved by the licensing board. There are no colleges or universities in North Dakota that currently have degree programs that are accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) but there are a variety of degree programs in psychology and counseling available in the state.<sup>1</sup> LAMFTs have the same capabilities as LMFTs, except LAMFTs are supervised by LMFTs. Currently, there are 4 LAMFTs and 52 LMFTs licensed in North Dakota. There are also 14 supervisors approved by the North Dakota Marriage and Family Therapy Licensure Board but only seven are located in North Dakota. There other seven supervisors are located in either Minnesota or South Dakota.<sup>6</sup>

## SOCIAL WORKERS

Social workers are licensed professionals who work in a variety of fields related to human services with the aim of helping individuals and families improve their lives

through the restoration or enhancement of biopsychosocial functioning. The three licensures obtainable in North Dakota are licensed clinical social worker (LCSW), licensed master social worker (LMSW), and licensed baccalaureate social worker (LBSW), with LCSWs having the most autonomy in practice and LBSWs having the least. LBSWs can do assessments, interventions, counseling, and case management or supervision, as well as educate and develop policies, programs, and activities. LMSWs have the same capabilities as LBSWs but have specialized knowledge and more advanced skills in these areas of practice. LCSWs have the same capabilities as LBSWs and LMSWs but have specialized clinical knowledge and training in the areas of practice, and can also diagnosis and treat mental, emotional, and behavioral disorders, conditions, and addictions.<sup>1</sup> During the 2019 legislative session in North Dakota, the titles for licensed social workers changed. What are now LCSWs used to be license independent clinical social workers; LMSWs used to be licensed certified social workers; and LBSWs used to be licensed social workers. There are 1,867 social workers licensed in North Dakota. Most are licensed baccalaureate social workers (LBSWs;  $n = 1,286$ , 68.9%), followed by licensed clinical social workers (LCSWs;  $n = 295$ , 15.8%), and licensed master social workers (LMSWs;  $n = 286$ , 15.3%).<sup>7</sup>

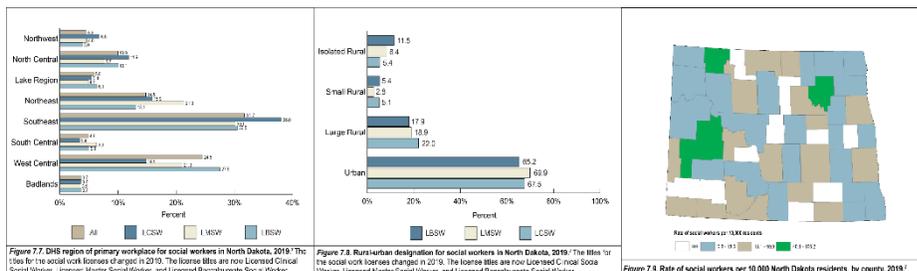
## Education

There are different educational and training requirements for the different social work licensures. To be licensed in North Dakota, LBSWs must have a baccalaureate degree in social work, pass an examination approved by the North Dakota Board of Social Work Examiners, and adhere to the code of social work ethics. LMSWs have the same requirements as LBSWs, except they must obtain a doctorate or master's degree. LCSWs have the same requirements as LMSWs and LBSWs, but they must complete an additional 3,000 hours of supervised clinical social work experience under a LCSW.<sup>1</sup> On average, social workers in North Dakota have been out of school for approximately 14 years ( $SD = 11$  yrs).<sup>7</sup>

The University of North Dakota, the University of Mary, and Minot State University all have bachelor's degree programs in social work that are accredited by the Council on Social Work Education (CSWE). The University of North Dakota also has a master's degree program in social work that is accredited by the CSWE. North Dakota State University (NDSU) offers a dual degree program in partnership with Minot State University. The dual degree program allows students the option to take all classes at NDSU and get a bachelor's degree in human development and family sciences from NDSU as well as a bachelor's degree in social work from Minot State University. Sitting Bull College is in the process of receiving full accreditation for their bachelor's degree program in social work. Their program is currently in candidacy status with the CSWE. Cankdeska Cikana Community College, Nueta Hidatsa Sahnish College, and the North Dakota State College of Science all offer associate degree programs in social work. This degree option is designed for students who are planning to pursue a bachelor's degree in social work once their associate's degree program is completed. It offers a cost effective way for students to begin their education in social work.<sup>1</sup>

## Practice Characteristics

North Dakota has created eight regional human service centers. These regional human service centers have been defined by the following regions: Region 1 (northwest), Region 2 (north central), Region 3 (lake region), Region 4 (northeast), Region 5 (southeast), Region 6 (south central), Region 7 (west central), and Region 8 (badlands). Data from the defined human service center regions was analyzed to determine where each type of social work professional practices in North Dakota based on these defined regions. As shown in Figure 7.7, the Southeast region has the largest percentage of each social work licensure level. Note that not all social work professionals in North Dakota listed the region of their primary workplace. As stated earlier, the data was examined to determine the eastern/western split for each of the social work professions. Based on these regions, most social work professionals work in the eastern part of the state. For LBSWs, 682 (53.0%) work in the eastern part of the state and 604 (47.0%) work in the western part of the state. It was found that 172 (60.1%) LMSWs work in the eastern part of the state and 114 (39.9%) work in the western part of the state. For LCSWs working in North Dakota, 183 (62.0%) work in the eastern part of the state and 112 (38.0%) work in the western part of the state.<sup>7</sup> The data was also analyzed to determine the specific rural-urban designation for the various social work professionals in North Dakota based on the RUCA Codes. These analyses indicate that 1,237 (66.3%) of the social work professionals in North Dakota work in urban areas, followed by those in large rural areas ( $n = 349$ , 18.7%). The results, categorized by licensure level, are listed in the table below and indicate that 838 (65.2%) of LBSWs, 200 (69.9%) of LMSWs, and 199 (67.5%) of LCSWs are all working in urban areas. This indicates that most social work professionals work in urban settings (Figure 7.8, Figure 7.9).<sup>7</sup>



## OCCUPATIONAL THERAPY PROFESSIONALS

Occupational therapists (OT) focus on helping clients gain/regain skills that allow them to live independently and engage in valuable and meaningful occupations. Settings where you will find an occupational therapist include but are not limited to acute care hospitals, rehabilitation centers, nursing homes, outpatient clinics, and/or school systems. Occupational therapists (OT) are also qualified behavioral health professionals who provide evaluation and intervention for individuals at risk of psychiatric, addiction, behavioral issues, and cognitive disabilities.

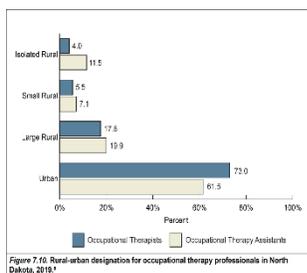
OTs provide therapy for individuals with the purpose of building and enhancing skills, developing habits, routines, and roles so that individuals are successful in their

everyday lives. To be licensed as an occupational therapist in North Dakota, one must obtain a degree from an occupational therapy educational program accredited by a national occupational therapy accrediting agency, complete a period of supervised fieldwork experience, and pass an examination approved by the Board of Occupational Therapy Practice.<sup>1</sup> Currently, there are 703 occupational therapy professionals (OTs, OTAs) licensed and working in North Dakota, 547 occupational therapists and 156 occupational therapy assistants. Based on the population of North Dakota, there are 9.2 occupational therapists per 10,000 North Dakota residents and 2.1 occupational therapy assistants per 10,000 North Dakota residents licensed in North Dakota. On average, occupational therapy professionals (OTs, OTAs) have been in practice in North Dakota for 13 years 5 months ( $SD = 10$  yrs, 3 mo). Broken down by profession, it was found that occupational therapists have been practicing on average, for 13 years, 1 month ( $SD = 10$  yrs, 1 mo) and occupational therapy assistants have been practicing, on average, for 13 years 11 months ( $SD = 11$  yrs, 1 mo).<sup>8</sup>

### Practice Characteristics

The majority of the occupational therapy professionals (OTs, OTAs) in North Dakota ( $n = 495$ , 70.4%) work in urban areas, followed by large rural areas ( $n = 127$ , 18.1%), small rural areas ( $n = 41$ , 5.8%), and isolated rural areas ( $n = 40$ , 5.7%). Of the occupational therapists working in North Dakota, 339 (72.9%) work in urban areas, and 148 (27.1%) work in rural areas. For occupational therapy assistants, 96 (61.5%) work in urban areas and 60 (38.5%) work in rural areas. Rural areas can be further broken down into large rural, small rural, and isolated rural areas. For occupational therapists, 96 (17.6%) work in large rural areas, 30 (5.5%) work in small rural areas, and 22 (4.0%) work in isolated rural areas. For occupational therapy assistants, 31 (19.9%) work in large rural areas, 11 (7.1%) work in small rural areas, and 18 (11.5%) work in isolated rural areas (Figure 7.10).<sup>8</sup>

***“Of the occupational therapists working in North Dakota, about 73% work in urban areas and about 27% work in rural areas.”***



### University of North Dakota Occupational Therapy Program

The Occupational Therapy program at the University of North Dakota graduated 52 students in May of 2019, four students in August of 2019, two students in December 2019, and 62 students in May 2020. Of the 59 students who graduated in May through December of 2019, 46 (78%) responded to an exit interview survey. The majority of the

graduates were originally from Minnesota ( $n = 22$ , 47.8%), followed by North Dakota ( $n = 7$ , 15.2%), Wyoming ( $n = 4$ , 8.7%), and other states ( $n = 13$ , 28.2%).

The Occupational Therapy graduates of 2019 were primarily working in Minnesota ( $n = 14$ , 33.3%), North Dakota ( $n = 6$ , 14.3%), Wyoming ( $n = 5$ , 11.9%), or other states ( $n = 17$ , 40.5%). Other states include Idaho, Colorado, Washington, California, Texas, Indiana, Iowa, and Nebraska. There were a total of 42 respondents to this question.<sup>9</sup> Of those 46 new graduate respondents, 41 were working as an occupational therapist. Thirty responded that they were working full-time and 13 indicated they were part-time or per diem. Only two graduates chose to take traveling positions. Forty-two students from the Occupational Therapy Class of 2019 reported their starting salary as annual expected income. The mean range was \$50,000-69,999. Responses included: \$60,000-69,999 ( $n = 13$ ; 31%); \$50,000-59,999 ( $n = 12$ ; 28.6%); \$70,000-79,999 ( $n = 7$ ; 16.7%); \$40,000-49,999 ( $n = 5$ ; 12%); \$80,000-89,999 ( $n = 2$ ; 4.76%); \$100,000-149,999 ( $n = 1$ ; 2.4%); \$20,000-29,999 ( $n = 1$ ; 2.4%); less than \$10,000 ( $n = 1$ ; 2.4%).<sup>9</sup> Practice settings for occupational therapy graduates include hospital ( $n = 12$ ), outpatient clinics ( $n = 11$ ), home health ( $n = 5$ ), early intervention ( $n = 3$ ), skilled nursing facilities ( $n = 3$ ), mental health ( $n = 3$ ), school systems ( $n = 2$ ), and other practice settings ( $n = 4$ ). Influential factors in selecting employment were reported by graduates and included practice setting, location, and salary/wage. When asked about student loan rates that were specifically for OT education, the mean score was in the \$30,000-39,000 range.<sup>9</sup>

## **BEHAVIOR ANALYSTS**

Behavior analysts are professionals who use experimental and applied analysis of behavior, and statistics, to develop techniques and treatments that facilitate the evaluation and modification of behavior, especially when the behavior is maladaptive.<sup>1</sup> For example, in North Dakota behavior analysts work with children who have been diagnosed with autism, and help develop treatment plans and adaptive strategies. According to the North Dakota Century Code (43-64), there are two licensure levels in North Dakota, the licensed assistant behavior analyst (LABA) and the licensed behavior analyst (LBA). These are new licensure titles recently approved by the North Dakota legislature during the 2019 legislative session. Licensed behavior analysts used to be referred to as licensed applied behavior analysts and licensed assistant behavior analysts used to be referred to as registered applied behavior analysts. To obtain these licenses, applicants must complete education, examination, and experience requirements established by the State Board of Integrative Health Care, such as certification from the Behavior Analyst Certification Board (BACB); have the physical, mental, and professional capability for practice of applied behavior analysis; and have a history free of any disciplinary action by the board.<sup>1</sup> There are 34 licensed behavioral analysts in North Dakota.<sup>10</sup>

## **BEHAVIOR TECHNICIANS**

Behavior Technicians are paraprofessionals who practice under the supervision of either an LBA or LABA. They are responsible for the direct implementation of behavior analytic services. To be a behavior technician in North Dakota, an individual

must meet requirements of the BACB, including at least a high school diploma or equivalent degree, passing a background check, 40 hours of training, completion of a competency assessment and the registered behavior technician (RBT) examination.<sup>1</sup>

## MENTAL HEALTH TECHNICIANS/CASE AIDES

Mental health technicians and case aides are entry-level paraprofessionals with a basic understanding of mental illness and treatment that provide direct care services in inpatient facilities and outpatient agencies. To be certified as a mental health technician in North Dakota, applicants must have a high school degree, training in CPR, first aid, crisis intervention, HIPAA and confidentiality, as well as medication module training and mental health certificate training.<sup>1</sup>

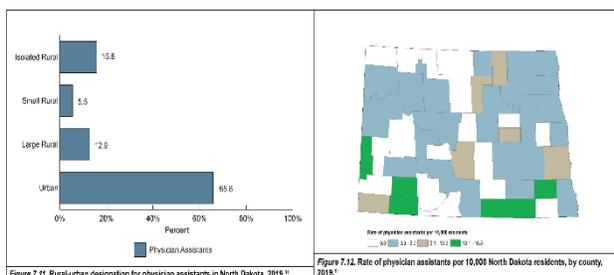
## PEER SUPPORT SPECIALISTS

Peer support specialists are individuals with lived behavioral health experience and use this experience to serve as a pro-social model, offer insight to an individual's care team, and provide support focused on advocacy, coaching, and mentoring. The only education or training required is a weeklong training through the NDDHS Behavior Health Division.<sup>1</sup>

## PHYSICIAN ASSISTANTS

### Practice Characteristics

North Dakota has a total of 357 physician assistants licensed and working in the state, which is equal to 46.85 PAs per 100,000 North Dakota residents. Physician assistants in North Dakota have been licensed on average for 10 years and 10 months (*SD* = 8 yrs and 8 mo). The majority of physician assistants in North Dakota work in urban areas (*n* = 229, 65.8%). Of the rural designations, isolated rural areas have the largest number of physician assistants (*n* = 55, 15.8%), followed by large rural areas (*n* = 45, 12.9%), and small rural areas (*n* = 19, 5.5%) (Figure 7.11, Figure 7.12). About 46% of PAs in North Dakota are practicing in primary care compared to the national average of 25%.<sup>11</sup>

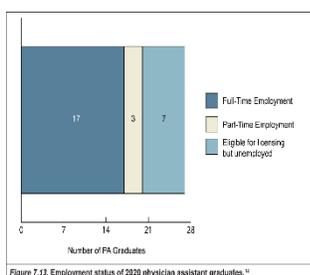


## University of North Dakota Physician Assistant Program

In May 2020, the Department of Physician Assistant Studies at the University of North Dakota graduated 28 students. Summarized below are workforce survey responses of 27 graduates who passed the national certification, thus were eligible for state licensing, and employment as a physician assistant. Of eligible respondents, all 27 completed the abbreviated workforce survey in the form sent. Home states of graduates eligible for state licensing and employment include North Dakota ( $n = 11$ , 41%), Minnesota ( $n = 8$ , 30%), South Dakota ( $n = 4$ , 15%) and one (3.7%) from each of the following states of Iowa, Idaho, Missouri, and Montana. When the survey was administered, 20 (74%) of those eligible for employment had secured jobs – 17 (63%) were employed full-time and 3 (11%) were employed part-time (Figure 7.13). The 20 graduates currently employed are working in the following states: North Dakota ( $n = 9$ , 45%), Minnesota ( $n = 6$ , 30%), South Dakota ( $n = 3$ , 15%), Missouri ( $n = 1$ , 5%), and Montana ( $n = 1$ , 5%).<sup>12</sup>

***“Approximately 50% of the employed physician assistant graduates are practicing in rural areas.”***

The majority of employed graduates reported working in a primary care setting ( $n = 10$ , 50%) – 3 of the 10 work in family medicine, 2 work in a rural emergency room setting, 2 work in internal medicine, 2 work in urgent care, and 1 in occupational medicine. The next most common employment setting is in surgical specialties including orthopedics ( $n = 3$ , 15%), followed by neurosurgery ( $n = 2$ , 10%), and general surgery ( $n = 2$ , 10%). Further, graduates also found employment in nephology ( $n = 1$ , 5%), pulmonology ( $n = 1$ , 5%), and COVID telehealth ( $n = 1$ , 5%). There are 10 (50%) of the 20 employed graduates practicing in rural areas (communities with a population of <25,000). The starting salary range for graduates of the Physician Assistant Studies program at the University of North Dakota averages \$113,330 per year.<sup>12</sup>



## PHYSICAL THERAPY PROFESSIONALS

Physical therapists are healthcare professionals who examine individuals with mechanical, physiological, and developmental body structure impairments or activity limitations and/or participation restrictions in movement and alleviate the impairments through designing and implementing therapeutic interventions. To be licensed in North Dakota, one must graduate from a professional physical therapy education program accredited by a national accreditation agency approved by the North Dakota Board of

Physical Therapy and pass the examination approved by the board. The most recent licensure data for physical therapists (PTs) and physical therapist assistants (PTAs) were obtained from the North Dakota Board of Physical Therapy in February 2020. The complete data set contained 1,098 licensed providers including 931 PTs and 167 PTAs. Of the 931 PTs, 878 (94.3%) were employed as a physical therapist. The remaining 53 PTs were either retired ( $n = 13$ ), employed in another field ( $n = 9$ ), or unemployed and seeking work within or outside of physical therapy ( $n = 27$ ). Of the 167 PTAs, 148 (88.6%) were employed as PTAs. The remaining 19 PTAs were unemployed, or seeking work within or outside of physical therapy.<sup>13</sup>

## Demographics

The demographic data of gender revealed 71.7% of providers were women, including 69.9% of PTs and 82.4% of PTAs. For race/ethnicity, 81.8% of PT and 13.7% of PTA providers were white (non-Hispanic).<sup>13</sup>

## Education

Physical therapists graduate with a Doctor of Physical Therapy (DPT) degree. The DPT, first introduced in North Dakota in 2006, has become the required entry-level degree nationally for physical therapists as of 2015. The majority of PTs practicing in North Dakota have a Doctor of Physical Therapy degree (60.3%), followed by a master's degree (23.7%), and bachelor's degree (15.4%). An associate degree is the entry-level degree for physical therapist assistants and nearly all (98.0%) PTAs in North Dakota have this degree (Table 7.3). A majority (74.7%) of all practicing PTs and PTAs in North Dakota graduated from a North Dakota school. Specifically, 81.8% of physical therapists obtained their degree from a North Dakota school, 6.8% graduated from a Minnesota school and 11 individuals were educated in another country. The ND Board of Physical Therapy reported the University of North Dakota accounts for 50% of the physical therapist licensees. The PTAs practicing in North Dakota included 32.4% educated in North Dakota and 48.0% educated in Minnesota.<sup>13</sup>

***“81.8% of physical therapists obtained their degree from a North Dakota school.”***

Table 7.3  
Educational attainment for North Dakota physical therapists and physical therapist assistants.<sup>13</sup>

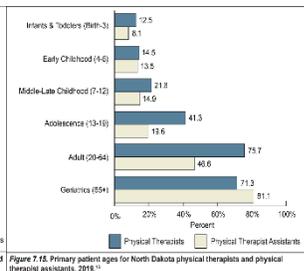
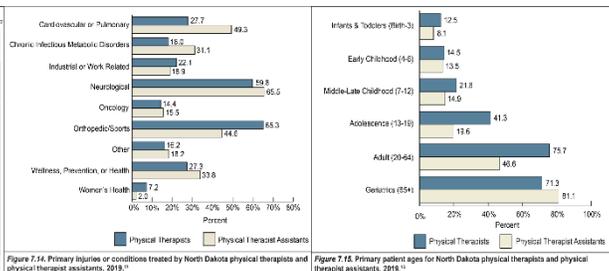
Degree	PT		PTA		Total	
	N	%	N	%	N	%
Associate's	0	0.0	145	88.0	145	14.1
Bachelor's	133	15.4	2	1.2	135	13.4
Certificate	5	0.6	0	0.0	5	0.5
Master's	208	23.7	0	0.0	208	20.3
Doctor of Physical Therapy	530	60.4	1	0.7	531	51.8
All	878	100.0	148	100.0	1,026	100.0

## Practice Characteristics

There were multiple practice settings identified for PTs and PTAs in the data set. The majority of PTs practice in an outpatient setting (57.9%), while a majority of PTAs practice in an extended care setting (43.9%), followed by the outpatient setting (30.4%) (Table 7.4). PTs and PTAs in North Dakota work with a multitude of individuals with various diagnoses, injuries, or conditions meaning most do not work solely with individuals requiring only one type of care. Thus, the following percentages will not total 100%. Most PTs see individuals with orthopedic/sports conditions or injuries (65.3%), followed by individuals with neurological conditions or injuries (59.8%). A majority of PTAs see individuals with neurological conditions or injuries (65.5%) followed by individuals with cardiovascular or pulmonary injuries or conditions (49.3%), and orthopedic/sports injuries or conditions (44.6%) (Figure 7.14). The majority of all PTs (75.7%) reported providing care to adults ages 20-64 years and 71.3% reported providing care to adults ages 65+. A majority of PTAs (81.1%) reported providing care to adults ages 65+ and 46.6% reported working with adults ages 20 – 64 (Figure 7.15).<sup>13</sup>

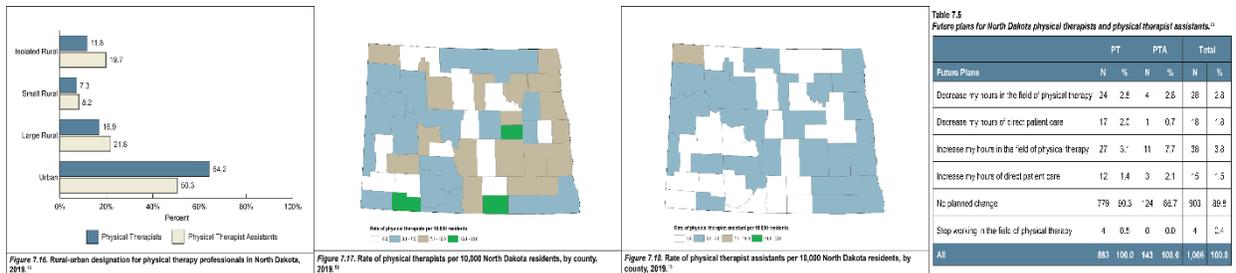
***“A majority of PTs (90.4%) reported no planned changes in the near future, some (4.5%) expect to increase their hours of physical therapy or direct patient care, while 5.2% expect to decrease their hours or leave the field of physical therapy.”***

Primary Workplace	PT		PTA		Total	
	N	%	N	%	N	%
Academic Institution (post secondary)	34	3.8	9	9.2	34	3.3
Acute Care Hospital	93	7.2	9	6.1	72	7.0
Home Care	55	5.7	9	6.1	55	5.8
Inpatient Rehabilitation Facility	21	2.6	5	3.6	26	2.5
Outpatient	1	0.1	0	0.0	1	0.1
Nonpatient care or nonclinical or otherwise related to physical therapy	11	1.2	0	0.0	11	1.1
Outpatient clinic affiliated with a hospital, health system, military or other government agency	307	35.2	27	19.2	334	32.6
Outpatient clinic not affiliated with a hospital, health system, military or other government agency	200	22.8	18	12.2	218	21.4
Passive or direct (non-actual based)	37	3.8	3	2.2	34	3.3
Skilled Nursing Facility, Long Term Care Facility, Assisted Living Facility or Group Home	92	9.1	65	43.9	148	14.1
School System	30	3.4	8	5.4	38	3.7
Other	48	5.5	4	2.7	52	5.1
All	878	100.0	140	100.0	1,018	100.0



A majority (64.2%) of all PTs were found to practice in an urban area and just over half (50.3%) of PTAs practice in an urban area as well (Figure 7.16, Figure 7.17, Figure 7.18). A majority of PTs (90.4%) reported no planned changes to their state of practice in the near future, some (4.5%) expected to increase their hours of physical therapy or direct patient care, while 5.2% expected to decrease their hours or leave the field of physical therapy. A majority of PTAs (86.7%) reported no planned changes, 9.8% expected to increase their hours of physical therapy or direct patient care, and 3.5% expected to decrease their hours or stop working in the field of physical therapy (Table 7.5).<sup>13</sup>

***“A majority (64.2%) of all PTs were found to practice in an urban area while just under half (49.7%) of PTAs practice in a rural area.”***



## University of North Dakota Doctor of Physical Therapy Program

The UND School of Medicine & Health Sciences Doctor of Physical Therapy program graduated 52 individuals in May 2019. An electronic survey was distributed to the graduates approximately one year after graduation. A total of 30 students responded to the survey for a response rate of 58%. The original class included 27 (52%) students from North Dakota, 14 (27%) from Minnesota, and the remaining students were from Wyoming (6%) and other states (15%). All 30 (100%) of the graduate respondents were employed as physical therapists in a full time (97%) or part time (3%) position. There were 8 (27%) employed in North Dakota while the remainder of the respondents reported employment in Minnesota (33%), South Dakota (7%), and one person was employed in each state of Wyoming, Illinois, Idaho, Oregon, Wisconsin, Colorado, Georgia, Alabama, and Kentucky. The primary area of practice for the graduates was an outpatient clinic (63%). Notably, the majority of respondents (73%) reported an initial salary between \$55,000 and \$75,000.<sup>14</sup>

## NUTRITIONISTS AND DIETICIANS

### Licensed Registered Dietitians

In North Dakota, there are 468 licensed registered dietitians. Currently there are 6.1 licensed registered dietitians per 10,000 North Dakota residents working in North Dakota. Licensed registered dietitians working in North Dakota have been practicing for an average of 13 years, 2 months ( $SD = 10$  yrs, 11 mo).<sup>15</sup>

### Licensed Nutritionists

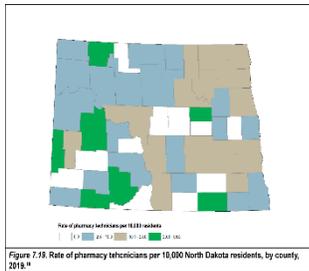
In North Dakota, there are 33 licensed nutritionists. That amounts to 0.4 licensed nutritionists per 10,000 North Dakota residents working in North Dakota. Licensed nutritionists working in North Dakota have been practicing for an average of 12 years, 7 months ( $SD = 10$  yrs, 7 mo).<sup>15</sup>

## PHARMACY PROFESSIONALS

### Pharmacy Technicians

There are 771 pharmacy technicians licensed and working in North Dakota (Figure 7.19). Most pharmacy technicians work in urban areas ( $n = 458$ , 59.4%),

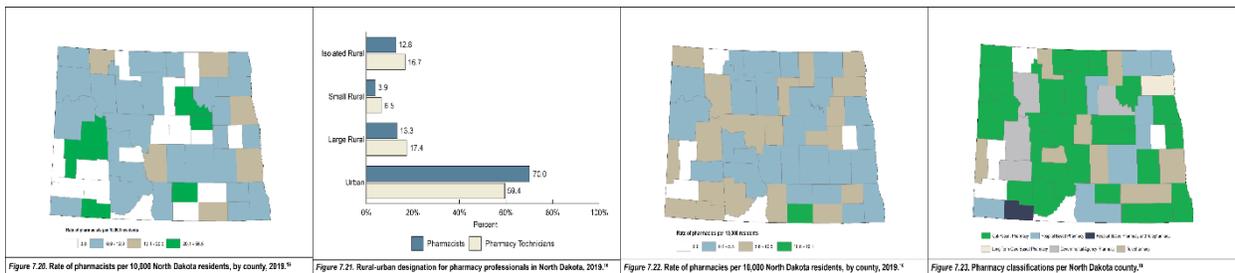
followed by large rural areas ( $n = 134$ , 17.4%), isolated rural areas ( $n = 129$ , 16.7%), and small rural areas ( $n = 50$ , 6.5%). Pharmacy technicians in North Dakota have been licensed for an average of 9 years and 6 months ( $SD = 7$  yrs, 2 mo).<sup>16</sup>



## Pharmacists

There are 893 pharmacists licensed and working in North Dakota (Figure 7.20). Most pharmacists in North Dakota work in urban areas ( $n = 625$ , 70.0%). The next most common area in which pharmacists in North Dakota work is large rural areas ( $n = 119$ , 13.3%), followed by isolated rural areas ( $n = 114$ , 12.8%), and small rural areas ( $n = 35$ , 3.9%) (Figure 7.21, Figure 7.22, Figure 7.23). Pharmacists in North Dakota have been licensed for an average of 16 years ( $SD = 12$  yrs, 11 mos).<sup>16</sup>

***“Most pharmacists in North Dakota work in urban areas (70%). The next most common area is large rural areas (13.3%), followed by isolated rural areas (12.8%), and small rural areas (3.9%).”***



## MEDICAL LABORATORY SCIENTISTS

### Introduction

***“Currently there are 15 licensed medical laboratory scientists per 10,000 North Dakota residents and 12.3 medical laboratory scientists per 10,000 North Dakota residents working in North Dakota.”***

There are 1,133 medical laboratory scientists licensed in North Dakota. Medical laboratory scientists are licensed in three categories, as scientists/technologists, technicians, or specialists. Most of the medical laboratory scientists licensed in North Dakota are licensed as clinical laboratory scientist/medical technologists ( $n = 786$ ,

69.4%), followed by clinical laboratory technician/medical laboratory technician ( $n = 337$ , 29.7%), and specialist ( $n = 10$ , .9%). Currently there are 15 medical laboratory scientists per 10,000 North Dakota residents licensed in North Dakota and 12.3 medical laboratory scientists per 10,000 North Dakota residents working in North Dakota.<sup>17</sup> Based on the population of North Dakota, it was found that there are 4.4 clinical laboratory technician/medical laboratory technicians per 10,000 North Dakota residents licensed in North Dakota and 3.6 clinical laboratory technician/medical laboratory technicians per 10,000 North Dakota residents working in North Dakota. Also, there are 10.4 clinical laboratory scientist/medical technologists per 10,000 North Dakota residents licensed in North Dakota and there are 8.6 clinical laboratory scientists/medical technologists per 10,000 North Dakota residents working in North Dakota. Finally, there are 0.13 specialists per 10,000 North Dakota residents licensed in North Dakota and 0.1 specialists per 10,000 North Dakota residents working in North Dakota.<sup>17</sup>

## Education

Clinical laboratory scientists/medical technologists working in North Dakota have been in practice, on average, for 14 years, 6 months ( $SD = 10$  yrs, 4 mo). Clinical laboratory technicians/medical laboratory technicians have been in practice, on average, for 15 years, 5 months ( $SD = 10$  yrs, 7 mo). Specialists have been in practice, on average, for 8 years, 11 months ( $SD = 8$  yrs, 2 mo).<sup>17</sup>

## Practice Characteristics

Most medical laboratory scientists working in North Dakota work in urban areas ( $n = 545$ , 59.1%), followed by those working in isolated rural areas ( $n = 172$ , 18.6%), large rural areas ( $n = 151$ , 16.4%), and small rural areas ( $n = 55$ , 6%). Four did not have a rural-urban designation. When examining rural-urban designation by profession it was found that of the 270 clinical laboratory technician/medical laboratory technicians working in North Dakota, 153 (57.5%) work in urban areas, 28 (10.5%) work in large rural areas, 18 (6.8%) work in small rural areas, 67 (25.2%) work in isolated rural areas, and 4 (1.5%) did not have a rural-urban designation. Of the 649 clinical laboratory scientist/medical technologists working in North Dakota, 386 (59.5%) work in urban areas, 121 (18.6%) work in large rural areas, 37 (5.7%) work in small rural areas, and 105 (16.2%) work in isolated rural areas. For specialists working in North Dakota, 6 (75%) work in urban areas, and 2 (25%) work in large rural areas (Figure 7.24).<sup>17</sup>

***“Most medical laboratory scientists working in North Dakota work in urban areas (59.1%), followed by those working in isolated rural areas (18.6%), large rural areas (16.4%), and small rural areas (6%).”***

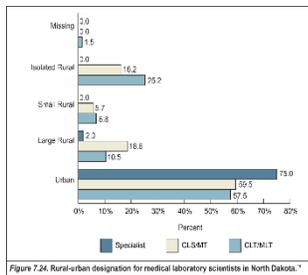


Figure 7.24. Rural-urban designation for medical laboratory scientists in North Dakota.<sup>17</sup>

## DENTAL PROFESSIONALS

Dental professionals such as dentists, dental hygienists, and dental assistants are important health care providers in North Dakota. According to the most recent licensure data there are 684 dental hygienists that hold a license to practice and are working in North Dakota. That is equal to 9.7 dental hygienists per 10,000 North Dakota residents working in North Dakota (Figure 7.25). It was also found that there are 410 licensed dentists in North Dakota, which amounts to 5.4 dentists per 10,000 North Dakota residents licensed and working in North Dakota (Figure 7.26). Licensed dentists have been practicing, on average, for 16 years and 9 months ( $SD = 13$  yrs, 9 mo). Dental hygienists working in North Dakota have also been in practice, on average, for 15 years and 11 months ( $SD = 12$  yrs, 5 mo).<sup>18</sup>

***“There are 410 licensed dentists in North Dakota which amounts to 5.4 dentists per 10,000 North Dakota residents licensed and working in North Dakota.”***

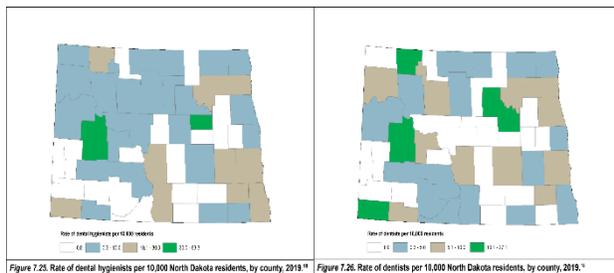


Figure 7.25. Rate of dental hygienists per 10,000 North Dakota residents, by county, 2019.<sup>18</sup> Figure 7.26. Rate of dentists per 10,000 North Dakota residents, by county, 2019.<sup>18</sup>

## Practice Characteristics

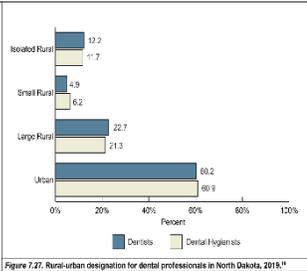
About 19% of the dentists in North Dakota reported working in specialty areas; of these, 22 (5.4%) reported oral and maxillofacial surgery, 18 (4.4%) reported orthodontics, 16 (3.9%) reported pediatric dentistry, 13 (3.2%) reported endodontics, 5 (1.2%) reported periodontics, and four (1.0%) reported prosthodontics (Table 7.6). Most licensed dentists working in North Dakota work in urban areas ( $n = 247$ , 60.2%), followed by large rural areas ( $n = 93$ , 22.7%), isolated rural areas ( $n = 50$ , 12.2%), and small rural areas ( $n = 20$ , 4.9%). Overall, 163 (39.8%) of the dentists working in North Dakota work in rural areas. Most dental hygienists working in North Dakota work in urban areas ( $n = 415$ , 60.9%), followed by large rural areas ( $n = 145$ , 21.3%), isolated

rural areas ( $n = 80, 11.7\%$ ), and small rural areas ( $n = 42, 6.2\%$ ). Overall, 267 (39.2%) dental hygienists work in rural areas (Figure 7.27).<sup>18</sup>

**“Most licensed dentists working in North Dakota work in urban areas (60.2%), followed by large rural areas (22.7%), isolated rural areas (12.2%), and small rural areas (4.9%)”**

ADA Specialty	Frequency	Percent
Endodontics	13	16.7
Oral and Maxillofacial Surgery	22	28.2
Orthodontics	18	23.1
Pediatric Dentistry	16	20.5
Periodontics	5	6.4
Prosthodontics	4	5.1

Frequency Missing = 332



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## **CHAPTER EIGHT: Healthcare Facility Workforce in North Dakota**

*Click on the chapter title to return to the table of contents*

## **INTRODUCTION**

This chapter addresses three overarching components of North Dakota's healthcare system – behavioral health facilities, nursing facilities, and hospitals. Healthcare facilities play an important role not only in patient care, but also in the economic well-being of communities across the state. Healthcare facilities tend to be one of the region's largest employers, particularly among rural areas, and provide a vital service to the public, utilizing a team of healthcare providers and workforce personnel in order to deliver optimal care to patients. The North Dakota Nursing Facility Workforce Survey was started in 2016 and completed in September 2017 and examines different aspects of the rural and urban nursing facility workforce. Additionally, a new survey of the North Dakota Hospital Workforce Survey was completed as of April 2020. However, the 2018 North Dakota Hospital Workforce Survey summary was provided here because of an extremely low response rate during the 2020 survey. The 2020 summary is provided in Appendix D. These surveys are updates from previous surveys, providing new information on the rural and urban hospital workforce.<sup>1,3</sup> Because Chapter 5 provides an in-depth look at nursing personnel across the state (including information from the North Dakota Nursing Facility Workforce Survey and the North Dakota Hospital Workforce Survey), Chapter 8 will instead examine all other personnel types outside of nursing. As a result, all findings exclude values for nursing staff unless otherwise specified.

## **NORTH DAKOTA BEHAVIORAL HEALTH WORKFORCE SURVEY**

### **Introduction**

The North Dakota Healthcare Workforce Group was tasked with developing an assessment of Behavioral Health (BH) facilities in North Dakota. This section was prepared to provide information about the current (2019 – 2020) circumstances of BH facilities in North Dakota, specifically workforce positions filled and vacant, as well as issues of recruitment and retention. The following information is not meant to be a conclusive analysis, but rather a snapshot of the state of affairs within BH facilities. Data collection methods and aggregate response summaries are provided below.

### **Survey Method**

The survey of BH facilities was based upon a previously used questionnaire for hospital and nursing facility surveys (2014, 2016, and 2018). The questionnaire contained 17 questions assessing facility characteristics and issues of workforce. The survey was electronically disseminated. The link to the questionnaire and a request to respond to it were sent to 72 selected BH facilities statewide.

## Results

### Facility Characteristics

BH facilities reported an average of 60 beds with some facilities reporting zero beds and one facility reporting 372 beds. Facilities reported an average of 87 clients served in a typical day; with a minimum of three clients and a maximum of 340 clients served in a typical day. The majority of responding facilities reported zero days in a typical month at full capacity (see Figure 8.1). Fifty-eight percent of responding facilities responded “no” to the question; “In the last month, have you had to turn away any prospective clients due to capacity limitations?” Only three facilities reported more than 24 hours or 1 day for the length of time it takes to place a typical patient in an inpatient program. Only five facilities reported more than 24 hours or 1 day for the length of time it takes to place a typical patient in an outpatient program.

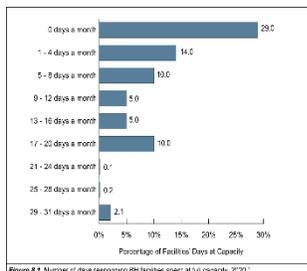


Figure 8.1. Number of days responding BH facilities spent at full capacity, 2020.

Among the questions asked on the questionnaire was a matrix of specific positions with questions regarding the number of Full Time Equivalent (FTE) for each. There were 29 position titles assessed with the questionnaire. BH facilities were asked to report the number of FTE for internal positions, external positions (i.e. contract workers), and vacant positions. A single FTE is one individual working 40 hours per week, 0.5 FTE is one person working 20 hours per week, 0.25 FTE refers to one person working 10 hours per week, etc. The actual number of individuals working for a facility will be higher than the FTE count reported. Other questions inquired about the difficulties associated with recruitment and retention of positions as well as patient referrals to and from other facilities.

### Full Time Equivalent (FTE)

The position matrix results are below in Figure 8.2. The figure presented shows each positions' FTE in the order the positions were presented in the online survey. The figure itself is a stacked bar graph, meaning each bar represents the number of FTE for a position with colors corresponding to internal, external, and vacant FTE.

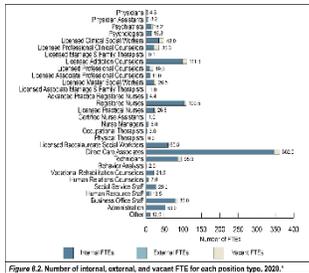


Figure 8.2. Number of internal, external, and vacant FTEs for each position type, 2020.

The five most populous positions in BH facilities were (in descending FTE order): Direct Care Associates, Licensed Addiction Counselors, Registered Nurses, Technicians, and Business Office Staff. These five positions accounted for more than 670 FTE total. The least populous positions in BH facilities were (in descending FTE order): Behavior Analysts, Licensed Associate Marriage and Family Therapists, Certified Nurse Assistants, Licensed Marriage and Family Therapists, and Physical Therapists. These five positions accounted for less than five FTE total. The positions with the largest vacancy percentages were: Licensed Professional Counselors (46% of positions vacant), Licensed Professional Clinical Counselors (37% vacant), Physician Assistants (29% vacant), Human Relations Counselors (28% vacant), and Licensed Clinical Social Workers (27% vacant).

### Recruitment and Retention

Facilities were asked several questions regarding recruitment and retention. Results reveal a wide variety of challenges among specific positions. When asked to characterize the difficulty in generally filling workforce vacancies the majority of facilities that responded did so with “difficult” or “very difficult.” The facilities were asked to rate the difficulty of filling each of the named positions. The five positions reported as having the highest average difficulty to fill (i.e. reported as “difficult” or “very difficult”) were: Psychologists, Psychiatrists, Physician Assistants, Licensed Clinical Social Workers (formerly Licensed Independent Clinical Social Workers), and Licensed Professional Clinical Counselors (see Figure 8.3).

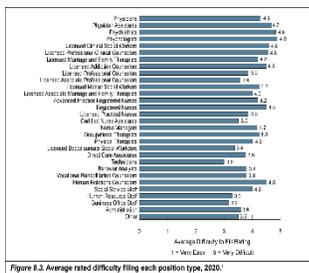
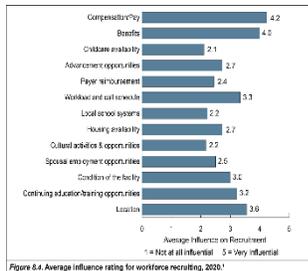


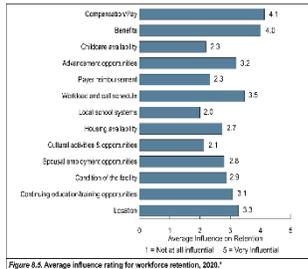
Figure 8.3. Average rated difficulty filling each position type, 2020.

The facilities were also asked to list in rank order the five most difficult positions to fill and responded with Licensed Addiction Counselors and Psychiatrists as the most frequently listed as most difficult, followed by Registered Nurses, Licensed Professional Counselors, Licensed Professional Clinical Counselors, and Licensed Clinical Social Workers.

The BH facilities were asked to describe how influential specific factors were in recruiting and retaining employees. The facilities reported Compensation, Benefits, and Location as the most influential for recruiting workforce (see Figure 8.4).



Similarly, the BH facilities reported Compensation, Benefits, Workload / Call Schedule, and Location as most influential in retaining workforce (see Figure 8.5).



## Patient Referrals

The BH facilities were given a list of healthcare facilities across the region (i.e. mostly in North Dakota) which included BH facilities and more general care facilities (e.g., hospitals, clinics, etc.). The list was used to assess which BH facilities were referring patients out to other facilities and to assess which other facilities were referring patients into their own BH facility. The most frequently reported facilities to refer patients to the responding BH facilities were Heartview Foundation, Northeast Human Service Center, North Dakota State Hospital Chemical Dependency Services, North Dakota State Penitentiary, and Lake Region Human Service Center. The most frequently reported facilities to which the responding BH facilities referred patients were Heartview Foundation, Southeast Human Service Center, Northeast Human Service Center, ShareHouse, Inc., and South Central Human Service Center.

## Limitations

Only 56 BH facilities attempted to respond and only 25 responded completely to the questionnaire. Only those 25 facilities responded regarding FTE positions. That translates to a response rate of 35% (i.e. 25 of 72 facilities statewide). Therefore, the results reported here should not be used to infer the number of FTE filled and vacant, or difficulty in hiring and keeping positions at other BH facilities.

## NORTH DAKOTA NURSING FACILITY SURVEY

In 2016, the Center for Rural Health, in collaboration with the North Dakota Long Term Care Association, completed a workforce survey of all of North Dakota's nursing facilities. The questionnaire was modified based on feedback from North Dakota nursing facility chief executive officers (CEOs), North Dakota Long Term Care Association staff, and Center for Rural Health staff. The questionnaires were sent to all 81 rural and urban nursing facility CEOs who met the eligibility criteria. This included 27 nursing facilities in urban areas with 2,594 total beds, and 54 rural facilities (9 in large rural areas, 6 in small rural areas, and 39 in isolated rural areas) with 3,528 total beds. All 81 CEOs were asked to participate by filling out a mailed paper workforce questionnaire. The questionnaire included 20 questions, one of which involved a matrix asking for staffing information such as number of full-time equivalent internal employees and contract employees, longest vacant position by employee types, and difficulty in recruiting by employee type for 24 nursing facility employee types. Other questions inquired about CEO and employee turnover rates, difficulty recruiting and retaining nurses, external service contracting, and overtime and salary information. The data included in this report are for 95.7% of the nursing facility locations (78 of 81 locations: 24 urban facilities and 54 rural with total bed counts of 2,333 and 3,528, respectively). Some values may differ from those found in the previous *report* due to an allocation correction between personnel types, as well as receiving additional responses. For further information about the Survey results and the questionnaire, visit <https://ruralhealth.und.edu/pdf/2016-nd-nursing-facility-workforce-survey-chartbook.pdf>.

### Limitations

While the findings from the 2016 North Dakota Nursing Facility Workforce Survey provide a great deal of information about the nursing facility workforce, they may not be generalizable to all of North Dakota's providers such as those registered nurses [RNs] working in short-term hospitals, physician clinics, and so on. In addition, caution should be taken in interpreting the data findings because some vacancy rates are based on relatively small numbers of employees. For example, although the vacancy rates of NPs appears to be high at 19.2%, this percentage was based on 21.1 employed FTEs with only 5.0 vacant FTEs across the state. Similarly, PAs had a vacancy rate of 23.8%; however, there were only 12.8 employed FTEs and 4.0 vacant FTEs statewide. Although rates based on these small numbers may be misleading, they are reflective of nursing facility staff and vacancies.

Employees' information was requested as FTEs. Generally, this means that an FTE of 1.0 represents an employee working 40 hours a week. The actual number of individuals working for the nursing facility will be higher than the FTE count reported. For example, if two RNs are each working 20 hours a week (0.5 FTE each), it would work out to one FTE, while the number of unadjusted individual employees would be two.

Many internal and external factors influence vacancy rates. For instance, a nursing-facility-employee-type vacancy rate is influenced by the salaries that other nursing facilities pay and the salaries being paid by other types of healthcare entities, which in turn influence the abundance and shortage of specific employee types, along with many other factors. If a facility unsuccessfully recruits for a specific type of employee for an extended length of time, the facility may stop recruiting for the position and limit its services. This situation can result in misleadingly low vacancy rates.

## Survey Findings

North Dakota's 2016 statewide vacancy rates for nursing-facility employee types are presented in Figure 8.6. The statewide rates were calculated by dividing the FTEs currently being recruited by the sum of FTEs currently being recruited plus the current FTEs employed for each provider type, then multiplying the quotient by 100, which resulted in the percentage of vacant positions. Physician assistants (23.8%) had higher vacancy rates than many other personnel types, including grounds keeping staff (10.5%) and dietitians (10.1%). These positions are based on a small number of vacant FTEs; however, the numbers are 4.0 for PAs, 1.5 for grounds-keeping, and 6.0 for dietitians.

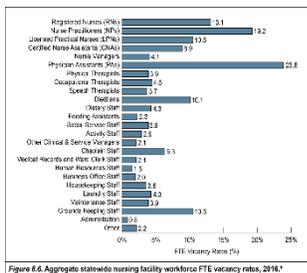


Figure 8.6. Aggregate statewide nursing facility workforce FTE vacancy rates, 2016.\*

***“Rural nursing facilities have a more difficult time recruiting and retaining the various types of nurses than do urban facilities.”***

Examining the nursing facility workforce at the aggregate state level misses many of the important intrastate variations in factors such as vacancy rates. For example, Figure 8.7 shows FTE vacancy rates differentiated between rural and urban facilities. Rural nursing facilities have a more difficult time recruiting and retaining the various types of nurses than do urban facilities.

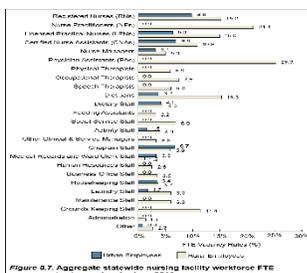
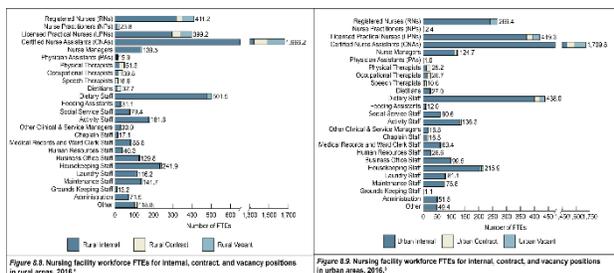


Figure 8.7. Aggregate statewide nursing facility workforce FTE vacancy rates by rural and urban, 2016.

Among clinical providers, there were no reported urban vacancies for physical therapists, occupational therapists, speech therapists, or physician assistants. Excluding physician assistants, the rural vacancy rates for these positions were also quite low, ranging from 5.9% to 7.5%. The rural vacancy rate for physician assistants was high at 25.3%; however, this was based on a small number of FTEs (12.8 internal and contract FTEs, and 4.0 vacant FTEs).

Other nursing facility staff that were directly involved in patient care included dietitians, dietary staff, feeding assistants, and activity staff. In all cases, the rural vacancy rates were higher than the urban ones, although there was not a sizeable difference between urban and rural areas among dietary staff. The largest discrepancy was among dietitians, whose rural vacancy rate (15.3%) was over four times larger than the urban rate (3.7%).

Figures 8.8 and 8.9 show rural and urban FTEs, respectively, for provider types across three categories: 1) internal employees, 2) external contract employees, and 3) vacancies for which nursing facilities were recruiting candidates to fill. Across both rural and urban nursing facilities, Certified Nursing Assistants (CNAs) were by far the most abundant employee type. Dietary staff was the next most numerous employee type with 898.8 FTEs (internally and contract employed). The next four most frequent types of employees, among both rural and urban locations, were housekeeping staff (441.4 FTEs), activity staff (308.7 FTEs), business office staff (224.8 FTEs), and maintenance staff (209.0 FTEs). In almost all cases, there were more rural FTEs for each provider category than their urban colleagues.



Rural and urban clinical provider FTEs, including physician assistants, physical therapists, occupational therapists, and speech therapists are also shown in Figures 8.8 and 8.9. The numbers of such providers are relatively small, although positions such as physical and occupational therapists have a greater proportion of outside contract FTEs than other personnel types. Overall, there were fewer rural and urban physician assistants (11.8 and 1.0 FTEs, respectively) and speech therapists (15.6 and 10.6 FTEs) than there were physical therapists (48.3 and 25.2 FTEs) and occupational therapists (36.8 and 26.7 FTEs). Across all of the positions, there were more rural FTEs for each provider category than was true for their urban colleagues. Vacant FTEs were also considerably lower for such employee types, with urban facilities not reporting any vacancies, and rural ranging from 1.0 to 4.0 vacant FTEs.

Rural and urban FTEs are also shown for other nursing facility staff such as dietitians, dietary staff, feeding assistants, and activity staff in Figures 8.8 and 8.9. Here, the largest category was dietary staff (rural 478.7 FTEs versus urban 420.1 FTEs), with activity staff (rural 174.4 FTEs versus urban 134.3 FTEs) second-highest. There were

relatively few dietitians and feeding assistants. Across all positions, the number of FTEs for each employee type was again higher for rural areas (710.7 FTEs) than urban (592.4 FTEs). In both rural and urban areas, dietary staff had the highest number of vacant FTEs (22.8 FTEs in rural and 17.9 in urban), followed by activity staff, dietitians, and feeding assistants. Rural facilities additionally reported higher overall vacancies than urban facilities (36.0 to 20.9 vacant FTEs).

While examining overall FTE numbers, external contract employees can also help to provide an integral part of the healthcare workforce picture. External contract employees are of special significance for two major reasons: 1) there is a near consensus among nursing facility CEOs that external contract employees are often considerably more expensive than comparable internal staff, and 2) they play an important role, especially for rural nursing facilities, in providing specific clinical services where the volume of need is not great enough to justify internally hiring a full-time provider (e.g., physical therapists, occupational therapists, and speech therapists). At the time of the survey, the total nursing facility workforce consisted of 7,938.7 FTEs. Not included in this number was 613.8 vacant FTEs, which resulted in an overall vacancy rate of 7.2%. If all external contract employee FTEs were counted as vacancies, the overall nursing facility vacancy rate would raise to 13.3%. Even with the contract employees, urban CEOs indicated that 4.9% of their salary expenditures were for overtime, while rural CEOs reported a much higher percentage at 8.4%. Most of the extra cost of overtime was associated with shortages of needed personnel.

***“Urban CEOs indicated that 4.9% of their salary expenditures were for overtime, while rural CEOs reported a much higher percentage at 8.4%. Most of the extra cost of overtime was associated with shortages of needed personnel.”***

In looking at statewide numbers for external contract employees, physical therapists had the greatest overall number of outside contract FTEs (39.4 FTEs). In rural areas, physical therapists had the most outside contract FTEs at 25.0, and came in second in urban areas with 14.5 FTEs (dietary staff had 19.6 outside-contract FTEs in urban areas, accounting for 4.5% of the dietary staff workforce). These FTEs accounted for 48.7% and 57.5% of the physical therapist workforce in rural and urban areas, respectively. In rural areas, the next four most frequently contracted positions (and their respective rates) included occupational therapists (18.3 FTEs, 46.1%), dietitians (14.4 FTEs, 44.2%), speech therapists (10.8 FTEs, 65.1%), and physician assistants (5.1 FTEs, 32.3%). In urban areas, other commonly contracted positions included occupational therapists (13.1 FTEs, 49.0%), speech therapists (6.3 FTEs, 59.4%), housekeeping (5.3 FTEs, 2.5%), and activity staff (4.8 FTEs, 3.5%). With the exception of dietary staff, rural and urban areas were consequently more likely to contract for positions such as physical therapists and occupational therapists, the FTEs of which take up a significant portion of their respective workforce numbers.

## Ratio of Beds to Personnel

The ratio of facility beds to number of personnel was also assessed for each facility. This is important, as it can provide a general sense of how many nursing facility residents each employee type cares for, as well as a benchmark by which to compare nursing facilities to one another. In this way, one can examine where the individual nursing facilities stand in comparison to the average number of beds per FTE employees among urban and rural areas.

Statewide, across all nursing facilities with values of at least one internal-contract FTE for each respective position, the average ratio of personnel number to facility beds ranged from 6.8 among dietary staff, to 278.7 among dietitians. Positions such as speech therapists, chaplains, and grounds-keeping staff had particularly high numbers of beds per employee type (ranging from 126.3-158.2). In contrast, employee positions such as dietary staff, housekeeping, activity staff, nurse managers, and physician assistants had the fewest numbers of beds per employees (6.8 to 29.7).

The number of beds per employee type was somewhat variable for clinical provider types with at least one internal-contract FTE. On average, physician assistants had the least number of beds per position (29.7). Among these facilities, there were no urban areas that internally employed physician assistants; in rural areas, there were three facilities below the average, whereas only one was higher. Occupational therapists also had a relatively high facility bed to employee ratio of 73.6. In urban areas, there were both four facilities that had ratios above and below this value; in rural areas, eight facilities had ratios below this value, and five were above it. Among clinical providers, physical therapists had the next highest overall ratio of 76.4. Urban areas had four facilities with values below this average and three above it; rural areas had ten below the ratio and four above it. Finally, speech therapists had the highest proportion of facility beds per position – more than double that of some of the other clinical providers. In urban areas, there were three facilities with values below this number, and two above it; among rural facilities, three had values below it, and only one had a ratio greater than the average.

The largest overall range with regard to ratio of beds to number of personnel type was among other staff such as dietitians, dietary staff, activity staff, and feeding assistants. As described above, dietitians had the highest number of beds per personnel numbers, with an average of 278.7. In urban areas, the majority of respondents had ratios that were below the average (n=15); there was only one facility above it. This was also the case in rural areas, where there were 11 locations with a ratio below the average, and three above it. Feeding assistants had a significantly smaller average, with 37.4 beds for each employee. Activity staff also had a low average ratio of 21.8 beds per employee. Both urban and rural areas were similarly split; in urban areas, there were 9 facilities above the average and 12 below it, while in rural there were 14 facilities above it and 32 below. Dietary staff had the lowest average of beds to employees at 6.8. Here, 11 urban facilities had bed-to-employee ratios above the average, with nine below it; rural facilities had 19 above the ratio, and 26 below it.

Employee types such as social service staff, chaplains, human resources, business office, administration, and medical record staff typically had larger ratios of

beds to personnel type, which is unsurprising given that there is less need for direct patient care among said employees. Chaplains had the largest ratio of beds to internal employee FTEs at 134.3. Urban areas were evenly split, with six facilities with ratios above and below the average; in rural areas there were ten facilities with ratios below it and five above it. Human resource staff followed, with 85.4 beds per employee. Among facility types, there were seven in urban areas with ratios below the mean and five above it; rural areas had 23 below and 14 above. Administration, medical records, and social service staff had slightly smaller ratios of beds to FTEs at 58.5, 51.9, and 46.9, respectively. Among administrative staff, there were nine urban facilities that had ratios greater than the average, and 11 below it; rural areas had 14 above and 33 below it. Medical records staff in urban areas had seven facilities with ratios above and 11 below the overall average of 51.9. In rural areas, there were 16 facilities above the average and 30 below it. Finally, among social service staff, there were nine facilities with ratios above the 46.9 average and 12 below; rural areas saw 21 facilities with ratios above the average and 26 below it.

Nurse managers had an average of 28.1 beds to internal FTE employees. Compared to this, there were 13 urban facilities with ratios above it and six below it; rural areas had 20 with ratios above it, and 24 facilities below the average. Other clinical service managers had a slightly higher bed-to-employee ratio, with an average of 44.9. Among these, there were four urban facilities with ratios below it and only two above it; among rural areas, there were four facilities with ratios below the average and two above it.

Other staff types include housekeeping, laundry, maintenance, and grounds-keeping. In this group, the employee type with the largest bed-to-internal FTE ratio was grounds keeping, with an average of 126.3. There was only one urban facility that listed a value—this ratio was higher than the average. Among rural areas, the opposite trend occurred, with most facilities having ratios below the average (n=9); only three were above it. Laundry and maintenance staff had much lower ratios of 35.1 and 32.1, respectively. The ratios of laundry personnel in urban areas were equally split around the average, with nine facilities reporting ratios above it, and 10 below. Rural areas were more likely to have ratios below the average (n=30) compared to those above it (n=15). A similar trend was seen for maintenance staff, with 12 urban facilities reporting ratios above the 32.1 average, and eight below it; rural areas had 18 facilities with ratios above it, as compared to 31 below the average. Finally, housekeeping had a very small average ratio of beds to FTE at 18.6. Looking at the ratios of urban facilities shows that there were 6 facilities above the average compared to 14 below it; rural areas had 15 facilities reporting ratios above the average, compared to 34 below it.

***“Physical therapists, occupational therapists, and speech therapists are the positions most commonly contract-employed.”***

The overall ratios of beds to employee type were also assessed for outside contract FTEs. Physical therapists, occupational therapists, and speech therapists were examined, as these positions are commonly contract-employed. Physical therapists had the lowest overall ratio of beds to contracted FTEs at 132.8. Among urban facilities, most had ratios below the average (n=7), whereas three were above the average. Rural

areas saw 20 facilities with ratios below the average, and six above it. Occupational therapists followed with 200.5 beds per contracted FTE. For this employee type, urban areas had seven facilities below the average and two above; rural areas saw 17 facilities with ratios below the average and eight above it. The highest average of the three employee types was speech therapists, with 1,545.4 beds per contracted FTE. All of the nine urban facilities had ratios lower than the average; 21 rural facilities had ratios below the average as well – only two were above. Such high rates of beds to FTEs are unsurprising, given that many of the aforementioned employee types are contracted because there may not be a need to hire them full-time. Additionally, there were a few facilities that completed one survey for more than one location; as a result, both the contracted and internal FTE ratios could be slightly inflated.

### ***Length of Vacancies***

In addition to information about FTEs, for each of the different employee types, nursing facility CEOs were asked about the duration (in months) of the longest vacant position for which they were recruiting at the time of the survey. The average for longest open vacancies was 80.8 months for dietary staff (median: 1.0 month), 60.0 months for housekeeping (median: 1.0 months), and 58.0 months for occupational therapists (median: 0.0 months). The averages for the remaining position types ranged from 13.0 months for chaplains to 50.0 months for social service staff; the median value of the remaining personnel types was zero.

***“Only 3.9% of rural and 4.8% of urban nursing facilities indicated that they directly employed physicians; the majority (56.9% of rural and 61.9% of urban) reported externally contracting physicians.”***

Regarding nursing facilities and physicians, the nursing facility CEOs were asked about whether they directly employed or externally contracted physicians. Only 3.9% of rural and 4.8% of urban facilities indicated that they directly employed physicians; the majority (56.9% of rural and 61.9% of urban) reported externally contracting physicians. One-third of both rural and urban CEOs indicated that they neither directly hired nor contracted physicians, whereas only 5.9% of rural CEOs reported doing both. Nursing-facility-employed physicians were reported to generally be in family practice. Other listed physician specialties were geriatrics and psychiatry. Much of their responsibilities revolved around fulfilling the duties of a nursing facility medical director. In most of the nursing facilities, the FTE of the physicians was small, with only the much larger nursing facilities reporting significant externally employed physician FTEs.

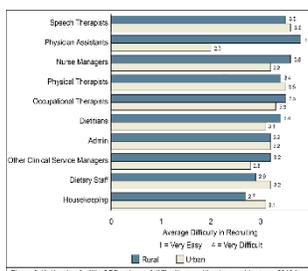


Figure 8-10. Nursing facility CEO ratings of difficulty recruiting by provider type, 2016.\*

The CEOs were asked to rate the difficulty of recruiting each of the employee types along a four-point Likert scale (Figure 8.10). Ratings were assessed on a four-point Likert scale (1 = very easy, 2 = somewhat easy, 3 = somewhat difficult, 4 = very difficult). Excluding nurses, the highest ten selected employee types are included wherein the mean ratings are shown comparing rural with urban. Overall fill difficulty across the positions is mixed. Physician assistants and nurse managers were particularly difficult to recruit among rural areas, whereas urban areas struggled with recruiting speech therapists and physical therapists. Positions such as dietary staff and housekeeping were harder to fill in urban areas than rural, whereas rural areas had more difficulty filling employee types such as dietitians and other clinical service managers.

***“Nurses of various types were listed by urban CEOs as the most difficult to recruit; rural CEOs reported that CNAs had the highest turnover rates of their employee types.”***

Respondents were additionally asked to list the most difficult employee category for which to recruit. Nurses of various types were listed by urban CEOs as the most difficult to recruit 76.2% of the time, and they were listed among the three most difficult to recruit 66.7% of the time (the comparable percentages for rural are 92.3% and 71.2%). In another question, 84% of the rural CEOs reported that CNAs had the highest turnover rates of their employee types (urban 71.4%).

## **NORTH DAKOTA HOSPITAL WORKFORCE SURVEY**

This section contains a summary of the previous reporting cycles' data (i.e. the *Fifth Biennial Report*). Data was collected for the current reporting period and that data is summarized in Appendix D. The new data was not reported here because extenuating circumstances rendered the hospitals' response rate extremely low. In 2018, the Center for Rural Health performed a workforce survey of all of North Dakota's short-term general hospitals. Questionnaires were sent to all 42 hospitals that met the eligibility criteria. All rural CAH hospital CEOs, as well as the six large Prospective Payment System (PPS) hospitals, were asked to contribute. The final response rate was 97.6%, with one PPS Hospital not participating. As a result, that facility's data from the 2014 survey was included in the survey in order to provide the most comprehensive overview possible.<sup>1</sup> There were 11 CAHs from the southwest area of the state, 9 from the northwest, 8 from the southeast, and 8 from the northeast.

The survey contained 12 questions, one of which included a matrix assessing FTEs and vacancies among workforce personnel. Other questions inquired about workforce-related issues such as the professionals most difficult to recruit, staffing information, as well as the greatest challenges in recruiting staff. Because of the abundance of North Dakota hospital workforce information garnered from the survey responses, only a portion of it can be included in this Report. For further information about the survey results and the questionnaire, visit <https://med.und.edu/healthcare-workforce/files/docs/2018/2018-hospital-assessment.pdf>; the 2014 report can be found



large number of FTEs (1,348.3 in total), and a large number of vacant FTEs (182.0), while the rate for dietitians was based on few employed and vacant FTEs.

Eleven (40.7%) of the 27 staff types had vacancy rates between 5 and 11%, whereas three (11.1%) of the 27 staff types had rates above 11%. Thirteen (48.1%) of the 27 staff types had rates below 5%. Vacancy rates below 5% can be a problem for providers because low rates indicate that there is more provider supply than there is demand. This can result in fewer vacancies that may drive down regional salaries for providers. Higher provider vacancy rates (e.g., 25% and higher) and a tight labor market can cause salaries and benefits to increase as the hospitals compete for the limited supply of providers. This can discourage hospitals from staffing configurations that include many of these provider types (thus narrowing the scope of services potentially provided).<sup>2</sup>

In comparing current statewide vacancy rates to those from the 2014 survey, there has not been a significant amount of variability. Some personnel types were added to the current survey (e.g., physicians and physical and occupational therapy assistants), whereas others were removed (e.g., medical record coders, computer technicians), so comparing changes between all position types is not possible at this time. In addition, not all respondents completed the survey in its entirety, which may affect overall comparisons between the two different survey versions. For example, some facilities may not have reported employed FTEs (and/or vacancies) for some positions, which could subsequently influence overall vacancy rates. As a result, some caution is warranted when comparing the current findings with results of the 2014 *report*.

Among corresponding personnel types, however, there were 10 positions that saw an increase in vacancy rates, eight that saw a decrease, and one position that saw no change (nuclear medicine, 0.0% vacancy rate), although many of these differences were small. The personnel types with the largest increase were surgical technologists (7.9% vacancy in 2014 compared to 19.5% in 2018). For this group, the overall employed number of FTEs stayed approximately the same (161.2 FTEs in 2014 and 167.5 in 2018), however the number of overall vacant FTEs increased from 13.8 FTEs in 2014 to 40.6 in 2018. Radiographer/radiology techs also saw a considerable increase in statewide vacancy rates (0.35% vacancy rate in 2014 to 10.5% in 2018). Among this personnel type, not only did the overall number of employed FTEs decrease from 282.9 in 2014 to 233.1 in 2018, but there was an overall increase in vacancies as well (1.0 vacant FTE in 2014 to 27.2 in 2018).

In contrast, some personnel types saw a sizeable amount of decrease in vacancy rates. Among these was MLT/CLT personnel, who had a vacancy rate of 9.5% in 2014 compared to 2.5% in the current survey. Here, the overall number of employed FTEs dropped from 183.2 in 2014 to 96.8 in 2018; vacancies also decreased from 19.1 in 2014 to 2.5 presently. Physician assistants also saw a decrease, with employed FTEs dropping slightly (172.8 FTEs in 2014 to 158.7 in 2018) along with vacant FTEs (22.6 FTEs in 2014 versus 9.0 in 2018).

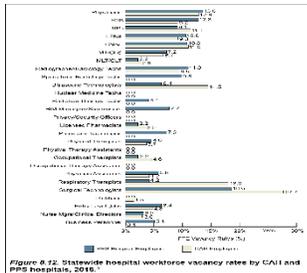


Figure 8.12 shows statewide vacancy rates for the different personnel categories for CAH and PPS hospitals. Among CAHs, the highest vacancy rates were for surgical technologists (27.7%), respiratory therapists (18.0%), and ultrasound technologists (14.5%), although these were based on relatively small numbers of both employed and vacant FTEs. In urban areas, the highest vacancy rates were again for surgical technologists (18.6%), physicians (13.6%), and radiographer/radiology techs (11.0%).<sup>2</sup>

Physician vacancy rates were considerably high for both CAH and PPS hospitals. As mentioned above, physicians had the second-highest vacancy rate (13.6%) in urban areas; they were fourth highest among CAHs. CAHs had 13.0 vacant FTEs for 88.24 employed FTEs, whereas PPS hospitals had 169.0 vacant FTEs for 1,078.08 employed FTEs.

***“Physician vacancy rates were considerably high for both CAH and PPS hospitals. Physicians had the second-highest vacancy rate (13.6%) in urban areas; they were fourth highest among CAHs.”***

Vacancy rates between CAHs and PPS hospitals for lab personnel (two categories) and radiology staff (five categories) are also shown in Figure 8.12. The two types of lab personnel are medical technologist or medical laboratory scientist (MT/MLS), and medical laboratory technician or clinical laboratory technician (MLT/CLT). The overall vacancy rates for lab personnel ranged from 2.2% for MLT/CLT to 7.2% for MT/CLS personnel, both among PPS Hospitals. The CAH and PPS hospital vacancy rates for the various radiology staff types (radiographer/radiology techs, specialized radiology techs, ultrasound techs, nuclear medicine techs, and radiation therapy techs) were somewhat lower. Here, the highest vacancy rate was for CAH ultrasound technologists at 14.5%, although neither CAH nor PPS hospitals reported vacancies for nuclear medicine techs. Radiation therapy techs were also in low demand.<sup>2</sup>

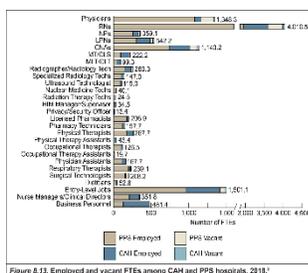
The vacancy rates for other types of medical care personnel (i.e., PAs, dietitians, physical therapists and assistants, occupational therapists and assistants, respiratory therapists, surgical techs, and entry-level jobs) are also illustrated in Figure 8.12. With only a few exceptions, the vacancy rates across these provider types and by CAH and PPS hospitals were low. The highest vacancy rate was for CAH surgical technologists at 27.7% (6.0 vacant FTEs for 15.69 FTE employed positions); among PPS hospitals there was an 18.6% vacancy (34.6 vacant FTEs for 151.8 FTE employed positions) for the same position type. In comparison to PPS hospitals, the vacancy rates of respiratory therapists for CAHs were also particularly high (18.0% versus 4.2%).

The nurse managers/clinical directors and business personnel types are additionally presented in Figure 8.12. Vacancy rates were low for both employment categories. The highest vacancy rates were for PPS hospital business personnel (5.1%, 7.0 FTE vacancies for 129.6 positions). Note that altogether the two personnel types represented 814.8 FTE filled positions and 18.4 FTE vacancies.<sup>2</sup>

Vacant FTEs among licensed pharmacists in the state were relatively low, with CAHs reporting a slightly higher rate (3.5%) than PPS hospitals (2.2%). Among pharmacy technicians, an opposite trend emerged, with PPS hospitals reporting a vacancy rate of 7.2%; no CAHs reported vacancies. With regard to Health Information Managers (HIM)/Supervisors, only PPS hospitals reported a vacancy (7.2%); no vacancies again were reported among CAHs. Similarly, neither PPS hospitals nor CAHs reported vacant FTEs for privacy/security officers.

As a whole, the vacancy rates across CAHs and PPS hospitals have not deviated substantially since the previous survey in 2014. As described above, surgical technologists were one exception to this—rates for CAHs and PPS hospitals jumped from 4.4% and 8.4% in 2014 to their current rates of 27.7% and 18.6%, respectively. In this personnel type, employed FTEs decreased by 6.3 FTEs from 2014 to 2018 among CAHs, and increased 12.6 in PPS hospitals; vacant FTEs went from 1.0 in 2014 to 6.0 in 2018 among CAHs, and from 12.8 to 34.6 in PPS hospitals. Respiratory therapists among CAHs also saw a vacancy rate increase, from 2.6% in 2014 to 18.0% in 2018. Employed FTEs among rural respiratory therapists dropped from 37.8 FTEs in 2014 to 25.1 FTEs in 2018; vacant FTEs among this group also increased from 1.0 to 5.5. Growth in PPS hospitals was seen among radiology techs (2014: 2.4%, 2018: 11.0%) and specialized radiology techs (2014: 1.0%, 2018: 9.8%).

In contrast, some considerable decreases can also be observed. For instance, the vacancy rate of physician assistants among PPS hospitals declined from 14.1% in 2014 to 5.8% in 2018. In this group, the overall employed FTEs stayed relatively the same (131.2 FTEs in 2014 to 113.5 FTEs in 2018), but vacant FTEs dropped from 21.6 to 7.0 in 2018. Similarly, in 2014, CAHs reported a vacancy rate among radiation therapy technicians of 20.0%; that percentage is now down to 0.0%. Here, employed FTEs decreased from 4.0 to 0.0, and vacant FTEs also decreased from 1.0 to 0.0. As described above, however, caution should be exercised when comparing these values, as some responses may be missing which could potentially skew comparisons.



HIM manager/supervisors, privacy/security officers, pharmacy technicians, physical therapy assistants, and occupational therapy assistants) to 22.8 among entry-level jobs in CAHs. Among PPS hospitals, FTE vacancies ranged from 0.0 (nuclear medicine techs, privacy/security officers, dietitians, physical therapy assistants, and occupational therapy assistants) to 169.0 FTEs among physicians.<sup>2</sup>

When looking at overall employed FTEs, those in entry-level positions had the highest numbers. Here, CAHs employed 457.33 FTEs, whereas PPS hospitals employed 956.1 FTEs; the corresponding numbers of vacant FTEs were 22.8 and 64.8. Physicians were next in line with 88.2 FTEs for CAHs and 1,078.1 for PPS hospitals; vacant FTEs were 13.0 and 169.0, respectively. Business personnel also had a large number of employed FTEs, with CAHs having 344.4 FTEs (0.4 vacant FTEs) and PPS hospitals having 129.6 (7.0 vacant FTEs).

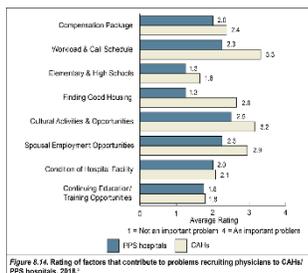
Compared to 2014, FTEs across CAH and PPS hospital employee positions have remained relatively stable. Among corresponding employee types, there was a total increase of 112.7 FTEs, although remember that this value does not include all listed employee types. Business personnel had the largest increase in FTEs among CAHs, going from 227 FTEs in 2014 to 344.4 in the present survey. MT/CLS personnel also had a smaller increase, from 95.9 employed FTEs in 2014 to 111.74 in 2018. MLT/CLTs had the largest decrease in FTEs, from 86.3 to 52.9 FTEs in 2018. In contrast to CAHs, PPS hospitals generally had lower numbers of FTE as compared to 2014 (among comparable positions, a decrease of 648.9). The largest decreases were seen among radiation therapy techs (196.0 FTEs in 2014 to 23.5 in 2018), and business personnel (297.1 FTEs in 2014 to 129.6 in 2018). These declines may not be completely representative of all PPS hospitals, however, as the matrix from which these values were calculated was not always completed in its entirety by respondents, resulting in smaller values. Entry level jobs saw the largest increase in employed FTE values, from 934.4 in 2014 to 956.1; this was followed by occupational therapists (88.4 FTEs in 2014 to 102.5 in 2018).

***“Both CAHs and PPS hospitals reported that the position they had been recruiting for the longest was physicians.”***

In addition to employed and vacant FTEs, the Hospital Survey also addressed the number of months that facilities had been working to fill their longest vacancy. Across both CAH and PPS Hospitals, the mean number of months recruiting for positions ranged from 0.0 to 27.0 months. After adding the average number of months together, PPS hospitals reported a considerably larger total than CAHs (110.5 months recruiting versus 76.4 among CAHs). Both CAHs and PPS hospitals reported that the position they had been recruiting for the longest was physicians (on average, 13.2 months in CAHs, and 27 in PPS hospitals). In addition to physicians, many healthcare facilities also spent a fair amount of time recruiting for positions such as physician assistants (an average of 5.4 months among CAHs and 5.0 months among PPS Hospitals). MT/CLS personnel (3.8 months for CAHs and 5.7 for PPS hospitals) and radiographers/radiology techs (5.4 in CAHs and 4.0 in PPS Hospitals) were also common.<sup>2</sup>

The hospital respondents were also asked to rank the difficulty of recruiting each of the 27 provider types. The ranking scale ranged from 1 to 4 as follows: 1- very easy, 2 - somewhat easy, 3 - somewhat difficult, and 4 - very difficult. The CAH most-difficult-to-fill vacancies were physicians (3.7); MLT/CLT (3.7) and MT/CLS (3.6) lab techs; radiation therapy techs (3.5); and ultrasound techs, licensed pharmacists, nuclear medicine techs, and respiratory therapists (all reporting a mean difficulty value of 3.4). In PPS hospitals, the most difficult positions to fill included MT/CLS (3.6) and MLT/CLT (3.5) lab techs; surgical technologists, physicians, and physical therapists (each at 3.3); and specialized radiology techs, physical therapy assistants, and occupational therapists (all reporting a mean difficulty value of 3.0).<sup>2</sup> It is important to remember that it is not only the availability of personnel that influences the difficulty in filling positions; many other factors, including salaries being offered for the positions, are at play.

In total, it is estimated that the PPS hospitals employed 389 specialist physicians and 158 primary care physicians (total 547 physicians, although these numbers do not take into account those employed by two PPS Hospitals), and CAHs employed 33 specialists and 56.5 primary care physicians (total 89.5). As described above, PPS hospital respondents rated the difficulty in filling primary care physician positions as a 3.3, with the comparable CAH rating of 3.7. This would rank the difficulty in filling physician vacancies as tied for fourth-most difficult for PPS hospitals and most difficult for CAHs.<sup>2</sup>



Of the hospitals that employ physicians, respondents were asked to rank on a four-point scale (1 - “Not an Important Problem” to 4 - “Important Problem”) factors that contribute to their recruiting problems (Figure 8.14). CAHs consistently reported that all of the eight barriers were more significant than did PPS hospitals. The highest-rated factors for CAHs were workload and call schedule (3.3), cultural activities and opportunities (3.2), and spousal employment opportunities (2.9). The three least-reported recruiting problems in CAHs were elementary and high schools (1.6), continued education/training opportunities (1.8), and condition of hospital facility (2.1). All PPS hospital response averages were 2.5 or lower. The highest means for PPS hospitals were cultural activities and opportunities (2.5), spousal employment opportunities (2.3), and workload and call schedule (2.3). The lowest three for PPS hospitals were elementary and high schools (1.3), finding good housing (1.3), and continuing education/training opportunities (1.8).<sup>2</sup>

***“The highest-rated recruiting problems for CAHs were workload and call schedule, cultural activities and opportunities, and spousal employment opportunities.”***

The hospital CEO respondents were asked to indicate how they staff their emergency departments with physicians on weekends. Respondents could mark more than one of the choices, so the percentages for each of the two geographic types can add to more than 100%. Among PPS hospitals (n = 4/6), the majority indicated that they utilized hospital physicians to staff the weekend emergency departments (67.7%), followed by local physicians (33.3%), and outside contracting physicians (16.7%). This differs slightly from 2014 survey results, where 100% indicated using hospital physicians, with one location (16.7%) also employing an outside-contracted position. Among CAHs (n = 36/36), most utilized their own hospital physicians (33.3%), followed by contracting outside for physicians (30.6%) or using local physicians (27.8%). In 2014, 50.0% of CAHs also used their own hospital physicians, 41.0% employed an outside-contracted position, and 29% used local physicians. In addition, the hospitals were asked to indicate the number of days per month that visiting physician specialists see patients in the hospitals. The mean for CAHs was 3.0 days per month, whereas the comparable mean for PPS hospitals was 6.0, although the latter value was based on one PPS hospital.<sup>2</sup>

## References

1. Center for Rural Health. (2020). 2020 North Dakota Behavioral Health Facility Survey (Data File)
2. Center for Rural Health. (2014). 2014 North Dakota Hospital Workforce Survey (Data File).
3. Center for Rural Health. (2018). 2018 North Dakota Hospital Workforce Survey (Data File).
4. Center for Rural Health. (2020). 2020 North Dakota Hospital Workforce Survey (Data File; summary in Appendix D).
5. Center for Rural Health. (2016). North Dakota Nursing Facility Workforce Survey (Data File).

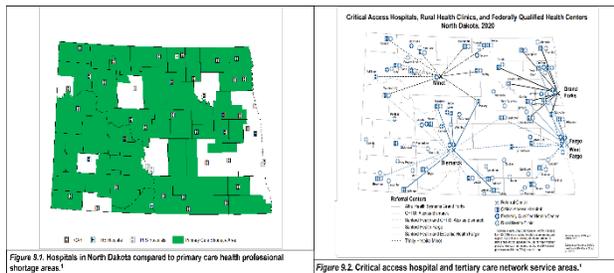
## **CHAPTER NINE: Healthcare Organization and Infrastructure in North Dakota**

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## HOSPITALS AND HEALTH SYSTEMS

A significant health organizational structure is the hospital, along with broader health systems that tend to be an organizational structure composed of a hospital, clinic system, and other healthcare elements (ambulance, nursing home, and others). According to the North Dakota Department of Health (NDDoH), there are 56 hospitals in the state. Of these 56 hospitals, there are 36 CAHs, nine general acute Prospective Payment System (PPS; tertiary), three psychiatric, two Indian Health Service (IHS), two long-term acute care, two transplant, one specialty, and one rehabilitative.

Figures 9.1 and 9.2 depict the distribution of North Dakota hospitals and the areas federally designated as health professional shortage areas (HPSAs). The tertiary hospitals are located in the four largest cities in the state, and the critical access hospitals (CAHs) supplement the six largest hospitals (Altru Health System in Grand Forks, Trinity Health in Minot, Sanford Health in Bismarck and Fargo, Catholic Health Initiatives [CHI]-St. Alexius Medical Center in Bismarck, and Essentia Health in Fargo) by providing hospital coverage elsewhere. Tertiary hospitals imply the third level of care as primary and secondary hospitals make referrals to tertiary hospitals that offer specialty care services. Tertiary hospitals are sometimes called referral hospitals. In addition, there are a number of other hospitals that provide a distinct level of care.



The United States Department of Veterans Affairs (VA) and its Veterans Health Administration operates a federally funded hospital for veterans in Fargo, N.D., that is similar to and complements the six largest hospitals in the state. Outpatient care through the Fargo VA Hospital is also provided by eight associated community-based outpatient clinics (CBOC) that are located throughout the state; the CBOCs are found in Bismarck, Devils Lake, Dickinson, Grafton, Grand Forks, Jamestown, Minot, and Williston, N.D.

CAHs are rural hospitals that must meet the following specific federal guidelines: cap of 25 acute-care beds, an average length of stay of 96 hours or less, location at least 35 miles from another hospital, and reimbursement on an allowable-cost basis as opposed to a PPS, which is used with the Big Six tertiary hospitals.<sup>2</sup> Nationally, about 74% of all rural community hospitals have converted to CAH status (1,350 out of 1,821 as of February 2018).<sup>2,3</sup> All rural hospitals in North Dakota, with the exception of the two IHS hospitals, are CAHs. In North Dakota, all CAHs are nonprofit; in the country, as a whole, 94% of all CAHs are either nonprofit or government.<sup>4</sup>

All 36 CAHs have important networking relationships with the Big Six hospitals located in the four largest cities in North Dakota. Each city thus forms a tertiary care

geographic region (Figure 9.2, Tables 9.1 and 9.2). Most of the CAHs are located an hour or more by surface transportation from their tertiary referral center. This is especially concerning in inclement weather when the transfer time can be substantially longer or even impossible. CAHs take care of an older population relative to the Big Six because North Dakota's rural population tends to be older (Table 9.2).

**Table 9.1**  
Tertiary hospital geographic regions related to critical access hospitals.<sup>1</sup>

Tertiary Hospital	Square Miles	People per Sq. Mi.	Number of CAHs	Average Distance
Bismarck	29,646	7.3	10	110.5
Fargo	12,452	18.2	5	95.9
Grand Forks	10,555	11.1	10	68.6
Minot	20,419	7.5	11	84.5

Minot and Bismarck hospitals serve the largest areas, although Grand Forks and Fargo have the highest concentrations of people. The Fargo region has the fewest CAHs. The distances between the CAHs and the tier areas are greatest for Bismarck. The CAH closest to a tertiary hospital is only 36 miles away, while the CAH farthest from a tertiary hospital is 182 miles away.

Nationally, as well as in North Dakota, the hospital market continues to consolidate nationally. In comparison to South Dakota, rural North Dakota hospitals tend to have more independence and autonomy in that they are community-controlled, nonprofit hospitals. All CAHs, as well as the PPS hospitals in North Dakota, are nonprofits. North Dakota is unique in that there are no for-profit hospitals. For the rural hospitals, about 56% are independent (neither owned nor formally managed by an external system). There are 15 CAHs that have more formalized relationships with a tertiary hospital where more decision making rests with the larger facility. All CAHs must operate with some form of communication and transfer agreements with a referral hospital. All of the CAHs work with at least one regional tertiary on quality improvement efforts. The tertiary health systems also operate a number of primary care medical clinics either in conjunction with a CAH, or sometimes in a more competitive model. Chapter 7, Quality and Value of Healthcare, discusses new health system arrangements that are in response to national health reform and alternative payment models. A number of North Dakota CAHs are participating in these new structures, including accountable care organizations (ACOs).

**Table 9.2**  
Tertiary hospital cities and CAH demographics.<sup>1</sup>

Tertiary Hospital	Tertiary Beds	CAH Beds	Tertiary Average Age	CAH Average Age	Tertiary % Male	CAH % Male
Bismarck	510	230	38.2	42.1	49.4	50.5
Fargo	687	120	35.5	38.5	50.6	50.6
Grand Forks	277	187	34.7	41.9	41.4	50.4
Minot	416	235	36.4	50.5	50.7	51.3

Hospitals in the Fargo region have the most beds (807 total). Bismarck has 740, Minot has 649, and Grand Forks has 464. For all regions, the average age of people in the CAH territories is older than those in the four main cities. This places a greater burden on the CAHs for certain types of care. These numbers relate to hospital bed numbers before the current COVID-19 outbreak.

Nearly all hospitals, including rural hospitals, face challenges that affect their ability to provide quality healthcare services. Common issues plaguing rural hospitals, including CAHs, include: healthcare workforce supply; reimbursement from both public and private payers; new models of care with corresponding alternative payment structures; access to behavioral and/or mental health services; community economic conditions and population changes; newer pressures to implement health information

technology (HIT) and to collect, monitor, and assess quality-of-care. Rural hospitals in particular, because of their small financial margins and a greater reliance on public payers such as Medicare, contend with an especially difficult environment. For a more comprehensive discussion on these topics please see the 5<sup>th</sup> edition of this report.

## **AMBULATORY CARE**

There are approximately 300 primary care and specialty clinics in the state. Rural and urban hospitals or health systems account for more than 55 percent of these clinics.<sup>5,6</sup> There are 53 rural based clinics, 42 being federally certified Rural Health Clinics (RHC) in the state, which is a decline from previous years. These are primary care clinics. CAHs own and operate most of the RHCs as provider-based RHCs with the remaining RHCs being either owned by a tertiary provider (six RHCs) or are independent clinics generally owned by a physician or group practice. All of the North Dakota provider-based clinics are owned by hospitals, primarily CAHs, which are nonprofit entities in this state; therefore, the provider-based RHCs are nonprofit. Under federal law, RHCs, both provider-based and independent, can be for-profit or not-for-profit, public, or private.<sup>7</sup>

There are five Federally Qualified Health Clinics (FQHC) in North Dakota, with the most common type being the community health center (CHC) model. The five centers (four CHCs and one migrant health center) operate in 17 communities. Twelve of the communities are rural, and five are urban (Bismarck, Fargo, Grand Forks, Minot, and West Fargo). For a comprehensive discussion of RHC's and FQHC's please see the 5<sup>th</sup> edition of this report.

## **EMERGENCY MEDICAL SERVICES**

Emergency medical services (EMS) are a fundamental service and health delivery function. EMS commonly refers to out-of-hospital acute medical care or transport to definitive care for patients with illnesses and injuries that the patient or the medical practitioner believe to be a medical emergency.<sup>8</sup> EMS can be viewed as a pre-hospital service, but as EMS continues to develop, it is also seen as a vital element in an overall integrated health-delivery system, where even the role and function of emergency care personnel are expanding to include more and different skill sets such as community paramedicine. Increasingly, other critical elements that are meant to address medical and health issues come into play within a framework of EMS.

At the state level, the division with primary responsibility is the Emergency Preparedness and Response Section of the NDDoH. The section has three divisions: Emergency Medical Systems, Hospital Preparedness, and Public Health Preparedness. The Division of Emergency Medical Systems (DEMS) has a wide jurisdiction of responsibility and service, including licensing ground and air ambulances and quick response units; updating and maintaining training, testing, certification, and licensure programs; providing technical assistance to EMS services; approving continuing education curriculum; administering state EMS grant programs; maintaining data systems; coordinating and managing the state Critical Incident Stress Management

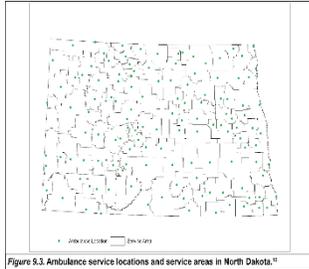
(CISM) Team; coordinating the state stroke system of care; coordinating the state cardiac system of care; maintaining a relationship with the North Dakota EMS Association; and other functions. In addition, the DEMS works closely with the Center for Rural Health on related matters, including a multistate evaluation of an emergency cardiac device, stroke efforts, and the Medicare Rural Hospital Flexibility program. The division also administers the ST-Evaluation Myocardial Infarction (STEMI) program, an initiative aimed at improving the system of care for heart attack patients and the community paramedic program; and provides oversight to the Simulation in Motion-North Dakota (SIM-ND) program, which provides training and education in trauma events through the use of simulation, including four semi-truck vehicles that travel throughout the state to rural hospitals, clinics, and ambulance systems. SIM-ND is a collaboration between the state and the UND School of Medicine and Health Sciences. Each semi-truck has one section designed to replicate a hospital emergency department and one section replicates an ambulance. Providers are trained through the use of simulators and mock drills.<sup>9</sup>

In North Dakota, there are 5,104 licensed EMS providers, according to the Department of Health. This includes 604 paramedics, including 12 community paramedics, 85 AEMTs, 1,998 EMTs, 2,191 EMRs, and 207 RNs. The average EMS area is 560 square miles (range 14 to 2,240 miles). The average distance traveled within an area is 12 miles (0.2 to 31.6 miles). The average distance from an EMS unit to a CAH is 26 miles (0.1 to 101 miles). The average distance from an EMS unit to a tertiary hospital is 73 miles (0.7 to 192 miles).

More than 90% of the EMTs in North Dakota are volunteers. Nationally, over 70% of all ambulances are volunteer-based.<sup>10</sup> The EMS system in rural areas is heavily dependent on a volunteer model that is seriously strained because of an aging volunteer base, changes in family dynamics and culture, local economics, and how volunteers value personal time versus civic commitment. While the number of paramedics is relatively small (604), they constitute a growing provider base along with the AEMTs. These are the highest-trained EMS personnel. There is a slight increase in the number of higher-trained personnel showing that the expectation for improved skill sets is present. Paramedics are concentrated in urban areas, but the number of rural paramedics has increased.

North Dakota infrastructures, including advanced life support (ALS) systems, basic life support (BLS) systems, and quick response units (QRU), employ paramedics in both rural and urban areas. Advanced life support (ALS) systems must be staffed by paramedics. Sixteen of the state's 22 ALS units are rural-based. While there are more ALS units in rural than urban areas, the majority of paramedics are working in an urban setting. A rural unit may employ only one or two, whereas an urban ALS unit will rely on many more. There is one Critical Access Hospital that employs five paramedics and there are some that employ multiple numbers. There are 136 ground ambulance units in North Dakota, which is an increase from 2016. These 136 are comprised of 100 basic life support (BLS); 22 ALS; and 14 substations. Substations are not quick response units and can transfer patients but must be under the direction of a BLS or ALS. There are 101 quick response units (QRU). QRU respond to a scene, but cannot transfer patients to a hospital. In the last *report* there were only 82 QRU so the number increased by 23%. There are six air services.<sup>37</sup> As of 2016 (last data) 63% were

organized as nonprofits, 29% were government controlled, and only 8% were for profit. Similar to CAHs, communities are more willing to tax themselves to take on some of the financial burden of maintaining an ambulance system. In 2015, 63% of ambulance units received local mill levy support.<sup>11</sup>



Advanced EMS support is typically available around the four major cities (Figure 9.3). Most of the EMS support throughout the state is ground-based and provides basic services (Table 9.3). The average population served by an EMS unit is 5,623 people, with a median of 1,543 (173 to 146,029). About 90 percent of the EMS units serve fewer than 5,000 people but cover an average of 534 square miles. Call volume is not evenly distributed because nine ambulance services account for 68% of all calls (more than 52,000), and the remaining 113 squads account for 32% (about 25,000 calls).

In 2017, ambulances made 76,187 runs. For some of the most rural and frontier counties the numbers are even more stark as 33 ambulances (24 percent of all ambulances) conduct 50 or fewer runs a year. Those 33 would account for about 2% of the over 76,000 runs in the state.<sup>13, 14</sup>

**Table 9.3**  
Number and type of EMS units in North Dakota<sup>12</sup>

	Air	Ground	Substation	Total
Advanced Life Support	0	17	•	18
Basic Life Support	0	108	6	114
Critical Care	0	•	•	0

EMS faces many challenges in the state. These obstacles were documented in a recent *report* which was completed for the state of North Dakota in 2011. The following were primary challenges identified from the research:

- Recruitment of volunteers was significantly more difficult than a decade before.
- An aging volunteer base is without an adequate supply of generational replacements.
- Almost half (46%) of the volunteers listed on local service rosters were inactive.
- Need was increasing to provide some level of financial incentives for volunteers.

- A small number (35%) of ambulance members frequently take calls.
- Some EMS volunteers reported taking more than 120 hours a week for call time.
- Thirty-five percent of ambulance squads had difficulty in filling schedules during specific times of the day or week.
- Some services reported that they expect to close within the next five years.<sup>15</sup>

The *report* also found that some of the issues have a social, cultural, or political orientation. For example, the authors discuss a finding that “EMS is often not seen as a vital component of community infrastructure worthy of the same funding as law enforcement, public health, road maintenance, water, sewer, and waste removal.” In addition, it is common for people, including some public officials, to not understand how EMS is funded. There is some level of resistance to more state involvement because of concerns over loss of local autonomy and control, and local political subdivisions such as cities, townships, and counties are generally not open or ready to assume more responsibility for the direct funding or operations of EMS.

It is important to understand that EMS is not a mandated service like fire or police protection, therefore differs in the way funding is provided. Fire and police are governmental functions and supported by public funding, (e.g., either mill levy and/or local sales tax). EMS relies on some reimbursement, local donations, grants, a small amount of local tax support, and other sources. In many ways, this is why over 70% of U.S. ambulances are volunteer and in North Dakota about 96% are volunteer. There is little public dollars targeted to this essential service, yet people tend to view it as a public function similar to fire and police. A former director of NDDEMS, said, that the current system “is not a sustainable mode either near term or far term.”<sup>16</sup>

Through state grants with funding supported by the state legislature there has been gradual change. In an environment, particularly rural, where the emergency system is built on volunteerism and local non-public dollars, and relies on a small number of major emergencies and even runs, there is some gradual movement toward realignment. Some small ambulances that are supported by state grants have converted to QRU status or substations. This may be a more realistic and sustainable model. It does require these rural units to not only change their function, but also change their own self-image. Similar to rural school consolidation, giving up your ambulance and working with and depending on a neighboring community with an ambulance is difficult. It can be seen as threatening to the survival of the small town that gave up the ambulance, but also disheartening to the volunteers. Many EMS advocates encourage greater experimentation with alternative delivery models. Some of this is associated with a more regional system where full-fledged ambulances connect, in a geographical area, with QRU or substations to more effectively and efficiently meet area needs.

The EMR in a QRU system can respond, provide basic life support and stabilize the patient until the ambulance intersects. Approximately five percent of North Dakota EMS run volume is considered time sensitive, meaning a rural system with strategically located ambulances, more reliance on paramedics and community paramedics, and

connecting with QRU and substations, has been advocated by many as an alternative arrangement that may be more sustainable.<sup>14, 18</sup>

Two elements are vital to any EMS transformation. The first is education and training. The EMS Association has placed emphasis on not just management functions, but leadership development. In collaboration with, and support from, the Center for Rural Health's Rural Medicare Hospital Flexibility Program (Flex), the association hosts regional meetings to address a wide range of discussions and training, including, but not limited to, the following: access to adequate training, maintaining trauma designations, adequate patient transport services, and health information exchange. The EMS Association coordinated four regional meetings in 2017. Three of the meetings are held at CAHs with one having been hosted by a tertiary hospital. Additionally, Flex has collaborated with the EMS Association on workforce shortage matters to help improve EMS capacity and performance; assistance on applying for state grants and with the "attribute survey," which is part of the application process; state EMS Management Conference; EMS Management courses (two half-day courses on grant writing, finance, bad debt collection); mental and behavioral health training; regional transport planning; and EMS Safety courses.<sup>18</sup>

The second is critical component to EMS transformation relates to the funding mechanism. It has been said that for rural EMS "low population means low volume." What this means is that the funding mechanism from insurance is based on volume, which means reimbursement is contingent upon runs. Frontier areas are small population areas that generate a small number of runs; thus, the amount of funding for some ambulance units is quite small. There are 33 ambulances that have 50 or fewer runs and 100 or so ambulances account for only 10% of the runs, and 22 account for 90%. The counter to the volume-based system has been referred to as "readiness." The rationale here is that the public sets aside funds for police and fire to be ready to respond; however, EMS is not funded in that manner. In North Dakota EMS is not mandated; it is something that other political subdivisions decide how to address, and there are private ambulance systems as well. This can be somewhat precarious as some communities are able to support EMS better than others. Currently, the EMS system is highly dependent upon state funding, which goes to ambulance systems via a grant process called the Rural Emergency Medical Services Assistance (REMSA) Grant.

Public policy at the state level has significantly taken on more responsibility for putting forth state monies to assess and plan for rural EMS changes and to address through state and federal grants the need to better educate and train an adequate EMS personnel. The 2007 legislative session set aside money for rural EMS. The Legislature put \$1.25 million into a staffing restructuring grant, which was followed in 2009 with an additional \$1 million for a total of \$2.25 million targeted to rural staffing. In 2011, the program language changed to the EMS Assistance Grant, and a total of \$4.25 million was approved. In 2013, the Legislature increased this to \$6.6 million and increased it again in the 2015 session to \$7.5 million. In 2017, the state dollars for REMSA were slightly reduced to \$6.9 million. Thus, in a ten-year period, the support to staffing development—training and skill set improvement—went from \$1.25 million to as high as \$7.5 million before a slight reduction.

All EMS funding (training grants, assistance grants, and Oil Impact Grants for units in the Oil Patch) has increased significantly over the years and amounts to approximately \$21 million, a significant investment in rural North Dakota. Grants have been used not only on staffing and training but also on assessment and planning, and structural realignment to assist in facilitating change in rural EMS. Funding from the state, and in some cases augmented by federal funds through the Flex program, has been used for management and leadership training of rural EMS squads. In addition, through state funding there were “earmarked” funds for oil-impacted counties that covered additional costs associated with staff, equipment, coverage, and training. In the current biennium, this amounts to \$6 million. REMSA changes included ambulance subsidies based on call volume combined with a second round of grants that could be used to address funding concerns. This change resulted in an interim legislative committee study. The Committee took testimony during the 2017-2018 interim. Much of the focus is on REMSA. DEMS representatives have identified the need to change and restructure the rural EMS system. While that has been the focus on EMS restructuring over the last ten years, there is still a need for significant change.

One DEMS representative stated, “The 2017-2019 REMSA Grant was designed to empower the creation of more efficient and effective EMS systems within each local funding area. The fundamental purpose of the REMSA grant is to stabilize and sustain the EMS system in North Dakota. The emphasis has shifted to ‘system’ building rather than the traditional focus on preserving individual services.”<sup>19</sup> This indicates that many groups, including advocacy and government groups, accept and want to build on the idea of fundamental, transformative change. However, when policy changes resources, such as funding, some perceive the change as a threat. Under the new formula, some low volume services have had reductions in funding. While perceived as an incentive for them to change organizational structure from an ambulance to a QRU, this formula can be resisted by individual units. At the time of this writing, a resolution to REMSA concerns was not available. As Table 9.1 shows, the average distance from a CAH to a tertiary hospital is 89 miles, with the longest being 182 miles.<sup>1</sup>

While the past six legislative sessions have been supportive of rural EMS, public policy in North Dakota tends to favor a higher degree of restraint and to not take on additional public functions. Although improvements are being made in rural EMS, and while there is a growing recognition of the serious problems facing rural EMS, the future of EMS must contend with the cultural and political norms of state public policy where the state has significantly increased financial resources and commitments (and does not want to take on full responsibility), and where political subdivisions have not fully recognized their more comprehensive role in the EMS system. There is an understanding that the state government does not wish to be the employer of community-based emergency services personnel. There is an increasing recognition that, in addition to improving actual provider skill levels, there is a corresponding need to improve the ability of rural units in the areas of management, leadership, and planning.

Federal grants have also been used to address North Dakota EMS. Since its inception in 1999, the Flex Program has worked to strengthen the rural North Dakota EMS system first by building CAH and EMS partnerships through small program grants intended to strengthen EMS through additional training, equipment purchases,

community education, and other efforts; and second by supporting management and leadership development. Most rural ambulance units are community-based, independently operated, or both with only about 20% of CAHs owning the local ambulance system. The Flex Program has sought to strengthen the relationship between CAHs and local ambulance systems. As was previously noted, during the past six years, Flex has provided grant funding to the North Dakota EMS Association to support EMS management training, EMS leadership development, joint EMS and CAH meetings, and for rural EMTs to attend a national rural EMS conference. Additionally, some EMS units have been participants in federal Rural Health Outreach Grant initiatives. The Rural Health Information Hub has been contacted to identify funding sources as well. The Center for Rural Health has also presented grant writing workshops<sup>18, 20</sup> to support statewide efforts on the EMS Voluntary Event Notification Tool (EVENT). EVENT is a Web-based EMS reporting of events such as near misses, assaults on EMS, patient safety events, and other situations. Flex funds assist the Association in promoting EVENT utilization among state EMS units through meetings, conferences, and website and newsletter marketing.

The Center for Rural Health's CAH Quality Improvement Network secured a federal Rural Health Network Development grant to work with the 36 CAHs on adapting to a new North Dakota law on first-dose medication oversight in the hospital and on hospital-to-hospital emergency transfer communications. The Center for Rural Health works with CAHs to develop a process for collecting and reporting on emergency department transfer communication and to improve this important element in the health system. Patient transfers typically are between the rural ambulance, CAH, and a tertiary emergency department. Technical assistance (TA) comes in the form of meetings and calls to identify barriers to transfers or "hand-offs," and to identify high-performing transfers and share best practices. For the CAH Quality Network, the focus on transfers is part of improving important quality metrics related to continuity of care, lowering and avoiding medical errors, and lowering redundant tests. The grant was initiated in 2016 and was closed in 2018. The transfer protocols have been implemented.<sup>21</sup>

Behavioral health and mental health have emerged in the past few years as a significant issue in North Dakota, and rural EMS and emergency department staff are affected by the demand. The Flex Program is supporting the NDEMSEA in utilizing the Escaping Violent Encounters (EVE) solutions to better inform and address EMS behavioral health training. This has specific EMS content with a focus on identification, recognition, de-escalation of aggression, and defense. The Flex Program also uses funds to support participation of rural North Dakota EMTs in the national Joint Committee on Rural Emergency Care (JCREC) and conference attendance.<sup>22</sup>

Another EMS effort supported through state policy is a community paramedic pilot program. A number of states have initiated this new model. The 2013 North Dakota Legislature supported this effort, and in 2014, a pilot program was released. The North Dakota Legislature called for a Community Paramedic Subcommittee to operate under the North Dakota EMS Advisory Council with representatives from EMS, nursing, nurse practitioners, and rural health. Stakeholder meetings were convened, and the program solicited licensed North Dakota ambulance services to participate in the pilot. Four pilots were selected in Rugby, Fargo, Bowman, and Dickinson. During the 2015–2016 biennium, Fargo Sanford and Fargo Essentia, along with the Southwestern District

Health Unit in Dickinson, proceeded. Rugby sought and was denied a Center for Medicare and Medicaid Services (CMS) waiver and thus had to curtail its efforts. Dickinson Southwestern District Health Unit proceeded under an additional public health grant from a private funder called Million Hearts. More than 12 paramedics from these communities completed additional training in community paramedicine based on a national curriculum. Efforts being explored by these EMS services include hospice support, prevention of high-risk readmissions, diversion of non-emergent emergency department visits, outreach to clinic patients, behavioral health, and public health support. Community paramedics are experienced field paramedics who undergo additional education to provide a wider scope of primary and non-emergent care. Community paramedicine does not require an additional license and community paramedics operate within the standard scope of practice for a paramedic. During the biennium, discussions with third-party payers commenced. Medicaid did approve some reimbursement of community paramedics who provide immunizations.<sup>22, 23</sup>

Community paramedics can be employed to conduct in-home evaluation and patient follow-up to provide care to patients who may seek emergency services for non-emergent conditions; treat patients at high risk for readmission from chronic conditions; treat patients requiring clinic appointments but who lack transportation; staff rural clinics providing basic screening and follow-up; work as part of a public health team offering primary healthcare outreach, behavioral health, and transportation; and provide some level of home care or hospice services. Community paramedics could, in time, be an important provider in frontier and rural areas, and the discipline could serve to build closer collaboration between emergency services and primary care, public health, home care, and long-term care. For North Dakota, the community paramedicine provider could address three critical areas: 1) inconsistent access to care and providers at all levels including the disparity between urban and rural areas, 2) diminished volunteer EMS staffing associated with rural population change and low-volume operations, and 3) the refocus of healthcare to being more preventive and wellness oriented. The community paramedic model has promise as a way to blend elements of emergency care with primary care and public health. It is still developing albeit at a slow pace. Reimbursement remains a hurdle.<sup>24</sup>

Related to these three areas, is the concentration of human health resources to better coordinate care and manage services not only for the betterment of the patient but also to create organizational and financial efficiencies. The community paramedic model may be a new provider class that can help to redesign elements of the delivery system, particularly in rural areas.<sup>23</sup> Barriers at this time for developing the community paramedic model revolve around reimbursement and patient volume.

Currently in North Dakota, there is only Medicaid reimbursement to community paramedics performing immunizations. Minnesota allows a much wider scope of services to be reimbursed under Medicaid such as health assessments, medication compliance checks, chronic disease monitoring and education, hospital discharge follow-up, and immunizations and vaccinations.<sup>25</sup> As more services become reimbursable, the application of the community paramedic model will likely increase. This relates to the issue of patient volume and health-system restructuring. Ambulance services have a high level of fixed costs. A larger health system employing community

paramedics that are addressing more population health services offers the opportunity to spread out the costs, which a small or rural system cannot do. In other words, cost savings accrue to the system both in the form of lower cost interventions that replace more expensive services such as repeated visits to the emergency department or rehospitalization, and in the form of maximizing the utilization of a fixed-cost resource.

Preliminary data from the community paramedicine efforts in Fargo indicate that, in a relatively small sample of 30 patients, emergency room visits were reduced by one-half and the no-show rate to primary care providers was cut by 30%.<sup>26</sup> As CAHs and rural or independent ambulance systems become more integrated into alternative payment models such as ACOs, with possibly some form of bundled payments, the ability to align community paramedic services along a continuum of services that improves patient outcomes and maximizes system performance and efficiencies becomes more realistic.

Another important area for North Dakota relates to stroke and cardiac systems of care. The NDDoH, through the Emergency Preparedness and Response Section and the Emergency Medical Services and Trauma Division, works to establish and maintain a statewide stroke system to improve emergency care to those suffering a stroke. Part of this is through a hospital designation process. Critical Access Hospitals can be designated as Stroke Ready. The CAH Quality Network assists CAHs in this endeavor.<sup>27</sup>

In a similar way, the state works to establish and maintain a comprehensive cardiac system. The department does this in a variety of ways including having developed a Cardiac Ready Community designation program and process for communities, which is similar to what was previously stated about stroke designations. These designations are for a community that is prepared to take on cardiac emergency events and to improve survival rates including recognition of signs and symptoms, access to the EMS system, availability of Automated External Defibrillators (AEDs), and offering high-performance CPR. In addition, the department has used the Million Hearts program with the American Heart Association in the community paramedic effort in Dickinson and Billings County to address hypertension referrals. A Cardiac Task Force has worked on a continuum of care with statewide cardiac protocols and recommendations for ambulances and hospitals. As of 2018, there were nine Cardiac Ready Communities and 27 other communities have signed letters of intent.<sup>27</sup>

EMS is a complicated system with much nuance in its delivery structure and the dynamic quality found in a changing workforce. The complexity is a part of the ongoing need to construct viable stroke and cardiac systems of care. As part of this pursuit, there are efforts focusing on EMS regional transport plans. This also represents a level of integration with the trauma system because that system also has transport plans. Corresponding with the transport plans are also the designation of hospitals at certain levels and standard practices. For cardiac care, in 2012, the Mission: Lifetime program began in North Dakota, which has facilitated discussions and reviews associated with EMS transport of cardiac patients, designating percutaneous-coronary-intervention-capable tertiary hospitals and also the development and implementation of general standards to guide the care of patients having a STEMI or acute cardiac event. STEMI refers to ST-elevation myocardial infarction, which is a form of heart attack. The Flex Program has assisted CAHs and rural EMS on the subject of regional transport plans

related to both stroke and cardiac care. However, the focus on stroke and cardiac care is looking at new models that may better reflect the unique quality of these systems as opposed to simply replicating the trauma model.

In 2013, the NDDoH DEMS was awarded a grant to address gaps in the cardiac system of care. The NDDoH DEMS project, known as the North Dakota Cardiac Care System–Automated CPR Component, received an award amount of \$3.03 million. This project distributed the LUCAS®2 Mechanical Chest Compression System to more than 400 hospitals and ambulance services throughout North Dakota. The LUCAS®2 is a lightweight, portable mechanical CPR device used to deliver high-quality chest compressions to patients in cardiac arrest.<sup>28</sup>

In 2014, the Center for Rural Health was contracted by the NDDoH to evaluate the success of the project and assist with improving the efficiency and effectiveness of the North Dakota cardiac system of care. The evaluation facilitated two multiagency emergency preparedness exercises to assess the interoperability of medical devices and databases used to collect cardiac arrest data across the cardiac system of care in North Dakota. The lessons learned from the exercises assisted in identifying equipment and service gaps, and refining database processes. Extending the notion of cardiac systems of care, collaborations between the NDDoH, American Heart Association, Center for Rural Health, and the Powers Lake community transformed Powers Lake into the first Cardiac Ready Community (CRC). The goal of a CRC is to have a well-prepared community trained in both CPR and AED use, as well as the appropriate response to a cardiac arrest. Since 2016 new strategies have been developed to collect project impact data by phone interviewing providers post- LUCAS®2 usage. As of this update, emergency medical services and hospital providers report the LUCAS®2 device helped to save the lives of seven North Dakotans who suffered a sudden cardiac arrest.<sup>29</sup>

## **TRAUMA SYSTEM AND CENTERS**

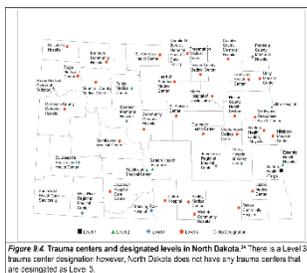
Trauma, according to the North Dakota Century Code, means “tissue damage caused by the transfer of thermal, mechanical, electrical, or chemical energy, or by the absence of heat or oxygen.”<sup>30</sup> In the United States, traumatic injuries are estimated to be responsible for more than 192,000 deaths a year, with an estimated death rate of 66.6 per 100,000 persons.<sup>31</sup> Trauma ranks as the third-leading cause of death and is the leading cause of death for people 46 years of age or younger, or 47% of all deaths in that age group. Trauma injury accounts for 30% of all life years lost in the United States, which is more than cancer, which accounts for 16%, and heart disease, at 12%, combined.<sup>32</sup> Falls and motor vehicle crashes account for the majority of trauma in North Dakota.

In 2014, the next most prevalent causes of trauma include ATVs, motorcycles, assault, machinery, and animals. Trauma events, as recorded in the state trauma registry, have increased 49% from 2008 to 2014 to a total of 6,008. The numbers in 2014 are slightly below what were previously reported when there were 6,227 cases of reported trauma events.<sup>33</sup> The area with the largest percentage increase in trauma was the northwest quadrant, recording a 115.4% increase from 2007 to 2014. The southwest quadrant experienced an increase of 64%; northeast, 54%; and southeast, 33%. The

area with the highest number of trauma events was found in the southeast, with 1,812. This is also the location of the state’s largest city, Fargo. The northwest quadrant has a significant level of oil extraction activity. Likely because of the rapid expansion in oil and other energy development, the incidence of employment related trauma increased by 49% from 2009 to 2014, increasing from 32 in 2009 to 166 in 2014. Agriculture has experienced a decline in trauma rates from 104 to 85 occurrences from 2009 to 2014.

Trauma is more prevalent in younger populations nationwide, including North Dakota. In 2014, the age cohort with the highest level of trauma was the 20–29 age group, followed by the 50–59, and 30–39 age groups. Most trauma cases in the state’s registry were categorized as minor, as opposed to moderate or severe.<sup>33</sup>

All hospitals, including all 36 CAHs, with the exception of one IHS hospital, are designated as trauma centers (Figure 9.4). Verification of trauma centers is based on nationally recognized standards by the American College of Surgeons Committee on Trauma. The standards include hospital organization, clinical capabilities, facility and equipment availability, quality improvement processes, prevention and public education, trauma research, continuing education, trauma service support personnel, and transfer agreements.



There are five trauma center levels. Level I is a comprehensive regional resource—tertiary care center—providing total care for every area of injury from prevention to rehabilitation. There are no Level I trauma centers in North Dakota. North Dakota has six Level II trauma centers. A Level II facility is able to initiate definitive care to all injured patients. It offers 24-hour immediate coverage by general surgeons, including orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, and critical care. The six tertiary hospitals are all Level II trauma centers. North Dakota does not have any Level III trauma centers. This level can provide prompt assessment, resuscitation, surgery, intensive care, and stabilization of injured patients. Level IV trauma centers provide advanced trauma life support before transfer of patients to a higher-level trauma center. This level provides evaluation, stabilization, and diagnostic capabilities for injured patients. Seven rural hospitals have this designation: six CAHs and one IHS. Level V trauma centers are the most common in North Dakota with 30 CAHs having this designation. A Level V trauma center provides initial evaluation, stabilization, and diagnostic capabilities and prepares patients for transfer to higher levels of care. All CAHs have transfer agreements for patients requiring more comprehensive care at a Level I through Level III trauma center.<sup>35</sup> The average travel distance to a trauma center is almost 23 miles. Studies have found a number of factors

that are advantages and assets to the North Dakota trauma system. Common advantages include the following:

- Inclusive system with excellent participation
- Good EMS coverage despite geographic challenges
- Strong, enabling legislation
- Good working relationship between EMS and trauma systems
- Strong cooperation among hospitals
- Rural Hospital Flexibility (Flex) Program collaboration
- State radio communication system
- Budget surplus
- State Legislature is engaged

Challenges and vulnerabilities include the following:<sup>36</sup>

- Large geographic area with a scattered (low-density) population
- Difficulty in recruiting providers
- High reliance on volunteers, particularly in rural areas
- No statewide trauma registry data and little use of existing data collected by trauma centers
- No hospital discharge data
- Lack of specific pediatric protocols and practices
- Relative shortage of air ambulance services
- Poor coordination with existing injury prevention program
- An aging population

## **LONG-TERM CARE**

North Dakota must contend with an aging population that has a corresponding effect on policy decisions at both the state and federal level as it relates to health infrastructure, health status, education, housing, transportation, economic development, and other sectors. Long-term care (LTC) services are a function of healthcare that is directly affected by population factors, particularly the aging of the population. In North Dakota, long-term care facilities include assisted living, basic care, and nursing care. Each is a different type or level of care with corresponding services.

According to the North Dakota Long Term Care Association, one out of every two North Dakotans will require some type of LTC service during their lives. The need for personal assistance with everyday activities increases with age. The top three factors affecting the need for nursing home care are: 1) being female, 2) being 80 or older, and 3) living alone. Older women are two times as likely as men to live alone. By age 75, 55% of individuals are living alone. The association also found that the most common reasons provided for nursing home placement include: 1) the need for assistance with daily care throughout the day, 2) needing continuous supervision, 3) falls, 4) Dementia, and 5) complex medical needs.<sup>37</sup>

North Dakota has 80 skilled nursing facilities; 60 are in rural areas and 96% are nonprofit. North Dakota has 62 basic-care facilities; 39 are in rural areas and 64% are nonprofit. North Dakota has 75 assisted living facilities; 41 are located in rural areas and 66% are nonprofit.<sup>38, 39, 40</sup>

The number of skilled nursing facilities has remained stable over the past three years; however, there are slightly more urban facilities than in the past. Overall, nursing home occupancy rates have declined. As was the case for rural hospitals, long-term care facilities will need assistance to adjust to these changes. Reimbursement streams, workforce needs, and regulatory requirements can either be barriers or facilitators of change with public policy shaping those broader, systemic elements. Long-term care is generally regarded as heavily regulated. In order for nursing facilities or other forms of aging services to adjust to changing markets there will be a need for congruent public policy.

North Dakota long-term care facilities provide care to more than 16,000 citizens.<sup>37</sup> The growth in the elderly population will have a significant impact on aging services and LTC. North Dakota is projected to see a 50% increase in the 65 and older age group from 2011 to 2025, from 98,595 to 148,060 individuals.<sup>40</sup> Currently, North Dakota ranks 7th in the nation with the highest proportion of individuals 85 years and older.<sup>41</sup>

An assisted-living facility is a residential setting, where the residents have private apartments and contract for services. There is an à la carte service plan for residents to select the services that best fit their needs. A basic plan typically covers meals, housekeeping, activities, transportation, and laundry. The assisted-living facility typically provides health services from bathing to medication management to hospice. In North Dakota, the age range of current residents is from 51 to 104, with the average age being 85. Females comprise 72% of assisted living tenants. The most common reasons people have for choosing assisted-living are: 1) assistance with daily care, 2) social isolation, 3) limited community services, and 4) need for supervision. More than 55% who move out of an assisted living facility are admitted to a skilled nursing facility. The cost of assisted living has an average rental charge of \$2,341 a month (\$923 to \$4,380). The average service package is \$1,017 per month. Most costs are absorbed by the tenant, with LTC insurance assisting in 23% of the cases.

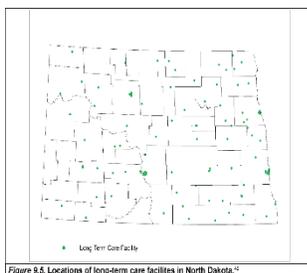
A basic-care facility is a congregate residential setting with private rooms and semiprivate rooms, providing 24-hour supervision with a comprehensive care plan. Basic care provides an all-inclusive rate providing room, meals, personal care services, supervision, activities, transportation, medication administration, nursing assessment, and care planning. The average age of a basic care resident in North Dakota is 79, with a range of 40 to 105 years. Females comprise 71% of basic care residents. The most common reasons people chose basic care include the following: 1) assistance with daily care, 2) needing supervision, and 3) confusion. More than half (55%) who move out of a basic-care facility are admitted to a skilled nursing facility. The cost of basic care is on average \$3,668 a month (\$2,300 to \$5,100). Fifty-seven percent of basic care residents need assistance to pay for care.

A nursing facility provides 24-hour nursing care and supervision. It is the highest level of LTC in North Dakota. The most significant reason for admission to a nursing facility is that the resident requires care throughout the day. Residents are unable to

meet their own needs of dressing, toileting, eating, and remaining safe. Most residents are admitted after a hospitalization or come directly from their home. The average age of a nursing-home resident is 84 years old with a range of 33 to 109 years. The average length of stay is less than a year. According to CMS, nursing facilities in North Dakota had the second highest percentage of residents who were 95 years of age or older in the country at 9.24, compared with a U.S. average of 5.18%. North Dakota also ranked first in having the highest percentage of nursing home residents who were 85–94 years of age with 47.2% versus 35%.

A slightly lower percentage of residents in North Dakota are female than found in assisted-living and basic care but still account for 68% of nursing home residents. The most common reasons for entering a nursing facility include the following: 1) assistance with daily care, 2) need continuous supervision, 3) falls, 4) dementia, and 5) complex medical needs. The average cost for one day of care in a North Dakota nursing facility, in 2016 was \$258.78. Nursing facilities can charge extra for a private room and more than 90% do so. In 2016, Medicaid was the primary payer for nursing facility care accounting for 54% of the payments. This was followed by private pay at 38%, Medicare at 8%, and 'other' at less than 1%.<sup>37</sup>

LTC faces many challenges. Similar to hospitals, clinics, EMS, and public health, one of the primary obstacles is workforce. As of 2016, 48 of the more than 80 nursing facilities reported more than 669 vacancies. This is actually an improvement from 2012 when 63 facilities reported 750 vacancies. The annual turnover rate for certified nurse assistants (CNA) is 62%. The CNA turnover rate has fluctuated over the past few years, but it has been more than 50% since 2006.<sup>37</sup>



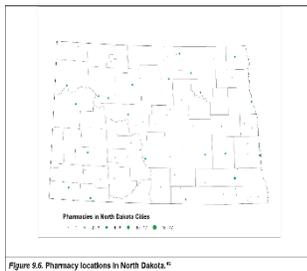
The nursing turnover rate has been more than 30% since 2010, with the licensed practical nurse (LPN) turnover being 42% and the rate for RNs standing at 5% in 2012. More than one-third of the nursing facility workforce is 50 years of age or older. The workforce situation is so challenging that in 2016, 12 nursing facilities stopped admissions because of insufficient staffing. In 2016, 73% of nursing facilities contracted with private agencies to deliver daily resident care. This represented a significant increase from 2010 data when two out of five facilities contracted for staffing. Many nursing facilities' residents are served by a workforce of their peers. The oldest employee in a LTC facility is 90 years of age.<sup>37</sup>

Like hospitals, nursing facilities are having to contend with an environment that is driven more and more by public policy focused on quality improvement. In 2016, the CMS added six new quality measures to the consumer-based Nursing Home Compare, nearly double the previous number of measures. As of 2018, these are the newest

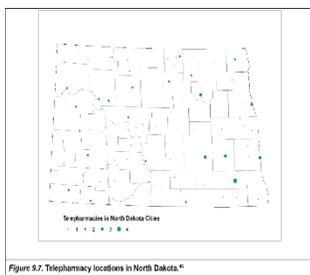
quality measures identified. The new measures address: 1) successful discharges to the community, 2) outpatient emergency department visits, 3) re-hospitalizations, 4) improvement in the functions of a patient, 5) whether the patient's ability to move independently worsens, and 6) antianxiety or hypnotic medications.<sup>43</sup> All of the measures are used to establish a star rating (1 to 5) intended to assist consumers in their evaluation of nursing home care. The CMS updated the star rating system in March 2018.<sup>44</sup>

## PHARMACIES AND TELEPHARMACY

North Dakota has more than 233 pharmacies with 150 (64%) being located in rural areas (Figure 9.6). Five counties, all rural, have no pharmacies.<sup>45</sup> Rural pharmacies, like other rural health providers, have felt the pressure of reimbursement and workforce issues. One tool for rural pharmacies is their ability to utilize telepharmacy and an option. Telepharmacy is a valuable way for pharmacists to work with rural communities in highly rural states.



The development of telepharmacies began in North Dakota. North Dakota was the first state to pass administrative rules allowing retail pharmacies to operate in certain remote areas. In 2017, there were about 25 states with laws governing telepharmacies, an increase from 10 in 2012.<sup>47,48</sup> Telepharmacies have become a practical means to keep access to medications available in a growing number of rural locations (Figure 9.6). A telepharmacy benefits the patient and the pharmacist, creates employment opportunities for health workers, supports local business and economic development, and supports local health providers and organizations such as CAHs, clinics, long-term care facilities, and public health. Telepharmacies operate with a licensed pharmacist at a central pharmacy site who supervises a registered pharmacy technician at a remote telepharmacy site through the use of videoconferencing technology. The technician prepares the prescription drug for dispensing by the pharmacist. The pharmacist communicates face-to-face in real time with the technician and the patient through audio and video computer links.<sup>48</sup>



Forty-five North Dakota counties are involved with the North Dakota Telepharmacy Project. As of 2016, there were 98 pharmacies involved in the Telepharmacy Project. Many of these remote sites are in communities where the central pharmacy closed, or in communities that either have not had a pharmacy or not had one for many years. The Telepharmacy Project has both protected access to an essential service and has in some cases expanded access. Of the 98 sites, 69 are retail pharmacies and 27 are hospital pharmacies. There are also two Minnesota sites. Approximately 80,000 rural citizens have had pharmacy services restored, retained, or established through the Telepharmacy Project, which is a collaboration of the North Dakota State University College of Health Professions, the North Dakota Board of Pharmacy, and the North Dakota Pharmacists Association. The effort has restored valuable access to healthcare in rural and frontier areas of the state and has added approximately \$26.5 million in economic development to local rural economies.<sup>48</sup>

## **PUBLIC HEALTH**

Public health is an important and fundamental set of health and environmental services that have made significant contributions to improving the health status of most Americans, rural and urban. Public health covers a wide scope of activities, and can be defined as “the science of protecting the safety and improving the health of communities through education, policy making and research for disease and injury prevention.”<sup>49</sup> Public health is also an evolving concept that goes beyond the provision of services as the U.S. health system transforms under the ACA. At the same time, public health remains unheralded and misunderstood. A rural North Dakota public health director once remarked, “If I am doing my job well, you don’t even know I’m here.” While acute care, long-term care, clinical care, and EMS attract much of the spotlight, garnering more public awareness and attention, public health throughout the 20th century and into the present has significantly changed the lives of millions of Americans. Some of the accomplishments associated with public health include: development and widespread access to vaccinations, control of infectious disease (e.g., through emphasis on clean water and improved sanitation), fluoridation of drinking water, provision of safer and more healthful foods, access to family planning, increased motor vehicle safety, and tobacco control. Disease prevention and health promotion are highly associated with public health.

Schneider distinguishes public health from medicine in this manner: “While medicine is concerned with individual patients, public health regards the community as its patient, trying to improve the health of that population. Medicine focuses on healing

patients who are ill. Public health focuses on preventing illness.”<sup>50</sup> Thus public health is concerned with the concept of population health, including the determinants of health. Population health and public health are not synonymous, but they do interrelate. According to Kindig and Stoddard (2003), population health refers to “an approach that focuses on interrelated conditions and factors that influence the health of populations over the life course, identifies systematic variations in their patterns of occurrence, and applies the resulting knowledge to develop and implement policies and actions to improve the health and well-being of those populations.” Thus, population health is a comprehensive concept requiring a systematic understanding of the health status of the population through a focus on the determinants of health, public health policy, processes to address health, and the involvement of both a healthcare and public health system—all to improve the population’s health.

Population health is concerned with both the measurement of health outcomes and the pattern of determinants.<sup>51</sup> To augment the availability of highly trained public health workers and strengthen the population health workforce, North Dakota State University and the University of North Dakota recently initiated collaborative Master of Public Health degree programs. The programs share similar core coursework but distinctive specialization tracks. Organizationally, for the UND SMHS, this indicates that the comprehensive goal of improving population health is interrelated and inclusive of focal areas such as public health, which emphasizes understanding health within a context of the individual choices, the nature of disease and disease prevention, community dynamics, organizational structures, and public policy. Most Center for Rural Health faculty are also members of the Department of Population Health at UND; thus, there is a concerted effort to infuse the concepts and processes associated with public health and rural health to address comprehensive population health needs. More evident is that both the Center for Rural Health and the North Dakota Public Health Association are lead sponsors of the annual Dakota Conference on Rural and Public Health.

In some respects, the national experiment in health reform—particularly when thought of within the context of the Institute for Healthcare Improvement’s (IHI) Triple Aims of better care, better health, and lowered cost—represents a unique opportunity in the American health system to better maximize both healthcare and public health practices to meet the needs of the overall population. The healthcare system, under the ACA, is evolving as it takes up a movement to value health outcomes linked with improved organizational efficiency, for example, in an effort to address the Triple Aims. To do so, the healthcare system is more inclined to be engaged with traditional public health concerns such as population health. Recently a healthcare leader in North Dakota said, “As hospitals, we never used to be too concerned with things like poverty and housing, but now [under health reform] we have to be, and that is a good thing.”<sup>52</sup> In order to improve the status of health in the United States, there must be an improvement in, and the corresponding controlling of health costs can create an economic model that may be better suited to improve, both the healthcare system and the health of the population.

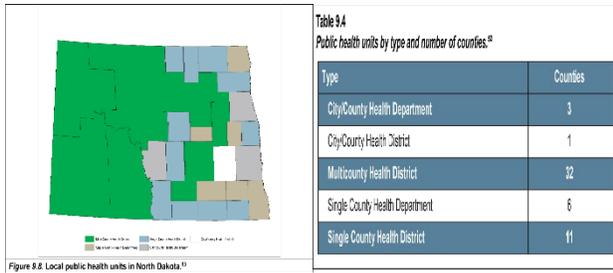
An example of this is the ACA requirement that all nonprofit hospitals conduct a Community Health Needs Assessment (CHNA) and implementation plan every three years. The rationale is to produce a community health benefit, an activity or effort that

improves population health. The community-benefit concept, while expansive in both design and implementation, lends itself nicely to a focus on population health and the determinants of health. The fact that hospitals are required to include public health in this facilitates the interconnections for a comprehensive--possibly even transformative--vision of community health and population health overall. Integration does not have to be formal or structural; it can be collaborative and cooperative as exercised by independent organizations. However, greater cohesion within the system is a goal. Part of this is linking payment and outcome through alternative payment models in the form of ACOs, patient-centered medical homes, clinically integrated networks, the use of bundled payments, and other new organizational platforms that seek system redesign based on an emphasis on outcome and value over volume. In other words, by focusing not only on patient outcomes and health status (including prevention and maintenance) but also on a provider-incentive system where outcome and efficiency are rewarded, the American health system seeks to transform itself into one that better integrates population health, curative care, and palliative care.

## **PUBLIC HEALTH UNITS**

While each public health unit can determine its own mission and primary focus, there are some common services provided. All North Dakota public health districts provide the following: immunizations (for all ages), blood pressure screening (adults and school-age children), scoliosis screening (school-age children), vision screening (school-age children), high-risk infant follow-up, and vitamin B12 injections. In addition, most but not all units provide the following services: maternal and child health (e.g., home visits, sudden infant death syndrome prevention follow-up visits, and child health services); health promotion (e.g., diabetes, foot care, and community wellness programs); communicable disease (e.g., tuberculosis and skin and scalp conditions); school health (e.g., hearing screenings and AIDS education); environmental health (e.g., public water system inspection, environmental sanitation services, and water pollution control); occupational health nurse activities; mental health; skilled nursing activities; and maternal and child health initiative grants.

North Dakota's public health system is decentralized with 28 independent local public health units working in partnership with the NDDoH (Figure 9.8). The 28 local public health units are organized into single or multicounty health districts, city-county health departments, or city-county health districts. Seventy-five percent of the local health units serve a single county, city, or combined city-county jurisdiction, while the other 25% serve multicounty jurisdictions (Table 9.4). The majority of the multicounty jurisdictions are located in the western part of the state. In this decentralized approach, the units are required to meet state standards and follow state laws and regulations, but they can exercise their own powers and have administrative authority to make decisions to meet their local needs.



Some rural public health units, like rural hospitals, have used special federal rural health grants to address broader community needs. The Southwestern District Health Unit in Dickinson, which serves a large eight-county region, has used multiple federal Rural Health Outreach grants and Rural Health Network Development grants to create a health screening (e.g., various cancers and cardiovascular conditions) and education model. The public health effort, called Pathways to Healthy Lives, is a strong community-engagement model in which the public health unit, the local Dickinson hospital, and the community action agency worked as a network along with many other area groups to plan and develop services. The impetus for the effort was a community needs assessment and planning process conducted a number of years ago. This community engagement effort became the nucleus for community awareness and involvement, which is at the heart of rural health.

The Tri-County Chronic Disease Management Program was also a Rural Health Outreach grant product. Developed and administered by the City-County Health Department in Valley City, Tri-County was a network-focused effort involving City-County, Central Valley Health Unit in Jamestown (serving Stutsman and Logan counties), and South Central Adult Services in Logan County. The program placed a strong focus on self-management and teaching clients how to learn more about their chronic disease, and to self-monitor and manage it, while working closely with their primary care providers. Clients gained awareness and more self-confidence.<sup>54</sup>

Both rural efforts, Dickinson and Valley City, are examples of essential health services (e.g., health screenings and chronic disease management) that are recognized and valued under health reform, possibly at a level that is higher than was previously found (at least they are services that can be adequately rewarded within new payment models). While these are services that public health has championed, in the current transformative climate they are now also services that produce “value” in terms of stronger health system performance. In an age of alternative payment models, these are services that can contribute to better care, better health, and lowered cost. Thus, some functions that public health units perform at a high level, with accepted quality indicators and at a reasonable cost, can now be services that could be attractive to an ACO or other model. Public health units have been involved in other federal rural health grants addressing community wellness, chronic disease, home care, mental health, and other critical community health needs.

Public health units have been involved, to one degree or another, with nonprofit hospitals in a CHNA process. The Public Health Accreditation Board (PHAB, which will be discussed in more detail later but is the process required for public health agencies to follow to reach full accreditation) requires public health entities to also conduct a

Community Health Assessment (CHA) process as part of an accreditation effort. Thus, public health has been actively engaged in the community assessment process, either one that was meant to meet accreditation needs or one to meet the ACA requirement for hospitals.

At the time (2018) of this *Report*, another round of CHNA processes were in progress; however, evidence to date has found support in rural North Dakota for a number of issues that lend themselves to public health solutions: obesity/overweight, poverty, teen pregnancy, bullying, elder services, and adolescent or adult alcohol or drug abuse, to name a few. An observation from the CHNA experience was that if the community health partners developed open, collaborative relationships, then there was an opportunity for progress on these health issues. The value of the process is that it can encourage health organization collaboration in striving to build a vision for community health. Through a variety of channels, health reform is either encouraging or sometimes requiring more collaboration between provider groups in an effort to improve health status. The CHNA process used by the CRH is built on a community participatory model. Population health in a transformative period requires more than the collaboration of health providers: it requires community engagement.

## **SUMMARY**

Healthcare in North Dakota is delivered through more than 300 ambulatory care clinics, 52 hospitals, 80 skilled-nursing facilities, 68 basic-care facilities, and 72 assisted-living facilities, supported by an array of EMS providers, trauma centers, 28 public health units, oral health providers, mental health providers, and pharmacies. As a general rule, the further the facility is from a metropolitan area, the more its operation is threatened by financial and other pressures, including staff recruitment and retention. Rural health organizations tend to be small in size but have a significant effect on both the health of individuals and the economic base of the community. Rural health providers do not operate in isolation. While most are independently operated or owned or both, they have forged generally positive working and referral relationships with more urban providers. There are numerous examples of collaboration, partnership, and networks.

National health goals are focusing on better health, better care, and lowered costs, the health delivery system is going through profound change. Improvements in population health and a realignment of provider payments to incorporate those improvements is a new and fundamental reality. For North Dakota, increased financial access (e.g., greater insurance options) does not necessarily translate into direct physical access when the financial viability and organizational survivability of some facilities, especially rural, is still an issue. The corresponding workforce shortages or maldistribution of some health professionals remains an important issue.

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## **CHAPTER TEN: Quality and Value of Healthcare**

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## NATIONAL OVERVIEW

The quality and safety of care delivered in a healthcare system is directly associated with improving and maintaining overall health status. In a complex healthcare system, there are a number of concerns, such as the availability of providers; access to care and health services, technology, and treatment advancement; and the financial dimensions of affordability and payment. Each of these is a contributing factor in the overall strategy to be considered when reforming or redesigning the health system. In addition, the quality of care provided to the population and the patient outcomes produced are equally important facets of reform. This chapter will focus on two areas: quality of care and health reform in North Dakota.

The Institute of Medicine's (IOM) six principal aims to improving health—including safety, effectiveness, patient centeredness, timeliness, efficiency, and equity—are the cornerstones for improving health status and system performance in a period of transformative change.<sup>1</sup> The IOM has been central in identifying the elements in the U.S. healthcare system that have contributed to the systemic dysfunction associated with cost, performance, access, quality, and other facets, and has offered insights and articulated critical reform elements. Be it formalized healthcare reform as envisioned through public policy instruments, or restructuring and providing incentives through market conditions compelled by an adaptive private health system, the configuration of healthcare must contend with systemic, societal, and policy change. The IOM, along with other organizations, calls for a modernized or modified healthcare system predicated on openness, responsiveness, and shared responsibility. The federal Agency for Healthcare Research and Quality (AHRQ) applies these six aims in its nationwide analysis and assessment of health quality.

The IOM work influenced the development of the Medicare Modernization Act (MMA) of 2004 and the Patient Protection and Affordable Care Act (PPACA), or Affordable Care Act (ACA) for short, of 2010. The MMA initiated quality data reporting for hospitals, pay for reporting, transparency through posting hospital-based data for public review, and the development of pay-for-performance strategies. The ACA continued the focus on improving quality and safety, transparency, and pay-for-performance or value-based purchasing for hospitals, nursing homes, physicians, home health, hospice, acute long-term care hospitals, rehabilitation hospitals, and others. In addition, the ACA calls for a national strategy on quality to improve the delivery of healthcare services, patient-health outcomes, and population health. The National Priorities Partnership (NPP), composed of 52 major national organizations, created a shared vision to achieve better health, and a safe, equitable, and value-driven healthcare system. After engaging approximately 300 public and private stakeholders and collecting input, the NPP, with the ACA as a policy umbrella, developed the National Quality Strategy (NQS). Within the federal government, the NQS is led by the AHRQ. The NQS was created to improve the delivery of healthcare services, patient health outcomes, and population health. The Strategy was released in March 2011 to align quality measures and quality improvement activities. The NQS established what has become the focus or goal of health reform: better care, better health, and lower costs. The three have become the accepted principles of national health reform. The NQS created its "Three Aims" of better care, healthy people/healthy communities, and

affordable care out of the ACA in 2011. In 2007, the Institute for Healthcare Improvement (IHI) developed its Triple Aim framework, which is essentially the same concept with different wording: improving the patient experience of care, improving the health of populations, and reducing the per-capita cost of healthcare. Better care refers to improving the overall quality of healthcare with an emphasis on more patient-centered, reliable, accessible, and safe care. Better health addresses the U.S. Department of Health and Human Service's Healthy People vision and mission of improving population health by supporting evidence-backed interventions on behavioral, social, and environmental determinants of health. Lower costs refer to identifying strategies to reduce the cost of quality healthcare for individuals, families, government, and employers.<sup>2,3,4</sup>

The NQS evolved from previous NPP efforts, including a report to the secretary of Health and Human Services covering priorities on a national quality standard, which discussed goals associated with patient and family engagement, population health, safety, care coordination, palliative and end-of-life care, and the implications of healthcare overuse versus appropriate care.<sup>3</sup> The report also discussed a series of drivers for a transformative system, including performance measurement, public reporting, payment systems, research and knowledge dissemination, system capacity, and professional development. The continuing work of the NPP builds on the efforts of the IOM and others. This represents a developmental process involving private and public entities, with health policy implications such as influencing the focus and even the structural elements found in healthcare reform. While the private sector can put in play many transformative elements, the public sector sets many of the parameters for healthcare system transformation through financing mechanisms, workforce considerations, and legal conditions.

Better care is achieved by employing the IOM's goals to be more patient-centered, employing evidence-based science, addressing safety, and targeting effectiveness and efficiency to improve access and achieve greater equity. Better health of the population is attained by promoting effective communication; improving care coordination; engaging communities, employers, payers, and providers as partners; and promoting the most effective prevention and treatment approaches. Affordable care focuses on the need to simultaneously produce better care and better health, and to do so in a manner that reduces the rising cost of healthcare for individuals, families, employers, and the public sector.

The emphasis in healthcare reform on new healthcare delivery models, reforming payment structures by rewarding improved outcomes, focusing on patient-centeredness and evidence-based treatments, and accentuating disease prevention are all efforts to improve health status and to lower the growth in healthcare costs.

To help achieve these aims, the NQS established six priorities to help focus the efforts of public and private partners:

1. Making care safer by reducing harm caused in the delivery of care
2. Ensuring that each person and family is engaged as partners in their care
3. Promoting effective communication and coordination of care
4. Promoting the most effective prevention and treatment practices for the leading causes of mortality, starting with cardiovascular disease

5. Working with communities to promote wide use of best practices to enable healthful living
6. Making quality healthcare more affordable for individuals, families, employers, and governments by developing and spreading new healthcare delivery models.<sup>3</sup>

The six NQS priorities show the continuing development of thought relative to a transformative approach to the healthcare delivery system. The six IOM principles of safety, patient-centeredness, effectiveness, efficiency, timeliness, and equity are similar to those expressed through healthcare reform and have served as guiding pillars for reform. There is a continuing movement to foster greater transparency, inclusion, patient-centeredness, and communication; to call for enhanced accountability from providers and the overall healthcare system to individuals, families, payers, employers, and communities; to focus on prevention, health promotion, care coordination, and greater patient knowledge and involvement; to emphasize that better health and better care can arise from a responsive healthcare system that recognizes that efficiency in organizational performance can produce better health and medical outcomes; and to initiate new healthcare delivery approaches to associate patient outcomes with provider payment structures in order to ensure a more equitable distribution of healthcare services. The IOM addressed both the need for change and the cost associated with the resistance to change in 2012.

In a 2013 IOM report, the argument was made that the pace of change was still too slow in implementing appropriate steps to improve the performance, quality, cost, and equity dimensions of the U.S. healthcare system, and the adoption of evidence-based practice was inconsistent.<sup>5</sup> The IOM found that the healthcare delivery structure was still too complex; costs were too high and efficiency was sacrificed; unacceptable outcomes were present in the form of shortfalls in patient safety, care coordination, access to care, limited clinical evidence guiding patient care, and health disparities; and that an intrinsic need to grow, adapt, and learn was hindered. If the commitment to, pace of, and instruments for change were not secured and applied, then the healthcare system will continue to decline.

To achieve greater value through a more optimally performing healthcare system, the IOM supports strategies to 1) capture the opportunities present in technology, industry, and policy; 2) develop pathways to a continuously learning healthcare system; 3) engage patients, families, and communities; 4) achieve and reward high-value care; and 5) create a new culture for care.

The healthcare community, including providers, payers, policymakers, academics, and advocacy groups, recognizes the need to better align or build viable linkages between those who practice healthcare and those who generate knowledge of the healthcare system and the resident components of that system. A 2015 summary report discussed the need to integrate research into the delivery of care to leverage its experiences, rather than creating a set of parallel infrastructures and processes.<sup>6</sup>

An important element discussed in the proceedings was the idea that to transform the healthcare delivery system, research could not reach a natural progression without understanding the implementation of research into the real world, and delivery systems that relied on the knowledge and present organizational structure

could not be expected to transform to the level of significant change. In August 2016, the National Academies of Sciences, Engineering, and Medicine's Roundtable on the Promotion of Health Equity and the Elimination of Health Disparities issued findings.<sup>7</sup> Those findings incorporated another element of a transformative system: the role of the private sector or of the contributions of private-public partnerships and the implications for healthcare, health equity, and health status. The movement to value incorporated a focus on: quality improvement as argued by the IOM, NPP, AHRQ, and many other sources; changing the structure, orientation, financing, and performance of the health system; and the actors who serve as agents for change. The latter point, from the National Academies, was that the range of participants goes beyond the public sector and how the health system adapts or does not adapt to public instruments and new policy directives; it also involves the needs of the private business sector. Employers pay for the majority of private health costs and have a vested interest in a transformative health system and the implications for economic opportunity, including workforce productivity and availability, better employee health, and improved community health. Private and public collaboration lends itself to the concept of community benefit embedded in health reform as a responsibility of the health system to facilitate improved population health. Collaborative models are a vehicle for health, business, transportation, housing, and other sectors to fashion comprehensive changes to population health.<sup>7</sup>

A recent report originated from discussions involving national experts on payment strategies to support high quality care. The focus was on people with serious health conditions such as cancer, COPD, and heart disease. A range of ideas were discussed, including, but not limited to, the following: 1) incorporation of more social services as an integrated approach; 2) changing Medicare to better incentivize care coordination; 3) relying less on an acute care model where reimbursements "trickle down" and instead use more community-based networks; 4) supporting delivery system reform that more adequately connects social services, long-term services, and support structures to the patient; 5) including a hospice and palliative care benefit in integrated financing and delivery; and 6) encouraging more health systems and state and local governments to lead in innovation for quality, accessibility, and affordability.<sup>8</sup>

Healthcare is struggling with and contemplating many of the same issues from its past, including controlling cost, improving quality of care and health status, and instituting higher organizational and system performance. Much of what drives healthcare system change involves public policy instruments being used by private and public sector players in an effort to improve not only the system of care at a global level but also to create real concrete change in health and medical outcomes at the individual and community levels. Better care, better health, and more affordable care have become focal points in the redesigned American healthcare system.

## **ASSESSMENT OF HEALTH QUALITY IN NORTH DAKOTA**

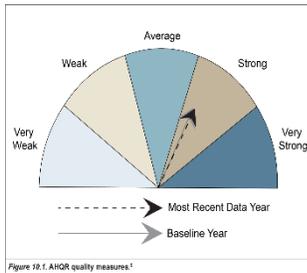
There are different public and private organizations that analyze state-specific quality data. Such analysis can be instructive for state and local officials, providers, employers, payers, and individuals who are interested in understanding effective interventions and healthcare status. Such data can serve to guide both public policy and

local programs' responses. The amount of quality-relevant data, the number and type of measures, the number of health organizations and providers collecting and using quality-related measures grow each year. Both the scientific knowledge and the policy directives that guide and shape the incorporation of data metrics and evidence-based principles become more refined and pronounced over time. The recognition on the part of policymakers and health advocates of the importance in understanding how healthcare systems and providers intervene to promote optimal health and the actual collection and analysis of health outcome data are fundamental factors in a transformative U.S. healthcare system.

In the most recent report, the AHRQ rated North Dakota as strong in comparison with other states in regard to overall healthcare (Figure 10.1).<sup>9,10</sup> In previous reports, North Dakota was reported as average. (States are graded as very weak, weak, average, strong, and very strong.<sup>11</sup>) On all health care quality measures, North Dakota was ranked seventh. South Dakota was ranked thirty-fifth and Minnesota was ranked fifth.<sup>12</sup> North Dakota was rated strong for person-centered care, effective treatment, and healthy living. It was rated very strong for care coordination and average for patient safety. In comparison to its base year, North Dakota improved on patient-centered care but did decline slightly on effective treatment. For access to care the state scored strong on patient centeredness, which was an improvement from average in the base year. Structural access improved from the base year rating of weak to the current rating of average. Diseases and conditions saw North Dakota score three strong ratings, including cardiovascular diseases, chronic kidney disease, and diabetes. North Dakota declined from strong to average for cancer and from average to weak for mental health and substance abuse. Priority populations saw North Dakota stay the same rating but with slightly lower scores for children, white, and non-Hispanic white. For the Hispanic category the state did improve slightly. There were new measures for the 2017 report where no base year for comparison was available; North Dakota was rated average for high income, low income, older adults, and black. The data cells were too small to record numbers for residents of rural areas, women, and adults with basic and/or complex activity limitations. North Dakota was rated average for both private insurance and public insurance. Ratings remained essentially the same for type of care, including being rated strong for acute care, chronic care, and prevention; however, it declined on the safety measure by moving from strong in the base year to average in 2017. Setting of care showed North Dakota improving from average to strong for ambulatory. However, the state declined from strong to average for hospital and nursing home; it remained strong for home health-hospice.

For 2017, there were 126 individual measures (150 in 2015). North Dakota was deemed to have achieved or improved upon its benchmark year on 61 measures. It was scored as close to the benchmark on 43, and rated far away from the benchmark on 22 measures. The state's best measures were for breast cancer deaths per 100,000; home health patients who had improved in upper body dressing; home health patients who had improved in toileting; and home health patients who had timely initiation of care. Its weakest measures were: hospital admissions for immunization-preventable influenza for those 65 and older; hospital admissions for short term complications of diabetic population, ages 6-17; long stay nursing home residents with moderate to severe pain;

long stay nursing home patients who had a fall with a major injury; and long stay nursing home residents whose depression or anxiety increased.



The Commonwealth Fund’s scorecard for 2018 showed North Dakota ranked 22 out of 51<sup>13</sup>, which was improved from its position of 26 in 2015<sup>14</sup>, but still below its ranking of 14 in 2014<sup>15</sup>. North Dakota ranked 9 overall in 2009, which shows a decline over time.<sup>16</sup> The Commonwealth Fund also used subcategories to analyze quality and performance: access, prevention, and treatment; avoidable hospital use and costs; equity; and healthy lives. The rankings associated with each measure are presented in Table 10.1 for 2014, 2015, 2018, and 2020. Based on the Commonwealth Fund assessment, North Dakota has experienced some slight improvement on its main measures. It is classified as a better than average performing state. The state’s overall ranking has improved, as did the scores for access, avoidable hospital use and costs, equity, and healthy lives compared to 2015. Only the prevention and treatment measure went backward.

The Commonwealth Fund assesses states on 47 indicators. North Dakota saw improvements in 14 indicators and declines on 9 indicators. There were 10 that either stayed the same or did not have a comparison year. On most of the 47 indicators, more states showed improvements over declines.<sup>14</sup>

North Dakota’s best category was avoidable hospital use and cost, where the state stood at 9, which was an improvement from 22 in 2015, but a decline from being ranked first in 2014. Within the avoidable hospital use and cost category, North Dakota had five measures where it was in the top ten, including ranking first for adults ages 18-64 with low back pain who did have an imaging study at diagnosis. It also ranked second for hospital admissions for ambulatory care–sensitive conditions, ages 18-64, per 1,000 employer-insured enrollees.

Since access is so pivotal a metric in understanding health and is important within the context of health reform, some findings related to it will be reviewed. Under health reform, North Dakota has seen the number of uninsured decline. This is due in large part to the state approving Medicaid Expansion. Even though more recent policy changes may be working against this trend, North Dakota did witness the uninsured rate declining from 14% to 9% (ages 19-64).

The Commonwealth Fund report found that the most improved indicators for North Dakota were home health patients without improved morbidity, colorectal cancer deaths, and high out of pocket medical spending. The report also identified indicators that had worsened such as mentally ill adults reporting unmet need, home health patients with a hospital admission, and hospital 30-day mortality.

Table 10.1  
North Dakota rankings associated with the Commonwealth Fund State Scorecard, 2020.<sup>17</sup>

Category	2014	2016	2018	2020
Access	9 <sup>th</sup>	26 <sup>th</sup>	24 <sup>th</sup>	23 <sup>rd</sup>
Prevention and Treatment	17 <sup>th</sup>	19 <sup>th</sup>	23 <sup>rd</sup>	22 <sup>nd</sup>
Avoidable Hospital Use and Costs	1 <sup>st</sup>	22 <sup>nd</sup>	9 <sup>th</sup>	11 <sup>th</sup>
Equity	18 <sup>th</sup>	38 <sup>th</sup>	27 <sup>th</sup>	-
Health Lives	23 <sup>rd</sup>	27 <sup>th</sup>	26 <sup>th</sup>	19 <sup>th</sup>

In analyzing the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) data for North Dakota for 2016, North Dakota’s critical access hospitals (CAHs) ranked 18 in state rankings of CAH reporting rates for inpatient quality measures in 2016 with 94.4%.<sup>17</sup> The rate for all US CAHs was 85.6%. Minnesota ranked 12 and South Dakota 42. For state rankings of CAH reporting rates for outpatient quality measures for 2016, North Dakota ranked 16 with 69.4% in comparison to a U.S. rate for CAHs of 60.2%. Minnesota, once again, was rated higher at fifth place and South Dakota scored 43. Other indicators from the report showed that North Dakota CAHs exceed other CAHs on some measures and rated lower on other measures. North Dakota CAHs were significantly better than all other CAHs for the following:

- Median time from Emergency Department (ED) admission to ED departure for admitted patients (61 minutes shorter than other)
- Admit decision time to ED departure time for admitted patients (26 minutes shorter)
- Median time from ED arrival to ED departure for discharged patients (20 minutes shorter)
- Median time from door to diagnostic evaluation (2 minutes shorter)
- Patient left without being seen
- Appropriate follow-up interval, colonoscopy, average risk patients

North Dakota CAHs were deemed significantly worse compared to all other CAHs nationally for immunization for influenza and healthcare workers given influenza vaccination.

In North Dakota, 94.4% of the CAHs submitted data to Hospital Compare on at least one inpatient process for care measure for discharges in 2016. This was higher than the U.S. CAH rate which was 85.6% for 2016. The highest rate for North Dakota was in 2013 with 97.2%, compared to the U.S. CAH rate of 86.4%. The lowest rate for North Dakota was 2014 with a compliance rate of 75.0% compared to a U.S. CAH rate of 84.8%. North Dakota for 2016 ranked 18. For outpatient process of care measures, while the submission levels are lower in comparison to inpatient, North Dakota exceeded the national rate for CAHs in all years. The year 2016 was the lowest rate for outpatient submissions for North Dakota at 69.4%. The year 2013 had a 100% compliance level, with 83.3% in 2014 and 72.2% in 2015. For the U.S. overall, 2016 had a rate of 60.2%; 2015, 67.1%; 2014, 50.7%; and 2013, 54.0%. What was consistent across the board was CAHs were more likely to submit inpatient data more so than

outpatient. North Dakota did rank 16 overall for outpatient submission to Hospital Compare.

CAHs are neither required to report such data, nor provide financial incentives as do acute care Prospective Payment System (PPS) hospitals. CAHs tend to provide the data as it offers them a platform to learn and compare. The Medicare Rural Hospital Flexibility program in most cases provides some level of assistance. For example, the North Dakota CAH Quality Network, created by CAHs and the Center for Rural Health, was as an outgrowth of the Flex program to assist CAHs on quality improvement.

In looking more closely at HCAHPS data from 2013 to 2017, some interesting findings emerge. On some common measures: 1) North Dakota CAHs compare well to CAHs in the region (Kansas, Nebraska, South Dakota, and North Dakota), and 2) North Dakota CAHs perform better than North Dakota PPS hospitals. One standard measure is patients who reported that their doctors always communicated well. In the third quarter of 2016 to the second quarter of 2017, state CAHs had 86.2% of patients agreeing with this statement. That is slightly below CAHs in the other states that ranged from 87% to 88%; however, 77.6% of patients in North Dakota PPS hospitals agreed with the statement. That is below PPS in other states, where the figure ranged from 80% to 83%. The national rate for all hospitals was 82%; thus, ND CAHs exceed that standard. North Dakota ranked 13 on this measure. North Dakota CAHs were slightly below their 2016-2017 rate with 83.6% agreeing to the physician statement for 2014-2015. On a state-by-state ranking, 2016-2017 is a significant improvement from the last report where the state ranked 22 on the physician measure; these data covered the fourth quarter of 2014 to the third quarter of 2015. At that time, ND PPS were higher in 2014-2015 at 79.6%.

A second standard measure is patients who reported their nurse always communicated well. During this time period, ND CAHs had 85.5% of patients agreeing with the statement. That was slightly above CAHs in the other states that ranged from 83% to 85%; however, 74.9% of patients in North Dakota PPS hospitals agreed with the statement. While local CAHs were higher than regional CAHs, ND PPS hospitals were below the region. The other PPS hospitals in the three states ranged from 80.5% to 81.1%. The national rate for all hospitals on this nursing communication measure was 80% and ND rated high, ranking 7. This was a significant improvement from data from the fourth quarter of 2014 to the third quarter of 2015 when ND ranked 19 on this measure. A third standard measure is patients who gave their hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest). North Dakota CAHs compared well for 2016-2017 with 78.5% agreeing to the statement. Nebraska was the highest, 82.2%; followed by Kansas, 80.0%; but South Dakota tied with North Dakota. Once again, ND PPS hospitals were below the other states at 64.9%, with the other states ranging from 76.5% to 77.6%. The national rate was about 73% and North Dakota ranked 15, another significant improvement from 2014-2015 when it ranked 27.

Another important measure is the readmission rate. Readmission rates are viewed as a measure of the local health system's ability to coordinate the patient's care over the full continuum of care that is offered. In interpreting this data, a lower score is better. The most recent time frame was the third quarter of 2015 to the second quarter of 2016. In comparison to the CAHs in Kansas, Nebraska, and South Dakota, North Dakota had the lowest rate with a readmission rate of 15.2, which was a tie with

Nebraska. On this measure the PPS hospitals in North Dakota and the other states outperformed all CAHs, and ND PPS hospitals were comparable to the other states. ND PPS had a readmission rate of 14.8, slightly above the Nebraska rate of 14.6 and South Dakota with 14.7, but better than Kansas with 14.9. North Dakota was below the national rate that was 15.3. This placed North Dakota at 17<sup>th</sup> overall. North Dakota in 2015-2016, for both CAH and PPS, outperformed the national CAHs and PPS hospitals, relative to 2014-2015. In the 2014-2015 period, ND CAHs had readmission rates of 15.5 while PPS had 15.1.

Payment and value of care are converging forces. Value is associated with cost and outcomes. Patients who are hospitalized for a heart attack, heart failure, hip/knee replacement, or pneumonia may require different tests, treatments, and/or services to address their conditions. Hospital Compare uses hospital results on payment streams as a measure. However, value of care does not imply payments alone, as it is important to consider the quality of care received as a factor as well. Generally, lower costs are associated with better outcomes such as fewer readmissions, better recovery, and more successful discharges. From quarter three of 2013 to quarter two of 2016, North Dakota did well on the payment for heart failure patients. North Dakota, for both CAHs and PPS, was below the national payment average of about \$16,200. For CAHs, it was \$16,096.85 and PPS, \$15,706.67. North Dakota CAHs were below the average payment for CAHs in the comparison states, while PPS were below Kansas and Nebraska, but higher than South Dakota. Along with ND, South Dakota PPS were below the national average. Here North Dakota ranked 27.

In terms of impact, two measures are used. The first is the 30-day hospital wide mortality metric for heart failure. From third quarter 2013 to second quarter 2016 North Dakota CAHs and PPS hospitals had a mortality rate of 12.4. This was comparable to South Dakota where the rates were 12.4 for CAHs and 12.3 for PPS. Nebraska, on the other hand, had a mortality rate for heart failure for CAHs of 13.2, and PPS had a rate of 12.8. The national rate was just below 12.0, and North Dakota ranked 39. A second measure is the mortality rate for heart attack. In the third quarter 2013 to second quarter 2016, North Dakota CAHs were below the national rate of 13.6 with a rate of 13. North Dakota PPS hospitals were above the national rate with 13.9. Overall, North Dakota ranked 35.

Quality Health Associates (QHA) provides assistance to hospitals on key measures for heart failure, pneumonia, acute myocardial infarction, and other conditions. Overall, when comparing North Dakota PPS hospitals with CAHs, the PPS hospitals since 2005 have had better measures. Overall, the PPS hospitals in the state outperform the CAHs. When North Dakota CAHs were compared nationally with other CAHs, there was no significant difference or North Dakota CAHs outperformed the national rates.<sup>18</sup>

QHA is also working with North Dakota nursing homes to reduce healthcare-acquired conditions in nursing homes such as pressure ulcers and falls. Through a multistate collaborative, the Great Plains Quality Improvement Network, QHA is providing training and tools based on the best clinical, management, and leadership practices of high-performing nursing homes. About 60% of North Dakota nursing homes are participating in the Nursing Home Quality of Care Collaborative.<sup>19</sup>

## HEALTH REFORM IN NORTH DAKOTA

In North Dakota, as of May 2018, there were 22,500 North Dakotans who had gained private insurance coverage through the Marketplace.<sup>20</sup> In March 2016 that number was 20,536 and in 2015 it was 18,171.<sup>20</sup> Of the over 20,000 people with Marketplace coverage, 85% are receiving a federal subsidy.<sup>20</sup> That percentage tracks well with the national number of 87% of Americans in the Marketplace receiving a subsidy. Correspondingly, the other enrollment option, Medicaid expansion, saw 19,389 individuals enrolled as of March 31, 2016, and 21,982 for 2017.<sup>21,22</sup> Thus, as of 2018 about 43,000 North Dakotans had health coverage either through the Marketplace or Medicaid expansion. An exact number of uninsured in North Dakota has been difficult to determine; however, about it was estimated to be between 60,000 and 80,000 before the ACA. Healthinsurance.org showed the North Dakota uninsured number at about 70,000 for 2013.<sup>23</sup> The uninsured rate was 6.9% as of 2015. North Dakota had the 8<sup>th</sup> largest drop in its uninsured rate from 15.0% in 2013 to 6.9%, or a decline of 8.1%. Arkansas and Kentucky had the largest decline of 12.9% each, and like North Dakota, they too expanded Medicaid.<sup>24</sup>

Seven of the ten states with the largest reductions in the uninsured rates had expanded Medicaid.<sup>24</sup> In 2017, 17 states saw their uninsured rate rise by what was deemed a “statistically significant margin,” including North Dakota, which stood at 9.8% or an increase of 2.9%. Minnesota’s 2017 uninsured rate rose modestly by 0.7% from 5.6% (2016) to 6.3% while South Dakota’s rate increased by 1.9% from 9.9% (2016) to 11.8%.<sup>84</sup> The NDHA has estimated the economic impact of Medicaid Expansion to North Dakota at \$542 million. The vast majority of this total \$534 million was federal dollars, due to the original 95% federal match that will be 90% in 2020 but will not drop below that figure. This contrasts significantly with traditional Medicaid, where the split between the federal and state share can be as high as 50:50. Thus, a 90:10 share is very beneficial to state government. The North Dakota investment is reasonably low. Only a small amount of this total impacts hospitals. NDHA estimates that Medicaid expansion positively impacts the state’s hospitals’ bottom line at about \$68 million per year. The estimate from the North Dakota Rural Health Association for the impact on CAHs is about \$27 million annually.

In North Dakota, hospitals receiving millions of dollars more in Medicaid reimbursement is positive. The reimbursement is at a level that can be used to treat a new patient base that because of limited access to healthcare services has, in many cases, years of untreated conditions. It does cost money to treat these patients, not only to address chronic conditions or delayed primary care but also to hopefully improve their individual health status and focus on prevention. Over time, these new patients, through prevention, care coordination, health coaching, and other methods, become examples of the concept of better care, better health, and lowered cost. Additionally, by reducing uncompensated-care costs, hospitals have the resources to address community needs as part of their community benefit effort. The NDHA has stipulated that losing Medicaid Expansion would 1) increase health coverage for over 20,000 North Dakotans; 2) force the closure of some hospitals and clinics, especially in rural areas; 3) create longer wait

times for patients; 4) lessen the availability of some health services; and 5) produce higher health insurance premiums.<sup>26, 27, 28</sup> Health providers, both clinicians and health systems, recognize the importance of concepts like population health and contributing factors such as social determinants of health. The issue, in many cases, is the system has been structured more on a curative model with a payment system that relied on fee-for-service and the number of encounters. In essence, whether the patient improves or not, someone is reimbursed for the treatment. However, health system transformation is now moving more-and-more to payment associated with outcome and performance: volume to value. It has not always focused on prevention, wellness, the importance of lifestyle and behavior change, and care coordination. Those elements have been there, certainly, but it has been difficult to design a payment methodology to account for them. These are hallmarks of system transformation. People without financial resources such as health insurance tend to seek care later than is warranted and when they do present, conditions have worsened and much of the care provided is uncompensated. For providers, policy changes like Medicaid expansion and more people gaining access via the Marketplace allows providers to see people when they need to be seen, offer opportunities to address prevention and maintenance, and allows for better care management. Providers in North Dakota have seen the benefits of Medicaid Expansion and Marketplace access. CAH CEOs have commented, anecdotally, on having 300, 400, or 600 more people insured in their service area. This represents better access to care. As one CEO stated, “we can take care of people better, see them more often, manage it better, and we get paid to do what we should be doing.”<sup>29</sup>

Many people enrolling through the Marketplace are eligible for a federal subsidy to help buy down the cost of their premiums. In North Dakota, about 85% of the Marketplace enrollees received the federal tax credit for 2018. The average subsidy per month was \$289 in North Dakota, the U.S. average was \$323, with the average out-of-pocket cost after the subsidy being \$142 per month in 2016.<sup>30, 31</sup> The ACA, as enacted in 2010, had an individual mandate for people to carry insurance with corresponding financial penalties for not possessing health insurance. However, as was previously discussed, the new tax act eliminated the mandate. From a policy perspective, one of the factors to monitor as we proceed is the impact of not requiring individuals to carry insurance. Some preliminary estimates of a survey from the Commonwealth Fund found that nationwide 5% would drop their insurance, 5% were not sure, and 90% would keep it. Men were more inclined to drop coverage (7%) than women (3%); Hispanics (7%) more so than white (5%) or black (3%); people living in the south (6%) than northeast (5%), west (5%), or Midwest (4%); and people with a higher deductible: \$3,000 or more (11%), \$1,000 or more (8%), or no deductible (3%).<sup>68</sup> An implication of people declining insurance is that many of these people are relatively healthy. Insurance plans need healthy subscribers to spread the risk. If healthier people drop out of the market, then: 1) premiums increase to account for the costs, 2) providers experience more uncompensated care, and 3) the ability to fully engage in a population health directed system of care is threatened. On the other hand, proponents of eliminating the mandate to carry insurance would argue that it is an individual right to decide this. The advent of both short term, short duration plans and small association plans will provide people with more options and at a lower cost. Policy makers, insurers, providers, and researchers will pay close attention to the ramifications.

Since one of the principal obstacles to carrying health insurance has been cost, the ACA addresses insurance affordability through Medicaid expansion or through the Marketplace. To increase the number of people having access to private insurance so as to meet the federal mandate, the ACA provided tax credits, which is a subsidy to make insurance affordable. In June 2015, the Supreme Court upheld the constitutionality or legality of the use of subsidies in every state, including those that use the federal as opposed to state marketplace. The state-versus-federal marketplace had been at the heart of the constitutional question. If the Court had ruled against this, making the tax credit not available in states that used the federal marketplace, like North Dakota, the average increase in premiums in North Dakota would have been 169% in one year because of the absence of a tax credit. With 85% of North Dakota Marketplace subscribers availing themselves of a tax credit, this would have effectively increased premiums from 35% to 55% nationwide. This shows that even though the ACA Marketplace is a public-access platform, the health insurance market can be influenced by both private and public economic forces. It is a complex structure. It is important to understand that the subsidy is only available by enrolling through the Marketplace. The subsidy can go as high as 400% of the federal poverty level, for a family of four in 2018, up to an income of \$98,400.<sup>32, 33, 34</sup>

There are resources to assist North Dakotans with enrolling in the Marketplace and Medicaid expansion. The ACA supported private contracts to organizations to serve as navigators to assist people in maneuvering the complex health insurance market, including eligibility for Medicaid and Medicaid expansion. One of the changes in 2017 was a significant reduction in resources for the Navigator program cutting from about \$62 million in 2016 to \$36 million in 2017. The funding in North Dakota went from about \$300,000 in 2016 to only \$12,000 for 2017, or a cut of 96%. This cut 12 Navigator positions leaving one statewide navigator. The Great Plains Tribal Chairman's Health Board Navigator program (serving both North and South Dakota) was cut from about \$150,000 down to \$10,000. However, funding to the Federally Qualified Health Center's (FQHC) in North Dakota to operate their Navigator program remained in place. Additionally, the larger health systems and some rural facilities have maintained staff to assist people.<sup>35</sup>

There are other key features to healthcare reform that affect North Dakotans. One of these is filling the doughnut hole found in the expansion of Medicare to include prescription coverage (Medicare Part D). Created as part of the Medicare Modernization Act (2004), prescription coverage was available up to a set amount with a deductible and coinsurance, and then there was a coverage amount that reverted back to the responsibility of the beneficiary, this gap is the doughnut hole. Insurance would cover the remainder. Because of annual adjustments, this doughnut hole was set for 2018 so that the customer is responsible for prescription costs above \$3,750 until it reaches the cap of \$5,000. The gap between the \$3,750 and the \$5,000 was referred to as a doughnut hole. The customer covers 35% of the cost of brand name drugs and 44% of generics as a co-pay. The gap closed by 2019, and at that point, under the ACA, the co-pay moved to a standard 25% of the cost of prescriptions. Nationwide, about 3.4 million Medicare recipients benefit from this ACA feature. More than 11,866 North Dakota Medicare recipients received \$11.5 million from the federal government as part of the ACA policy to close the doughnut hole, about \$967 each.<sup>36</sup>

A commonly discussed benefit from the ACA relates to preexisting conditions. Somewhere between 50 million and 129 million non-elderly Americans (19%–50%) have some form of preexisting health condition that could have placed them in a position to be denied insurance coverage. Before the ACA, millions of Americans either were denied coverage or feared they could be dropped by their company. One study found that 36% of those who tried to purchase insurance directly were turned down, charged more, or had a specific health problem excluded from their coverage plan.<sup>37</sup> In North Dakota, 111,000 non-elderly residents have a preexisting condition now protected under federal law through the ACA. That represents about one-quarter (24%) of the state's non-elderly population.<sup>38</sup> This includes over 70,000 people who are age 55-64, which is over 80% of that age cohort.<sup>39</sup> In addition, many North Dakota families now benefit from the ACA provision that adds coverage for people up to the age of 26 on their parents' health plan. As of 2016, this covered about 7,000 young North Dakotans.<sup>40</sup> Nationally, more than 6.5 million young adults were covered under a parent's plan.

While thousands of North Dakotans and millions of Americans have experienced new opportunities for insurance coverage from the Marketplace or Medicaid Expansion, the cost of coverage for people seeking ACA compliant plans through the Marketplace or through an agent increased in 2017, 2018, and 2019. The average increase, nationwide, in 2017 was about 25%, although this varied greatly by region, plan, or even individual conditions. For 2018, for the four Marketplace Metal plans which were platinum, gold, silver, and bronze, the lowest cost silver plan saw premiums increased nationally by 32%; the lowest cost gold plan, 18%; and the lowest cost bronze plan, 17%. Silver plan premiums typically rose at a higher rate because many state insurance commissions placed the added cost from the loss of the cost saving reductions (CSR) entirely into the silver plan rates.<sup>41</sup> North Dakota was one of the very few states that did not allow insurance companies to do this. A number of factors contribute to insurance rates, including members' use of health care services over the past year, medical inflation, increase in the overall sickness of the risk pool, changes in benefit design, loss of the cost sharing reduction (CSR) in the Marketplace subsidies, changes in the service area, and profit margin goals.<sup>42</sup>

According to the Georgetown University Health Policy Institute's Center on Health Insurance Reforms, the repeal of the individual mandate penalty is increasing premiums. It had been projected by the CBO that the repeal would push up premiums by about 10% annually on top of other factors driving price. Insurers are concerned the repeal will simultaneously reduce the size of their market and increase the number of their subscribers with poor health (pre-existing conditions). Plans vary greatly in rate requests they have made to their state insurance commissions. Blue Cross Blue Shield of Vermont requested a modest increase of 2% for 2019 while the Virginia Kaiser Foundation Health Plan requested 32%. Pacific Source in Oregon requested a rate hike of 9.58% while Maryland's Blue Preferred sought an increase of 91.4% for 2019.<sup>42</sup> There has been a corresponding movement of subscribers to high deductible plans. In 2017, the percentage of people under the age of 65 enrolled in such high deductible plans stood at 42% or over 55 million of the 138 million with private health plans, both employer supported or individual. A plan is considered high deductible if the annual deductible is \$1,300 for an individual or \$2,600 for a family plan.<sup>43, 44</sup>

There are many people who have insurance either through their employer, have to purchase it on their own, or do purchase it through a federal or state Marketplace but are not eligible for a federal subsidy and have experienced premium increases in the open market. Most people are accessing insurance as an employment benefit of about 50%, or they are part of the Marketplace or participate in public insurance such as Medicare, Medicaid, or CHIP. Individual rates will increase at double digit levels in many places. Some employer plans are kept in check by having higher deductibles and co-pays making a trade-off between premiums and out-of-pocket costs for the employee. With the advent of health association plans, which can be sold across state lines and as short duration, limited service plans, there will be more insurance options. These new insurance products will likely have fewer benefits that may fall outside the ACA essential 10 benefits and have a lower premium, but higher individual costs through higher deductibles. Some deductibles are as high as \$5,000 for an individual plan and over \$10,000 for a family plan.<sup>45</sup>

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## **CHAPTER ELEVEN: Conclusion**

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Using updated employment and demographic datasets and incorporating the results of several recent comprehensive statewide cross-sectional healthcare workforce studies, this *Sixth Biennial Report: Health Issues for the State of North Dakota 2021* concludes with a similar takeaway bottom line message as the *First, Second, Third, Fourth, and Fifth Biennial Reports* did—that continued implementation of the Healthcare Workforce Initiative (HWI) is having and increasingly will have a significant positive effect on helping to narrow the gap between the demand for and the supply of finite healthcare resources. Furthermore, absent full implementation of the HWI, North Dakota likely will face a major gap between the societal demands for healthcare and the capacity of the healthcare system to deliver that care.

Chapter 2 provides a new overview of social determinants of health. This topic has been addressed in previous reports, however, there is an increased focus on social determinants as they factor into health outcomes in the state as well as highlighting areas that have disparities or need additional focus. Social determinants of health, while not a new topic, does provide additional insight as to how North Dakota may best address health care for the entire population of the state and prioritizing efforts to serve as many people as possible.

As Chapter 3 demonstrates, the general level of health in North Dakota is reasonably good, and for eight of 10 general health measures (including metrics like cholesterol level and the frequency of high blood pressure, diabetes, and colon cancer screening), North Dakota fares better than the rest of the country on average. However, a disturbing finding that merits further study is that the age-adjusted mortality rate for North Dakotans has exceeded the national average for the past 19 years, and although the gap in mortality has begun to narrow, it is more the result of increasing national mortality rates than decreasing state-level deaths.

As was found in the five previous *Biennial Reports* that were released in 2011, 2013, 2015, 2017, and 2019 rural depopulation, out-migration of the young from the state, an increasingly older adult population, low population density in some regions, and recent localized population growth in the major cities and in the Oil Patch are exacerbating the imbalance between a rising demand for healthcare and the available supply of providers. The imbalance between supply and need for healthcare resources is both quantitative (to a relatively minor degree) and distributional (to a major degree), in that while North Dakota is short of specific providers, the healthcare providers we have are distributed disproportionately in the metropolitan areas in excess of what population demands would otherwise require. Some of the apparent maldistribution is entirely appropriate, since it is desirable to have specialists regionalized in more urban areas to maximize the efficient delivery of healthcare services.

However, since even family physicians—the bulwark providers of care in rural areas—are disproportionately found in metropolitan areas, it is clear that major challenges remain in recruiting and retaining needed providers in more remote areas. Importantly, family physicians constitute the physician group whose geographic distribution is the most optimal compared with all other physician provider groups. A similar pattern of more providers relative to the population in urban compared with rural regions is found for non-physicians as well. Advanced-practice providers like physician assistants and nurse practitioners also are disproportionately distributed in

the metropolitan areas of North Dakota, although physician assistants show the least maldistribution of any healthcare provider group.

The *First Biennial Report* concluded that North Dakota had a paradox regarding its healthcare workforce, which it characterized as shortages in the midst of plenty. The size of the physician workforce in North Dakota in 2011 was found to be at or better than national norms for many specialties, but with maldistribution of providers resulting in shortages especially in micropolitan and rural areas. As was emphasized in subsequent *Biennial Reports* and confirmed in the current *Sixth Biennial Report*, North Dakota may have slipped as to the size of its physician workforce relative to the population and lags the rest of the United States in the number of physicians relative to its population. Thus, the baseline shortage of 50 physicians estimated in the *First Biennial Report* likely has grown to somewhere between 50 and 100 physicians currently. One important reason for the increase in the shortfall has been the significant population growth in western North Dakota and the urban areas that occurred not long ago as a consequence of the development in the Oil Patch.

As we found in the five prior *Biennial Reports*, the current shortage of physicians is only going to increase as the population grows and ages in the future if there is not continued implementation of the HWI. And the shortage of workers in the healthcare field over the next 15 years will not be limited to physicians. An entire cadre of additional healthcare providers— from nurses to physician assistants to occupational and physical therapists to medical laboratory specialists and others—will be needed to ensure that effective, efficient, and appropriate healthcare is available to all North Dakotans, as is envisioned in the HWI.

The population projection model used in the *First Biennial Report* was predicated on an assumption of modest population growth based on forward trending of historical patterns, and a major influence from the aging of our current population. In our *First Biennial Report*, we underweighted (relative to national projections) the effect of population growth, since we assumed (as others did at the time) that the stable-growth model would continue to apply in the future. As discussed in detail in Chapter 1, the stable-growth model that we utilized predicted a population increase to only 796,000 people by 2040, which is a slower growth rate than the country as a whole (note that the population of North Dakota was estimated to be about 755,000 people in 2017, which would imply a growth rate of only 0.2% per year over the 25 years from 2015 to 2040). The workforce projections that we utilized in the initial report were based on that stable- (and slow) growth model. Any significant population growth in excess of that previously projected will necessitate even larger growth in the health workforce than previously anticipated.

We were intentionally conservative in estimating physician needs in our *First Biennial Report*—in retrospect, probably too conservative. We adapted and applied national workforce predictions to North Dakota, but intentionally adjusted the calculations downward so as to not overestimate healthcare workforce needs. The national workforce modeling calculations anticipate that future workforce needs are driven primarily by population growth (about two-thirds of the effect in the model) and less so by the aging of the population (about one-third of the effect). Since North Dakota has a disproportionately large older adult population (more than the national average), we over-weighted the effect of aging in our modeling of healthcare workforce

needs for the state at the same time that we underweighted the effect of population growth. Thus, we used a model that applied national estimates to the North Dakota population, and then we reduced the predicted shortage by 50% to account for lower anticipated population growth. The *First Biennial Report* estimated that the physician shortage by 2025 would be 210 physicians—50 short as of the 2011 baseline, and 160 more needed by 2025, for a total shortage of at least 210 by 2025.

Utilizing updated census data and population growth modeling, the *Second Biennial Report* found that the shortage in 2013 likely had grown to between 100 and 200 physicians (not to mention other healthcare workers). Thus, using our old estimates of future population growth, the revised estimate provided in the *Second Biennial Report* was that 260 to 360 more physicians will be needed by 2025 (i.e., 100 to 200 needed immediately plus 160 needed by 2025).

The *Third Biennial Report*, issued in the midst of the oil boom, concluded that 500 additional physicians likely was a conservative estimate of the number of additional physicians needed in North Dakota by 2025 if the population continued to grow as rapidly as it did at the peak of the boom. The number did not include the need for replacement of physicians who retire, leave the state, or cease practicing medicine for other reasons. As discussed in Chapter 4 of this current *Report*, the age at which North Dakota's physicians retire will have a significant effect on future healthcare workforce size and the extent of the physician shortage. It is perhaps the most important factor impacting future physician supply, since more than 40% of the US physician workforce is aged 55 years and older. Delaying or accelerating retirement age by only two years, for example, can have almost a 10% effect on future workforce size. Taking these factors into consideration, it is likely that the prior estimate of roughly 500 additional physicians needed by 2025 still is correct, even factoring in slower ongoing population growth.

All five prior *Biennial Reports* concluded with a strong endorsement of the HWI, a multifaceted plan to address the healthcare needs of North Dakota, and emphasized necessary steps to reduce disease burden, increase the healthcare workforce through enhanced retention of graduates as well as expansion of class sizes, and achieve a better-functioning healthcare delivery system through more cooperation and coordination. In view of the realization that the state's workforce needs likely are larger than previously estimated, those recommendations are reinforced in this *Sixth Biennial Report* with added emphasis on the imperative to continue with full implementation of the Healthcare Workforce Initiative. It is important that the three major stakeholder groups involved in the HWI—the North Dakota Legislature that provides the funding; the UND SMHS that does the training and provides the programmatic support for the HWI; and the healthcare enterprise and local communities throughout the state that provide essential partnerships that are vital to the success of the HWI—continue to work together in a cohesive and effective manner to ensure the ultimate success of the HWI.

Continued and full implementation of the HWI has been threatened, however, by the budgetary constraints placed on the UND School of Medicine and Health Sciences (SMHS) during the 2017–2019 biennium because of the state's economic downturn. Effectively about a 10% cut, the budgetary constraints forced a delay in the implementation of 19 planned and approved residency slots (post-MD degree training), although some of those slots have been funded more recently by Sanford Health.

A second major conclusion of this *Sixth Biennial Report* is that further attention and planning (by the healthcare enterprise as a whole, the North Dakota Legislature, the UND School of Medicine and Health Sciences, and other stakeholders) are needed to address two particularly pressing and challenging healthcare delivery needs in North Dakota:

- A pressing need to address a variety of mental and behavioral health issues throughout the state, but especially in the more rural regions.

## **CHAPTER TWELVE: Healthcare Workforce Development**

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All five prior editions of the *Biennial Report* have considered healthcare workforce issues in considerable detail. The *Fifth Report* in 2019 reassessed the various options available to increase the in-state healthcare workforce: recruit from outside the state, increase the number of trainees, and retain more graduates for practice within North Dakota. It concluded that the best plan for the state's healthcare workforce development would be an approach that combined increasing both the number of graduates and the retention of practitioners. Those two concepts became two of the four important building blocks (along with reducing disease burden and improving the efficiency of our healthcare delivery system) of the Healthcare Workforce Initiative (HWI) that subsequently was proposed by the University of North Dakota (UND) School of Medicine and Health Sciences (SMHS) Advisory Council, endorsed by the North Dakota State Board of Higher Education, and approved and funded by the 62<sup>nd</sup>, 63<sup>rd</sup>, 64<sup>th</sup>, 65<sup>th</sup>, and 66<sup>th</sup> Legislative Assemblies. Almost all of the components of the HWI have been implemented by UND under the oversight of its Advisory Council. For example, medical and health sciences class sizes have been expanded to the desired and approved levels on schedule. However, the one outlier at present is that residency slot expansion (a residency is post-MD degree graduate medical training required of all physicians before they can get a full license to practice medicine) envisioned under the approved HWI plan has been truncated owing to budget challenges during the 2019-21 biennium. HWI funding for an approved new family medicine residency program based in Fargo was not possible, but fortunately Sanford Health generously agreed to provide the required financial support so that this residency program is now up and running (under the umbrella of UND programs). Sanford Health similarly agreed to fund an orthopedic surgery residency program also based in Fargo.

The residency expansion issue notwithstanding, one important aspect of any plan such as the HWI that relies on educational programs to balance the supply of healthcare professionals with the need for their services is that it necessarily requires a relatively long lead time to achieve its goal, since the training of additional physicians, for example, takes a minimum of seven (and often more) years from the time a student enters medical school until that doctor is ready to see patients in the community.

Since the HWI plan that has been implemented utilizes a variety of approaches both to increase retention and expand class sizes, it might be useful to review the rationale for those approaches and to reevaluate why recruitment of healthcare professionals from outside the state is believed to be an inferior option.

## **RECRUIT FROM OUTSIDE NORTH DAKOTA**

One approach to meeting workforce needs is to recruit physicians and other healthcare professionals from training programs or employed positions outside of North Dakota. Indeed, this approach has always played a role in filling the state's workforce complement, and it likely will continue to play an ongoing (albeit more limited) role even as the impact of the HWI becomes apparent. Even if the current healthcare workforce supply were adequate, however, there would be an ongoing need to replace a portion of current healthcare providers resulting from normal and expected turnover in the workforce (from retirement, death, relocation, or change in job status), which for physicians typically is at least 5% per year. For North Dakota, this means that nearly

100 new physicians are needed annually—whether locally produced or recruited externally—just to *maintain* current physician workforce levels.

Recruitment may come from physicians located in other states or other countries. The recruitment of international medical graduates (IMGs) has been particularly important for filling a gap in rural primary care needs.<sup>1</sup> Currently, about 1 in 4 physicians practicing in North Dakota are IMGs (similar to the U.S. as a whole). Some but not all analyses have suggested that proportionally more IMGs than U.S. medical graduates (USMGs) practice in underserved settings. Recent studies have indicated that graduates in general are trending away from practice in rural underserved areas. A state comparison of the percentages of generalist IMGs and USMGs shows that North Dakota has significantly fewer IMG physicians in metropolitan areas, significantly more IMGs in micropolitan areas, and more IMGs in rural areas.<sup>1</sup>

IMGs have filled an important and essential role in providing primary care to North Dakota rural communities for many years. However, relying on an expectation that it will be possible in the future to recruit additional IMGs to meet future needs likely will be difficult for several reasons. First, there is no reason to assume that the national trend for IMGs will be dissimilar to USMGs, whose career choices typically do not gravitate toward primary care and especially rural primary care practice (physicians who graduate from the UND SMHS, however, tend to buck the national trend; our graduates are much more likely to go into family medicine (99<sup>th</sup> percentile), primary care (94<sup>th</sup> percentile), or practice in a rural area (99<sup>th</sup> percentile) than graduates of all other medical schools).<sup>2</sup>

Rules regarding J-1 visa waivers are in evolution and will have an effect (positive or negative) on the availability of IMGs. IMGs often come from developing nations, and there is a continuing debate over the effect of retaining IMGs for service in the United States rather than encouraging service to their own countries of origin.<sup>1</sup> The question has been posed whether it is proper and ethical to encourage a “brain drain” whereby the best and brightest physicians from developing countries come to the United States rather than remain home and help to provide for even more pressing medical needs there?

It is important to note that when North Dakota communities recruit for professional talent from outside the state, they compete on the world market. Intense competition for scarce human resources often requires that healthcare facilities offer premium compensation to attract workers, which in turn raises costs to North Dakota patients. This is particularly true in the most rural of our communities, where the work is demanding and professionals have access to fewer support mechanisms than they could find in larger communities. Cost considerations aside, in order to meet additional future shortages through external recruitment, North Dakota would have to recruit more successfully against other competitors than it does at present.

There are additional factors that bear consideration. Anecdotal data suggest that the turnover rate of physicians recruited from out of state is about double that of locally produced physicians. Given the substantial expense of physician recruitment that has been estimated at \$250,000 or more per physician, the need to recruit twice as often does and will add considerable financial pressure to the already constrained financial resources of hospitals operating on slim operating margins (especially the critical access hospitals in rural North Dakota). Additionally, it takes additional time for

nonresident physicians to acculturate to the North Dakota experience, and the longer this process takes, the more likely there will be turnover of the position.

## **INCREASE THE NUMBER OF HEALTHCARE PROFESSIONALS TRAINED IN NORTH DAKOTA**

A second strategy (one that is a benchmark of the HWI) is to grow our own physicians and other healthcare professionals by increasing the number of health professionals trained in the state. As noted above, this approach has a built-in time lag of a minimum of seven years for physicians to complete education and training, and a somewhat shorter time frame for other healthcare professionals.<sup>3</sup> However, the educational process itself does not necessarily guarantee a specific number or type of physicians or healthcare professionals to meet the healthcare needs of rural North Dakota communities, since a trainee's choice of career pathway ultimately is a matter of personal choice that can be influenced but not dictated.

### **What are the Needs of North Dakota?**

To understand the need, we first must review the current status of the healthcare workforce in North Dakota in comparison to the national situation. In North Dakota, the current number of active patient-care physicians is 1,688 or 221 per 100,000 population. This compares with the U.S. average of 227. The current number of active patient-care physicians in North Dakota in primary care is 574 or 75 per 100,000 population, which is lower than the U.S. median of 83.<sup>4</sup> While these data suggest that North Dakota is doing reasonably well, the United States currently is experiencing an aging healthcare workforce with a geographic maldistribution that is not adequately meeting the current needs of many communities, especially rural. This is especially true for North Dakota. Rural communities have too small a population to support specialists, and they rely on primary care physicians and other providers to adequately and affordably meet healthcare needs. Nationally, one-third of all physicians are in primary care, while almost one-half of physicians in primary care (mostly family physicians) are in rural communities.<sup>4</sup> Family physicians provide the broadest care to all segments of the population and are essential to addressing the healthcare needs of North Dakota's rural and remote communities. But rural communities have experienced a chronic shortage of primary care physicians for many decades.

The challenge for rural communities is to attract and retain healthcare professionals to areas where technology is less advanced, salaries may be less competitive, and geographic or other challenges exist (especially spousal ones). The current healthcare workforce is aging, and younger healthcare professionals typically seek more specialization and a better work–life balance. Healthcare delivery methods will continue to evolve in order to address the increasing demand for management of chronic diseases; care of the aging with increasing dementia; and the need to address significant population health issues such as obesity, physical inactivity, and cigarette smoking. And these issues are inter-related—successfully addressing population health issues likely will result in longer survival and thus a paradoxical *increase* in the number of people with chronic diseases. These complex and challenging realities require

thoughtful strategies (such as the HWI) to ensure the right healthcare professionals with the right skills are available to keep our citizens and populations healthy.

## **National Recommendations for Increasing Health Professions Students**

In June 2006, the Association of American Medical Colleges (AAMC) recommended a 30% increase in U.S. medical school enrollment and an expansion of graduate medical education (GME) positions to accommodate the growing demand for healthcare professionals.<sup>5</sup> The AAMC periodically has updated its workforce predictions and recommendations. Its analysis in 2017 found that the recommended 30% increase in medical school slots had been achieved in the prior decade or so, and as a consequence the AAMC initially moderated its projection of future physician workforce shortages. Nevertheless, the most recent AAMC report in 2018 increased its projected shortfall to between 42,600 and 121,300 physicians nationwide by 2030, with primary care practitioners and surgeons the specialties with the greatest predicted shortages.<sup>6</sup> Because GME (residency training) is a requirement for licensure in the United States, the AAMC and others have emphasized that simply increasing the number of graduating medical students without ensuring a commensurate growth in the number of residency training positions will not eventuate in more physicians; there will be a bottleneck at the residency level. However, the number of federally sponsored GME positions has been essentially frozen since 1997 by the Balanced Budget Act, and the growth of GME slots since then has been slow—less than half the rate of growth of medical student positions.

There has been considerable debate by experts regarding the AAMC recommendation for a 30% increase in the number of first-year medical school slots. Estimating the most effective response to address a current and future workforce need can never be absolutely accurate, but this recommendation likely is a conservative estimate that takes into account many factors and variables. An AAMC report on the complexities of projecting physician supply and demand from 2008 includes the following findings that support the prediction of increasing demand:<sup>3</sup>

- Aging of the population will drive demand for healthcare services sharply upward.
- The U.S. population is projected to grow by more than 50 million by 2025.
- Increased health coverage (including expanded insurance coverage as a consequence of the Affordable Care Act) will increase the demand for healthcare services.
- Increased clinical productivity (that is to say, more efficient healthcare delivery) is hard to accomplish because of the increasing complexity of care of current (and future) patients.
- Increasing the numbers and roles of physician assistants and nurse practitioners may help, but the full effect is difficult to predict.
- Effects of the healthcare workforce shortage will include longer wait times, increased travel distances, shorter visit times, expanded use of non-physicians, higher prices, and possible reduced access to the healthcare system.

- Shortages are expected to continue to be especially problematic in poor, rural, and urban communities.<sup>7</sup>
- A 30% increase in the number of matriculated medical students and a commensurate increase in GME positions (which seems unlikely for the foreseeable future) will only moderate but not eliminate the mismatch between the demand for and the supply of healthcare services.

## **North Dakota's Production of Medical Students**

The UND SMHS is the only medical school in North Dakota. The number of students enrolled in medical school in the years 2016–2017 was 296 or 39.1 per 100,000 population. This ranks nationally as 4<sup>th</sup> out of the 50 states.<sup>4</sup> For the freshman medical student class of 2020, 83% of the seats (not including the seven seats committed to the federally funded Indians Into Medicine Program) were occupied by students from North Dakota or Minnesota (with ties to North Dakota). North Dakota had 136 residents in training, which ranked at 44<sup>th</sup> out of 50 states, but had 84 primary care residents, ranking 24<sup>th</sup> out of 50.<sup>4</sup> Compared with the national benchmark, it is evident that the UND SMHS is doing an excellent job of educating North Dakota students in medicine. Compared with other states, North Dakota has more capacity for training residents and, with the state-supported expansion of residency training slots through the HWI, will be graduating more North Dakota-trained physicians in the coming years.

The UND SMHS consistently has ranked in the top five schools in the country for the percentage of students choosing a family medicine residency program; in the past several years, it has ranked No. 1. In a recent study of medical schools that looked at social mission based on producing primary care physicians, physicians who serve Health Professional Shortage Area (HPSA) communities, and educating students from underrepresented minorities, the UND SMHS ranked in the top 20% of all U.S. schools.<sup>8</sup> The UND SMHS has done very well in producing primary care physicians (94<sup>th</sup> percentile) and educating students from underrepresented minorities. The diversity of its students is primarily a result of its nationally recognized Indians Into Medicine (INMED) Program that ranks first in the United States in graduating students from federally recognized tribes.

One result of the general countrywide decline in medical student interest in primary care residencies has been the increased number of international medical school graduates (IMGs) in these residency programs.<sup>9,10</sup> In North Dakota, the number and percentage of residents who are IMGs is 57 and 41.9%, which ranks 4<sup>th</sup> out of 50 states. While IMGs are more likely to choose primary care and to practice in HPSAs, they are somewhat less likely to stay in practice in rural or underserved areas than U.S. graduates.<sup>4,7</sup> As IMGs become settled in the United States, they tend to move away from their initial practice site. One longitudinal comparison of U.S. medical graduates with IMGs showed that almost 90% of U.S. graduates were practicing in urban settings in the United States.<sup>9</sup>

## Factors Affecting the Selection of Primary Care and Rural Practice

Rural communities in North Dakota will continue to need high-quality physicians and, in particular, primary care physicians and other healthcare professionals who can provide primary care. There are many personal and experiential factors that affect an individual's decision to choose a specialty and to select a practice site. But the two enduring factors that best predict a student's residency (and eventual practice) choice have been found repeatedly to be the "fit" of the particular specialty with the interests of the student and the right work-life balance associated with that specialty choice.

A 2009 report<sup>11</sup> from the Robert Graham Center suggested that two things are clear regarding primary care: there is a problem with sufficient access to primary care physicians in rural and impoverished areas, and current practice configurations or organizations will have great difficulty absorbing all currently uninsured patients if universal access to healthcare insurance coverage were to be achieved. For these reasons and others, it is especially important to understand the factors that influence the decision of medical students and residents in their choice of where to practice, and we need to consider providing further opportunities for support and encouragement in this decision.

What can be done to help ensure the right number of the right physicians? Studies have shown that medical students' choices of primary care or specialty careers beyond the considerations of specialty "fit" and work-life balance are influenced by the following:<sup>11-15</sup>

- Student-related factors such as gender, race and ethnicity, socioeconomic status, rural or urban background, and attitudes and values.
- Exposure to required family medicine curriculum during the third or fourth year of medical school.
- Income differences between specialties.
- Institutional factors such as state funding, Title VII Health Professions
- Student Loan funding, and the strength of family medicine departments.

Each one of these items is important, but none are a direct or certain predictor of career choice. Awareness of the personal factors helps to identify the potential influences on choices and may help in addressing these factors through the recruitment and admissions process. Educational experience throughout medical education and residency can be designed to assure quality experiences in primary care and at rural sites.

One systematic review of the literature has shown that medical students with experience in a rural setting are more likely to choose a career in primary care and are three times more likely to practice in a rural community compared to the national average.<sup>12</sup> The most successful outcomes for addressing the rural physician shortage have been the employment of comprehensive medical school rural programs.<sup>12</sup> There are six U.S. programs that met the criteria (developed by the authors of a recent article) that included the primary purpose of increasing the supply of rural physicians. These criteria are having a defined cohort of students, having a focused admissions process, and having a specific rural curriculum or an extended full-time required rural clinical

curriculum. These programs are similar to the UND SMHS Rural Opportunities in Medical Education (ROME) Program. All of these programs increased the supply of rural physicians with an average of 53% to 64% of their graduates in practice in rural communities. This compares with the national rate of 3% for recent medical school graduates planning on rural practice or the 9% of physicians currently practicing in rural communities.<sup>13, 14</sup>

In 2000, a national survey reported predictors of generalist physicians' decisions to care for underserved populations (most rural areas are underserved), and identified four independent factors:<sup>14</sup>

- Identifying oneself as a member of an underserved ethnic or minority group.
- Growing up in a rural or inner-city area.
- Strong interest before medical school in practicing medicine in underserved areas.
- Participation in the National Health Service Corps.

Another survey confirmed the factors of coming from a rural background and being a member of an underrepresented minority, and also included the factor of older age.<sup>15</sup> Note that all of these factors are identifiable at the time of admission to medical school, and thus could be influenced by admission criteria. Recognizing this, the UND SMHS has an admission process that gives additional weight to rural origin, rural experience, and rural commitment as it considers student applicants to its medical school curriculum.

### **Why Does Primary Care Matter?**

How important is it to have adequate numbers of primary care providers in our communities? Studies have shown that a greater supply of primary care physicians is associated with lower mortality from all causes, whereas a greater supply of specialty physicians is associated with higher mortality. States with higher ratios of primary care physicians to population had better health outcomes, including lower rates of death from heart disease, cancer or stroke; infant mortality; low birth weight; and self-reported poor health. This was even after controlling for sociodemographic measures that can be related to poorer health (such as age, education, income, and unemployment) and lifestyle factors (seat belt use, obesity, and smoking). This relationship of improved health with increased primary care also is demonstrated in international studies. In addition to health benefits, there are reductions in healthcare system costs and reductions in disparities across population subgroups.

What is it about primary care that results in these improved health outcomes? Six mechanisms are thought to account for the beneficial effect of primary care on population health:<sup>16, 17</sup>

- Greater access to needed services.
- Better quality of care.
- Greater focus on prevention.

- Early management of health problems.
- Cumulative effect of the main primary care delivery characteristics.
- Role of primary care in managing and avoiding unnecessary and potentially harmful care.

The U.S. ranks behind other developed countries in health and healthcare system performance, partly because of a long decline in the interest in and vitality of primary care. The suggestion has been made that the U.S. should move toward having 50% of active patient-care clinicians (physicians, nurse practitioners, and physician assistants) in primary care practice.<sup>16</sup> A recent comparison of health and healthcare systems in the U.S. and Canada demonstrates these differences. In the U.S., there are 50% more specialists than primary care physicians, compared with 10% more specialists than primary care physicians in Canada. Costs have been approximately \$2,500 less per person per year in Canada than in the U.S. Canada ranks significantly higher in most measures of health outcomes than the U.S. and has fewer social disparities in healthcare and health outcomes. This has been attributed to specific healthcare system characteristics and the strong primary care infrastructure in Canada.<sup>18</sup>

### **Challenges to Addressing the Health Workforce Pipeline and Need for the Health Professions**

Seeking and encouraging applicants from rural communities to apply to healthcare professions schools is an important part of any plan to improve healthcare workforce needs,<sup>19</sup> as has been done at the UND SMHS. Some rural educational systems are not able to provide the strong science and math background necessary for success in medical school, and this challenge may increase as a result of recent economic challenges. Additional potential challenges for rural students include coming from a lower educational and socioeconomic status, having fewer role models in healthcare, experiencing less encouragement for attaining advanced degrees, less technology familiarity, and the need to travel to obtain a medical education. It is important to note, however, that studies have shown no significant academic performance differences between students from rural or urban backgrounds.

### **Increasing the Numbers of Health Professions Students and Residents**

Recognizing the healthcare workforce needs in North Dakota and the nation, the UND SMHS, through the HWI, has increased the number of its healthcare professions students and residents by around 25%.

Ensuring an increase in the number of students interested in primary care and rural practice necessitated additional operational changes. These included continued support of the RuralMed Program, curricular changes in the early years to assure the development of competency in primary care, and additional rural community sites and rural physicians for clinical training. Geriatric, population health, and public health programs have been added at the UND SMHS and will be critical factors in this growth to support educating and attracting students interested in addressing the important

healthcare needs of the state. These programs will enhance the experience of primary care for interested students and physicians while developing specific skills for the care of aging individuals and for addressing population health effectively.

The increased number of resident training slots in North Dakota have been designed specifically to attract the interest of our own medical school graduates and to assure an effective workforce for North Dakota. Adding more students to our primary care programs with an option for further training in geriatrics, public health, management of chronic disease or mental health, and disease prevention and health promotion is a priority.

## **Conclusion**

The decision to increase the number of healthcare professionals trained in North Dakota (“growing our own”) to meet the current and future healthcare needs of the population is a critically important component of the HWI. There is a need for all physicians but particularly in the specialties of primary care and surgery. There is a corresponding need for other healthcare professionals to complement the work of physicians, and the numbers needed will require ongoing assessment. Successfully meeting those needs will result in improved population health status, help to control costs, and improve quality. While there is a significant time lag in “growing our own,” the selection of students from rural North Dakota communities with a commitment to

rural practice will increase the likelihood of successful rural and primary care recruitment. The UND SMHS is striving to meet current and anticipated workforce needs by partnering with North Dakota Area Health Education Centers (AHECs) and others to address the resources and opportunities required to increase the number of North Dakota students interested in and prepared for a healthcare professions education. There are a wide variety of programs and activities in place across North Dakota to encourage students to pursue healthcare careers, and even more are planned (see Appendix A).

## **INCREASING THE RETENTION OF HEALTHCARE PROFESSIONALS**

Successful recruiting of students and residents into primary care and rural practice is one step in addressing the workforce needs of North Dakota. An equally important step is to improve the retention of healthcare professionals who graduate from a North Dakota program for rural practices and communities within the state.<sup>19</sup>

### **Factors Affecting Retention**

The first, and necessary, step in addressing the healthcare needs of rural North Dakotans is to recruit and retain physicians and other healthcare professionals to practice primary care in rural communities. If they don’t stay and practice in those communities, however, we will not be effectively meeting the needs of those communities. Factors that affect students’ specialty selection also may affect retention.<sup>20</sup>

- Start-up grants or practice development subsidies.
- Tax credits for rural or underserved area practices.
- Providing substitute physicians (locum tenens support).
- Malpractice immunity for providing voluntary or free care.
- Payment bonuses or other incentives by Medicaid or other insurance carriers.
- Subsidies for the installation of effective electronic health records.

Very few studies have been done regarding retention of physicians in communities beyond the study of the effects on physicians of mandatory service for the National Health Service Corps or other obligations. In a recent study, it appears that recruiting and retention are distinct processes. Generally, the factors that influence recruitment are not directly related to retention. Physicians have reported over time that staying in practice in a rural community is affected by local poverty, social and professional isolation, a lack of amenities, and the hardship of rural practice—long hours, frequent on-call shifts, and lower income than in more urban settings.<sup>20</sup>

### **Approaches to Improving Retention**

Using repeated surveys, a study by Pathman and colleagues<sup>20</sup> compared the retention of physicians in rural HPSA communities with rural non-HPSA communities and found no significant difference between the two. The conclusion of this study confirms other studies that found that the principal factor affecting rural physician shortages is that too few physicians are recruited there in the first place, and not that there are more problems retaining those successfully recruited. There were two characteristics of the physicians who remained in rural practice longer—owning their practice and being on-call fewer than two times a week. Even though recruitment may be the primary factor, these issues affecting retention are more modifiable than many of the issues affecting recruitment. Suggestions to improve retention include the following:

- Promoting practice ownership through low-interest loans and start-up guarantees.
- Offering leadership opportunities.
- Providing a greater voice in clinic policies and work schedules.
- Reducing on-call frequency by coordinating cross-coverage.
- Providing telephone triage systems.
- Providing full-time physician staffing in local emergency rooms.

### **The Need to Study and Evaluate the Effectiveness of Programs**

There continues to be a need to study and to better understand the factors or approaches that positively affect retaining quality physicians in a community. An international report that included an extensive review of the literature has shown that while most studies on retention are done on physicians, there is little information on financial incentives and there is a lack of coherence between the strategy to retain

physicians and the factors that matter to healthcare workers in choosing and remaining in a location.<sup>21</sup>

Another international study addressed whether compulsory programs such as the National Health Service Corps are effective in retaining providers in rural or remote areas.<sup>22</sup> The conclusion of the study was that no rigorous assessment has been done to compare the outcomes between workforce disparities in countries with compulsory service to those without compulsory service. Conclusions, in addition to further evaluation, are that for success in any compulsory program, good planning and transparency of the rationale and requirements are important. Also, successful retention depends on the support of the healthcare system and the benefits to the healthcare worker: pay, housing, continuing education, and clinical backup or supervision.

### **Continuing Professional Development**

Communities can help retain good physicians and healthcare professionals by being aware of the challenges and needs for their continuing education and development. Two unique aspects of rural medical practice are the scope of practice and the distance from major urban centers with specialist services. Rural practice includes clinic, house calls, nursing home care, hospital admissions and care, emergency room care, obstetric care, general surgery, and anesthesia. Rural physicians perform a wider range of procedures than providers in more urban settings, play an important role in the initial management of trauma, and have to provide care unique to location, such as wilderness or industrial areas, specific cultural groups, or agricultural medicine. The reality of rural practice attracts certain types of individuals interested in this breadth and variety. Continuing in this practice requires the confidence and skills that come from support and access to continuing professional development.<sup>23</sup> Learning new information or skills and spending time away with peers is essential to continuing a healthy and rewarding practice. One challenge is that rural physicians generally cannot leave their community for continuing education or professional development. Medical schools can be helpful in retention of rural physicians by creating programs for education and training that provide content that is needed by rural physicians, methods that are accessible through outreach to the community or distance technology, or immersion retraining experiences. Communities can support their physicians by providing financial support for professional development, arranging for physician coverage, and arranging for interesting exchange opportunities between rural and urban physicians. The needs of rural physicians are unique and can only be met successfully if there is flexibility and variety to address different needs. An example of how the UND SMHS can help in this regard is its Rural Surgery Support Program, where the School provides on a temporary basis a highly qualified general and trauma surgeon to local (typically rural) communities in need of such services for a limited time. The School thus functions to provide a local and internal locum tenens service to the communities of North Dakota.

## **Increased Retention of Graduates**

We know that medical students, especially those interested in primary care, have an increased likelihood of practicing in the vicinity of where they did their residency training. One approach to increasing the needed workforce is to attract students to and retain individuals from our own residency programs. There are a variety of interventions that are likely to increase the retention of graduating physicians within the state. These include revising and refining the admissions process to select students most likely to remain within the state to practice and revising the curriculum to ensure optimal exposure to primary care experiences. We feel that it is important to provide increased longitudinal clinical experiences in rural communities. Reducing debt burden through the RuralMed Program, where the four-year tuition costs are defrayed if the physician agrees to practice in a rural area of North Dakota for five years, addresses one issue that may affect the decision to practice rural primary care—that of extensive debt load from medical school tuition. Role models are extremely important and influential in decision-making for our students and residents.

## **Conclusion**

Research has shown that the principal factor in addressing a physician shortage is successful recruitment.<sup>20</sup> To be successful in keeping a quality healthcare workforce, however, there are modifiable factors related to educational and work experience that will lead to better retention that should also be considered. Increasing the types and length of experience in rural communities during medical and other health career student education and training will help develop more confident, informed decision-making about choosing rural practice. Many graduates and clinical faculty currently practice in our rural communities, and we hope to increase those numbers. The UND SMHS will continue to advocate for funding for scholarships or loan repayment for students who commit to rural practice (such as the RuralMed Program). It will work in partnership with rural health systems and physicians to encourage and support mentoring. The UND SMHS will continue to inform and advocate for issues related to reimbursement and practice support in partnership with healthcare systems and local and state government that can help to further ameliorate the long-standing problem of adequate rural healthcare delivery.

## **ROLE OF ADVANCED PRACTICE PROVIDERS**

Increased deployment and utilization of non-physician providers, especially physician assistants and nurse practitioners, is an important component in addressing North Dakota's healthcare workforce needs now and in the future. The training and use of such providers in North Dakota is explored in more detail in Chapters 5 and 6 of this *Biennial Report*. Precisely what role such advanced practice providers (APPs) fill, however, remains unclear. The hope and expectation is that APPs would complement physician providers by providing needed basic clinical services to patients who are otherwise underserved; thus, APPs are especially important in the most rural communities, where their increased deployment would ameliorate some level of

physician shortage. It is hoped that an APP might, in effect, be a substitute for a physician. And while APPs do provide such a service especially in rural areas of North Dakota, it is not clear what fraction of APPs function in this role. From a national perspective, many APPs are providing other non-primary care services to patients; many APPs, for example, work in subspecialty areas.<sup>24</sup> While these services may well be needed and important, they do not necessarily alleviate the problem of physician shortages in rural areas. Thus, APPs are not the sole answer to the problem of healthcare provider shortages in rural regions of North Dakota, but they are a component of the solution. To what extent they will be an even more effective positive force in the future remains to be seen.

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## **CHAPTER THIRTEEN: Recommendations: Healthcare Planning for North Dakota**

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The proactive approach taken by the last five North Dakota Legislative Assemblies to address the current and especially the anticipated future healthcare workforce and healthcare delivery challenges facing the state already is having a positive effect that should grow as the Healthcare Workforce Initiative (HWI) becomes more impactful over the next few years. However, because of budgetary uncertainty during the current biennium, not all of the HWI approved residency slots have been able to be funded. Phase I of the HWI began in 2011, following the 62nd Legislative Assembly with an initial increase in medical and health science student class sizes, provisions for additional residency positions (post-MD degree clinical training required for state licensure), implementation of coordinated Master of Public Health degree programs at the two research universities (the University of North Dakota [UND] and North Dakota State University [NDSU]), and expansion of the RuralMed Program (which encourages physician graduates to set up their practices in rural areas of North Dakota). Phase II of the HWI began in 2013, following the 63rd Legislative Assembly and provided support for additional expansion of the class and residency cohort along with continued support for the multiple other provisions of the HWI. Implementation of the HWI was continued with support from the 64th Legislative Assembly, although as noted above, full implementation of the residency expansion has been slowed as a result of the current budget allotment (family medicine and orthopedic residency slots in Fargo subsequently have been funded by Sanford Health and the programs now are operational).

Implementation of the HWI also required the construction of a new facility for medical and health sciences education that would accommodate the increased class sizes and permit consolidation of previously scattered UND health sciences programs into one building, thus facilitating interprofessional education. Construction of the new facility was completed on time and on budget in 2016, and the move into the new building occurred during the spring and summer of 2016, just in time to welcome the medical student Class of 2020 as well as the health sciences students starting their classes later that fall.

The Healthcare Workforce Initiative is designed to help meet North Dakota's healthcare delivery issues by utilizing four foundational approaches:

- Reduce disease burden, thus lowering the demand for healthcare services and related costs.
- Retain more physician and other healthcare provider graduates for clinical practice within the state.
- Train more physicians and other healthcare providers by increasing the medical, health sciences, and resident class sizes.
- Improve the efficiency of the healthcare delivery system in North Dakota principally through the training of healthcare providers who are proficient in team-based, interprofessional healthcare delivery methods.

This combination of reducing demand and increasing supply of various healthcare resources, along with necessary improvements in the healthcare delivery system, should bring the healthcare demand and supply equation into significantly better balance in North Dakota over the next 10 to 15 years.

## REDUCE DISEASE BURDEN

It is axiomatic to say that the best way to treat disease is to prevent it in the first place. Although simple in concept, disease prevention has proven to be much more difficult to achieve in practice. Nevertheless, the HWI incorporates several concrete steps to encourage and highlight disease prevention and reduction. The HWI includes these strategies to reduce chronic and acute disease, all of which have been implemented:

- A Department of Population Health at the UND School of Medicine and Health Sciences has been inaugurated under the leadership of Dr. Gary Schwartz, chair of the department. The department's focus is on developing programs that positively influence the health-related behaviors of North Dakotans.
- The Master of Public Health Programs at UND and NDSU continue to grow.
- A geriatrics residency training program at the UND SMHS has been implemented. It consists of a special advanced clinical training residency program in geriatric medicine for physicians who have recently completed a family medicine or internal medicine residency (i.e., a one-year residency in geriatrics following the completion of the standard three-year family medicine or internal medicine residency).

### Health-Related Behaviors

Many of the most serious health problems affecting North Dakotans (and all Americans) are caused, or at least made worse, by the personal choices we make about eating, smoking, physical inactivity, and other considerations.<sup>2</sup> In fact, these health-related behaviors account for nearly 40% of all deaths in the United States.<sup>2</sup> As an example, chronic diseases such as heart disease, type 2 diabetes, and cancer are among the most common and costly health problems. However, they are also among the most preventable because they share—as common contributing causes—undesirable health-related behaviors. One of the best ways to “cure” these widespread diseases is to improve health literacy and the choices people make that affect their health. The potential effect of prevention is substantial. The U.S. Centers for Disease Control and Prevention estimates that if tobacco use, poor diet, and physical inactivity were eliminated in the United States, it would prevent 80% of heart disease and stroke, 80% of type 2 diabetes, and 40% of cancer.<sup>3</sup>

In North Dakota, there is good evidence that we can improve health-related behaviors through public education and collaboration. Through the combined effort of many agencies and individuals, the percentage of North Dakota youth who currently smoke cigarettes decreased significantly from 21.1% in 2007 to 12.6% in 2017.<sup>4</sup> Successful improvement of health-related behaviors can avoid not only an enormous toll of suffering and death from disease but also can be accomplished at far less expense than treating the resulting diseases.<sup>1</sup> Based on the foregoing factors, the new Department of Population Health and the Master of Public Health Programs and their

respective faculty members at UND and NDSU are focusing on public education and other efforts to positively affect the health-related behaviors of North Dakotans.

### **Master of Public Health Programs**

One of the most practical approaches to improving health education and other public health initiatives in the state is to prepare its health professionals to undertake these roles as they enter practice. Specifically, having individuals with graduate training in public health (Master of Public Health degree) can augment capacity and reduce disease burden. UND and NDSU have partnered to create two collaborative graduate-level programs in public health that truly are cooperative. Since the programs began accepting students in 2012, they have grown and matured. The first graduates of the programs are now beginning to have a positive effect on the health of the public.

### **Geriatrics Training Program**

As outlined previously, the population of North Dakota is going to age markedly in the next decade. To provide for this increasingly older population, it will be essential to greatly expand training in the field of geriatrics. To accomplish this, the UND SMHS recruited noted gerontologist Dr. Donald Jurivich to lead the School's Department of Geriatrics, which will include a variety of programs to assist practitioners throughout North Dakota in optimizing their care of seniors. Additionally, the recently developed geriatrics residency for recent family or internal medicine graduates shows considerable promise to provide greater in-state practitioner expertise in chronic-disease management, fall and injury prevention, and more appropriate health-related decision-making in elderly.

### **RETAIN MORE GRADUATES**

As outlined previously in this *Report*, there are a variety of interventions (many of which are accepted best practices based on national consensus) that the UND SMHS has implemented that are likely to increase the retention of graduating physicians for eventual clinical practice within the state. These include the following:

- A revised and refined medical school admission process designed to select students most likely to remain within the state to practice.
- A revised curriculum to ensure optimal exposure to primary care experiences and to provide increased longitudinal clinical experiences in rural communities, actions that are associated with an increased retention rate.
- Reduced debt burden through the RuralMed Scholarship Program, where the four-year tuition costs of medical school are defrayed if the physician agrees to practice in a rural area of North Dakota for five years.
- Partnerships with physicians and healthcare systems to optimize and enhance mentoring and affinity relationships.

## **TRAIN MORE PHYSICIANS AND HEALTHCARE PROVIDERS**

Increasing retention efforts is a necessary but not sufficient approach to meeting the state's healthcare workforce shortage. Accordingly, an essential component of meeting the healthcare workforce needs of North Dakota is to expand class sizes or, to use the colloquial expression, "widen the pipeline." In response to a charge from the Association of American Medical Colleges, total medical school class size across the United States has been increased by about 30% over the past decade. The UND SMHS now has successfully increased medical class size by almost that same magnitude as a consequence of the HWI, and this should help ensure an adequate physician workforce in the future for North Dakota when coupled with the other efforts already underway and planned.

But simply increasing the medical student class size will be insufficient to meet the needs of North Dakota unless additional residency slots are available in the state for postgraduate training. The optimal retention of physicians occurs when the students go to school and enter residency within the same state; in those cases, about 2 out of 3 students remain in-state. Simply increasing class size will result in only about 1 out of 3 physicians remaining in-state for ultimate practice. Accordingly, the HWI as originally proposed incorporates a total of 17 new residency slots per year (total of 51 slots overall).

Following the most recent allocation of slots by the UND SMHS and its Advisory Council, all available slots have been committed to the following residencies or fellowships: family medicine, geriatrics, hospitalist, psychiatry, orthopedic surgery, and general surgery. Many of these offer training specific to rural practice.

Although 15 slots for the approved Fargo family medicine track could not be funded through the HWI due to the budget shortfall, fortunately these slots have all been funded by Sanford Health. Similarly, the orthopedic surgery slots are funded by Sanford Health.

The healthcare workforce shortage is not limited to physicians. Accordingly, the HWI also has allowed an expansion of 30 students per year (total of 90, or an increase of about 15%) for health sciences students trained by the UND SMHS. The reason that the increase was 15% for health sciences students and 26% for medical students was because most surveys have suggested that the health sciences workforce shortfall may be more modest than the physician shortfall, since some of the health sciences programs around the country ramped up their class sizes even before the more recent increase in medical school class size.

## **IMPROVE THE EFFICIENCY OF THE HEALTHCARE DELIVERY SYSTEM**

There are numerous health system initiatives already underway locally, regionally, and nationally—and many others proposed—that strive to improve the efficiency of our healthcare delivery system, with a goal of providing better care at lower cost in a more patient-friendly manner. Additionally, especially given the unique and difficult challenges of depopulation and low population density in rural North Dakota, alternative healthcare delivery models, including enhanced use of non-physician

providers, telemedicine and other virtual care delivery methods, home care, and medical homes, need to be explored and expanded. Although the future of the Affordable Care Act remains unclear, the act does offer support for some of these approaches, which may work to the advantage of North Dakota and its citizens.

One of the prime ways in which the UND SMHS intends to improve the efficiency and effectiveness of the state's healthcare delivery system is by better training of a wide spectrum of healthcare students in optimal methods of interprofessional healthcare delivery. But working together in effective interprofessional teams doesn't just happen; team members need to learn about each other's discipline and practice working together. So before we can expect to have effective healthcare teams taking care of actual patients, we need to properly train students in an interprofessional environment. The School's curriculum (along with the specially designed space in the new facility) has been redesigned to encourage and permit broadened interprofessional education. In support of interprofessional education, the new building has eight learning communities that provide the physical spaces where students from a variety of professions learn together.

## **RECOMMENDATIONS FOR MEETING NORTH DAKOTA'S HEALTHCARE WORKFORCE NEEDS**

Ongoing (and full) funding for the HWI by the 67<sup>th</sup> Legislative Assembly and others to follow is absolutely essential. North Dakota is one of the few states in the nation that has taken a forward-looking and proactive approach to healthcare needs through the HWI, and it is poised to reap the benefits of this approach in the next decade and beyond. Early indicators are quite positive; there are young physicians who are recent graduates of the UND SMHS, its residency programs or both who are or will be moving to Hettinger, Devils Lake, and Williston among other communities that have labored for years heretofore to attract physicians. In addition to continuing to endorse and support the full implementation of the HWI, there are a variety of other approaches that policymakers might consider during the 67<sup>th</sup> Legislative Assembly:

- North Dakota state income tax credit for healthcare practitioners who volunteer to teach healthcare students.
- Creation of a RuralMed-like (or other financial incentive) program to encourage rural practice for other needed non-physician providers (e.g., addiction counselors, medical laboratory technicians, and nursing assistants).
- Expansion of residency slots available through the HWI.
- Support for expanded mental and behavioral healthcare.

## **STRATEGIC PLAN FOR HEALTH<sup>5</sup>**

No one could have predicted the impact COVID-19 has had on the world, our nation, and on the state of North Dakota. Even before the pandemic, there were signs that many North Dakotans were not experiencing life to the fullest because of health-related issues. Among some communities and groups, disparities in health and

wellbeing have been growing. Poverty, unstable housing, food insecurity, interpersonal violence, substance addiction, and lack of access to physical and mental healthcare affect too many North Dakotans, making it hard, if not impossible for them to live their best lives.

Given the unprecedented circumstances of COVID-19, Governor Burgum recognized the opportunity to revitalize and transform the state's public health infrastructure to be more responsive and supportive of North Dakotans' overall health and wellbeing. He appointed a State Chief Health Strategist, Dr. Joshua Wynne, University of North Dakota Vice President for Health Affairs and Dean, School of Medicine and Health Sciences, to lead the state in developing a strategic plan with the goal of North Dakota becoming the healthiest state in the nation.

In May 2020, Dr. Wynne established the Health Strategies Planning Group (HSPG), a team of public health experts, and charged them with identifying ways to achieve Governor Burgum's bold goal. The HSPG embraced the opportunity to develop innovative approaches to building policies, systems, and infrastructure needed to support a more robust response to public health crises and transform North Dakota into the healthiest state in the nation.

North Dakota has a historic opportunity to develop a more comprehensive, collaborative and strategic approach to public health. Now is the time to optimize our capacity to execute both day-to-day activities and establish a stronger strategic direction which will harness the creative, spirited energy of our state to accomplish more than just doing things better – it is time to do better things.

The Strategic Plan will use a population health approach that identifies and understands how individual and community health is impacted by programs and policies across all sectors. This plan presents a path forward to achieve our goal for North Dakota residents to be the healthiest in the nation. Working together across public, private, non-profit, and tribal sectors, and from individual effort to statewide initiatives, we will succeed.

In becoming the healthiest state in the nation, health and wellbeing will improve for all North Dakotans. It means everyone has the opportunity to live as long in a manner that allows them to live their best lives. Some groups in North Dakota generally do very well and do not have issues with basic needs such as housing instability, food insecurity, interpersonal violence, or poor physical and/or mental health. However, there are populations in North Dakota that experience disproportionate disparities of health and wellbeing. Becoming the healthiest state in the nation requires North Dakota to focus on reducing disparities and establishing policies and structures that equitably support the health and well-being of all North Dakotans.

Listed below are key concepts that are important conceptual components of the Strategic Plan:

## **Population Health**

Population Health is a conceptual framework for assessing the health outcomes of a group of individuals and the distribution of such outcomes within the group. It also incorporates policy development, research agenda, and resource allocation that flow from these assessments. Population health is measured by health status indicators and

influenced by social, economic, and physical environments; personal health practices; individual capacity and coping skills; human biology; early childhood development; and health services. Healthcare systems, public health, and social policy all impact population health.

## **Health Equity**

Health Equity provides a fair and just opportunity for every individual to be as healthy as possible. Obstacles to health such as poverty, discrimination, and their consequences, including lack of quality education and housing, safe environments, and health care are removed.

## **Health in All Policies**

Health in All Policies (HiAP) is a collaborative approach that integrates and articulates health considerations into policymaking across sectors to improve the health of all communities and people. HiAP recognizes that health is created by a multitude of factors beyond healthcare and traditional public health activities.

## **Public Health**

Public Health is the combination of all evidence-based public and private efforts that preserve and promote health and prevent disease, disability and death at the population level.

## **Social Determinants of Health**

Social Determinants of Health (SDoH) are the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks (e.g., housing, community safety, educational attainment, food security).

## **CONCLUSION**

The HWI has provided the state of North Dakota with a blueprint for disease prevention, healthcare workforce development, and healthcare delivery system optimization that should be having a significant positive effect on the healthcare delivery challenges faced by the state. The HWI is only part of the solution, but it is a crucial element since it primarily addresses the educational foundation upon which the entire healthcare delivery system is based. Coupled with synergistic approaches by insurers, healthcare delivery institutions, other educational organizations, and policymakers, it will form part of the foundation of a revised and improved healthcare delivery system in the state.

## Deliverables

Continued full implementation of the HWI, the Strategic Plan for Health, and the other healthcare educational programs of the UND SMHS will help achieve a variety of goals that should be considered the deliverables to be received in exchange for funding of the HWI. The most important deliverable will be an adequate supply and distribution throughout North Dakota of caring, team-oriented primary and subspecialty-care practitioners schooled in interprofessional care. About half of the needed practitioners will result from a variety of increased retention efforts, and the other half will come from the expansion of class sizes and additional residency slots. Inherent in the plan is the anticipation that it will address the twin challenges of provider availability in North Dakota—an adequate supply of providers, as well as an appropriate distribution of those providers throughout all three population areas of the state (metropolitan, micropolitan, (large rural), and rural).

In addition to the obvious and necessary improvement in healthcare delivery throughout North Dakota, the increased number of healthcare providers will have a direct positive effect on the economic environment in the state as a result both of their increased employment and the “halo” effect that has been reported to generate \$1 million or more annually as a consequence of each additional physician practitioner employed.

It is anticipated that the UND SMHS will continue to generate at least \$2 of additional revenue for every \$1 appropriated by the Legislative Assembly. The additional revenue currently is composed of \$0.57 as a result of tuition, \$0.65 in grants and contracts (most often federal funds), \$0.54 in ancillary income such as from physician practice plans and contributions from the federal government to fund certain residency training costs, and \$0.14 from the mil levy. Currently, the UND SMHS generates about \$120 million biennially in additional revenue to that provided by the State of North Dakota. The total direct economic impact of the UND SMHS over the next three biennia should be well over a half a billion dollars.

Because much of the budget of the HWI is being allocated to cover clinical training in the community, a substantial portion of the appropriated and ancillary funds are being expended in areas other than Grand Forks County. A final positive direct impact of the HWI (specifically because of the new building in Grand Forks) will be an additional facility and administration (F&A) indirect cost return associated with federal and other research grants. Current estimates suggest that UND will garner almost \$1 million per year in additional revenue simply as a result of the construction of the new building that incorporates research space. This is because the F&A rate that any university receives is the result of a calculation by the federal government as to the indirect costs associated with its sponsorship of research at that institution. Much of the School’s former research space was constructed on the basis of earmarks and other federal dollars, which renders the space exempt from the calculation of F&A. With the construction of additional research space using nonfederal dollars (as was done in the new building), the F&A rate will increase, thus generating additional income for UND for as long as part of the building is used for research. Thus, given an expected building life of 50 years, the increased F&A rate alone should generate an additional \$50 million (assuming consistent research grant productivity).

Given the track record to date of the HWI and the predicted long-term positive impact on healthcare delivery in the state, it is essential that the UND School of Medicine and Health Sciences receives ongoing and continued support and funding from the North Dakota Legislature. For the 67th Legislative Assembly, the highest imperative is to continue full and stable funding of the HWI as well as for the UND SMHS.

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## Appendix A

Healthcare Workforce Pipeline Activities – Affiliated with the University of North Dakota (UND) School of Medicine and Health Sciences (SMHS) programs K-16 activities

- **Activity:** Health Insurance Portability and Accountability Act (HIPAA) Training (online). **Description:** Training on privacy and security of protected health information available at no cost, which is required for job shadowing in healthcare facilities. **Target Audience:** Middle school & High school students. **Partner(s):** AHEC. **Total Participants:** 3,562. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** State Appropriated Workforce, CRH State Office of Rural Health (SORH) Grant (federal: HRSA, FORHP).
- **Activity:** HOSA - Future Health Professionals. **Description:** A student organization that promotes career opportunities in the healthcare industry. **Target Audience:** Middle school & High school students. **Partner(s):** Center for Rural Health (CRH), UND School of Medicine, Sanford, University of Jamestown, ND Rural Health Association, and health occupation instructors. **Total Participants:** 584 student members and 16 chapters. **Communities Reached:** Bismarck (Bismarck High School, Century High School, Legacy High School, Missouri River Area Career and Technical Center), Killdeer, Mandan, North Valley Career & Technology Center (Grafton), West Fargo (Sheyenne High School & West Fargo High School), Fargo North, Hettinger, Grand Forks (Red River and Grand Forks Central high schools), SRCTC (Oakes). **Lead SMHS Program/Funding Source:** state: ND AHEC, ND Department of Commerce, Sanford Health, ND Rural Health Association, Jamestown University, US Army, CRH SORH (federal: HRSA, FORHP), State Appropriated Workforce, and UND SMHS; Federal: HRSA & ORHP.
- **Activity:** In-A-Box and other educational materials loan programs. **Description:** In-A-Box Program includes health and science activities. In addition, the AHEC and CRH have a number of resources available to schools, youth organizations, health facilities, education cooperatives, etc. **Target Audience:** Grades K–12. **Partner(s):** CRH/AHEC. **Total Participants:** Numbers not available. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** State Appropriated Workforce, CRH SORH (federal: HRSA, FORHP).
- **Activity:** Indians Into Medicine (INMED) Programs. **Description:** A comprehensive program designed to assist American Indian students who aspire to be health professionals to meet the needs of tribal communities. **Target Audience:** Indian students who are preparing for health careers. The Summer Institute program is a six-week academic enrichment session for junior and senior high school students; the Med Prep and Pathway components provide opportunities for college-level students. **Partner(s):** Tribal communities and other national education organizations. **Total Participants:** As of spring 2020, the program has graduated 250 medical doctors. The program has also graduated 299 students in nursing, clinical psychology, and various other health sciences. A total of 93 students in grades 7-12

attended the Summer Institute summer program in 2018 and 2019. Native Educators University Research Opportunity (NEURO) This comprehensive professional development program (K-12 teachers) aims to build on and improve teachers' understanding of the scientific process and support them in their science pedagogy in an effort to provide learning environments for American Indian students that foster scientific inquiry and promote the attainment of careers in healthcare - 5 teachers in 2019. **Communities Reached:** Not available. **Lead SMHS Program/Funding Source:** Indian Health Service (IHS) grant, National Institutes of Health grant, (federal) from the IDeA (Institutional Development Award) Network for Biomedical Research Excellence (INBRE) Program of the National Center for Research Resources; and (state) SMHS.

- **Activity:** Other health career fairs and student activities. **Description:** Local career fairs to inform and encourage students to pursue a career in healthcare. AHEC staff participate by providing health- career-related information and resources. **Target Audience:** All ages. **Partner(s):** Schools statewide. **Total Participants:** 2,111. **Communities Reached:** Bismarck, Fort Totten, Dickinson, and Devils Lake, Jamestown, Mayville and Fargo. **Lead SMHS Program/Funding Source:** AHEC (federal: HRSA, BHW).
- **Activity:** Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL-Health) Scrubs Camps. **Description:** A competitive mini-grant program intended to increase awareness, interest, and understanding of health careers available in rural North Dakota through creative and interactive activities. Program established in 2010. **Target Audience:** Grades 5–12. **Partner(s):** Schools, health facilities, and job development authorities statewide. **Total Participants:** 104 camps to date hosted a total of 7,866 students; 2009/2010: 14 camps funded, 1,016 students from 61 communities; 2010/2011: Nine camps funded, 441 students from 36 communities; 2011/2012: Nine camps funded, 407 students from 56 communities; 2012/2013: Nine camps funded, 682 students from 57 communities; 2013/2014: Nine camps funded, 653 students from 56 communities; 2014/2015: Eight camps funded, 699 students from 56 communities; 2015/2016: 9 camps funded, 830 students from 57 communities; 2016/2017: 10 camps funded, 891 students from 70 communities; 2017/2018: 10 camps funded, 931 students from 57 communities; 2018/2019: 9 camps funded, 953 students from 64 communities; 2019/2020: 8 camps funded (additional 8 were offered funding but had to cancel because of COVID-19), 381 students from 28 communities. **Communities Reached:** Adams, Alexander, Ambrose, Aneta, Ashley, Beulah, Bisbee, Blaisdell, Bottineau, Bowdon, Bowman, Burke, Buxton, Cando, Carson, Carrington, Cavalier, Center, Clifford, Colfax, Columbus, Crosby, Dahlen, Dakota Prairie, Dawson, Devils Lake, District 8, Donnybrook, Dunseith, Edmore, Egeland, Elgin, Ellendale, Fairmont, Fessenden, Finley, Flasher, Fort Totten, Fortuna, Four Winds, Galesburg, Garden Valley, Glen Ullin, Golden Valley, Grant County, Granville, Grenora, Halliday, Hamar, Hankinson, Hatton, Hazen, Hettinger, Hope, Jamestown, Killdeer, Klotten, Kenmare, Kramer, Lakota, Langdon, Leeds, Lemmon, SD, Lidgerwood, Lisbon, Maddock, Mandaree, Mayville, Max, Maxbass, McVillie,

Michigan, Milton, Minnewaukan, Mott, Munich, Nedrose, Newburg, New England, New Leipzig, New Rockford, New Town, Niagara, Noonan, Northwood, Oberon, Oakes, Osnabrock, Page, Palermo, Park River, Parshall, Pekin, Petersburg, Pettibone, Plaza, Pick City, Portland, Powers Lake, Ray, Reynolds, Robinson, Rolla, Rolette, Ross, Round Prairie, Rugby, St. Michael, Scranton, Sharon, Sheyenne, Souris, South Prairie, Stanley, Stanton, Starkweather, Steele, Surrey, Tappen, Tate Topa, Tioga, Tokio, Tolley, Tolna, Trenton, Tuttle, Upham, Wahpeton, Walhalla, Warwick, Watford City, Westhope, Whitman, Wildrose, Willow City, Williston, Wolford, Wyndmere, and Zap. **Lead SMHS Program/Funding Source:** CRH SORH (federal: HRSA, FORHP); (state) appropriated funds designated for workforce development. **Partners:** AHEC (federal: HRSA BHW), rural community health providers.

- Activity:** Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL-Health) Scrubs Academy I. **Description:** This four-day, three-night program is intended to provide hands-on activities from a wide variety of health professionals and an opportunity to experience campus living. Program began in 2011. **Target Audience:** Grades 6–8. **Partner(s):** Health professions educators, health providers, health career students. **Total Participants:** Nine (Tenth was cancelled due to COVID-19) Scrubs Academies have been held at the UND SMHS with a total of 512 students attending. 2011: 38 students from 21 communities; 2012: 45 students from 22 communities; 2013: 56 students from 27 communities; 2014: 51 students from 25 communities; 2015: 56 students from 25 communities; 2016: 55 students from 26 communities; 2017: 56 students from 21 communities; 2018: 80 students from 38 communities; 2019: 84 students from 27 communities. **Communities Reached:** Argusville, Arthur, Ayr, Battleview, Beach, Berlin, Berthold, Beulah, Bismarck, Bottineau, Carrington, Cavalier, Courtenay, Crookston, MN, Dawson, Devils Lake, Dickinson, Drayton, East Grand Forks, MN, Eldridge, Ellendale, Emerado, Enderlin, Esmond, Fargo, Fishers, Fordville, Frontier, Gackle, Grafton, Grand Forks, Grandin, Harvey, Hatton, Harwood, Hazen, Hecla, SD, Horace, Hunter, Jamestown, Kathryn, Lakota, LaMoure, Larimore, Leeds, Leonard, Lisbon, Mandan, Manning, Mayville, McKenzie, Mekinock, Milnor, Minot, Minto, Mohall, Monango, Mott, New Rockford, New Town, Northwood, Oakes, Oriska, Palermo, Park River, Pembina, Powers Lake, Ray, Reile's Acres, Rolette, Rolla, Roseau, MN, Ross, Rugby, Sentinel Butte, Stanley, Sykeston, Thompson, Towner, Upham, Valley City, Verona, Voltaire, Wahpeton, Washburn, West Fargo, Wilton, Wyndmere, and Ypsilanti. **Lead SMHS Program/Funding Source:** CRH State Office of Rural Health Grant program (federal: HRSA, FORHP); (state) appropriated funds designated for workforce development.

#### Healthcare Professional Continuing Education and Training

- Activity:** Dakota Conference on Rural and Public Health. **Description:** Annual conference to share strategies for building and sustaining healthy communities in North Dakota. **Target Audience:** Healthcare administrators, professionals, students, educators, legislators, and state agencies. **Partner(s):** UND; UND College of

Nursing and Professional Disciplines; Altru Health System; North Dakota Rural Health Association; North Dakota Public Health Association. **Total Participants:** 2013: 258 attendees; 2014: 312 attendees; 2015: 396 attendees; 2016: 399 attendees; 2017: 386 attendees; 2018: 273 attendees; 2019: 222 attendees; 2020: Cancelled due to COVID-19. **Communities Reached:** 2013 Mandan (statewide participation); 2014 Grand Forks (statewide participation); 2015 Minot (statewide participation); 2016 Grand Forks (statewide participation); 2017 Minot (statewide participation); 2018 Grand Forks (statewide participation); 2019 Minot (statewide participation). **Lead SMHS Program/Funding Source:** CRH SORH (federal: HRSA, FORHP) - Funded by sponsorships/exhibitors and registration fees.

- **Activity:** Rural Clinical Rotation Support. **Description:** Travel assistance for rural clinical rotation. **Target Audience:** Post-secondary health profession students in medicine, nursing, pharmacy dietetics, dentistry, social work, occupational and physical therapy. **Partner(s):** N/A. **Total Participants:** 131. **Communities Reached:** Baldwin, Beach, Bismarck, Bowman, Carrington, Cooperstown, Crystal, Fargo, Fessenden, Granville, Harwood, Hazen, Hunter, Larimore, Minot, Mohall, New Rockford, Reeder, Reynolds, Richardton, Scranton, Watford City, West Fargo, Williston, and Wilton. CHI St. Alexius Health Center, Devils Lake and Dickinson; Altru Family Medicine Residency; UND Center for Family Medicine in Bismarck; Luther Memorial Nursing Home; North Dakota State Hospital; Cancer Center of North Dakota; Sanford Health: Oakes Clinic; First Care Health Center, Park River; City County Health District, Valley City; Sanford Health: Wahpeton; Tioga Medical Center; Essentia, Wahpeton; West River Health Services, Hettinger; Jacobson Memorial Hospital, Elgin Clinic; Ortonville Area Health Services. **Lead SMHS Program/Funding Source:** AHEC (federal: HRSA BHW).
- **Activity:** Mind Matters Conference on Brain Injury. **Description:** Conference highlights new trends, innovative approaches, and collaborative models of care for individuals living with a brain injury. **Target Audience:** Survivors, family members, and professionals. **Partner(s):** Sanford Health, Onword Therapy, Rehab Visions. **Total Participants:** 2019: 99 attendees. **Communities Reached:** 2019: Bismarck (statewide participation) 2020: Canceled due to COVID-19. **Lead SMHS Program/Funding Source:** CRH funded through a subcontract with the North Dakota Department of Human Services.
- **Activity:** Certified Brain Injury Specialist training. **Description:** Formal training of best practices in the world of brain injury, formal testing and certification through the Brain Injury Association of America. **Target Audience:** professionals that work with individuals with brain injury. **Partner(s):** American Heart/Stroke Association of North Dakota. **Total Participants:** July 2019:44 attendees, December 2019: 22 attendees. **Communities Reached:** Statewide participation. **Lead SMHS Program/Funding Source:** CRH funded through a subcontract with the North Dakota Department of Human Services.

- **Activity:** Online Brain Injury Courses. **Description:** 5 online courses accessible and free to participants via University of North Dakota's blackboard program. Courses titles include: Introduction to Brain Injury, Cognitive and Behavioral Consequences of Brain Injury, Pediatric Brain Injury, Primary Care and Brain Injury, and Substance Use and Brain Injury. **Target Audience:** brain injury survivors, caregivers, family members and professionals. **Partner(s):** North Dakota DHS Medicaid and Aging Services Divisions. **Total Participants:** Launched in June of 2019: Total 683. **Communities Reached:** Courses are available nationwide. **Lead SMHS Program/Funding Source:** CRH funded through a subcontract with the North Dakota Department of Human Services.
- **Activity:** North Dakota Critical Access Hospital (CAH) Quality Network Annual CAH Meeting. **Description:** State conference to share and discuss best-practice models from across North Dakota with reference to Critical Access Hospital Quality Activity, CMS Conditions of Participation (CAH regulation education). **Target Audience:** CAH CEO, Directors of Nursing, Nurses, Quality Improvement Coordinators, Risk Managers and others as facility determines. **Partner(s):** ND Department of Health Facilities, ND Department of Health Infection Prevention, Quality Health Associates, ND Health Information Technology. **Total Participants:** 2018: 70 attendees; 2019: 75 attendees. **Communities Reached:** Statewide CAH participation to include all 36 ND CAHs. **Lead SMHS Program/Funding Source:** CRH Rural Hospital Flexibility Grant Program (federal: HRSA, FORHP)
- **Activity:** Care Coordination workshop to support CAHs and Rural Health Clinics (RHC) in the transition to value based models and transformation efforts in the health care systems. **Description:** The aim of this workshop was to share a fundamental approach for developing and improving a network care coordination service; including team development and process infrastructure. Through the workshop participants gained confidence in their network projects, new insights and relationships with network peers. This was an interactive workshop where participants learned about the components of care coordination and applied them to help meet their networks goals. **Target Audience:** 13 facilities participated with 3-5 team members from CAHs and RHC in ND. **Partner(s):** North Dakota Blue Cross Blue Shield, Quality Health Associates, ND Department of Health. **Total Participants:** 75. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** CRH (federal: HRSA, ORHP, and Rural Hospital Flexibility Grant Program).
- **Activity:** AHEC Scholars. **Description:** AHEC Scholars is a 2 year nationally recognized certificate program for health professions students interested in supplementing their education by gaining additional knowledge and experience in rural and/or underserved settings. **Target Audience:** Post-secondary Education. **Partners:** All ND College/Universities. **Total Participants:** 24 enrolled. **Communities Reached:** Williston, Jamestown, Mayville, Wishek, Minot, Washburn, Underwood. **Lead Funding Source:** AHEC (Federal: HRSA).

- **Activity:** Opioid Education/MAT training. **Description:** AHEC received supplemental funding and partner with Heartview Foundation's Dr. Henke to provide Opioid Addiction Training and introduced the importance of Medication Assisted Treatment to communities and healthcare providers and schools in four rural communities. **Target Audience:** All community members. **Partners:** Heartview Foundation, Bismarck. **Total Participants:** 197. **Communities Reached:** Mayville, Dickinson, Rolla, and Hettinger. **Lead Funding Source:** AHEC (HRSA).
- **Activity:** Annual ND CAH financial analysis project. **Description:** This ongoing annual analysis is completed by a long-time veteran ND CAH CEO. The report includes current data collection and analysis from all 36 CAHs, dating back to 2008. Presentations are shared statewide with CAH administrators at the annual ND Hospital Association Annual Convention, and also in an education session with North Dakota Healthcare Financial Management Association (HFMA). NDHA also utilized the data in discussions with ND congressional delegates as well as state legislators. Additionally, information from this project is shared with critical access hospital board members, as well as at a statewide ND CAH Quality Network meeting, with CAH nursing, risk, and quality staff. **Target Audience:** North Dakota Critical Access Hospitals, CEOs, CFOs, Nursing, Risk, Quality, Board members. **Partner(s):** North Dakota Hospital Association. **Total Participants:** 200. **Communities Reached:** Offered to CAHs statewide. **Lead SMHS Program/Funding Source:** Flex (HRSA).
- **Activity:** Support toward CAH-finance and RHC-finance related webinar education. **Description:** The North Dakota Flex Program provided education through Eide Bailly (accounting firm) for both a CAH Webinar Series (five sessions) and an RHC webinar education series (three sessions) aimed at CEOs, CFOs, and department managers. These interactive sessions are designed to increase knowledge and understanding of issues relative to CAH financial performance. **Target Audience:** North Dakota Critical Access Hospitals, CEOs, CFOs, business office staff. **Partner(s):** Eide Bailly. **Total Participants:** 15 CAHs, 14 RHCs. **Communities Reached:** Offered to CAHs statewide. **Lead SMHS Program/Funding Source:** Flex (HRSA).
- **Activity:** Medicare CAH and RHC Education. **Description:** Participants in CAH & RHC Medicare education learn tools and skills to research troublesome Medicare questions. The content is focused on 'rules-based' learning, helping participants to find and apply CMS rules and guidelines to ensure that hospital services furnished to Medicare beneficiaries are billed accurately and appropriately. The information in these courses is geared specifically to the coding, billing and reimbursement regulations as they apply to a Critical Access Hospital, and to a RHC. The classes help participants maintain compliance with the latest rules and regulations, prevent missed revenue and denials, and prepare for RAC and other government audits. **Target Audience:** North Dakota Critical Access Hospitals - CFOs, billing and coding staff, business office staff. **Partner(s):** Eide Bailly. **Total Participants:** 21

CAHs. **Communities Reached:** Offered to CAHs statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).

- **Activity:** Online BASICS Billing and Coding Education for Rural Health Clinics. **Description:** This online course covered the core principals of creating medical documentation in order to report accurate and complete quality metrics and turn the documentation into the CPT/HCPCS-II/ICD-10 CM codes, and formatting medical bills according to carrying rules of insurance companies. **Target Audience:** North Dakota Critical Access Hospitals - CFOs, billing and coding staff, business office staff. **Partner(s):** Association for Rural & Community Health Professional Coding (ArchProCoding). **Total Participants:** 14 CAHs. **Communities Reached:** Offered to CAHs statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).
- **Activity:** Health System Development and Community Engagement / Collaboration between Critical Access Hospitals and EMS Systems. **Description:** The goal of this project is to strengthen the communication between local EMS agencies and their Critical Access Hospitals through joint regional meetings. Issues for discussion include; access to adequate training, maintaining trauma designation, adequate patient transport services, fostering health information exchange, and other issues pertinent to the region involved. It is imperative that these groups recognize each others challenges and work toward a common goal as an increasing number of CAH facilities provide fewer services and will thus require more utilization of EMS services. **Target Audience:** North Dakota Critical Access Hospitals & EMS units. **Partner(s):** North Dakota EMS Association. **Total Participants:** 4 Meetings, Representing 8 CAHs, 13 ambulance services, 2 flight services, and 2 Quick Response Services. **Communities Reached:** Offered to EMS statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).
- **Activity:** North Dakota EMS Leadership Academy. **Description:** The ND EMS Leadership Academy is developed and facilitated by SafeTech Solutions, a national EMS consulting firm with extensive experience in rural EMS systems. This Level V of the EMS Leadership Academy was developed after numerous academy graduates expressed desire to formally gather with other graduates to continue their leadership journey, learn from each other, talk about successes and failures, recharge their leadership batteries and receive support and encouragement. Great leadership is an ongoing practice of reflection and learning. Topics of the two-day session include: developing leaders in our organizations; planning for the future; and meeting challenges associated with finding, fielding and engaging a high-quality EMS workforce. **Target Audience:** North Dakota EMS units. **Partner(s):** North Dakota EMS Association. **Total Participants:** 27 EMS Units. **Communities Reached:** Offered to EMS statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).
- **Activity:** EMS Management Conference. **Description:** Recognizing a training gap, the North Dakota EMS Association hosts EMS Management conferences geared

specifically to leaders and managers of EMS agencies who want to learn specific components on how to successfully run an ambulance service. Session topics include; EMS funding sources, successful billing practices, preparation of a budget, documentation, management case studies, collaboration and system building with other public safety services, quality data reporting, and regional transport plan discussions. Facilitators include those specializing in: financial preparation and audits, billing reimbursement, quality improvement/quality assurance measures, state education standards, strategic planning, organization structure, and mentorship of leaders. **Target Audience:** North Dakota EMS units. **Partner(s):** North Dakota EMS Association. **Total Participants:** 25 EMS Units. **Communities Reached:** Offered to EMS statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).

- **Activity:** Mental Health First Aid Courses. **Description:** This course helps teach individuals on how to help a person who may be experiencing a mental health related crisis or problem. Topics covered include anxiety, depression, psychosis, and addictions. A new course that has been added is the Mental Health First Aid course for Public Safety. This course, for police officers, first responders, EMS, fire fighters, corrections officers, and other public safety professionals teaches about defusing a crisis, promoting mental health literacy, combating stigma of mental illness, early intervention, and connecting people to care. **Target Audience:** North Dakota Public Safety Professionals. **Partner(s):** North Dakota EMS Association. **Total Participants:** 20 EMS Units. **Communities Reached:** Offered to EMS statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).
- **Activity:** EMS Safety Course. **Description:** The 8 hour NAEMT's EMS Safety course teaches students how to protect themselves and their patients while on the job. It promotes a culture of safety and helps reduce the number of on-the-job fatalities and injuries. EMS Safety is the only national, comprehensive safety course for EMS practitioners. Its interactive format features real-life case studies and compelling discussions on current safety issues, and provides participants with a forum to share their own experiences. Critical thinking stations help build participants' risk assessment and decision-making skills. Participants are taught to identify and remove hazards, defensive driving strategies, resiliency skill strengthening, infection control practice, and applying crew resource management. **Target Audience:** North Dakota EMS units. **Partner(s):** North Dakota EMS Association. **Total Participants:** 25 EMS Units. **Communities Reached:** Offered to EMS statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).
- **Activity:** EMS Leadership Training. **Description:** Series of training workshops conducted to develop leaders among North Dakota EMS professionals. **Target Audience:** EMS professionals. **Partner(s):** North Dakota EMS Association and NDDOH Division of EMS. **Total Participants:** 96. **Communities Reached:**

Statewide. **Lead SMHS Program/Funding Source:** CRH Flex (federal: HRSA, FORHP).

#### Recruitment and Retention

- **Activity:** Primary Care Office (PCO). **Description:** State-level office located in the NDDOH. Purpose is to provide technical assistance to organizations and communities in their efforts to expand access to primary care, oral health, and mental health services for underserved populations. PCOs work with National Health Service Corps (NHSC) providers, sites, state loan repayment and J-1 visa waiver programs and conduct health profession shortage area designations. **Target Audience:** Sites: Rural health clinics, CAHs, tertiary care centers, IHS, federally qualified health centers, human service centers, and private practice mental health sites. Students and providers: primary care, oral health, nursing, mental and behavioral health. **Partner(s):** NDDOH, HRSA BHW Division of Regional Operations Denver; Community Healthcare Association of the Dakotas; PCO Network; academic partners in the North Dakota University System, and AHEC. **Total Participants:** 148 providers currently serving (37 NHSC loan repayment; 46 state healthcare professionals' loan repayment; 19 Federal State Loan Repayment; 13 Dental Loan Repayment; 25 J-1 visa providers). **Communities Reached:** 149. **Lead SMHS Program/Funding Source:** UND Center for Rural Health through an NDDOH subcontract (federal: HRSA BHW).
- **Activity:** Rural Recruitment and Retention Network (3RNet) Membership. **Description:** A national Web-based network helping health professionals find jobs in rural and underserved areas throughout the country. **Target Audience:** Health professionals and healthcare organizations. **Partner(s):** N/A. **Total Participants:** 5,361 health profession candidates connected to rural healthcare entities. 45 providers placed in communities. (MD, PA, NP, RN, Radiology Technician, Dentist) providers placed in communities. **Communities Reached:** 36 (rural) CAHs, three IHS, and five federally qualified community health centers. **Lead SMHS Program/Funding Source:** CRH State Office of Rural Health Grant Program (federal: HRSA, ORHP); (state) appropriated funds—designated for workforce.

## **Appendix B**

3RNet: National Rural Recruitment and Retention Network

AAMC: Association of American Medical College

AAPM: Advanced Alternative Payment Model

ACA: Affordable Care Act

ACCME: Accreditation Council for Continuing Medical Education

ACGME: Accreditation Council for Graduate Medical Education

AD: Alzheimer's Disease

ACO: Accountable Care Organization

AED: Automated External Defibrillator

AEMT: Advanced Emergency Medical Technician

AGPCNP: Adult-Geriatric Primary Care Nurse Practitioner

AHA: American Hospital Association

AHCA: American Health Care Act

AHEC: Area Health Education Center

AHRF: HRSA Areas Health Resource File

AHRQ: Agency for Healthcare Research and Quality

AIDS: Acquired Immune Deficiency Syndrome

AIM: ACO Improvement Model

ALS: Advanced Life Support

APA: American Psychological Association

APM: Alternative/Advanced Payment Model

APP: Advanced Practice Provider

APRN: Advanced Practice Registered Nurse

ARRA: American Recovery and Reinvestment Act

ATV: All-Terrain Vehicle

BACB: Behavior Analyst Certification Board

BCBS: Blue Cross Blue Shield

BCBSND: Blue Cross Blue Shield of North Dakota  
BCRA: Better Care Reconciliation Act  
BFEPS: Benchmark for Excellence in Patient Safety  
BH: Behavioral Health  
BHW: Behavioral Health Workforce  
BHWET: Behavioral Health Workforce Education and Training  
BLS: Basic Life Support  
BPCI: Bundled Payments for Care Improvement Initiative  
BRFSS: Behavioral Risk Factor Surveillance System  
BSN: Bachelor of Science in Nursing  
CACREP: Council for Accreditation of Counseling and Related Educational Programs  
CAH: Critical Access Hospital  
CPA: Canadian Psychological Association  
CBO: Congressional Budget Office  
CBOC: Community-Based Outpatient Clinic  
CDC: Center for Disease Control and Prevention  
CDM: Chronic Disease Management  
CEO: Chief Executive Officer  
CFO: Chief Financial Officer  
CHA: Community Health Assessment  
CHC: Community Health Center  
CHF: Congestive Heart Failure  
CHI: Catholic Health Initiatives  
CHIP: Children's Health Insurance Program  
CHNA: Community Health Needs Assessment  
CHW: Community Health Workers  
CISM: Critical Incident Stress Management  
CLL: Chronic Lymphocytic Leukemia

CLS/MT: Clinical Laboratory Scientist/Medical Technologist  
CMMI: Center for Medicare and Medicaid Innovation  
CMS: Centers for Medicare and Medicaid Services  
CMSI: Center for Medicare and Medicaid Services Innovation  
CNA: Certified Nursing Assistant  
CNM: Certified Nurse Midwife  
CNS: Clinical Nurse Specialist  
COH: Community Outpatient Hospital  
COMAFTE: Commission on Accreditation for Marriage and Family Therapy Education  
CoP: Conditions of Participation  
COPD: Chronic Obstructive Pulmonary Disease  
CPC: Comprehensive Primary Care Initiative  
CPC+: Comprehensive Primary Care Plus  
CPCP: Comprehensive Primary Care Payment  
CPR: Cardiopulmonary Resuscitation  
CQM: Clinical Quality Measures  
CRC: Cardiac Ready Community  
CRH: Center for Rural Health  
CRNA: Certified Registered Nurse Anesthetist  
CSR: Cost Sharing Reduction  
CT: Computerized Tomography  
DDS: Doctor of Dental Surgery  
DEMS: Division of Emergency Medical Systems  
DHS: Department of Human Services  
DNP: Doctor of Nursing Practice  
DO: Doctor of Osteopathy  
DON: Director of Nursing  
DPT: Doctor of Physical Therapy

DSM: Direct Secure Messaging  
DSM-5: Diagnostic and Statistical Manual of Mental Disorder 5<sup>th</sup> Edition  
DUI: Driving Under the Influence  
ECHO: Extension for Community Healthcare Outcomes  
eCQM: Electronic Clinical Quality Measure  
ED: Emergency Department  
EDTC: Emergency Department Transfer Communication  
EHR: Electronic Health Records  
EMR: Emergency Medical Responder  
EMS: Emergency Medical Services  
EMT: Emergency Medical Technician  
EMT-B: Emergency Medical Technician-Basic  
EMT-I: Emergency Medical Technician-Intermediary  
EPCS: Electronic Prescribing of Controlled Substances  
ER: Emergency Room  
EVE: Escaping Violent Encounters  
EVENT: EMS Voluntary Event Notification Tool  
F&A: Facility and Administration  
F-CHIP: Frontier Community Health Integration Project Demonstration  
FFS: Fee-For-Service  
FNP: Family Nurse Practitioner  
FORHP: Federal Office of Rural Health Policy  
FPL: Federal Poverty Level  
FQHC: Federally Qualified Health Centers  
FTE: Full Time Equivalent  
FTR: Free Through Recovery Program  
FY: Fiscal Year  
GDP: Gross Domestic Product

GME: Graduate Medical Education  
GPTRAC: Great Plains Telehealth Resource and Assistance Center  
HAC: Hospital Acquired Condition  
HB: House Bill  
HCAHPS: Hospital Consumer Assessment of Healthcare Providers and Systems  
HELP: Health, Education, Labor, & Pensions  
HEN: Hospital Engagement Network  
HIIN: Hospital Improvement and Innovation Network  
HIM: Health Information Managers  
HIPAA: Health Insurance Portability and Accountability Act  
HIPE: Health in Partnership with Education  
HIT: Health Information Technology  
HITAC: Health Information Technology Advisory Committee  
HITECH: Health Information Technology for Economic and Clinical Health  
HMP: Health Management Program  
HOSA: Health Occupations Students of America  
HPSA: Health Professional Shortage Area  
HRET: Health Research & Educational Trust  
HRQOL: Health-Related Quality of Life  
HRSA: Health Resources and Services Administration  
HSC: Human Service Center  
HWI: Health Workforce Initiative  
IA: Improvement Activities  
IA: Iowa  
ICAHN: Illinois Critical Access Hospital Network  
IHI: Institute for Healthcare Improvement  
IHS: Indian Health Service  
IMG: International Medical Graduate

INMED: Indians into Medicine  
IOM: Institute of Medicine  
IRIS: Intelligent Resources Informed Strategies  
IT: Information Technology  
JCREC: Joint Committee on Rural Emergency Care  
JCT: Joint Committee on Taxation  
LABA: Licensed Assistant Behavior Analyst  
LAC: Licensed Addiction Counselor  
LAMFT: Licensed Associate Marriage and Family Therapist  
LAPC: Licensed Associate Professional Counselor  
LBA: Licensed Behavior Analyst  
LBSW: Licensed Baccalaureate Social Worker  
LCME: Liaison Committee on Medical Education (LCME)  
LCSW: Licensed Certified Social Worker  
LGBTQ+: Lesbian, Gay, Bisexual, Transgender, Queer Plus  
LICSW: Licensed Independent Clinical Social Worker  
LMFT: Licensed Marriage and Family Therapists  
LMSW: Licensed Master Social Worker  
LPC: Licensed Professional Counselor  
LPCC: Licensed Professional Clinical Counselor  
LPHU: Local Public Health Unit  
LPN: Licensed Practical Nurse  
LSW: Licensed Social Worker  
LTC: Long Term Care  
LVN: Licensed Vocational Nurse  
MA: Massachusetts  
MACRA: Medicare Access and CHIP Reauthorization Act  
MAPCP: Multi-payer Advanced Primary Care Practice

MAT: Medication Assisted Treatment  
MBQIP: Medicare Beneficiary Quality Improvement Program  
MCO: Managed Care Organization  
MD: Doctor of Medicine/Medical Doctor  
MIPS: Merit-based Incentive Payment System  
MLT/CLT: Medical Laboratory Technician or Clinical Laboratory Technician  
MMA: Medicare Modernization Act  
MN: Minnesota  
MT: Montana  
MT/MLS: Medical Technologist or Medical Laboratory Scientist  
NASAC: National Addiction Studies Accreditation Commission  
NCLEX-PN: National Council Licensure Examination for Practical Nursing  
NCLEX-RN: National Council Licensure Examination for Registered Nursing  
NCQA: National Committee for Quality Assurance  
ND: North Dakota  
NDBON: North Dakota Board of Nursing  
NDCC: North Dakota Century Code  
NDDEMS: North Dakota Division of Emergency Medical Services  
NDDHS: North Dakota Department of Human Services  
NDDoH: North Dakota Department of Health  
NDEMSEA: North Dakota EMS Association  
NDHA: North Dakota Hospital Association  
NDHIN: North Dakota Health Information Network  
NDMA: North Dakota Medical Association  
NDSPC: North Dakota Suicide Prevention Coalition  
NDSU: North Dakota State University  
NE: Nebraska  
NHQR: National Healthcare Quality Report

NHSC: National Health Services Corps  
NHSN: National Health Safety Network  
NP: Nurse Practitioner  
NPP: National Priorities Partnership  
NQS: National Quality Strategy  
NRHA: National Rural Health Association  
NSLP: National School Lunch Program  
OB-GYN: Obstetrician/Gynecologist  
OECD: Organization of Economic Cooperation and Development  
OIG: Office of the Inspector General  
ONC: Office of the National Coordinator  
OR: Oregon  
ORRA: Obamacare Repeal Reconciliation Act  
OT: Occupational Therapist  
OTA: Occupational Therapy Assistant  
PA: Physician's Assistant  
PA-C: Physician's Assistant – Certified  
PCCM: Primary Care Case Management  
PCMH: Patient-Centered Medical Home  
PCO: Primary Care Office  
PfP: Partnership for Patients  
PHAB: Public Health Accreditation Board  
PHAC: Participating Hospital Advisory Council  
PhD: Doctor of Philosophy  
PMHNP: Psychiatric Mental Health Nurse Practitioner  
PMPM: Per Member/Per Month  
PPACA: Patient Protection and Affordable Care Act  
PPCP: Priority Primary Care Provider

PPS: Prospective Payment System  
PQRS: Physician Quality Reporting System  
PSA: Prostate-Specific Antigen  
PsyD: Doctor of Psychology  
PT: Physical Therapist  
PTA: Physical Therapy Assistant  
PTN: Practice Transformation Network  
QHA: Quality Health Associates  
QIN-QIO: Quality Innovation Network-Quality Improvement Organization  
QIO: Quality Improvement Organization  
QPP: Quality Payment Program  
QRU: Quick Response Unit  
REACH: Regional Extension Assistance Center for HIT  
REC: Regional Extension Center  
REMSA: Rural Emergency Medical Services Assistance  
RHC: Rural Health Clinic  
RHND: Rural Health Network Development  
RN: Registered Nurse  
ROME: Rural Opportunities in Medical Education  
RUCA: Rural-Urban Commuting Area  
RUPRI: Rural Policy Research Institute  
SAMHSA: Substance Abuse and Mental Health Services Administration  
SCIP: Surgical Care Improvement Project  
SD: South Dakota  
SDOH: Social Determinants of Health  
SGR: Sustainable Growth Rate  
SIM-ND: Simulation in Motion-North Dakota  
SMHS: School of Medicine and Health Sciences

SNAP: Supplemental Nutrition Assistance Program  
SOAR: Statewide Online Ambulance Reporting  
STEMI: ST-Evaluation Myocardial Infarction  
STRIVE: Strategies Targeting Reduction in Infections via Engagement  
SUD: Substance Use Disorder  
TA: Technical Assistance  
TCPI: Transforming Clinical Practice Initiative  
UND: University of North Dakota  
USAC: Universal Service Administrative Company  
USDA: United States Department of Agriculture  
USMG: U.S. Medical Graduate  
UT: Utah  
VA: Veterans Affairs  
VBP: Value-Based Purchasing  
VBPM: Value-Based Payment Modifier  
WA: Washington  
WI: Wisconsin  
WY: Wyoming  
YRBS: Youth Risk Behavior Survey

## Appendix C

### Numeric

- 340B Drug Discount Program: U.S. federal government program created in 1992 that requires drug manufactures participating in Medicaid to provide outpatient drugs to covered entities at significantly reduced prices.

### A

- Accountable Care Organization (ACO): a group of hospitals, doctors, and other health care providers, who come together voluntarily to give coordinated high-quality care to their Medicare patients. The goal is to ensure that patients get the right care at the right time, while avoiding unnecessary duplication of service and preventing medical errors.
- Accreditation (accredited): the action or process of officially recognizing someone as having a particular status or being qualified to perform a particular duty.
- Accreditation Council for Continuing Medical Education: sets and enforces standards in physician continuing education within the U.S. It acts as the overseeing body for institutions and organizations providing continuing medical education activities.
- Accreditation Council for Graduate Medical Education (ACGME): an independent, not-for-profit, physician-led organization that sets and monitors the professional educational standards essential in preparing physicians to deliver safe, high-quality medical care to all Americans.
- Acquired Immune Deficiency Syndrome: a disease in which there is a severe loss of the body's cellular immunity, greatly lowering the resistance to infection and malignancy.
- Acuity: the measurement of the intensity of nursing care required by a patient.
- Acute Care: providing or concerned with short-term usually immediate medical care (as for serious illness or a traumatic injury).
- Acute Myocardial Infarction: a heart attack; when the heart is deprived of circulating blood due to blocked arteries.
- Addiction Counselor: a mental health professional who specializes in helping patients with addictions.
- Adult-Geriatric Primary Care Nurse Practitioner: an advanced practice nurse who has the education and training to assess and manage adult health and common acute and chronic illness. They emphasize prevention and wellness through patient education.
- Advanced life support: emergency medical care for sustaining life, including defibrillation, airway management, and drugs and medications.
- Advanced Practice Providers: medical providers (physician assistants or nurse practitioners) who are trained and educated similarly to physicians. They work in

all areas of the hospital and clinic, and patients can be treated by them in the emergency room, operating room, or during routine visits.

- **Advanced Practiced Registered Nurse:** a nurse with a graduate-level degree such as a Master's of Science in Nursing or a Doctor of Nursing Practice, and has been specially trained in one of the four recognized APRN roles.
- **Advocacy:** public support for or recommendation of a particular cause or policy.
- **Affordable Care Act:** landmark health reform legislation passed by 111th Congress and signed into law by President Obama in March of 2010 that aimed to expand coverage, lower healthcare costs, hold insurance companies accountable, guarantee more choice, and enhance the quality of care for all Americans.
- **Agency for Healthcare Research and Quality:** one of twelve agencies within the Department of Health and Human Services that invests in research and evidence to make health care safer and improve quality.
- **Aggregate:** a whole formed by combining several elements.
- **Agrarian:** relating to cultivated land or the cultivation of land; any community whose economy is based on producing and maintaining crops and farmland
- **Alleviate:** make less severe
- **Allopathic:** adjective form of allopathy; refers to the treatment of disease by conventional means such as using drugs that have the opposite effects compared to the symptoms.
- **Alzheimer's Disease:** A progressive disease that destroys memory and other important mental functions.
- **Amalgamate (amalgamation):** combine or unite to form one organization or structure.
- **Ambulatory care:** also called outpatient care, it is medical care provided in an outpatient basis, including diagnosis, observation, consultation, treatment, intervention, and rehabilitation services.
- **Ameliorate:** to make, something bad or unsatisfactory, better.
- **American Association of Nurse Practitioners:** a national professional membership organization with a mission to empower all nurse practitioners to advance quality health care through practice, education, advocacy, research, and leadership.
- **American Dental Association:** the largest dental association in the U.S. that is the leading source of oral health related information for dentists and their patients.
- **American Medical Association:** an organization that helps physicians help patients by uniting physicians nationwide and medical students to work on the most important professional and public health issues.
- **American Psychological Association:** the leading scientific and professional organization that represents psychology in the United States that included researchers, educators, clinicians, consultants, and student members.
- **American Recovery and Reinvestment Act:** a bill signed into law by President Obama that was designed to give the economy a boost by reducing federal

taxes, increasing unemployment benefits, and also increasing spending in certain areas

- Amid: surrounded by or in the middle of.
- Ancillary: providing necessary support to the primary activities or operations of an organization, institution, industry, or system.
- Anecdotal: not necessarily true or reliable, because based on personal accounts rather than facts or research.
- Anesthesiologist: a physician specializing in anesthesiology.
- Anesthesiology: the branch of medicine concerned with anesthesia and anesthetics.
- Anxiety: a nervous disorder characterized by a state of excessive uneasiness and apprehension, typically with compulsive behavior or panic attacks.
- Arthritis: painful inflammation and stiffness of the joints.
- Associate Degree: an undergraduate academic degree awarded by community colleges, junior colleges, technical colleges, and some bachelor-granting colleges and universities upon completion of a course of study lasting two years on average.
- Association of American Medical Colleges: a not-for-profit association dedicated to transforming health care through innovative medical education, cutting-edge patient care, and groundbreaking medical research.
- Asthma: a respiratory condition marked by spasms in the bronchi of the lungs, causing difficulty in breathing. It usually results from an allergic reaction or other forms of hypersensitivity.
- Autism: a developmental disorder of variable severity that is characterized by difficulty in social interaction and communication and by restricted or repetitive patterns of thought and behavior.
- Automated External Defibrillator: a portable electronic device that automatically diagnoses the life-threatening cardiac arrhythmias of ventricular fibrillation and pulseless ventricular tachycardia, and is able to treat them through defibrillation, the application of electricity which stops the arrhythmia.
- Axiomatic: self-evident or unquestionable.

## B

- Bachelor's Degree: an undergraduate academic four-year degree awarded by colleges and universities upon completion of a course of study. Also called a Baccalaureate degree.
- Balanced Budget Act of 1997: an omnibus legislative package that was designed to balance the federal budget by 2002.
- Basic-Care Facility: a congregate residential setting with private rooms and semiprivate rooms, providing 24-hour supervision with a comprehensive care plan.

- Basic Life Support: the level of medical care which is used for patients with life-threatening illnesses or injuries until the patient can be given full medical care at a hospital.
- Behavior Analyst: professionals who use experimental and applied analysis of behavior, and use statistics, to develop techniques and treatments that facilitate the evaluation and modification of maladaptive behavior.
- Behavior Analysts Assistant: works closely under the supervision of an applied behavior analyst and assists in completing assessments, developing ABA therapy, collect and analyze data to make intervention changes as needed.
- Behavioral Health: the scientific study of the emotions, behaviors, and biology relating to a person's mental and physical well-being, their ability to function in everyday life, and their concept of self.
- Benchmark for Excellence in Patient Safety: a program within the Health Care SafetyZone Portal where critical access hospitals can elect to participate in benchmarking and data sharing with all critical access hospitals in the nation that use the event-reporting system.
- Beneficiary: a person or entity who receives money or other benefits
- Biennium (Biennial): a specified period of 2 years.
- Birth Center: a place for childbirth where care is provided in the midwifery and wellness model.
- Blue Cross Blue Shield of North Dakota: an independent licensee of the Blue Cross and Blue Shield Association, serving residents and businesses with insurance needs in North Dakota.
- Board of Occupational Therapy Practice: board that licenses occupational therapists and occupational therapy assistants, monitors professional conduct and regulate the profession to ensure the highest quality of occupational therapy services for the residents of the state.
- Bulwark: a person, institution, or principle that acts as a defense
- Bundled Payment Model: providers and/or healthcare facilities are paid a single payment for all the services performed to treat a patient undergoing a specific episode of care.
- Bundled Payments for Care Improvement Initiative: comprised of four broadly defined models of care, which link payments for the multiple services beneficiaries receive during an episode of care. Organizations enter into payment arrangements that include financial and performance accountability for episodes of care.
- Bureau of Labor Statistics: measures labor market activity, working conditions, price changes, and productivity in the U.S. economy to support public and private decision making.
- Bush Foundation: a philanthropic foundation that invests in individuals and organizations in Minnesota, North Dakota, South Dakota, and the 23 Native Nations that share the same geographic area.

## C

- Cadre: a small group of people specially trained for a particular purpose or profession.
- Canadian Psychological Association: the national association for science, practice, and education of psychology in Canada.
- Cancer: a disease caused by an uncontrolled division of abnormal cells in a part of the body causing malignant tumor(s) to grow.
- Cardiac Arrest: a sudden, sometimes temporary, cessation of function of the heart.
- Cardiac Arrhythmia: abnormal variation from the normal heartbeat. The abnormal rhythm can be too slow, too fast, too irregular, or too early.
- Cardiac Ready Community: a community that has public access to AED's, CPR instruction, blood pressure screenings, and transport plans for first responders, EMS, and the local hospital.
- Cardiology: the branch of medicine that deals with the diseases and abnormalities of the heart.
- Cardiopulmonary Resuscitation (CPR): a medical procedure involving repeated compression of a patient's chest, performed in an attempt to restore the blood circulation and breathing of a person who has suffered cardiac arrest.
- Cardiovascular Disease: a general name for a wide variety of diseases, disorders, and conditions that affect the heart and blood vessel.
- Care coordination: deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient's care to achieve safer and more effective care
- Cartilage: firm, whitish, flexible connective tissue found in various forms in the larynx and respiratory tract, in structures such as the external ear, and in the articulating surfaces of joints.
- Case Aide: performs community contact work on simpler aspects of programs or cases and assists in providing services to clients and family members, under close supervision of caseworker.
- Catholic Health Initiatives: a national, nonprofit, faith-based health system in the U.S.
- Census: an official count or survey of a population, typically recording various details of individuals.
- Centers for Disease Control and Prevention: U.S. health protection agency that is a subdivision of the Department of Health and Human services.
- Centers for Medicare and Medicaid Services: is part of the U.S. Department of Health and Human Services that oversees many federal healthcare programs, including those that involve health information technology.

- Center for Rural Health: a federally designated State Office of Rural Health for North Dakota that connects resources and knowledge to strengthen the health of people in rural and tribal communities.
- Certified Application Counselor: an individual that is trained to help people with their insurance options through the Marketplace at no cost to the consumer.
- Certified Nurse Midwife: a registered nurse who graduated from a nurse midwifery education program accredited by the Accreditation Commission for Midwifery Education and have passed a national certification examination to receive the professional designation.
- Certified Nursing Assistant: helps patients or clients with healthcare needs under the supervision of a registered nurse or licensed practical nurse.
- Certified Registered Nurse Anesthetist: an advanced practice registered nurse who administers anesthesia and other medications. They also monitor patients who are receiving and later recovering from anesthesia.
- Chaplain: a member of the clergy attached to a private chapel, institution, ship, branch of the armed forces, etc.
- Chief Executive Officer: the person who has the most authority in an organization or business.
- Children's Health Insurance Program: a partnership between the federal and state governments that provides low-cost health coverage to children in families that earn too much money to qualify for Medicaid. In some states it can also cover pregnant women.
- Cholesterol: a compound of the sterol type found in most body tissue. It is an important constituent of cell membranes and precursor of other steroid compounds, but a high proportion in the blood of low-density lipoprotein (which transports cholesterol to the tissue) is associated with an increased risk of coronary heart disease.
- Chronic Disease: a persistent or recurring disease usually affecting a person for three months or longer.
- Chronic Obstructive Pulmonary Disease: a lung disease that makes it hard to breathe. It is caused by damage to the lungs over many years usually from smoking.
- Clinical Nurse Specialist: an advanced practice registered nurse who holds a master's or doctoral degree in a specialized area of nursing practice. They focus on diagnosing and treating patients, nurse management, and administration.
- Clinical Preceptor: a supervised clinical experience which allows students to apply knowledge gained in the classroom portion of a program to clinical practice.
- Clinical Quality Measures: tools that help measure and track the quality of health care services that eligible professional, eligible hospitals, and critical access hospitals provide.
- Coalition: an alliance for combined action

- Colloquial: (of language) used in ordinary or familiar conversation; not formal
- Colonoscopy: a procedure in which a flexible fiber-optic instrument is inserted through the anus in order to examine the colon.
- Commensurate: corresponding in size or degree; in proportion.
- Commission on Accreditation for Marriage and Family Therapy Education : establishment, review, and revision of accreditation standards and policies, and the accreditation of graduate and post-graduate educational programs.
- Commonwealth Fund: a private U.S. foundation whose stated purpose is to promote a high performing health care system that achieves better access, improved quality, and greater efficiency, particularly for society's most vulnerable.
- Community-Based Outpatient Clinics: clinics that provide the most common outpatient services, including health and wellness visits, so that individuals seeking care do not have to travel to larger medical centers.
- Community Health Center: private, nonprofit organizations that directly or indirectly (through contracts and cooperation agreements) provide primary health services to residents of a defined geographic area that is medically underserved.
- Community Health Needs Assessment: a state, tribal, local, or territorial health assessment that identifies key health needs and issues through systematic, comprehensive data collection and analysis.
- Community Health Worker: a frontline public health worker who is a trusted member of and/or has an usually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve quality of service delivery.
- Comorbidity: the simultaneous presence of two chronic diseases or conditions in a patient.
- Concussion: a type of traumatic brain injury caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. The sudden movement causes the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging brain cells.
- Conditions of Participation: a set of stringent health measures designed to regulate how hospitals and other medical establishments utilize Medicare aid.
- Congestive Heart Failure: a weakness of the heart that leads to a buildup of fluid in the lungs and surrounding body tissues.
- Constituency: a body of voters in a specified area who elect a representative to a legislative body.
- Contract employees: an individual retained by a company for a predetermined time, for a predetermined price.
- Council for Accreditation of Counseling and Related Educational Programs (CACREP): accredits master's and doctoral degree programs in counseling and its specialties that are offered by colleges and universities.

- Council on Social Work Education: national association representing social work education in the United States.
- Counselor: a person trained to give guidance on personal, social, or psychological problems.
- COVID-19 Pandemic: an ongoing illness of coronavirus disease also called severe acute respiratory syndrome coronavirus 2 and was declared a pandemic in March 2020.
- Credence: belief in or acceptance of something as true
- Critical Access Hospital: a designation given to rural hospitals that is designed to reduce the financial vulnerability of rural hospitals and improve access to health care by keeping essential service in rural communities.
- Critical Incident Stress Management: an adaptive, short-term psychological helping-process that focuses solely on an immediate and identifiable problem. It can include pre-incident preparedness to acute crisis management to post-crisis follow-up.
- Curriculum: the subjects comprising a course of study in a school or college.

## D

- Decennial: recurring every ten years.
- Deductible: a specified amount of money that the insured must pay before an insurance company will pay a claim.
- Deliverable: a report, a document, a software product, a server upgrade or any other building block of an overall project
- Dental Assistant: an individual qualified to work with a professional dentist and assist in various duties such as organizing appointments, sterilizing and arranging instruments, escorting patients, and taking x-rays.
- Dental Hygienist: an ancillary dental worker specializing in scaling and polishing teeth and in giving advice on cleaning the teeth.
- Dental Therapist: a member of a dental team who provides preventative and restorative dental care, usually for children and adolescents.
- Dentist: a person qualified to treat the diseases and conditions that affect the teeth and gums, especially the repair and extraction of teeth and the insertion of artificial ones.
- Dependency ratio: number of individuals who are economically inactive (less than 16 years of age or older than 65), divided by the number of individuals who are of working age (16 to 65 years old)
- Depopulation: a significant reduction in the population.
- Depression: formally known as Major Depressive Disorder; a mood disorder characterized by persistent feelings of sadness or hopelessness, lack of sleep, change in appetite, loss of interest in activities, and lack of energy every day for at least two weeks.

- Dermatology: the branch of medicine concerned with the diagnosis and treatment of skin disorders.
- Detriment: the state of being harmed or damaged.
- Diabetes: a disease in which the body's ability to produce or respond to the hormone insulin is impaired, resulting in abnormal metabolism of carbohydrates and elevated levels of glucose in the blood and urine.
- Diagnose: to identify the nature of, an illness or other problem, by examination of the symptoms.
- Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> Edition (DSM-5): a handbook used by health care professionals that contains descriptions, symptoms, and other criteria for diagnosing mental disorders.
- Didactic: intended to teach, particularly in having moral instruction as an ulterior motive.
- Dietitian: an expert on diet and nutrition.
- Direct Care Associate: responsible for providing in-home personal care and daily living tasks to individuals who are suffering from illness, physical disabilities, or the elderly requiring long-term care.
- Direct Secure Messaging: a national encryption standard for securely exchanging clinical healthcare data via the internet.
- Disparity: difference
- Disseminate: spread or disperse (something, usually information) widely
- Division of Emergency Medical Service: serves as North Dakota's lead emergency medical services agency. It is responsible for licensing ambulance services and quick response units, training, testing, certification, and licensure of EMS personnel, coordinating the State Trauma System, administering the EMS for Children Program, coordinating the State CISM Team, coordinating, the State Stroke System, of Care, and coordinating the State Cardiac System of Care.
- Doctor of Medicine: a degree that is attained by attending and graduating from a conventional medical school and requires passing a licensing examination and completing residency training prior to treating people or prescribing medications.
- Doctor of Nursing Practice: a degree designed for nurses seeking a terminal degree in nursing practice and offers a general leadership or administration focus.
- Doctor of Osteopathy: a fully licensed physician who practices in every medical specialty. They provide a full range of services, from prescribing drugs to performing surgery.

## E

- Early Intervention: system of services that helps babies and toddlers with developmental delays or disabilities in domains such as physical, cognitive, communication, social/emotional, and self-help.

- **Electrocardiograph:** a galvanometric device that detects and records the minute difference in electric potential caused by heart action and occurring between different parts of the body and it is used to diagnose heart disease. The output it gives is called an electrocardiogram.
- **Electronic health record:** a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting.
- **Emergency Department Transfer Communication:** a National Quality Forum endorsed measure to evaluate communication for transitions of care during emergency department transfers.
- **Emergency Medical Responder:** a person who is specially trained to provide out-of-hospital care in medical emergencies.
- **Emergency Medical Services:** refers to the treatment and transport of people in crisis health situations that may be life threatening.
- **Emergency Medical Technician:** a person who is specially trained and certified to administer basic emergency services to victims of trauma or acute illness before and during transportation to a hospital or other healthcare facility.
- **EMS Voluntary Event Notification Tool:** a web-based EMS reporting of events such as near-misses, assaults on EMS, patient safety events, and other situations.
- **Endodontics:** the branch of dentistry concerned with diseases and injuries of the soft tissues inside a tooth (i.e., dental pulp).
- **Enterprise:** a project or undertaking, typically one that is difficult or requires effort; a business or company.
- **Equity:** the quality of being fair and impartial.
- **Equivocal:** open to more than one interpretation; ambiguous.
- **Evidence based practice:** any practice that relies on scientific and mathematical evidence to form strong inductive or deductive arguments for guidance and decision-making.
- **Exit Interview:** an interview held with an employee (or student) who is about to leave an organization, typically in order to discuss the employee's reasons for leaving and their experience of working for the organization.
- **Expenditure:** the action of spending funds.

## F

- **Family Medicine:** the branch of medicine designed to provide basic health care to all the members of a family.
- **Family Nurse Practitioner:** a registered nurse with specialized educational and clinical training in family practice.
- **Federal Office of Rural Health Policy:** created to advise the Secretary of the U.S. Department of Health and Human Services on health care issues impacting rural communities including access to quality health care and health professionals,

viability of rural hospitals, and effect of the department proposed rules and regulations, including Medicare and Medicaid, on access to and financing of health care in rural areas.

- Federal Poverty Level: a measure of income used by the U.S. government to determine who is eligible for subsidies, programs, and benefits.
- Federally Qualified Health Center: outpatient clinics that qualify for specific reimbursement systems under Medicare and Medicaid.
- Feeding Assistant: any individual employed by a facility, or under contract, to feed or assist with the feeding of nursing facility residents must either have successfully completed a department-approved paid feeding assist and training course or be a certified nurse aid.
- Fieldwork: practical work experience conducted by a student in a professional working environment, rather than in a classroom.
- First Aid: the first and immediate assistance given to any person suffering from either a minor or serious injury or illness until full medical treatment is available.
- Flex-time: a work policy that allows employees the flexibility to choose their work hours.
- Forensic Odontology: a dentist who uses their training and knowledge of the teeth and uses that within the criminal justice field and legal system. Also called forensic dentistry.
- Frontier: a county with a population density of six or fewer people per square mile.
- Frontier Community Health Integration Project Demonstration: a federal 3-year initiative that seeks to develop and test new models of integrated, coordinated healthcare in the most sparsely populated rural counties. Its goal is to improve rural health outcomes and to reduce Medicare expenditures.
- Full time equivalent (FTE): the hours worked by one employee on a full-time basis. The concept is used to convert the hours worked by several part-time employees into the hours worked by full-time employees.

## G

- Gamut: the complete range or scope of something
- Gastroenterology: the branch of medicine which deals with disorder of the stomach and intestines.
- Generalist: an internist, family physician, or pediatrician who performs general medicine; one who treats most diseases that do not require surgery, sometime including those related to obstetrics.
- General Surgery: a surgical specialty that focuses on abdominal contents, alimentary tract, breast, skin, soft tissues, and the endocrine system.
- Geriatrics: a branch of medicine that deals with the problems and disease of old age and the medical care and treatment of aging people.

- Governor's Nursing Shortage Taskforce: Governor Burgum of North Dakota convened a taskforce comprised of a diverse group of stakeholders to examine the issue, identify causes, possible solutions, and to make recommendations to address the critical shortage of nurses and other healthcare workers in North Dakota.
- Graduate degree: an advanced academic degree (usually a master or doctorate degree) awarded by colleges and universities to individuals who have completed a bachelor degree and additional course work for the advanced degree.
- Grant: a sum of money given by an organization, especially a government, for a particular purpose.
- Great Depression: a severe worldwide economic depression in the 1930's.
- Great Plains Telehealth Resource and Assistance Center: an organization with the mission to build telehealth awareness, promote education, provide individualized consultation, and provide data specific to telehealth services in the Great Plains Region.
- Gross Domestic Product (GDP): a standard of measurement of the total value of all goods and services produced in either the nation or at a state level.

## H

- Health Information Manager: responsible for obtaining, analyzing, and securing the digital and traditional health records of patients.
- Health Information Technology: information technology applied to health and health care that supports health information management across computerized systems and the secure exchange of health information between consumers, providers, payers, and quality monitors.
- Health Information Technology for Economic and Clinical Health Act: part of the American Recovery and Reinvestment Act deals with privacy and security issues in relation to electronic storage of medical Files. The standards in this act are meant to improve the protection of medical information.
- Health Insurance: insurance that compensates the insured for expenses or loss incurred for medical reasons, as through illness or hospitalization.
- Health Insurance Portability and Accountability Act (HIPPA): U.S. legislation that provides data privacy and security provisions for safeguarding medical information, and protects America's workers with improvement to portability and continuity of health insurance coverage.
- Health Professional Shortage Area: an area designated by the Health Resources and Services Administration that indicates health care provider shortages in primary care, dental health, or mental health. These shortages can be geographic, population, or facility-based.
- Health Research and Education Trust: founded in 1944 it is a not-for-profit research and education affiliate of the American Hospital Association (AHA) with a mission to transform health care through research and education.

- Health Resources and Services Administration: part of the U.S. Department of Health and Human Services which is tasked with improving access to health care services for people who are geographically isolated, economically and medically vulnerable.
- Health System: the people, institutions, organizations, healthcare professionals, and resources needed to deliver health care to a target population within a geographical area.
- Healthcare SafetyZone Portal: a comprehensive web-based system that transforms any reporting, education, or safety procedure into easy and meaningful electronic processes.
- Health Workforce Initiative: a plan created to identify specific steps to reduce disease burden and increase the provider workforce through programs designed to increase provider retention for practice within the state of North Dakota as well as expand the provider network through class size increases
- Healthy North Dakota: a statewide partnership of more than 400 committee members and organizations working to determine solution for more healthful living.
- Healthy People: an agenda that provides science-based, national goals and objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States.
- High Blood Pressure: a common disease in which blood flows through blood vessels, or arteries, at higher than normal pressure. Complications from high blood pressure include chronic kidney disease, heart attack, heart failure, stroke, and possibly vascular dementia.
- High cholesterol: High Cholesterol: a condition that causes the levels of certain bad fats, or lipids, to be too high in the blood. High cholesterol can lead to a buildup of plaque in the blood vessels which can increase the risk of heart attack, stroke, and peripheral artery disease.
- Holistic Medicine: characterized by the treatment of the whole person, taking into account mental and social factors, rather than just the physical symptoms of a disease.
- Home health: medical care provided in a patient's home and is provided by skilled medical professionals.
- Homestead Act: a series of U.S. federal laws that gave an applicant ownership of land, typically called a "homestead," at little or no cost.
- Hospice Care: care that focuses on the quality of life rather than its length. It provides humane and compassionate care for people in the last phase of incurable disease so that they may live as fully and comfortably as possible.
- Hospital-Acquired Condition Reduction Program: a program that provides incentive for hospitals to reduce hospital-acquired conditions. This is done through reducing payments to applicable hospitals that rank in the worst

performing 25 percent of all subsection hospitals with respect to risk-adjusted hospital-acquired condition quality measures.

- Hospital Consumer Assessment of Healthcare Providers and Systems: a government survey for measuring patient satisfaction at hospitals across the country.
- Hospital Medicine: the discipline concerned with the medical care of acutely ill hospitalized patients.
- Hospital Readmission Reduction Program: a payment penalty program designed to reduce Medicare fee-for-service hospital readmission rates for conditions that account for expensive, high-volume admissions and frequent readmissions.
- Human Resource Counselor: a professional who provides counseling in different aspects of managing human resources such as career planning or development, performance management, stress management, and other areas which may affect employees emotionally.
- Human Services: a field that centers on meeting human needs through an interdisciplinary knowledge base, focusing on prevention as well as remediation of problems, and maintain a commitment to improving the overall quality of life of service populations.
- Huntington's Disease: An inherited condition in which nerve cells in the brain break down over time.
- Hypertension: abnormally high blood pressure.

I

- Immunization: the action of making a person or animal immune to infection, typically through an injection or series of injections.
- Impetus: the force that makes something happen or happen more quickly
- Incentive: a thing that motivates or encourages one to do something.
- Incidence: a measure of the probability of occurrence of a given medical condition in a population within a specified period of time
- Incrementalism: a method of working by adding to a project using many small incremental changes instead of a few large jumps.
- Indian Health Services: an agency within the U.S. Department of Health and Human Services that is responsible for providing federal health services to American Indians and Alaska Natives.
- Indians into Medicine: a comprehensive program designed to assist American Indian students who aspire to be health professionals to meet the needs of tribal communities.
- Infectious disease: a disease resulting from the presence and activity of a pathogenic microbial agent such as bacteria, viruses, fungi, or parasites.

- Influenza: a highly contagious viral infection of the respiratory passages causing fever, severe aching, and catarrh, and often occurring in epidemics. It is also called flu.
- Infrastructure: the basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.
- Inpatient Care: health care delivered in a hospital or other facility where the patient usually stays overnight and receives lodging and food as well as treatment.
- Institute for Healthcare Improvement: an independent not-for-profit organization leading the improvement of health care throughout the world.
- Institute of Medicine: a nonprofit organization with the mission to advance and disseminate scientific knowledge to improve human health.
- Internal Medicine: the medical specialty dealing with prevention, diagnosis, and treatment of adult disease not requiring surgery.
- International Medical Graduates (IMG): medical school graduates from any country outside of the United States and Canada.
- Internship: the position of a student or trainee who works in an organization, sometimes without pay, in order to gain work experience or satisfy requirement for a qualification.
- Interoperability: ability of different information systems, devices and applications ('systems') to access, exchange, integrate and cooperatively use data in a coordinated manner
- Interprofessional: a group of individuals from different disciplines working and communicating with each other.

## J

- Joint Committee on Rural Emergency Care: a committee dedicated to advancing policy and practice to ensure access to timely, affordable, and high quality emergency services in rural America.

## K

- Kaiser Family Foundation: a non-profit organization focusing on national health issues. It develops and runs its own policy analysis, journalism, and communications programs, sometimes in partnership with major news organizations.
- Kidney Disease: also called chronic kidney disease, means your kidneys are damaged and cannot filter blood the way they should resulting in a buildup of waste in the body.

## L

- Labor Market: the availability of employment and lab, in terms of supply and demand
- Liability: the state of being responsible for something, especially by law
- Liaison Committee on Medical Education (LCME): the nationally recognized accrediting authority for medical education programs leading to the M.D. degree in the U.S. and Canadian medical schools.
- Licensed Associate Professional Counselor: a two-year license that allows an individual to have the rights and privileges of a Licensed Professional Counselor but they work under continual supervision. They must attain the necessary supervised experience and meet the criteria to become a LPC within two years.
- Licensed Baccalaureate Social Worker: a license to provide individuals with support and guidance when seeking out services or supports within their community. LBSW is the first level of licensure recognized for social workers and requires a Bachelor of Social Work degree from a accredited institution.
- Licensed Behavior Analyst: a license that requires applied behavior analysis training and provides services to individuals with behavioral problems.
- Licensed Clinical Social Worker: a license that allows an individual to provide clinical treatment for mental illnesses to clients independent of supervision. They must attain a Master's degree in social work and two years of supervised field experience to become a LCSW.
- Licensed Master Social Worker: a license that requires an individual to operate under the supervision of a licensed psychologist, psychiatrist, or LCSW to provide mental health services. They must attain a Master's degree in Social work and meet the criteria to become a LMSW.
- Licensed Nutritionist: an individual that has earned credentials from a nationally recognized nutrition licensing body and may legally provide nutrition counselling, nutrition services, and advice.
- Licensed Practical Nurse: a nurse who works under the direction of a physician or a registered nurse and cares for people who are sick, injured, convalescent, or disabled.
- Licensed Professional Clinical Counselor: a license that allows an individual to provide mental health and substance abuse treatment to individuals, families, or groups. They must attain a Master's degree in clinical mental health counseling and 3,000 hours of supervised fieldwork to become a LPCC.
- Licensed Registered Dietitian: a professional license to assess, diagnose, and treat nutrition and regulation of diet. It requires a baccalaureate degree and experience requirements as approved by the Commission on Dietetic Registration.
- Licensed Vocational Nurse: the term used for Licensed Practical Nurse in Texas and California.

- Life expectancy: measure of the average time an organism is expected to live, based on the year of its birth, its current age and other demographic factors
- Liquidity measure: measure a firm's ability to pay operating expenses and other short-term, or current, liabilities.
- Locum Tenens: one filling an office for a time or temporarily taking the place of another-used especially of a doctor or clergyman.
- Long-Term Care Facility: a facility that provides rehabilitative, restorative, and/or ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living.

## M

- Maldistribution: uneven distribution of something, especially when disadvantageous or unfair.
- Malpractice: improper, illegal, or negligent professional activity or treatment
- Mammogram: an x-ray picture of a breast.
- Marriage and Family Therapist: a mental health professional; trained in psychotherapy and family systems, and licensed to diagnose and treat mental and emotional disorder within the context of marriage, couples, and family systems.
- Matriculated: enrolled at a college or university.
- Maxillofacial Surgery: a type of surgery that deals with any disease, disorders, injuries, or defects that affect either the jaw or facial regions of a person.
- Median: denoting or relating to a value or quantity lying at the midpoint of a frequency distribution of observed values or quantities, such that there is an equal probability of falling above or below it.
- Medicaid: a health care program that assists low-income families or individuals in paying for doctors' visits, hospital stays. Long-term medical, custodial care costs and more.
- Medicaid Health Management Program: a disease management program that focuses on asthma, diabetes, chronic obstructive pulmonary disease, and congestive heart failure. The program allowed providers to provide additional care coordination services in the form of a health management program for the previously listed health conditions.
- Medicaid Primary Care Case Management Program: a model of health care delivery that generally requires a Medicaid enrollee to choose and primary care provider who is responsible for coordinating the enrollee's care and is paid a monthly fee for doing so, on top of payment for providing medical services.
- Medical Director: an individual responsible for overall coordination of care and for implementation of policies related to care of residents in a nursing home.
- Medical Records Staff: responsible for a variety of tasks including collecting patient information, issuing medical files, filing medical records, and processing patient admissions/discharge papers.

- Medical Technologist: also called a medical laboratory scientist, clinical laboratory scientist, or medical laboratory technologist is an allied health professional that analyzes and tests body fluids and tissues.
- Medically underserved areas: areas having too few primary care providers, high infant mortality, high poverty or a high elderly population.
- Medicare: the federal health insurance program for people who are 65 or older, certain younger people with disabilities, and those with end-stage renal disease (permanent kidney failure requiring dialysis or a transplant).
- Medicare Access and CHIP Reauthorization Act: a law signed by President Obama in 2015 that repeals the substantial growth rate methodology for determining updates to the Medicare physician fee schedule, established annual positive or flat fee updates for 10 years, and institutes a two-track fee update beginning in 2019.
- Medicare Beneficiary Quality Improvement Program: a quality improvement activity under the Medicare Rural Hospital Flexibility (FLEX) grant program with a goal of improving the quality of care provided in small, rural Critical Access Hospitals.
- Medicare Part A: hospital insurance provided by Medicare through the Centers for Medicare and Medicaid services. It covers inpatient care in hospitals, nursing homes, skilled nursing facilities, and critical access hospitals.
- Medicare Part B: medical insurance that covers services and supplies that are medically necessary to treat health conditions of Medicare beneficiaries.
- Medicare Part D: U.S. federal-government program to subsidize the cost of prescription drugs and prescription drug insurance premiums for Medicare beneficiaries.
- Medicare Quality Innovation Network-Quality Improvement Organization: under the direction of the Centers for Medicare and Medicaid Services, it is one of the largest federal programs dedicated to helping improve the nations quality of care.
- Medicare Rural Hospital Flexibility Program: allows small hospitals to be certified as Critical Access Hospitals and offers grants to states to help implement initiatives to strengthen the rural hospital health care infrastructure.
- Mental Health: a person's condition with regard to their psychological and emotional well-being.
- Mental Health Technician: observes and assists assigned mental health patients with daily living activities, therapeutic activities, and socialization.
- Mental Illness: any of a broad range of medical conditions (such as major depression or schizophrenia) that are marked primarily by sufficient disorganization of personality, mind, or emotions to impair normal psychological functioning and cause marked distress or disability and that are typically associated with a disruption in normal thinking, feeling, mood, behavior, interpersonal interactions, or daily functioning.
- Metropolitan: denote areas with a core population of 50,000 or more

- Micropolitan: denote areas with core populations of 10,000 to 49,999
- Morbidity: the condition of being diseased.
- Mortality: the condition of being dead.
- Multi-Payer Advanced Primary Care Initiative: in this demonstration, CMA participated in multi-payer reform initiatives that were conducted by states to make advanced primary care practices more broadly available. It evaluated whether advanced primary care practice reduced unjustified utilization and expenditures, and improved the safety, effectiveness, timeliness, and efficiency of health care.

## N

- National Academy of Medicine: formerly known as the Institute of Medicine, it is an independent organization of eminent professional from diverse fields including health and medicine, and the natural and social sciences, that works to address critical issues in health, medicine, and related policy in the U.S. and globally.
- National Addiction Studies Accreditation Commission (NASAC): an academic accreditation organization for higher education in addiction studies programs.
- National Health Service Corps: an organization that connects primary health care providers to area of the U.S. with limited access to care.
- National Priorities Partnership: a partnership of 52 major national organizations with a shared vision to achieve better health, and a safe, equitable, and value-driven healthcare system.
- National Quality Strategy: a nationwide effort in the U.S. to provide direction for improving the quality of health and healthcare in the United States with three guided aims: better care, healthy people and communities, and affordable care.
- National Rural Health Association: a national nonprofit membership organization with more than 21,000 members. Their mission is to provide leadership on rural health issues through advocacy, communications, education, and research.
- National School Lunch Program: a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches to children each school day.
- Nephrology: specialty of medicine focused on the kidneys, specifically normal kidney function and kidney disease, the preservation of kidney health, and the treatment of kidney disease.
- Neurosurgery: surgery performed on the nervous system, especially the brain and spinal cord.
- Next Generation ACO: this model builds upon a provider's experience in the Pioneer ACO Model and the Shared Savings Program by offering a new opportunity in accountable care that sets predictable financial targets, enables

providers and beneficiaries' greater opportunities to coordinate care, and aims to attain the highest quality standards of care.

- North Dakota Board of Medicine: a board that protects the citizens of the state by regulating the practice of medicine by physicians, physician assistants, and fluoroscopy technicians and disciplines them if they violate the state's medical practice act.
- North Dakota Board of Nursing: a board that strives to proactively regulate the practice of nursing by providing timely information that gives registered nurses, licensed practical nurses, advanced practice nurses, QAP/Technicians, and medication assistant the knowledge they need to remain compliant with the laws and rules.
- North Dakota Board of Social Work Examiners: a board responsible for licensing qualified applicants to practice social work and to ensure that licensees comply with the state laws and regulations governing that practice.
- North Dakota Century Code: the collection of all the statutes passed by the North Dakota Legislative Assembly since the state's admission to the Union. It also includes the North Dakota Constitution.
- North Dakota Dental Association: a constituent organization chartered by the American Dental Association that is organized into 5 component districts representing 87% of North Dakota dentists.
- North Dakota Health Information Network: a network focused on improving healthcare by creating a secure medical record sharing network for providers and consumers. They aim to empower patients by ensuring their medical data remains safe and private.
- North Dakota Hospital Association: a voluntary trade organization of North Dakota's licensed hospitals committed to advancing public policy and fostering excellence in medical and health service.
- North Dakota Long Term Care Association: a professional association of community and long-term care providers, whose goal is to enhance the lives of the people they serve through collaboration, education, and advocacy.
- North Dakota Nurse Practices Act: the state law that governs the practice of nursing and scope of practice, specifically protects those who need nursing care
- Nuclear medicine: a medical specialty involving the application of radioactive substances in the diagnosis and treatment of disease.
- Nurse Manager: a nurse who manages the nursing staff at a particular facility. They are responsible for recruitment and retention of nursing staff, and overseeing them. They also occasionally collaborate with doctors on patient care, and help assist patients and their families when needed.
- Nurse Practitioner: a nurse who is qualified to treat certain medical conditions without the direct supervision of a doctor.
- Nursing Home: a private institution providing residential accommodations with health care, especially for elderly people. They provide 24-hour nursing care and supervision.

## O

- Obesity: the condition of being overweight with a BMI (body mass index) greater than 25.
- Obstetrics-Gynecology: the branch of medical science concerned with childbirth, caring for women in connection with childbirth, and women's reproductive health.
- Occupational Therapist: a licensed health professional who is trained to assist people to overcome the limitations caused by injury or illness, emotional or psychological difficulties, developmental delay or the effects of aging. It requires a Master's degree.
- Occupational Therapist Assistant: helps patients develop, recover, and improve, as well as maintain the skills needed for daily living and working. It requires an Associate's degree.
- Occupational Therapy: a form of therapy for those recuperating from physical or mental illness that encourages rehabilitation through the performance of activities required in daily life.
- Occupational Therapy Assistant: individuals that are directly involved in providing therapy to patients under the direction of an occupational therapist. They are involved in helping patients develop, recover, improve, as well as maintain the skills needed for daily living and working.
- Oil Patch: refers to western counties (Divide, Burke, Renville, Bottineau, McHenry, Ward, Mountrail, Williams, McKenzie, Dunn, McLean, Golden Valley, Billings, Stark, Slope, and Bowman) in North Dakota that occupy a portion of the Bakken Formation where oil is extracted.
- Ombudsman: an official appointed to investigate individual's complaints against maladministration, especially that of public authorities.
- Oncology: the study and treatment of tumors and cancer.
- Oral and Maxillofacial Surgery: the specialty of dentistry which includes the diagnosis, surgical and adjunctive treatment of diseases, injuries, and defects involving both the functional and aesthetic aspects of the hard and soft tissues.
- Oral Health: the health of the mouth (oral cavity) and includes hard tissue (teeth and bone) as well as the soft tissue (gums, cheeks, tongue, floor of the mouth, lips, palate, and throat).
- Organization for Economic Cooperation and Development: an intergovernmental economic organization with 35 member countries, founded in 1961 to stimulate economic progress and world trade.
- Orthodontist: a licensed dentistry professional qualified to treat irregularities of the teeth, especially alignment and occlusion, and jaws, including the use of braces.
- Orthopedic Medicine: the branch of medicine concerned with the diagnosis and treatment of problems related to the bones, joints, and ligaments.

- Outpatient Care: medical care or treatment that does not require an overnight stay in a hospital or medical facility. It may be administered in a medical office or a hospital, but most commonly, it is provided in a medical office or outpatient surgery center (also called ambulatory care).

## P

- Palliative care: specialized medical care for people living with a serious illness focused on providing relief from the symptoms and stress of the illness. The goal is to improve quality of life for both the patient and the family.
- Pap Smear Test: a test carried out on a sample of cells from the cervix to check for abnormalities that may be indicative of cervical cancer.
- Paramedic: a person trained to give emergency medical care to people who are seriously ill with the aim of stabilizing them before they are taken to the hospital.
- Parkinson's disease: A disorder of the central nervous system that affects movement, often including tremors.
- Part-Time Employment: working less than full-time, typically less than 30 hours per week.
- Patient-Centered Medical Home: a care delivery model whereby patient treatment is coordinated through their primary care physician to ensure they receive the necessary care when and where they need it, in a manner they can understand.
- Patient-Centered Primary Care Collaborative: a not-for-profit multi-stakeholder membership organization dedicated to advancing an effective and efficient health system built on a strong foundation of primary care and the patient-centered medical home.
- Payer-mix: the percentage of revenue coming from private insurance versus government insurance versus self-paying individuals
- Pediatric Medicine: a branch of medicine dealing with the development, care, and diseases of children.
- Pediatric Dentistry: branch of dentistry provides both primary and comprehensive preventive and therapeutic oral health care for children from birth through adolescence, including those with special health care needs.
- Peer Support Specialist: a person with "lived experience" who has been trained to support those who struggle with mental health, psychological trauma, or substance use.
- Per-Capita: for each person, or in relation to people taken individually.
- Percutaneous Coronary Intervention: a nonsurgical procedure that improves blood flow to the heart by opening narrowed arteries that supply blood to the heart.

- Per Diem: for each day. Often used in financial contexts. Also called flex time, referring to a flexible schedule where an individual picks and chooses which days they work based on open shifts.
- Perinatal: relating to the time, usually a number of weeks, immediately before and after birth.
- Periodontics: the branch of dentistry concerned with the structures surrounding and supporting the teeth as well as the disease and disorder that affect them.
- Pew Charitable Trusts: an independent nonprofit organization that invests in evidence-based, non-partisan analysis to solve current societal challenges.
- Pharmacist: an individual licensed to prepare, compound, and dispense drugs upon written order (prescription) from a licensed practitioner such as a physician, dentist, or advanced practice nurse.
- Pharmacy: a store where medicinal drugs are dispensed and sold.
- Pharmacy Technician: a health care provider who performs pharmacy-related functions, generally working under the direct supervision of a licensed pharmacist.
- Physical Therapy: the treatment of disease, injury, or deformity by physical methods such as massage, heat treatment, and exercises rather than by drugs or surgery.
- Physician: a person qualified to practice medicine.
- Physician Assistant: a medical professional who can diagnose illness, develop and manage treatment plans, prescribe medications, and often serve as a patient's primary healthcare provider usually under the supervision of a licensed physician.
- Pioneer ACO: designed for health care organizations and providers that were already experienced in coordinating care for patients across care setting. It allows these provider groups to move more rapidly from a shared savings payment model to a population-based payment model on a track consistent with, but separate from, the Medicare Shared Savings Program.
- Pneumonia: lung inflammation caused by bacterial or viral infection, in which the air sacs fill with pus and may become solid.
- Postulate: suggest or assume the existence, fact, or truth of (something) as a basis for reasoning, discussion, or belief.
- Practica: a supervised placement in a variety of settings (i.e., community mental health, hospitals, inpatient) that provides students the opportunity to apply knowledge and clinical skills gained in coursework to develop and practice the professional competencies that are an essential part of the training program.
- Practice Transformation Networks: a program designed to help participants develop the tools, skills, and knowledge necessary to successfully participate in shared savings programs and other alternative payment models.
- Preceptor: a skilled practitioner or faculty member who supervises students in a clinical setting to allow practical experience with patients.

- Premium: an amount to be paid for an insurance policy.
- Prescribe: to advise and authorize the use of a medicine or treatment for someone, usually put into writing (prescription) for documentation purposes.
- Prevalence: the proportion of a particular population found to be affected by a medical condition.
- Primary Care: health care provided by a medical professional (such as a general practitioner, pediatrician, or nurse) with whom a patient has initial contact and by whom the patient may be referred to a specialist.
- PrimeCare Select ACO: an ACO made up of a team of health care providers working together to coordinate care. It combines the entire range of patient care in an effort to realize greater efficiencies and lower the out-of-pocket costs for patients.
- Privacy Officer/Security Officer: both have a role in developing the facilities policies and procedures, training the staff in HIPPA's requirements, and working to establish and maintain compliance of PHI within the practice.
- Projection: an estimate or forecast of a future situation or trend based on a study of present ones.
- Prospective Payment System: several payment methodologies for which means of determining insurance reimbursement is based on a predetermined payment regardless of the intensity of the actual service provided.
- Prosthodontics: the branch of dentistry concerned with the design, manufacture and fitting of artificial replacements for teeth and other parts of the mouth.
- Prudent: acting with or showing care and thought for the future.
- Psychiatric Mental Health Nurse Practitioner: an advanced practice nurse who has the education and training to provide a wide range of mental health services to patients and families in a variety to settings. They can diagnose, conduct therapy, and prescribe medication for patients with psychiatric disorders, organic brain disorders, or substance abuse problems.
- Psychiatrist: a medical practitioner specializing in the diagnosis and treatment of mental illness.
- Psychiatry: the study and treatment of mental illness, emotional disturbance, and abnormal behavior.
- Psychologist: an expert or specialist in psychology.
- Psychology: the scientific study of the human mind and its functions, especially those affecting behavior in a given context.
- Psychometric test: a standard and scientific method used to measure individuals' mental capabilities and behavioral style
- Public Health: promotes and protects the health of people and the communities where they live, learn, work, and play through scientific research, education, and policy.
- Public Health Accreditation Board: a nonprofit organization dedicated to improving and protecting the health of the public by advancing and ultimately

transforming the quality and performance of state, local, tribal, and territorial public health departments.

- Public Policy: government policies that affect the whole population.
- Pulmonology: the branch of medicine concerned with the diagnosis and treatment of disease involving the respiratory tract.

## Q

- Quality Health Associates of North Dakota: collaborates with healthcare professionals, organizations, and communities across the state to improve the quality of care provided to the people of North Dakota by successfully balancing the needs of providers, consumers, stakeholders, and payers.
- Quality Improvement Organization: a group of health quality experts, clinicians, and consumers organized to improve the quality of care delivered to people with Medicare.
- Quartile: each of four equal groups into which a population can be divided according to the distribution of values of a particular variable.
- Quick response units: also known as first responders.

## R

- Radiation Therapy: a type of cancer treatment that uses external beams of intense energy to kill cancer cells
- Radiation Therapy Technologist: allied health professionals who work in medical and clinical settings administering radiation treatments to patients in highly targeted ways.
- Radiographer: also referred to as radiology technologists are allied health professionals who take x-rays and other medical images to assist clinical radiologists and other doctors to diagnose, monitor, or treat a patient's injury or illness.
- Radiology: the science dealing with x-rays and other high-energy radiation, especially the use of such radiation for the diagnosis and treatment of diseases.
- Regional Extension Center: an organization that has received funding under the Health Information Technology for Economic and Clinical Health Act to assist health care providers with the selection and implementation of electronic health record technology
- Regional Extension Assistance Center for HIT: formed as a program of an alliance of nonprofit organizations dedicated to helping clinics, small hospitals, and other settings in Minnesota and North Dakota improve care by implementing and effectively using electronic health record systems.

- Registered Behavior Technician: paraprofessional certification in behavior analysis and a person who assists in delivering behavior analysis services and practice under supervision.
- Registered Nurse: a graduate trained nurse who has been licensed by a state authority after qualifying for registration.
- Rehabilitation: treatment or treatments designed to facilitate the process of recovery from injury, illness or disease to as normal a condition as possible.
- Reimburse: to repay a person who has spent or lost money.
- Renal Disease: kidney failure, also called end-stage kidney disease which means the kidneys no longer work well enough to filter waste out of the blood.
- Residency: a period of specialized medical training in a hospital under the direct or indirect supervision of an attending physician.
- Respiratory Disease: a group of disease that damage the airways and lungs, and affect one's ability to breath properly.
- Respiratory Therapist: a licensed individual in the medical field that cares for patients who have trouble breathing due to various causes such as asthma, emphysema, or premature infants with underdeveloped lungs.
- Retention: the ability of an organization to retain its employees.
- Robert Graham Center: aims to improve individual and population healthcare delivery through the generation or synthesis of evidence that brings a family medicine and primary care perspective to health policy deliberations from the local to international levels.
- Rural: areas with a core population of less than 10,000.
- Rural Health Clinic: a clinic located in a rural, medically under-served that has a separate reimbursement structure from the standard medical office under the Medicare and Medicaid programs. They can be public, non-profit, or for-profit healthcare facilities.
- Rural Health Network Development Grant Program: the purpose of the program is to support rural integrated health care networks that have combined the functions of the entities participating in the network.
- Rural Opportunities in Medical Education (ROME) Program: a 24-48-week interdisciplinary experience in a rural primary care setting, open to third-year students at the University of North Dakota School of Medicine and Health Sciences. Students live and train in non-metropolitan communities under the supervision of physician preceptors.
- Rural-Urban Commuting Area (RUCA) codes: classify U.S. census tracts using measures of urbanization, population density, and daily commuting from the decennial census.

## S

- Salient: most noticeable or important

- Satellite Clinic: a facility owned by a hospital but operated at a distant site.
- School Psychologist: an expert who intervenes at the individual and school system level to provide support for various developmental and mental health issues.
- Scoliosis: abnormal lateral curvature of the spine.
- Scope of Practice: describes the procedures, actions, and processes that a healthcare practitioner is permitted to undertake in keeping with the terms of their professional license.
- Sequestration: the action of taking legal possession of assets until a debt has been paid or other claims have been met.
- Shared Savings ACO: facilitates coordination and cooperation among providers to improve the quality of care for Medicare fee-for-service beneficiaries and reduce unnecessary costs.
- Sigmoidoscopy: an examination of the sigmoid colon by means of a flexible tube inserted through the anus
- Simulation in Motion-North Dakota: a statewide, mobile education system using high fidelity human patient simulators to train pre-hospital and hospital personnel.
- Skilled Nursing Facility: a facility, very similar to a nursing home, that provides skilled nursing care and/or rehabilitative services to help injured, sick, or disabled individuals. These facilities typically offer more skilled medical expertise and services than a nursing home.
- Sliding fee: variable prices for products, services, or taxes based on a customer's ability to pay.
- Social Determinants of Health: the economic and social conditions that influence individual and group differences in health status.
- Social Services: services provided (usually through a government) for the benefit of the community, such as education, medical care, and housing.
- Social Worker: a trained person who works to alleviate the conditions of those in need of help or welfare.
- Socioeconomic Status: the social standing or class of an individual or group. It is often measured by a combination of education, income, and occupation.
- Specialty Care: specialized medical service provided by a physician specialist such as dermatology, mental health, oncology, or cardiology.
- Speech Therapy: training to help people with speech and language problems to speak more clearly.
- State Stroke System of Care Program: guidelines that were developed to assist healthcare providers in the care of stroke patients with a goal to reduce death and disability due to heart disease.
- Statewide Online Ambulance Reporting System: an online system that allows hospitals to log on and download patient-care reports in instances where that facility is listed as the destination.

- Stroke: when blood flow to a part of the brain stops usually caused by a clot in the blood vessels of the brain.
- ST-Segment Evaluation Myocardial Infarction: a term used to describe a classic heart attack. It is one type of myocardial infarction in which a part of the heart muscle has died due to the obstruction of blood supply to the area.
- Subsidy: a form of financial aid or support extended to an economic sector generally with the aim of promoting economic and social policy.
- Substance Abuse: an overindulgence in or dependence on an addictive substance, especially alcohol or drugs.
- Substance Abuse and Mental Health Services Administration: a branch of the U.S. Department of Health and Human Services that is charged with improving the quality and availability of treatment and rehabilitative services in order to reduce illness, death, disability, and the cost to society resulting from substance abuse and mental illness.
- Sudden Infant Death Syndrome: the death of a seemingly healthy baby in its sleep, due to an apparent spontaneous cessation of breathing.
- Suicide: the action of killing oneself intentionally.
- Surgical Care Improvement Project: a multi-year national campaign to substantially reduce surgical mortality and morbidity through collaborative efforts between healthcare organizations.
- Surgical Technologist: work under the supervision and delegatory authority of a surgeon to facilitate the safe and effective conduct of invasive and non-invasive surgical procedures, ensuring that the operating room environment is safe, that equipment functions properly, and that the operative procedure is conducted under conditions that maximize patient safety.
- Susceptibility: the state or fact of being likely or liable to be influenced or harmed by a particular thing.
- Synergistic: relating to the interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate effects.

## T

- Team-Based Care: the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively with patients and their caregivers—to the extent preferred by each patient - to accomplish shared goals within and across settings to achieve coordinated, high-quality care
- Telehealth: the use of electronic information and telecommunication technologies to support long-distance clinical health care professional health-related education, public health, and health administration.

- Telemedicine: the use of electronic technology and telecommunication technologies to support long-distance patient and healthcare provider interactions for the purpose of diagnosis and treatment.
- Telepsychiatry: the application of telemedicine to the specialty field of psychiatry. The term describes the delivery of psychiatric assessment and care through telecommunications technology, usually videoconferencing.
- Tertiary Hospital: a hospital that provides tertiary care, which is health care from specialists in a large hospital after referral from primary care and secondary care.
- Transforming Clinical Practice Initiative: a large federal investment uniquely designed to support clinician practices through nationwide, collaborative, and peer-based learning networks that facilitate large-scale practice transformation.
- Trauma: tissue damage caused by the transfer of thermal, mechanical, electrical, or chemical energy, or by the absences of heat or oxygen; physical injury or a distressing or disturbing experience.
- Trauma Center: a hospital equipped and staffed to provide care for patients suffering from major traumatic injuries such as falls, motor vehicle collisions, or gunshot wounds.
- Tuberculosis: an infectious bacterial disease characterized by the growth of nodules (tubercles) in the tissues, especially the lungs.
- Turnover rate: the percentage of employees leaving a company within a certain period of time.

## U

- Ulcer: an open sore on an external or internal surface of the body, caused by a break in the skin or mucous membrane that fails to heal.
- Ultrasound Technician: also referred to as a sonographer or diagnostic medical sonographer, operates special equipment that uses high-frequency sound waves to record images of internal organs.
- Urban areas: those with a core city population of 50,000 or greater.
- Urbanization: the process of making an area more urban
- Urgent Care: walk-in clinics that provide health care for individuals who are unable to see their primary care provider (either due to unavailability or care being needed outside of usual clinic hours) but need immediate care to treat and injury or illness that is not serious enough to require going to an emergency room. These clinics fill the gap between a doctor's office and emergency room care.
- Urology: the branch of medicine and physiology concerned with the function and disorders of the urinary system.
- U.S. Department of Agriculture: a department within the U.S. federal government responsible for developing and executing federal laws related to farming, forestry, rural economic development, and food.

- U.S. Department of Health and Human Services: a cabinet-level agency in the executive branch of the federal government tasked with enhancing and protecting the well-being of all Americans by providing effective health and human services and fostering advances in medicine, public health, and social services.
- U.S. Department of Veterans Affairs: a department within the U.S. federal government tasked with providing patient care and federal benefits to veterans and their dependents.

V

- Vacancy rate: number of vacant job-specific positions (or positions within the whole organization), divided by the total number of job-specific positions (or within the whole organization), multiplied by 100
- Vaccination: treatment with a vaccine to produce immunity against a disease.
- Value-Based Purchasing Program: an initiative of the Centers for Medicare and Medicaid that rewards acute-care hospitals with incentive payments for the quality of care they provide to Medicare beneficiaries.
- Vocational Rehabilitation Counselor: a professional who works with people with physical, mental, developmental, or emotional disabilities to overcome or manage the effects of disabilities on employment or independent living.
- Volunteer: a person who freely offers to take part in an enterprise or undertake a task.

W

- Webinar: a seminar conducted over the internet.
- World Health Organization: a specialized agency of the United Nations that is concerned with international public health. The primary role is to direct international health within the United Nations' system and to lead partners in global health responses.

X

Y

Z

## **Appendix D: Summary of North Dakota Hospital Facility Survey (2020)**

### **North Dakota Healthcare Facility Survey (2020)**

#### **Introduction**

The North Dakota Healthcare Workforce Group was tasked with developing an assessment of healthcare facilities in North Dakota. This document was prepared to provide information about the current (2019 – 2020) circumstances of healthcare facilities in North Dakota, specifically workforce positions filled and vacant as well as issues of recruitment and retention. The following information is not meant to be a conclusive analysis, but rather a snapshot of the state of affairs within healthcare facilities. Data collection methods and aggregate response summaries are provided below.

#### **Survey Method**

The survey of healthcare facilities was based upon a previously used questionnaire for hospital and nursing facility surveys (2014, 2016, & 2018). The questionnaire contained 23 questions assessing facility characteristics and issues of workforce. The survey was electronically disseminated. The link to the questionnaire and a request to respond to it were sent to 55 selected healthcare facilities statewide.

Among the questions asked on the questionnaire was a matrix of 36 specific positions with questions regarding the number of Full Time Equivalent (FTE) for each. Healthcare facilities were asked to report the number of FTE for internal positions, external positions (i.e. contract workers), and vacant positions. A single FTE is one individual working 40 hours per week, 0.5 FTE is one person working 20 hours per week, 0.25 FTE refers to one person working 10 hours per week, etc. The actual number of individuals working for a facility will be higher than the FTE count reported. Other questions inquired about the challenges associated with recruitment and retention of positions.

#### **Results**

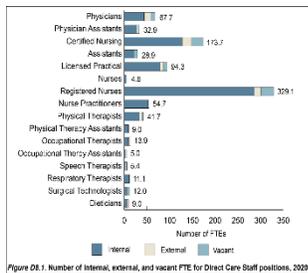
##### ***Facility Characteristics***

Responding healthcare facilities in North Dakota indicated their type as: clinic alone ( $n = 5$ ), hospital alone ( $n = 9$ ), clinic and hospital combination facilities ( $n = 16$ ), as well as hospital, clinic, and long-term care combination facilities ( $n = 18$ ).

##### ***Full Time Equivalent (FTE)***

The FTE portion of the survey was broken into multiple blocks based upon the type of positions assessed. The first block pertained to Direct Care Staff. The Direct Care Staff results are below in Figure D8.1. The figure presented shows each position's FTE

in the order the positions were presented in the online survey. The figure itself is a stacked bar graph – meaning, each bar represents the number of FTE for a position with colors corresponding to internal, external, and vacant FTE.



The five most populous positions in Direct Care Staff were (in descending FTE order): Registered Nurses, Certified Nursing, Licensed Practical Nurses, Physicians, and Nurse Practitioners. These five positions accounted for more than 710 FTE total. The least populous positions in Direct Care Staff were (in descending FTE order): Physical Therapist Assistants, Dieticians, Speech Therapists, Occupational Therapist Assistants, and (general) Nurses. These five positions accounted for less than 35 FTE total. The positions with the largest vacancy percentages were: Surgical Technologists (33% of positions vacant), general Assistants (24% vacant), Occupational Therapy Assistants (20% vacant), Certified Nurses (15% vacant), and Physicians (14% vacant).

The Laboratory Staff block of the FTE matrix results are below in Table D8.1. Notice in the table there were relatively low vacancy rates and minimal external FTE positions. The majority of Laboratory Staff positions are filled with internal employees. Two position labels in Table D8.1 are abbreviated as follows, “Lab Scientist” refers to Medical Technologist/Clinical Laboratory Scientist and “Lab Technician” refers to Medical Laboratory Scientist/Clinical Laboratory Technician.

Position	Internal	External	Vacant	Total	Rate
Lab Scientist	40.2	4.5	5.0	49.7	10%
Lab Technician	24.5	0.0	3.0	27.5	11%
Phlebotomist	12.8	0.0	2.5	15.3	16%

The Radiology Staff block of FTE matrix results are below in Table D8.2. The Radiology Staff block was composed of five positions: Radiographer / Radiology Technician (“Radiographer”), Specialized Radiology Technicians (MRI, CT; “SpecRadTech”), Ultrasound Technologist (“UltrasoundTech”), Nuclear Medicine Technicians (“NucMedTech”), and Radiation Therapy Technicians (“RadTherapyTech”). The Radiation Therapy Technicians were reported as having zero FTE across all responding healthcare facilities.

**Table D8.2**  
*Radiology Staff FTE Breakdown, 2020.<sup>4</sup>*

Position	Internal	External	Vacant	Total	Rate
Radiographer	35.0	0.5	3.8	39.3	10%
SpecRadTech	17.7	0.5	2.0	20.2	10%
UltrasoundTech	8.5	2.1	1.0	11.6	9%
NucMedTech	3.9	1.2	0.0	5.1	0
RadTherapyTech	0.0	0.0	0.0	0.0	0

The Health Information Management Staff block of FTE matrix results are below in Table D8.3. Only two positions were assessed in this block: HIM Manager / Supervisor (“MgrSuper”) and Privacy / Security Officer (“PriSec”).

**Table D8.3**  
*Health Information Management Staff FTE Breakdown, 2020.<sup>4</sup>*

Position	Internal	External	Vacant	Total	Rate
MgrSuper	10.0	3.3	1.0	14.3	7%
PriSec	5.7	1.0	0.0	6.7	0

The Pharmacy Staff block of FTE matrix results are below in Table D8.4. Again, there were only two positions assessed in this block: Pharmacists and Pharmacy Technicians. The responding facilities reported a vacancy rate of 13% for Pharmacy Technicians.

**Table D8.4**  
*Pharmacy Staff FTE Breakdown, 2020.<sup>4</sup>*

Position	Internal	External	Vacant	Total	Rate
Pharmacists	15.2	1.8	0.0	17.0	0
Pharmacy Techs	13.4	0.0	2.0	15.4	13%

The next block of the FTE matrix assessed Management Staff positions, those results are below in Table D8.5. The positions were Nurse Managers / Clinical Directors (“NCDirect”), Human Resource Staff (“HR”), and Business Office Staff (“Business”).

**Table D8.5**  
*Management Staff FTE Breakdown, 2020.<sup>4</sup>*

Position	Internal	External	Vacant	Total	Rate
NCDirect	52.7	0.0	0.0	52.7	0
HR	19.4	0.0	0.0	19.4	0
Business	97.1	6.0	3.0	106.1	3%

The final block of FTE results corresponds to the Facilities Staff and those results are below in Table D8.6. Those positions were Housekeeping Staff (“House”), Laundry Staff (“Laundry”), Maintenance Staff (“Maint”), Grounds-keeping Staff (“Grounds”), and Environmental Services Staff (“Enviro”).

Table D8.6  
Facilities Staff FTE Breakdown, 2020<sup>4</sup>

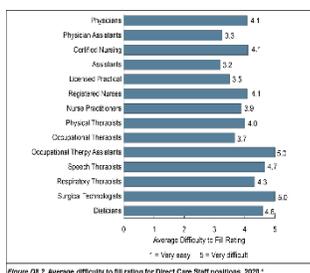
Position	Internal	External	Vacant	Total	Rate
House	60.6	0.0	3.5	64.1	5%
Laundry	27.1	0.0	1.0	28.1	4%
Maint	37.0	1.0	3.5	41.5	8%
Grounds	1.0	0.0	0.0	1.0	0
Enviro	40.0	1.0	0.6	41.6	1%

As the tables above show, the vast majority of FTE for positions other than Direct Care Staff are filled internally and show very low vacancy rates. Facilities were asked to rank the top five positions having the highest turnover rates. The nursing positions were consistently ranked in those top five – more frequently than all other types of positions.

### Recruitment and Retention

Healthcare facilities were asked several questions regarding recruitment and retention. Results reveal a wide variety of challenges among specific positions. When asked to characterize the difficulty in filling primary care provider vacancies the majority of facilities that responded (61%) did so with “difficult” or “very difficult”. When asked to characterize the difficulty in filling specialty care provider vacancies the majority of facilities that responded (60%) did so with “difficult” or “very difficult”. When asked the same type of question regarding the difficulty of filling administrative vacancies, only 25% responded with “difficult” or “very difficult”.

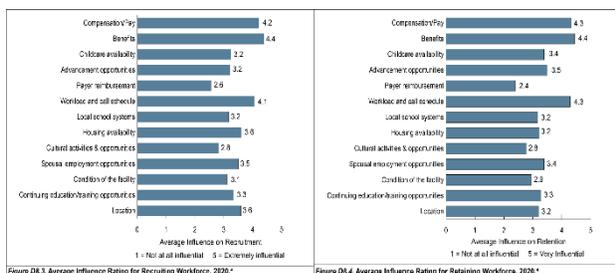
The facilities were asked to rate the difficulty of filling each of the named positions listed in the FTE matrices mentioned above. The Direct Care Staff positions’ average difficulty ratings are listed in Figure D8.2 below. The facilities did not respond with ratings for Nurse and Physical Therapy Assistant positions.



The average difficulty to fill ratings for Laboratory Staff were as follows; Medical Technologist/Clinical Laboratory Scientist 4.75, Medical Laboratory Scientist/Clinical Laboratory Technician 4.67, and Phlebotomists 3.50. The Radiology Staff positions’ average difficult to fill ratings were; Radiographer / Radiology Technician 4.22,

Specialized Radiology Technicians (MRI, CT) 4.40, Ultrasound Technologist, Nuclear Medicine Technicians 4.75, and Radiation Therapy Technicians which had no respondent ratings. The average difficulty to fill ratings for Health Information Management Staff were as follows: Manager / Supervisor 4.00 and Privacy / Security Officer 2.50. The Pharmacy Staff positions' average difficulty to fill ratings were 3.25 for Pharmacists and 4.00 for Pharmacy Technicians. The average difficulty to fill ratings for Management Staff were as follows; 4.67 for Business Office Staff and 3.83 for Nurse Managers / Clinic Directors. The facilities did not respond with ratings for the Human Resources position. The Facilities Staff positions' average difficulty to fill ratings were as follows: 3.29 for Housekeeping, 2.75 for Laundry staff, 3.33 for Maintenance staff, and 4.00 for Environmental Services Staff. The facilities did not respond with ratings for the Grounds-keeping staff.

The facilities were also asked to rate a series of characteristics in terms of the amount of influence each characteristic had over recruitment as well as retention. The range of ratings were from 1 (not at all influential) to 5 (extremely influential). Average influence in recruitment ratings are displayed in Figure D8.3. Average influence in retention ratings are displayed in Figure D8.4.



## Limitations

Only 30 healthcare facilities attempted to respond and only 20 responded completely to the questionnaire. Only those 20 facilities responded regarding FTE positions, translating to a response rate of 36% (i.e. 20 of 55 facilities statewide). Therefore, the results reported here should not be used to infer the number of FTE filled and vacant, or difficulty in hiring and keeping positions at other healthcare facilities.