

FIFTH BIENNIAL REPORT | 2019

HEALTH ISSUES FOR THE STATE OF NORTH DAKOTA

SCHOOL OF MEDICINE & HEALTH SCIENCES
ADVISORY COUNCIL



UND SCHOOL OF MEDICINE & HEALTH SCIENCES
UNIVERSITY OF NORTH DAKOTA



SCHOOL OF MEDICINE & HEALTH SCIENCES
ADVISORY COUNCIL

This *Report* was prepared by the UND School of Medicine and Health Sciences Advisory Council

David Molmen, MPH

Grand Forks, Chair, Northeast Campus

Craig J. Lambrecht, MD

Bismarck, North Dakota Hospital Association

Joshua Wynne, MD, MBA, MPH

Grand Forks, Executive Secretary
Vice President for Health Affairs and Dean
UND School of Medicine & Health Sciences

Senator Tim Mathern, MPA

Fargo, North Dakota Senate

Thomas F. Arnold, MD

Dickinson, Southwest Campus

Casey Ryan, MD

Grand Forks, State Board of Higher Education

Representative Lois M. Delmore

Grand Forks, North Dakota House of
Representatives

Representative Jon O. Nelson

Rugby, North Dakota House of Representatives

Senator Robert S. Erbele

Lehr, North Dakota Senate

Shari L. Orser, MD

Bismarck, North Dakota Medical Association

Dean Gross, PhD, FNP-C

Fargo, North Dakota Center for Nursing

Stephen J. Tinguely, MD

Fargo, Southeast Campus

L. Gary Hart, PhD

Grand Forks, UND Center for Rural Health

Mylynn Tufte, MBA, MSIM, BSN

Bismarck, North Dakota Department of Health

Christopher D. Jones, MBA

Bismarck, State Department of Human Services

Breton M. Weintraub, MD, FACP

Fargo, Veterans Administration Medical Center

John M. Kutch, MHSA

Minot, Northwest Campus

Courtney M. Koebele, JD

Bismarck, North Dakota Medical Association

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*.

Acknowledgement

We acknowledge the exceptional contributions of the following individuals in the preparation of the *Report*: Mandi-Leigh Peterson, Robin Besse, Karen Vanderzanden, Nathan Fix, Sonja Bauman, Kristen Leighton, and Delphine Tamukong of the North Dakota Healthcare Workforce Group; Dr. Tom Mohr, associate dean for Health Sciences; Dr. Rashid Ahmed, associate dean of research, Dr. Jana Zwilling, and Dr. Rhoda Owens, of the College of Nursing and Professional Disciplines; Brad Gibbens, of the Center for Rural Health; Jessica Sobolik and Brian Schill of the Office of Alumni and Community Relations; and Laura Cory of Information Resources. In addition, we thank Dr. Gary Schwartz, chair of the Department of Population Health; Rebecca Quinn, Dr. Shawnda Schroeder, and Lynette Dickson of the Center for Rural Health.

Cover photo courtesy of North Dakota Tourism.

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.

This latest version, the *Fifth Biennial Report: Health Issues for the State of North Dakota*, updates 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.

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EXECUTIVE SUMMARY

North Dakota (ND), 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 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 for many decades. The data that were reviewed for this report illustrate two major problems in North Dakota. One problem is an inadequate number of healthcare providers; however, the larger problem 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 shortage. Without direct intervention, the difficulty of providing adequate healthcare in North Dakota will worsen over the coming decades from the combination of aging of the population (including aging and eventual retirement of the healthcare workforce) along with localized population growth in the Oil Patch and the cities, both of which will increase the demand for healthcare services in those areas.

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 both the *First and Second Biennial Reports on Health Issues for the State of North Dakota (Report)*. Phase I of 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. Phase II of the plan, which includes full class size expansion and further growth of residency slots in the state, has been implemented as well. 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 *Fifth Biennial Report on Health Issues for the State of North Dakota (Report)* updates the first four *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 in the future.

Demographics 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 less than a population of 10,000. Fifty percent 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, where only a few decades ago, 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 49th in population density, and is 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.

The Health of North Dakota: The health of North Dakotans, in comparison with the rest of the United States, generally is good. 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 alcohol consumption, 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, and although the gap had narrowed over the past three decades, it recently widened. Our physicians are older and more likely to be male than elsewhere in the United States. About one-fourth of the physician workforce is made up of international medical graduates, a little higher than the rest of the country. The UND SMHS is an important source of physicians for the state, accounting for 47% of the more than 1,000 physicians practicing in North Dakota who graduated from a U.S. medical school. The Rural Opportunities in Medical Education (ROME) program has had 144 participants, of which 88 are currently practicing medicine. Of those, 66% are practicing in primary care, and 29% are practicing in rural areas.

About 44% 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, current estimates indicate a shortage of some 260 to 360 physicians by 2025, the consequence of a heightened need for healthcare services as the Baby Boom generation ages, but also from retirements in the aging physician workforce (one-third of the physicians in North Dakota are 55 years of age or older). If the population of North Dakota increases to 800,000 people at some point in the future, as predicted, around 500 additional physicians will be needed.

Primary Care Physician 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 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; more than half 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: The state's nursing workforce was examined using a new hospital survey and new licensure data. A majority of hospital nurses are licensed practical nurses (LPNs) or registered nurses (RNs). There was a vacancy rate of greater than 10% for all levels of nurses. North Dakota institutions train a majority of the state's nursing workforce. 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.

Psychiatrists, Behavioral Health, and Non-Physician Healthcare Workforce: A majority of the data reported are from professional licensure boards and is new to the current *Report* or expanded from previous *Reports*. 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 three-quarters of the physical therapists and physical therapist assistants were trained in North Dakota, with half having received training at UND. Of those physician assistants trained in North Dakota, half practice in rural areas and 38% practice in rural primary care.

Healthcare Facility Workforce: Nursing facilities and hospitals typically rely on external contract employees, along 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 were 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 EMS providers, trauma centers, 28 public health units, oral health providers, mental health providers, and pharmacies. Generally, 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 impact on both the health of individuals and the economic base of the community.

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 burgeoning 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 that they will be able to utilize this 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 United States. North Dakota ranked 22nd in the country in a recent assessment 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 66th 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 66th Legislative Assembly is the effect of the state’s current financial status on funding for the HWI. Because of the required budget allotment process during the 2015–2017 biennium that amounted effectively to more than a 10% budget reduction, 19 approved residency slots (post-MD degree training) could not be funded. The budget submitted by the UND SMHS for the 2019–2021 biennium and endorsed by both UND and the State Board of Higher Education has been structured to make current funding levels permanent (that is, part of base funding) and thus allow a continuation of the various vital healthcare educational programs of the UND SMHS. It will be up to the 66th 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 full funding of the HWI as requested in the submitted UND SMHS budget.

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 gamut 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 (individual and employer health insurance purchases) and 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 steadily declined since 2000.¹ 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. At times, other branches of government (the U.S. Supreme Court) intercede as in the June 2012 court ruling on the ability of the federal government to mandate increased Medicaid coverage under the Affordable Care Act (ACA).

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%.² 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. Provider networks are a growing trend in healthcare and will be accelerated under healthcare reform related to the ACA, particularly in the development of accountable care organizations (ACOs). ACOs are healthcare delivery organizations that utilize payment and care delivery models that link provider reimbursement to quality outcome measures and a reduction in the overall cost of care for a specified population of patients. North Dakota's 36 critical access hospitals (CAHs) participate in nine provider network arrangements with either larger hospital systems or other provider-type networks to address the common issues of quality improvement, technology, education and training, and other needs. Hospitals can belong to multiple networks. For example, the 36 CAHs participate in 38 quality improvement network arrangements and 37 health information technology (HIT) arrangements, while 34 participate in staff education collaborations and 18 address local health professional recruitment and retention concerns via networks.³

Overall, CAHs in North Dakota have formed collaborative relationships with other providers (urban hospitals, rural hospitals, clinics, emergency medical services, public health districts, 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. The CAHs also serve as local healthcare hubs in that 30 of the 36 CAHs (83%) also own the local primary care clinic and 14 of the CAHs (39%) own the local nursing home. Local integration is critical in maintaining local access to essential services for the public. A total of 33 CAHs (92%) own another non-acute-care healthcare organization or business.⁴ Networks, partnerships, or collaborative efforts affect the healthcare workforce in that 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, following 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 “Big 6” 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 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 ‘Big 6’ 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.⁴ 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

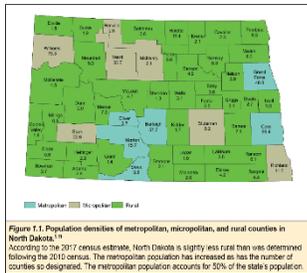
North Dakota is comprised of a mixture of several densely populated larger cities, many smaller towns, and large areas with low population density. The distribution of North Dakota’s population is another challenging issue for efficient healthcare delivery. Figure 1 shows the population per square mile 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.⁵

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.⁶⁻⁹ 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 12.3% from 2010 to 2017, based on the 2017 U.S. Census estimate.⁵ 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 2010-2017, in comparison, was 5.5%.⁵ North Dakota's growth mainly occurred in two locations: the cities (Fargo, Grand Forks, 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:

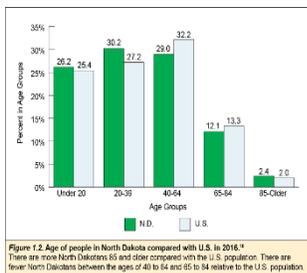
- **Metropolitan** describes a population cluster or area with a core population of 50,000 or greater. The state's three largest cities (Fargo, Bismarck, and Grand Forks) are located in metropolitan areas as are their surrounding areas.
- **Micropolitan** (or large rural) describes areas with a population 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.⁹⁻¹¹ Depending on the definition of rural, North Dakota is among the five states with the largest component of rural areas.¹¹
- **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.⁵



Age

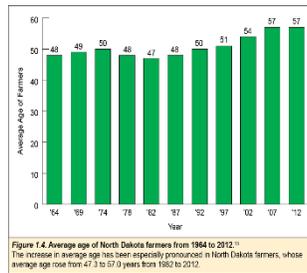
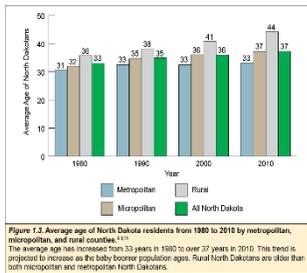
Older populations use dramatically more healthcare resources than do younger populations. North Dakota's population is among the oldest in the nation. It is tied for fourth in the country in the percentage of its state population that is 85 years or older. This greatly influences the need for providers. For example, nationally in 2015, 15- to 24-year-olds on average generated 1,769 ambulatory office visits annually, while Americans age 75 or older made 7,623 annual visits (over four times as many).¹² If we assume that a family physician provides 5,500 office visits a year, 1000 15- to 24-year-olds would take up 32% 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.

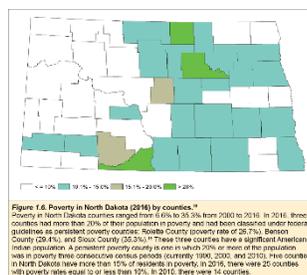
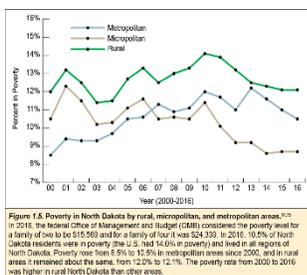


INCOME FACTORS

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.¹⁴

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 (10.5% compared with 12.1%).^{11,15} About 15% of North Dakota's children, those under 18 years of age, are in poverty compared to 19% nationally. About 10% of people in the state who are 65 years and older are in poverty compared to 9% nationally.¹⁶ 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.¹⁷ The distribution of poverty across the counties of North Dakota in 2016 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.”

INSURANCE COVERAGE

Rural Areas

North Dakota’s rural areas have a lower percentage of their population with health insurance coverage than other more populated areas.¹⁹ A greater number of farmers purchase health insurance as individuals as opposed to a group market and incur higher premiums and out-of-pocket costs. A study of farmers in seven rural states, found that 17% of farmers or farm family members had delayed seeking care because of high out-of-pocket costs. In that same study, 15% of North Dakota farmers were in that situation. Forty-nine percent of North Dakota farmers spent more than 10% of their income on healthcare, compared to 44% of farmers in the other six states. The median amount spent out-of-pocket for medical and dental care and prescription drugs was about 15% more in North Dakota compared to the other states.¹⁹

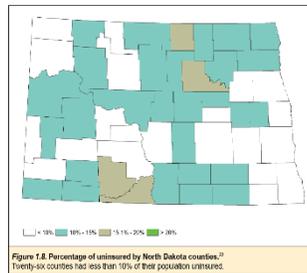
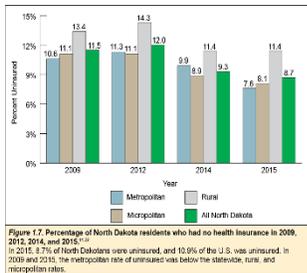
Uninsured

A lack of health insurance or inadequate coverage (high deductibles and copayments or service limitations) lessens access to care for the individual or family and contributes to deteriorating financial standings for health facilities and providers. A 2012 survey of North Dakota CAH administrators found that more than 95% said a lack of insurance or having inadequate coverage was a problem, which was an increase from about 90% in 2014, and 75% in a similar survey in 2008.²⁰ As shown in Figure 1.7, rural areas have a significantly higher level of uninsured population compared with micro- or metropolitan areas.

Less medical care and less timely care are received by the uninsured. The National Academy of Medicine, formerly known as the Institute of Medicine, estimated that a lack of health insurance accounted for about 18,000 deaths per year in the United States. Overall, the uninsured get about half as much care as those privately insured and receive fewer preventive services and screenings, and on a less timely basis. This includes lower numbers of the uninsured receiving blood pressure and cholesterol checks, which can result in higher rates of heart disease, cancer, and diabetes. Pregnant women who are uninsured have fewer prenatal checks. Consequently, the uninsured have worse health outcomes compared to those with health insurance. The death risk for certain chronic diseases is estimated to be about 25% higher for those without insurance.²¹

“North Dakota’s rural areas have a lower percentage of their population with health insurance coverage than other more populated areas. Less medical care and less timely care are received by the uninsured.”

One of the strongest predictors of whether a person is uninsured is that they reside in a rural area. Figure 1.8 shows the distribution of the uninsured residents across North Dakota. The highest levels of uninsured live in rural areas. Across the state, approximately 91.3% of North Dakotans have insurance and 8.7% do not have insurance. The impact of the ACA on the rate of under- or uninsured North Dakotans is still to be determined, since implementation of its various components is staggered over time. Enrollment in federal exchanges began in 2014, but implementation of all of the provisions of the law is not expected until 2018.



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. The health condition of the individual may regress because of lower income, less health insurance, and greater age. Rural North Dakotans face more constraints in accessing care and achieving an acceptable health outcome, especially for rural American Indians. Health access and health status are typically worse on reservations.

Table 1.1
Summary of demographics in North Dakota's population by metropolitan, micropolitan, and rural areas⁽¹⁾⁽²⁾⁽³⁾

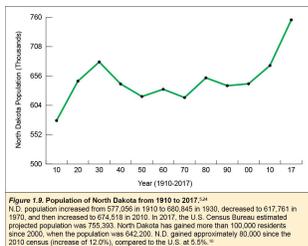
	Metropolitan		Micropolitan		Rural	
	N	%	N	%	N	%
Total - 2016	277,957	50	191,740	24	198,245	26
Gender - 2016						
Male	139,646	51	95,272	53	101,551	51
Female	138,311	49	96,468	47	96,694	49
Age - 2016						
Under 20	97,938	26	49,044	27	51,953	26
20-59	126,772	34	97,955	32	144,944	32
60-64	105,448	28	51,275	28	63,304	32
65-84	40,604	11	19,312	11	32,036	16
85 and Older	7,335	2	4,154	2	6,658	3
In Poverty - 2016						
Yes	30,387	11	15,216	9	23,345	12
No	225,510	90	195,430	91	199,825	88
Uninsured - 2015						
Yes	23,822	8	12,735	8	18,240	11
No	290,354	92	143,838	92	141,896	89

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 1.9) 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.²³



“The ND counties with the most significant population increases from 2000 to 2017 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.

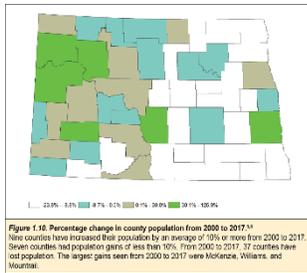


Figure 1.10 shows the change in population by county from 2000 to 2017. The counties with the most significant population increases from 2000 to 2017 were McKenzie, Williams, and Mountrail. The data indicate unique trends in county population: gradual urbanization, decline in the most rural areas, growth 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.^{8,9} 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.^{25,26}

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.^{6,9} 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 2010.²⁶ 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.²⁷ 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.^{7,10} 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%).

Changes in Population by County and Age

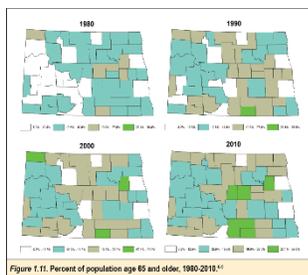
Figure 1.11 shows the progression of population change for people age 65 and older at four census periods (1980, 1990, 2000, and 2010). There has been a continual increase in the proportion of older adults in the rural counties. In 2010, the eight counties with 27% or more of their population age 65 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 2010.⁹ Thirty-four counties had a median age of 45 and older, while Sheridan County had a median age of over 53 years.⁹

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.⁹ 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.”

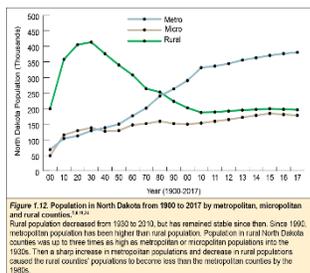
The dependency ratio is the number of individuals (less than 16 years of age or older than 65) who are economically inactive, divided by the number of individuals who are of working age (16 to 65 years old). A ratio of greater than 1.0 indicates that the number of economically inactive workers exceeds 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 is predicted that by 2020 the dependency ratio will increase to 71.⁹ It is anticipated that there will be 18 counties (all rural) where there will be 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 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.



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 1.12). 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.

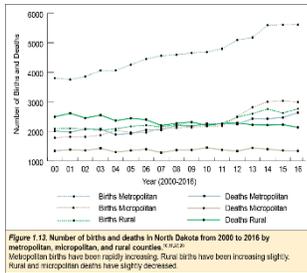


Change in Population by Births and Deaths

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 2000²⁷ to 11,364 in 2016.²⁸ Although the number of deaths also increased from 5,846²⁷ in 2000 to 6,105 in 2016,²⁸ in 2016 the birth rate exceeded the death rate by 5,259. 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 1.13). 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 2016, there were 65 births per 1,000 females of childbearing age in rural areas, compared to 55 births in metropolitan areas.

Metropolitan areas had 2,441 more births than deaths on average from 2000 to 2016. Micropolitan areas had on average 886 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 on average 35 more deaths than births; 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.²⁹ 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.



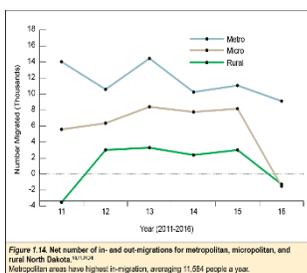
Change in Migration Patterns

Metropolitan and micropolitan areas have been experiencing a steady in-migration over time, while rural areas have had an out-migration. Since 2011, North Dakota has had an average in-migration of 18,528 people per year. Although rural areas have experienced an average in-migration of 1,151 individuals per year since this time, current trends indicate decreasing in-migration levels (Figure 1.14).

“Metropolitan and micropolitan areas have been experiencing a steady in-migration over time, while rural areas have had an out-migration.”

The changing rural and urban economies caused by a decline in the number of farms, a loss of young adults and young families, and increased economic opportunity in metropolitan and micropolitan areas play substantial roles in shaping the population. The availability of well-paying jobs, the types of jobs and career growth available, and the opportunities for dual-career families are all factors that cause a shift to metropolitan areas.

A significant change in the economy of rural North Dakota is energy, specifically oil and natural gas. Coal and oil have played important roles in North Dakota’s economy, dating back to the early 1950s, and another boom cycle began in the mid-2000s. The effect is felt most acutely in the 17 oil-producing counties.^{10,11,30}



PROJECTED POPULATION

Population changes in North Dakota are generally tied to economic changes. Thus, predicting future population trends and changes presumes the ability to correctly predict future economic conditions which has not always been particularly accurate.

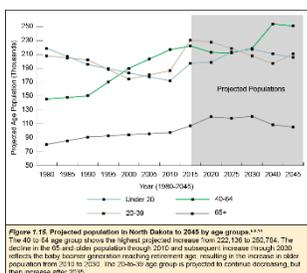
However, there is a need to have predictive models regarding state population trends to help plan for future healthcare and other services.

Projection to 2045, Total and Age Groups (Stable-Growth Model)

The gradual aging of North Dakotans will place renewed pressure on both the public and private sectors as well as on the corresponding institutions and organizations involved in assessing older adults' needs and allocating appropriate resources. It not only will continue to affect the response of the healthcare system but also will have an impact on the overall health of the population. There will be a corresponding need to manage chronic disease, and to identify better ways of encouraging patients to care for themselves. In addition, there will be corresponding effects on healthcare spending and costs, health organizations' viability (particularly in the rural areas), and health system redesign.

“The population trends and projections present unique challenges to institutions and the capacity of the state and communities to respond. Regardless of community size, there will be significant effects on a range of sectors: education, health, business/economic development, housing, transportation, government, and social/civic organizations.”

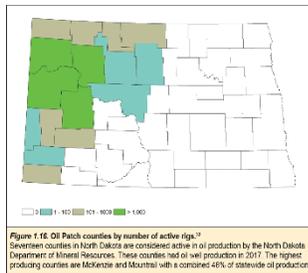
The stable-growth projection indicates that while the 65-and-older cohort will peak by 2030 and then decline, the next oldest cohort (40 to 64 years) will be increasing from 2030 to 2040; thus, the effect of an aging population will continue (Figure 1.15). The population trends and projections present unique challenges to institutions and the capacity of the state and communities to respond. Regardless of community size, there will be significant effects on a range of sectors: education, health, business/economic development, housing, transportation, government, and social/civic organizations such as faith-based and service organizations. Even a more conservative model projects population growth that will test the ability of sectors to plan for the effects of the expected change.



OIL PATCH IMPACT

Counties by Oil Production

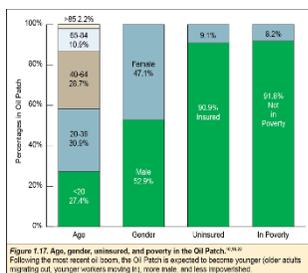
The recent oil boom has propelled North Dakota to being the second-largest oil-producing state; from ninth place in 2006. This boom has produced an economic impact of over \$13 billion and has produced roughly 30,000 jobs with expectations of adding 7,000 to 10,000 a year for about five years.³¹ All of the oil production is focused in the western half of the state, especially the far west counties (Figure 1.16).



Demographics: Age, Gender, Insurance Status, Poverty

People in the Oil Patch are comparable to the rest of North Dakota for age, gender, uninsured status, and poverty status, although relative to rural North Dakota overall the older adult population is not as large (Figure 1.17).

Based on current data, the age composition of the Oil Patch has not changed dramatically over the last several years. If the oil boom resumes, then the younger working-age population moving in will seek not only energy-related jobs but also employment in ancillary industry or business, along with the more traditional needs in retail, service, schools, health facilities, government, transportation, and other key sectors. The resulting housing crunch or changes in the nature and culture of the area would likely compel some older people to move to other areas of the state. If there is a reduction in oil production, the 17 oil-producing counties will most likely return to a past demographic of slowly developing micropolitan areas and declining rural areas.



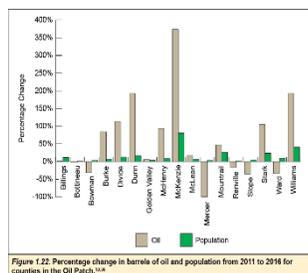
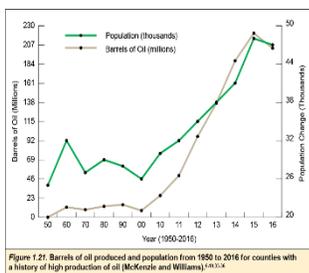
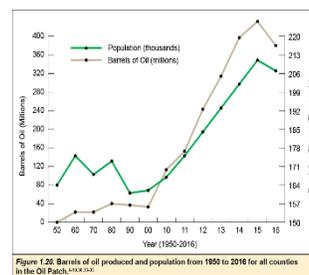
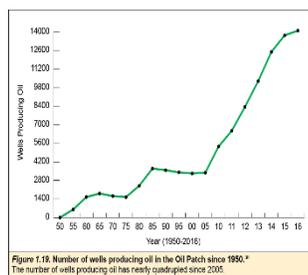
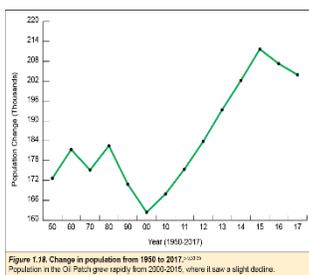
Population and Oil Production

The economy and population of Oil Patch counties has experienced highs and lows. Figure 1.18 shows how the boom-and-bust pattern over the past several decades affected population. The recent growth in oil production, however, is the largest to date

(Figure 1.19). The increase in population in the oil counties contributed to the increase in the overall state population. From the 2000 census to the 2017 census estimate, there has been an increase of about 41,523 people in the 17 primary oil-producing counties.⁵

Figures 1.20 and 1.21 show that oil production and population follow nearly identical patterns. This represents the parallel between economics and population. As oil production is forecast to continue to grow over several decades, it is expected that population will follow accordingly. There are regions, however, where the tight relationship between oil production and population is not found (Figure 1.22). Counties such as Ward have seen an increase in population without an increase in oil production. This suggests that Ward County supports oil production from nearby counties. Counties such as Dunn and Divide have had large increases in oil and moderate increases in population, suggesting that Oil Patch workers are living in nearby counties.

As the largest micropolitan community in the Oil Patch, Minot is emerging as an economic hub for the region. It is the state's fourth-largest city and is in Ward County, which had a population increase from 2000 to 2017 of 10,151 people, a 17% increase. Other micropolitan communities (Dickinson and Williston) are in the heart of oil country and have seen growth in their oil production, but because they are core population centers, they are experiencing even more population growth. Stark County (Dickinson) had a population increase of 34% over the past 17 years, while Williams County (Williston) had a 69% increase in population (10,951). Stanley (Mountrail County), Tioga (Williams County), and Williston (Williams County) benefit because they are in close proximity to major supply transportation routes. Watford City (McKenzie County) had an increase since the year 2000 of 6,364 people and the largest percentage increase of 122%. Dunn and Divide counties have seen significant increases in oil activity; however, their population growth is smaller. For example, Divide County, north of Williams County and Williston, had its population increase by fewer than 250 people.^{5,8}



SUMMARY AND OBSERVATIONS

The changes in the state's population have had an effect on the North Dakota healthcare system. Increases in urban areas will lead to a larger patient base, and health systems will need to respond accordingly to meet the new demand for services. The continuing decline in the rural population will also produce health system pressures. Challenges to the already slim and sometimes negative operating margins for CAHs, the ability to financially maintain federally certified rural health clinics and federally qualified health centers, and the complications associated with an aging population on rural emergency medical services (ability to identify volunteers) and long-term care centers will be exacerbated by depopulation. Workforce supply will be affected because of mounting competition for providers, particularly in primary care; competitive salary packages; and the overall issue of attracting providers willing to live and practice in declining environments. The projected population changes will pressure communities and health systems to respond in a proactive manner to adopt alternative models of delivery care to suit the needs of a changing population.

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CHAPTER TWO: 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.¹ 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).²

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.^{3,4}

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.⁵ 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.⁶ In general, healthcare costs in the United States are high in comparison with other countries, accounting for about 17.2% of gross domestic product (GDP), which is a common and accepted measure of economic production and activity.⁷ 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% by 2021. Regarding per-capita spending, in 2016, the United States spent \$9,892 vs. 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).⁸ 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).⁹ 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.¹⁰ 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.¹¹ 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, there are six principal aims to improving health that should be followed: safety, effectiveness, patient centeredness, timeliness, efficiency, and equity.¹² 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 Institute of Medicine 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.¹³ 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.¹⁴

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 *Fifth Biennial Report* and will be discussed in more detail in Chapters 3–5. 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.¹⁵ 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.¹⁶ 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 2.1 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 for the past six years. 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 increased trend from 2011 to 2016 with some variance between years. Despite the increase 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 13.2% from 2015 to 2016 (6,229 to 5,406), according to the North Dakota Attorney General's office.¹⁷

BEHAVIORAL RISK TRENDS

Table 2.1
Percent of adults reporting behaviors^{18,19}

	2011 (518,017)	2012 (540,271)	2013 (558,985)	2014 (583,766)	2015 (590,349)	2016 (591,289)
Smokes	21.7	20.9	20.7	18.8	17.9	16.9
Drinks Alcohol	57.4	59.1	59.0	57.2	57.9	60.2
Binge Drinks	21.7	23.2	22.8	22.3	22.6	23.3
Drinks & Drives		3.2		3.2		3.8
Doesn't Always Wear a Seatbelt	29.5	33.9	28.6	28.4	26.6	26.2
No Physical Activity/Exercise Other Than Job	25.5	23.8	25.8	21.3	24.6	22.1

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, the 10 leading behavioral causes of death worldwide (factors such as high blood pressure, tobacco use, high blood glucose, physical inactivity/overweight, alcohol use, 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.^{20,21}

“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 2.2 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 2.2
Percent of adults reporting general health conditions^{22,23}

	2011 (518,017)	2012 (540,271)	2013 (558,985)	2014 (583,766)	2015 (590,349)	2016 (591,289)
Disabled	19.6	16.0	16.5	15.4	16.6	17.0
Overweight/Obese	59.7	62.2	64.3	63.7	61.5	62.8
General Health Fair/Poor	14.6	13.3	14.7	14.0	13.9	14.8
1+ Days Poor Health	18.1	19.0	18.1	16.4	18.4	19.0
1+ Days Poor Phys. Health	33.3	33.6	34.1	31.2	34.8	33.1
1+ Days Poor Mental Health	32.1	31.4	30.4	30.5	33.0	32.5

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 (62.8% versus 58.9%), and the state has a lower pneumonia immunization rate than the U.S. overall (32.5% versus 30.5%). In the *Fourth Biennial Report*, it was reported that North Dakota scored slightly worse on overweight/obesity by having 63.7% 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. Similarity, the percentage of North Dakotans viewing themselves as having only fair or poor health has increased over the past two years: 14.0% in 2014 to 14.8% in 2016; however, the U.S. rate in 2016 (17.7%) was higher than the state rate.²²

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 over the past six years. 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. North Dakotans have a lower prevalence of high cholesterol (34.8% compared with 36.1%), high blood pressure (30.3% compared with 31.8%), asthma (12.8% compared with 13.5%), and diabetes (8.6% compared with 10.7%) than nationally. Table 2.3 shows the percentage of North Dakotans reporting various health conditions since 2011.

Table 2.3
Percent of adults reporting general health conditions¹⁹

	2011 (518,077)	2012 (540,271)	2013 (558,965)	2014 (583,768)	2015 (590,348)	2016 (591,288)
High Cholesterol	35.3	NA	36.1	NA	34.8	NA
High Blood Pressure	29.0	NA	29.6	NA	30.3	NA
Arthritis	23.9	24.4	25.9	NA	22.7	23.2
Asthma	11.5	10.5	12.3	12.1	12.7	12.8
Cardiovascular Disease	4.0	4.1	4.0	4.0	3.6	4.1
Diabetes	8.2	8.6	8.9	8.6	8.7	8.6

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.^{23,24}

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.²⁵ 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 Affordable Care Act requires new health plans to cover preventive services for certain populations, including testing for high blood pressure and cholesterol.²⁶ 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.³ 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:³

- Reduce the proportion of adolescents ages 13–15 years with untreated dental decay in their permanent teeth.
- Reduce tobacco use by adolescents (9th- through 12th-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 2.4, 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 24
Percent of youth risk behaviors^a

	Total (43,385)	Female (21,355)	Male (22,050)
Smokes	19.2	14.4	15.8
Drinks	29.1	31.9	26.4
Drinks & Drives	6.5	4.9	8.1
Doesn't Always Wear a Seat Belt	7.0	2.9	10.6
Doesn't Always Exercise Moderately	48.7	57.1	40.7
Overweight/Obese	28.6	26.2	31.8
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 15.5 million Americans with a history of cancer were alive in 2016.²⁸

An estimate from the American Cancer Society is that in 2018 about 195,000 cancer deaths (out of an estimated 609,640 cancer deaths) will be caused by tobacco use, which increased from the 188,800 reported for 2016 in the *Fourth Biennial Report*. 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.^{28,29} 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.²⁴ The American Cancer Society estimates that in 2017 there will be more than 1.6 million new cases of invasive cancer in the United States.²⁸

Age is a primary risk factor for most cancers, with about 86% of all cancers diagnosed among individuals ages 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.²⁸

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.²⁸ 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 versus 36 years for the United States) 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.³⁰

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).³

“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 2.5 and Figure 2.2). Digestive system cancer, including colorectal, is the most commonly diagnosed cancer in North Dakota (Table 2.6 and Figure 2.3), 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 2.4), although it is higher for bladder and lung cancer nationally (Figure 2.5).

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.³¹

“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 2.1.

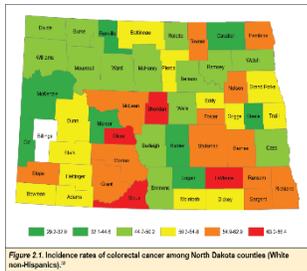


Table 2.5
Cancer rates per 100,000 people¹³

Age	All North Dakota		Males		Females	
	Rate	Cases Per Year	Rate	Cases Per Year	Rate	Cases Per Year
0-4	22.1	10	-	-	-	-
5-9	-	-	-	-	-	-
10-14	-	-	-	-	0	0
15-19	29.3	14.0	-	-	-	-
20-24	33.7	29.0	26.7	12.0	-	-
25-29	68.2	35.0	54.6	15.0	83.9	20.0
30-34	115.1	50.0	113.1	26.0	117.4	24.0
35-39	145.9	53.0	83.0	16.0	204.4	36.0
40-44	224.1	66.0	101.3	20.0	354.2	66.0
45-49	363.0	160.0	268.9	60.0	358.8	100.0
50-54	838.3	350.0	566.1	144.0	711.7	176.0
55-59	911.8	450.0	666.6	233.0	610.6	290.0
60-64	1,323.1	507.0	1,510.6	207.0	1,123.8	210.0
65-69	2,036.2	545.0	2,289.8	305.0	1,789.2	241.0
70-74	2,937.0	421.0	3,672.5	262.0	1,511.5	169.0
75-79	2,497.5	458.0	3,223.4	260.0	1,523.1	196.0
80-84	2,821.5	387.0	3,386.3	211.0	1,939.5	176.0
85+	2,039.4	380.0	2,577.1	147.0	1,171.7	200.0
All ND	498.2	3,657.0	443.0	2,219.0	449.9	1,838.0

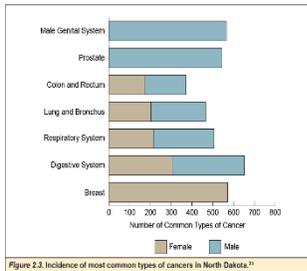
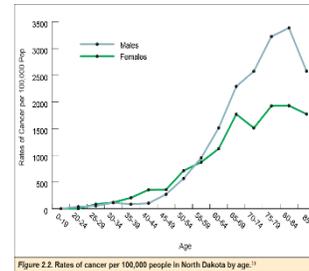
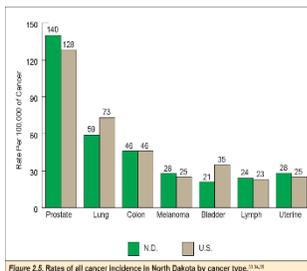
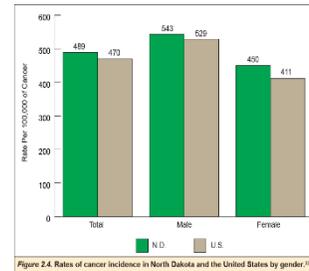


Table 2.6
Most common cancer rates¹⁵

Type	All North Dakota		Males		Females	
	Rate	Cases	Rate	Cases	Rate	Cases
Digestive System	80.2	632	93.4	347	67.6	305
Breast	75.8	579	0.0	0	145.1	571
Male Genital System	69.6	566	146.0	566	0.0	0
Prostate	66.7	544	140.2	544	0.0	0
Respiratory System	63.8	506	80.8	232	50.8	214
Lung/Bronchus	58.6	466	73.4	264	47.8	202
Colon/Rectum	45.1	371	53.2	196	39.4	175



Screenings and Immunizations

Table 2.7 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 2.7
Screenings^{14,2}

	2011 (518,017)	2012 (540,271)	2013 (558,965)	2014 (583,766)	2015 (599,348)	2016 (591,289)
Cholesterol	67.0	NA	67.8	NA	69.2	NA
FSA	NA	55.9	NA	52.4	NA	52.1
Blood Stool	NA	34.5	NA	32.3	NA	29.3
Sigmoid/Colonoscopy	NA	61.0	NA	64.6	NA	66.4
Mammogram	NA	63.2	NA	62.3	NA	60.7
Pap	NA	91.1	NA	90.3	NA	89.6
Flu	NA	38.5	41.5	40.2	43.6	41.9
Pneumonia	28.0	25.6	28.2	27.5	31.5	32.5

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.³

The development of a public health infrastructure has 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).²⁹

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.³⁶

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.³

Mortality

Nationally, premature mortality is higher in rural areas than urban areas. In North Dakota, Figure 2.6 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 since 2000 (Figure 2.7). 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%.^{37,38}

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.³⁹

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.⁴⁰ 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.⁴¹ 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.⁴² Research establishes that the rural opioid problem is disproportionately higher. Nevertheless, despite the recent increase in the opioid problem, North Dakota has the lowest rate of drug deaths in the country (Table 2.8). Some research indicates that rural adolescents are more likely to abuse prescription pain-killers than urban adolescents.⁴³ Other research studies have found the misuse of nonmedical prescription opioids is concentrated in states with large rural areas.⁴⁴

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).⁴⁴ 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.³⁵

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 owing to malpractice and liability concerns.^{38,45}

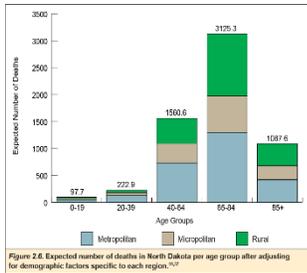


Figure 2.6. Expected number of deaths in North Dakota per age group after adjusting for demographic factors specific to each region.³⁷

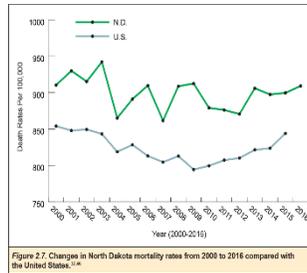


Figure 2.7. Changes in North Dakota mortality rates from 2000 to 2016 compared with the United States.³⁷

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 2.7) 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 2016 (909.2).³⁷ Figure 2.8 shows changes in mortality rates for metropolitan, micropolitan, and rural areas, as well as North Dakota overall.

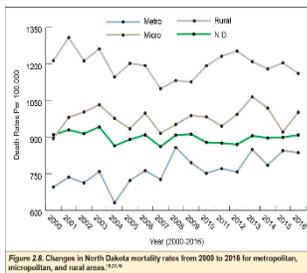


Figure 2.8. Changes in North Dakota mortality rates from 2000 to 2016 for metropolitan, micropolitan, and rural areas.³⁷

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.⁴⁷ 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 > 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 socioeconomics, 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, seatbelt use, and physical activity; however, behavioral risks related to alcohol use have increased for North Dakota adults. The general health of North Dakotans has shown an increase in overweight/obese persons, but a decrease in disabled persons, and has remained relatively stable in the areas of one or more poor health days. The percentage of adults reporting chronic health conditions has shown variance in recent years with fluctuating trends showing similarities between 2011 and 2016. 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, although mortality rates in North Dakota have fluctuated, the rates in 2000 and 2016 were similar.

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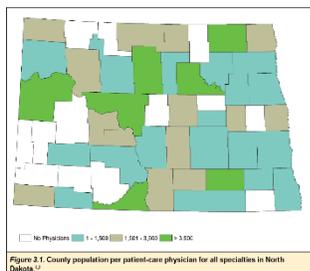
CHAPTER THREE: Physician Workforce in North Dakota

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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 3.1). Thirteen 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

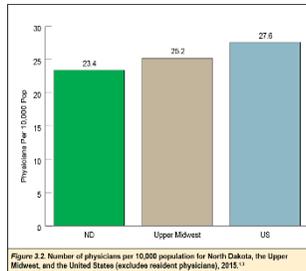
When comparing the availability of physicians to provide healthcare services in North Dakota with regional and national benchmarks, it is important that the comparisons are of similar designations. There are a number of ways to select physicians for analyses, and analyses often are not clear about the 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 3.1 shows the allopathic physicians (MDs) in North Dakota and the United States for the years 1985, 1990, 1995, 2000, 2012, and 2015. 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 is narrowing. 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 3.1
All medical doctors (MDs) per 10,000 population in North Dakota and the United States by year¹⁴

	N.D.	U.S.	% ND of U.S.
1985	17.6	22.8	77.2
1990	19.5	24.2	80.6
1995	22.0	27.0	85.2
2000	25.0	28.4	88.0
2012	28.4	32.3	87.9
2015	23.4	28.0	83.6



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.² The difference in 2015 physician-to-population ratios per 10,000 population is illustrated in Figure 3.2. The ratio for North Dakota is 16.8% lower than for the United States as a whole and 7.4% 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 2015 (Table 3.2). North Dakota has 37.2% fewer female physicians than the United States and 23.4% 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 3.2
Gender of physicians per 10,000 population in North Dakota with comparisons, 2015¹⁴

	N.D.	Upper Midwest	U.S.
Women	6.8	8.6	8.9
Metropolitan	10.5	11.1	11.0
Micropolitan	4.9	4.5	3.6
Rural	1.5	2.4	2.0
Men	16.5	16.6	17.7
Metropolitan	25.4	20.5	19.3
Micropolitan	11.3	11.4	9.9
Rural	4.2	5.7	5.2

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 3.3 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.

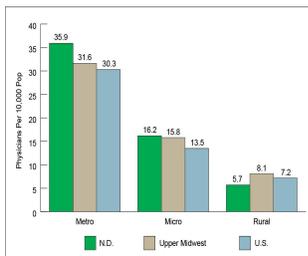


Figure 3.3. Physicians per 10,000 population for North Dakota with comparisons, 2015.^{1,14}

Table 3.3 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 19.3% fewer office-based physicians (per 10,000 population) than the United States and 11.3% fewer office-based physicians than the Upper Midwest. 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.

	N.D.	Upper Midwest	% diff	U.S.	% diff
Office	15.0	16.8	-11.3	18.2	-19.3
Metropolitan	22.7	20.3	11.2	19.8	13.6
Micropolitan	10.8	12.4	-13.8	10.4	3.8
Rural	4.1	6.3	-42.3	4.6	-11.5
Hospital	6.7	6.4	4.6	6.5	3.0
Metropolitan	10.7	8.4	24.1	7.2	39.1
Micropolitan	4.4	2.7	47.9	2.4	58.8
Rural	1.2	1.5	-22.2	1.1	8.7

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 22.9% and 39.1%, respectively. For micropolitan areas, North Dakota similarly has more by 45.7% and 56.7%, respectively. In rural counties, North Dakota has 22.2% fewer physicians than the Upper Midwest and 8.7% 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 3.4 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 3.4 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 3.4 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 3.5 shows that North Dakotan physicians are slightly less likely to be female or work in a hospital-based practice than the Upper Midwest and U.S. The state has a greater percentage of IMG physicians, however.

“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.”

	N.D.	Upper Midwest	U.S.
<35	3.2	4.2	4.9
Metropolitan	6.0	6.8	6.5
Microspottan	2.8	1.2	1.1
Rural	0.5	0.6	0.5
35-44	6.7	6.3	6.7
Metropolitan	10.8	8.1	7.5
Microspottan	3.8	3.5	2.8
Rural	1.0	1.2	1.3
45-54	5.7	6.3	6.4
Metropolitan	8.6	7.8	7.0
Microspottan	3.3	4.3	3.6
Rural	1.1	2.2	1.7
55-64	5.4	6.4	6.6
Metropolitan	7.7	7.4	6.9
Microspottan	4.8	5.1	4.4
Rural	1.5	2.3	2.5
65-74	3.4	3.8	4.4
Metropolitan	4.8	4.3	4.7
Microspottan	3.0	3.5	3.2
Rural	1.6	2.1	2.0
75+	2.2	2.2	2.9
Metropolitan	2.8	3.3	3.8
Microspottan	2.2	2.4	2.3
Rural	1.8	1.8	1.7

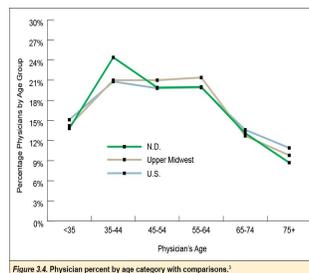


Figure 3.4. Physician percent by age category with comparisons.²

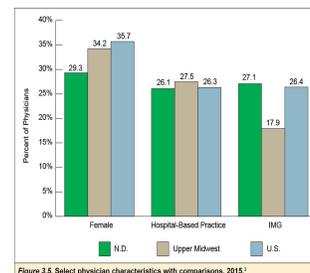


Figure 3.5. Select physician characteristics with comparisons, 2015.³

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 3.5
Percent of ND physicians who graduated from medical school in different states and where physicians who graduated medical school in ND currently practice, 2017

Region/State	Medical Schools that ND CPC Physicians Graduated From		Where UND SMHS Graduates are Currently Practicing		Net ND Migration Balance
	N	%	N	%	
ND	545	47	545	34	-
MI	92	8	338	21	-246
WI	15	1	36	5	-21
IA	48	4	33	2	+15
MO	57	5	18	1	-39
CA	31	3	42	3	-11
SD	28	2	42	3	-14
WV	23	2	40	2	-17
Other Midwest	136	9	37	5	-19
Other West	45	4	240	15	-200
Northeast	64	5	27	2	-37
Other South	111	10	120	7	-9
Total	1,166	100	1,623	100	-457

“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 3.5 shows that of the 1,166 physicians currently practicing in North Dakota that were trained in the United States, 545 (47%) of them graduated from the UND SMHS. However, of the 1,623 MD graduates from the UND SMHS only 34% are currently practicing in North Dakota. Minnesota supplies the largest number out-of-state trained physicians to North Dakota (92 or 8%), however North Dakota has exported 338 (21%) of its graduates to Minnesota. In 2017, 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, 1,078 medical school graduates practice outside North Dakota versus 621 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 -457 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 2017, of the 1,166 U.S. medical school graduates practicing in North Dakota (excluding graduates from Canada and other countries), 621 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.²

Of the 1,610 physicians practicing direct patient care in North Dakota in 2017, 433 (26.9%) completed at least one residency within North Dakota while 1,177 (73.1%) did not. Of the 1,298 physicians who completed at least one residency in North Dakota, 66.6% (865) practice in other states and 33.4% (433) practice in North Dakota (Table 3.6).

Table 3.6
Percent of ND physicians who graduated from residencies in different states and where physicians who completed a residency in ND currently practice, 2017

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	337	22	433	33	-
MIN	184	12	209	16	-25
MICH	112	7	14	1	+68
CA	54	4	70	5	-16
WIS	74	5	41	3	+33
TX	57	4	49	4	+8
NY	92	6	10	1	+82
OH	68	5	18	1	+52
Other Midwest	224	15	126	10	+98
Other West	89	6	165	14	-66
Other Northeast	94	6	33	3	+61
Other South	143	9	110	9	+33
Missing	0	0	2	0	-2
Total	1,528	100	1,298	100	230

Among current practicing physicians in North Dakota, approximately 22.1% (337) completed their most recent residency in North Dakota. Other common state residencies were located in Minnesota (12.0%, 184), Michigan (7.3%, 112), New York (6.0%, 92), Wisconsin (4.8%, 74), Texas (3.7%, 57), Ohio (4.5%, 68), and California (3.5%, 54). In addition to the individual states listed, North Dakota physicians frequently completed their most recent residency in other Midwestern states (14.7%, 224), followed by other Southern states (9.4%, 143), other Northeastern states (6.2%, 94), and other Western states (5.8%, 89).

“Among current practicing physicians in North Dakota, approximately 22.1% 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, 33.4% (433) of physicians who currently practice in North Dakota completed at least one residency in the state as well. Approximately 209 (16.1%) of N.D. residency graduates currently practice in Minnesota; 5.4% (70) practice in California; 3.8% (49) practice in Texas; 3.2% (41) practice in Wisconsin; and 1.1% (14) are currently working in Michigan. With regard to regional areas in addition to the specific states, 14.3% (185) of those who completed a N.D. residency now work in other Western states; 9.7% (126) work in other Midwestern states; 8.5% (110) work in other Southern states; and 2.5% (33) work in Northeastern states.

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

25 physicians to Minnesota, but gained 98 from Michigan. It lost 16 physicians to California, but gained 33 from Wisconsin. Additional gains include eight from Texas, 82 from New York, and 52 from Ohio. Regionally, North Dakota received 98 physicians from other Midwestern States, 61 from other Northeastern states, and 33 from other Southern states, but lost 96 to other Western states. Two physicians additionally did not report their practice location. Together, this results in a total net influx of 230 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 865 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 230. 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.”

In 2017, 26.9% of the physicians practicing in North Dakota completed at least one residency training in North Dakota. In 2017, 33.9% of North Dakota's total direct-care physicians received their medical degree from the UND SMHS. In 2017, 44.4% of the currently practicing physicians in North Dakota completed either a residency in North Dakota or received their medical degree from the UND SMHS, or both.²

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 3.7 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 3.7
Percent of North Dakota specialty physicians who graduated from the UND SMHS and/or completed at least one residency in North Dakota as of 2017¹

Residency	Percent
Family Medicine	72
Internal Medicine	50
Obstetrics & Gynecology	64
Pediatrics	42
Psychiatry	46

Residency Training in North Dakota

Figure 3.6 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.⁷ 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 3.8 shows the current numbers of residents in the programs.

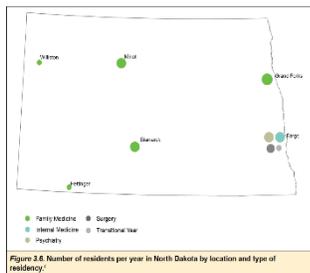


Table 3.8
Number of current North Dakota residency slots by type of residency program as of 2017

Residency	Number in Residency in 2016 – 2017	Duration Years	Number who completed training in 2016 – 2017
Family Medicine	65	3 Years	19
Internal Medicine	24	3 Years	8
Psychiatry	16	4 Years	3
Preliminary Surgery	3	1 or 2 Years	3
Categorical Surgery	25	5 Years	5
Transitional Year	8	1 Year	8
Total	141		46

“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 2017, 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.²

The geographic distribution of physicians is discussed in Chapter 4 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.⁸ Currently, IMGs account for approximately 25% of the practicing physician workforce in the United States and is expected to grow in the future.⁹ 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.¹ 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 3.9). 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 is 74% male compared to 70%, respectively. The average age of IMGs is 49.4 compared to 51.2 for USMGs. When examining physician specialty, IMGs are slightly more primary care-oriented than USMGs with 38.7% and 37.1%, respectively. IMG Surgeons represent less than half the rate of USMGs with 8.4% and 20.5%, respectively. IMGs are 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 3.9
Rate of IMGs and USMGs with comparisons, 2017¹⁰

	N.D.	Upper Midwest	U.S.
IMG	6.0	4.1	6.5
Metropolitan	9.0	5.2	7.2
Metropolitan	4.8	2.5	2.6
Rural	1.4	1.0	1.3
USMG	16.2	18.8	18.0
Metropolitan	25.0	23.2	19.7
Metropolitan	10.6	12.4	10.0
Rural	4.3	6.8	5.4

The largest numbers of IMGs practicing in North Dakota come from India, the Philippines, and Pakistan (Table 3.10). 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%).

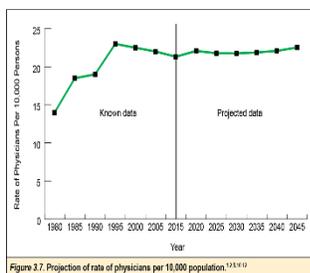
Table 3.10
Country of origin of IMG physicians practicing in North Dakota for regions with greater than 10 physicians, 2017*

Region	Country	Total Number	Per. Country
Northern Plains	India	12	33
	Philippines	10	27
	Pakistan	10	27
Central Plains	India	10	18
	Philippines	10	18
	Pakistan	10	18
	Other	10	18
Western Plains	India	12	12
	Philippines	10	10
	Pakistan	10	10
Central Corridor	India	11	11
	Philippines	10	10
	Pakistan	10	10
Western Corridor	India	13	13
	Philippines	10	10
	Pakistan	10	10
Southwest Corridor	India	14	14
	Philippines	10	10
Central Corridor	India	13	13
	Philippines	10	10

“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 3.7, the standard projection of population growth shows a relatively steady supply of physicians relative to the population (as shown in blue), 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.¹³ 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)¹⁴ 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.¹³ Nevertheless, it is possible that one-third (or even more) of all currently active physicians might retire within the next decade.¹³ 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 (5.6 physicians per 10,000 citizens compared with 8 in other Upper Midwest states and 7.1 for the United States). Aging is a problem because more than half of North Dakota's physicians (52.7%) 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. The eventual influence of the Affordable Care Act remains uncertain. 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 FOUR: Primary Care and Specialty Physician Workforce in North Dakota

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PRIMARY CARE PHYSICIANS

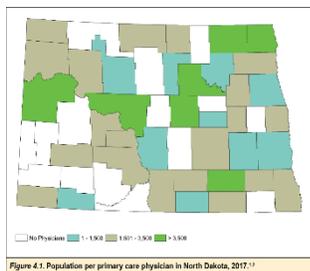
Primary care physicians are the foundation of the North Dakota healthcare delivery system, and access to them by all of North Dakota's population is an overarching goal. Primary care physicians are defined as physicians in the specialties of family medicine, general internal medicine, and general pediatrics. 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 4.1. There are no primary care physicians in 16 counties which have a combined population of 42,275.^{1,2} 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 lower than for the Upper Midwest (Figure 4.2).

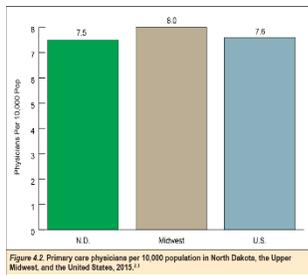
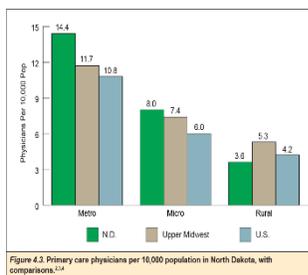


Figure 4.3 shows that across North Dakota, the Upper Midwest, and the United States, the practicing-primary-care-physician-to-10,000-population ratios are lower for rural counties. For metropolitan and micropolitan counties, North Dakota's rate per 10,000 population is higher than for the Upper Midwest and for the United States. Regarding rural counties, North Dakota trails the Upper Midwest (3.6 versus 5.3) and the United States (3.6 versus 4.2) in the number of physicians per 10,000 population.



Of the 604 primary care physicians practicing in North Dakota in 2015, 60.2% (364) were family physicians, 26.8% (162) were general internists, and 12.9% (78) were general pediatricians.¹

Distribution by Selected Characteristics

Table 4.1 shows the percentage of primary care physicians broken down by gender, hospital-based practice, and international medical graduate (IMG) status. Of the 604 primary-care, direct patient care physicians practicing in North Dakota, 68% are located in metropolitan counties, 17.7% in micropolitan counties, and 14.2% in rural counties. Rural counties have a lower percentage of physicians who are female than metropolitan or micropolitan counties (33.7% rural versus 36.4% micropolitan, and 39.4% metropolitan). The percentage of hospital-based physicians in metropolitan areas is 17.5% versus 19.8% in rural counties. That is, rural based primary care physicians are more likely to practice in conjunction with a hospital rather than other settings. As shown in Table 4.1, the percentage of North Dakota physicians who are IMGs varies little by metropolitan status (24.3% up to 26.5%). In North Dakota, 25.8% 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 physicians' workforce in the United States.

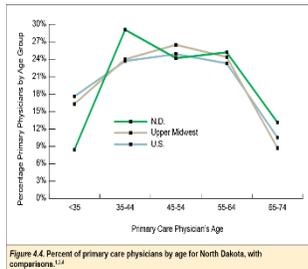
“Rural based primary care physicians are more likely to practice in conjunction with a hospital rather than other settings.”

Table 4.1
Percent of primary care physicians in North Dakota who are female, have hospital-based practices, and are IMGs, 2017¹

	N	Percent in Each Area	Female (%)	Hospital Based Practice (%)	IMG (%)
Metropolitan	411	66.0	39.4	17.5	26.5
Microopolitan	107	17.7	36.4	16.8	24.3
Rural	86	14.2	33.7	19.8	24.4
Total	604		38.0	17.7	25.8

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 4.4. North Dakota’s primary care physicians are less likely to be in the under 35 group and more likely to be in the 35 to 44 age group with respect to the comparison regions. 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 4.2. 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 (26.7% versus 14% and 10%, 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 implications of this finding is the susceptibility of the rural counties of 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 the rural counties indicates the difficulty of attracting recent graduates to rural North Dakota’s counties.

Table 4.2
Percent of primary care physicians in North Dakota by age and area, 2017¹

	N	<35	35-44	45-54	55-64	65-74
Total	604	8.4	28.1	24.1	25.1	13.0
Metropolitan	411	9.0	33.1	26.8	22.1	10.0
Microopolitan	107	10.3	23.4	19.6	32.7	14.0
Rural	86	3.5	17.4	22.1	30.2	26.7

Table 4.2 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 than for rural, shown in Table 4.3.

Table 4.2
Age and area of primary care physicians per 10,000 population in North Dakota with comparisons, 2019^{1,7}

	N.D.	Upper Midwest	U.S.
<35	2.9	1.6	1.7
Metropolitan	2.8	2.1	1.9
Micropolitan	2.0	0.7	0.8
Rural	0.3	0.4	0.3
35-54	2.5	2.3	2.5
Metropolitan	4.5	2.8	2.6
Micropolitan	1.6	1.0	1.2
Rural	0.9	1.1	0.8
45-54	2.3	2.2	2.5
Metropolitan	2.5	3.0	2.6
Micropolitan	1.5	2.0	1.6
Rural	0.8	1.2	1.1
55-64	1.9	2.4	2.3
Metropolitan	2.5	2.6	2.4
Micropolitan	2.2	2.1	1.8
Rural	1.1	1.6	1.3
65-74	1.1	0.9	1.0
Metropolitan	1.1	0.9	1.1
Micropolitan	0.8	0.8	0.8
Rural	0.5	0.5	0.5
75+	0.1	0.1	0.2
Metropolitan	0.1	0.1	0.1
Rural	0.1	0.0	0.1

Table 4.4 shows that North Dakota has a lower 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 4.4
Practice base and area of primary care physicians per 10,000 population in North Dakota with comparisons, 2019^{1,7}

	N.D.	Upper Midwest	U.S.
Office	7.0	7.2	7.3
Metropolitan	9.6	8.2	7.8
Micropolitan	5.6	5.9	4.9
Rural	2.7	4.4	3.5
Hospital	1.5	1.2	0.9
Metropolitan	2.3	1.3	1.0
Micropolitan	0.6	1.0	0.7
Rural	0.7	0.8	0.5

Distribution by Origin

Four out of 10 (43.5%) primary care physicians in North Dakota graduated from the UND School of Medicine and Health Sciences (Figure 4.5). Figure 4.6 shows that nearly half (46%) 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 (62.4%) 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 (43.5%) primary care physicians in North Dakota graduated from the UND School of Medicine and Health Sciences”

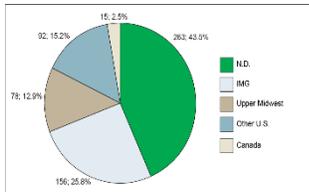


Figure 4.5. Locations where North Dakota primary care physicians graduated from medical school, 2017.
North Dakota's primary care physicians graduated from medical schools from all over the United States and the world. UND SMHS graduates account for 48.9% of practicing primary care physicians in North Dakota. MDs account for 28.8% and Canadian medical school graduates account for 4.4%. The rest of the Upper Midwest states account for 12.9% while the rest of the United States accounts for 15.2% (combined 28%) of North Dakota's primary care physicians.

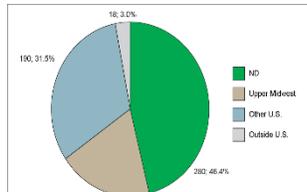


Figure 4.6. Locations where North Dakota primary care physicians completed their residency, 2017.
Nearly half (47.8%) of North Dakota's currently practicing primary care physicians completed their residency training in North Dakota. Primary care physicians who graduated from residency programs outside of North Dakota came from the Midwest (15.2%), other United States (31.5%), and Canada and other foreign (3.5%).

Table 4.5
Percent of ND primary care physicians who graduated from medical school in different states and where primary care physicians who graduated medical school in ND currently practice, 2017

Region/State	Medical Schools that ND Primary Care Physicians Graduated From		Where Primary Care UND SMHS Graduates are Currently Practicing		Net ND Migration Balance
	N	%	N	%	
ND	263	61	263	41	-
MN	36	8	124	19	-88
WI	4	1	31	5	-27
SD	9	2	19	3	-10
IA	19	4	6	1	+13
MT	0	0	24	4	-24
CA	7	2	15	2	-8
MO	17	4	4	1	+13
Other Midwest	30	7	29	5	+1
Other West	7	2	79	12	-82
Northeast	15	3	4	1	+11
South	26	6	42	7	-16
Total	433	100	639	100	-206

Table 4.5 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, 376 of the 639 graduates of the UND SMHS are primary care physicians practicing outside of North Dakota. However, 170 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 206 SMHS graduates to other parts of the United States. The largest number of SMHS graduates 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 4.6, 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 2013's 585 practicing North Dakota primary care physicians, 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 726 total North Dakota-trained residency graduates who are practicing, 434 (60%) practice in other states and 292 (40%) practice in North Dakota. Of North Dakota's total primary care physicians in 2017, 48% completed residency training in North Dakota.

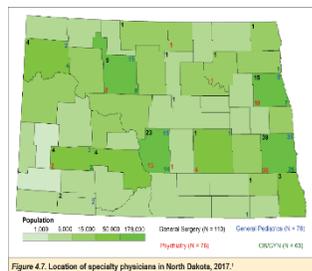
Table 4.6
Residency locations for ND primary care physicians and current practice state for physicians who completed a ND residency, 2017

Region/State	Where ND Practicing Physicians Completed Their Residency		Where Physicians Who Completed At Least One Residency in ND Currently Practice		Migration Into ND
	N	%	N	%	
ND	280	48	280	40	-12
WI	53	9	120	17	-67
WI	28	4	22	3	+6
CA	11	2	35	5	-24
NY	28	5	3	0	+25
SD	7	1	30	4	-23
MI	22	4	5	1	+17
TX	6	1	20	3	-14
Other Midwest	65	11	43	6	+22
Other West	25	4	103	14	-78
Other Northeast	24	4	12	2	+12
Other South	38	7	51	7	-13
Missing	0	0	2	0	-2
Total	585	100	726	100	+141

SPECIALTY CARE PHYSICIANS

Distribution by Geography

As can be seen in Figure 4.7, 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 with long travel times from 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 4.7). Overall, the majority of pediatricians and obstetrics and gynecologists specialists are female. In contrast, only about 11% of the general surgeons in North Dakota are female. However, the very small number of rural county general pediatricians (two) renders any meaningful analysis problematic. Metropolitan 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%) specialties.

Table 4.7
Percent of specialist physicians in North Dakota who are female, have hospital-based practices, and are IMGs, 2017¹⁷

	N	Female	% Hospital-Based Practice	% IMG
General Surgery	110	10.9	20.1	10.0
Metropolitan	81	11.1	28.4	9.9
Micropolitan	21	9.5	23.8	4.8
Rural	8	12.5	85.0	26.0
Psychiatry	76	47.4	26.0	32.9
Metropolitan	59	47.5	25.4	32.2
Micropolitan	14	50.0	35.7	42.9
Rural	3	33.3	0.0	0.0
Gen Peds	70	57.7	24.4	14.7
Metropolitan	59	57.5	27.1	14.9
Micropolitan	17	52.9	11.8	23.5
Rural	2	100.0	80.0	0.0
OB-GYN	48	61.9	23.0	4.8
Metropolitan	47	61.7	25.5	0.0
Micropolitan	14	64.3	21.4	7.1
Rural	2	90.0	0.0	100.0

Approximately 23% - 29% of specialty physicians work in hospital-based practice (Table 4.7). 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 4.8. General surgeons (57.3%) and psychiatrists (57.9%) are more likely to be in the 45- 64 age category whereas general pediatrics (62.8%) and OB-GYN (60.3%) are more likely found in the 35- 54 age category.

Table 4.8
Percent of specialists in North Dakota by age and area, 2017^{1,4}

	N	35-44	45-64	65-74
General Surgery	110	5.5	23.6	28.2
Metropolitan	81	4.9	25.9	28.4
Microcoltan	21	9.5	23.8	19.0
Rural	8	0.0	0.0	37.5
Psychiatry	76	11.6	15.8	31.6
Metropolitan	59	15.3	16.8	28.8
Microcoltan	14	0.0	14.3	42.9
Rural	3	0.0	0.0	33.3
Gen. Peds.	78	6.4	34.4	28.2
Metropolitan	59	6.8	40.7	27.1
Microcoltan	17	5.9	11.8	35.3
Rural	2	0.0	50.0	0.0
OB-GYN	63	7.8	36.5	23.8
Metropolitan	47	8.5	36.2	27.7
Microcoltan	14	7.1	35.7	14.3
Rural	2	0.0	50.0	0.0

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 4.8). The North Dakota ratio for general surgeons is slightly higher than the Upper Midwest but similar to the United States, and its ratio for general pediatricians is lower than for the nation.

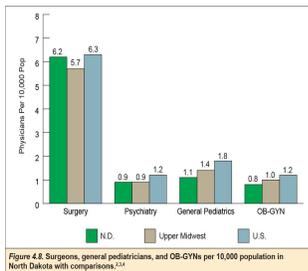


Table 4.9
Specialty physicians per 10,000 population in North Dakota by area with comparisons, 2015^{1,4}

	N.D.	Upper Midwest	U.S.
Surgery	6.2	5.7	6.3
Metropolitan	9.7	7.0	6.8
Microcoltan	4.2	4.5	3.7
Rural	1.3	1.7	1.6
Psychiatry	0.9	0.9	1.2
Metropolitan	1.5	1.1	1.3
Microcoltan	0.6	0.5	0.4
Rural	0.1	0.2	0.2
Gen. Peds.	1.1	1.4	1.8
Metropolitan	1.5	1.8	2.0
Microcoltan	1.1	0.8	0.9
Rural	0.1	0.2	0.4
OB-GYN	0.8	1.0	1.2
Metropolitan	1.1	1.2	1.3
Microcoltan	0.8	0.8	0.7
Rural	0.1	0.2	0.3

The specialists-per-10,000-population ratios by rural or urban status for 2015 are shown in Table 4.9. Across North Dakota and for each specialty, the rural counties have lower ratios than the micropolitan 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. Primary care physicians in rural counties are more likely to be older. In 2017, there were 604 direct-patient-care primary care physicians in North Dakota (364 family medicine, 162 general internal medicine, and 78 general pediatrics). North Dakota has a slightly lower 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 (61%) 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 2017, 46.4% completed residency training in North Dakota. Of North Dakota's total primary care physicians (including IMGs), 43.5% received their medical degree from the UND SMHS. Considering both North Dakota residency graduates and UND SMHS medical school graduates, 62.4% of North Dakota practicing primary care physicians received at least some of their training in North Dakota.

In 2017, there were 110 general surgeons, 76 psychiatrists, 78 pediatricians, and 63 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 FIVE: Nursing Workforce in North Dakota

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

INTRODUCTION

This is the inaugural edition of the complete nursing workforce chapter for the *Fifth Biennial Report*. This project 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 also a unique state in that the rural nature of our healthcare systems provide more opportunity for progressive innovation of healthcare workforce roles.

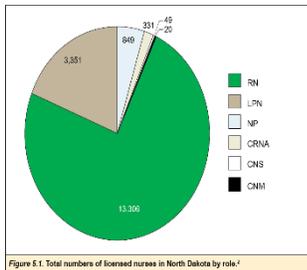
To demonstrate the nursing roles as clearly as possible this biennium, we have used multiple data sources. Licensure data from the ND Board of Nursing (NDBON), dated January of 2018, provides an account of all nurses licensed in ND as of that date. ND nurses renew licensure every other year by December 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 2016-17, 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 2018. 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 2,500.¹

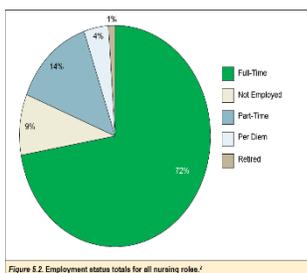
Additional limitations with the licensure data include the self-reporting of information. Individuals did not always enter their educational information appropriately. Employer setting and employer practice area may have been misinterpreted by the individual as there are no clear definitions given in 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 by our team 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 over 17,000 licensed nurses. These include 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 is delineated in Figure 5.1. These roles are all reported separately in later sections of this document.



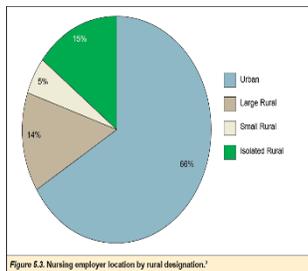
Most (72%) of the nursing workforce in ND is employed full-time. Approximately 18% of nurses are employed part-time or per diem, with roughly 10% unemployed or retired (Figure 5.2). Per diem nurses are defined as nurses who are on the payroll, but may not be regularly scheduled, working flex-time or in an on-call status.

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



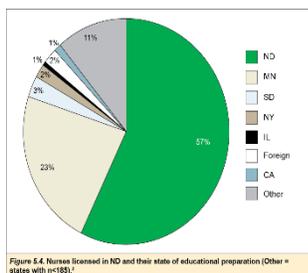
North Dakota is a very rural state with only four areas, encompassing six counties, in the urban classification. Approximately two-thirds of nurses licensed in North Dakota are employed in an area classified as urban. The remaining third are in rural areas. Interestingly, more nurses are employed in isolated rural areas than in areas with a large or small rural designation (Figure 5.3). In relation, the distribution of the population of ND is 51% urban, 21% large rural, 6% small rural, and 22% isolated 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 57% of nurses currently licensed in the state. Minnesota nursing programs are a distant second with 23%. Ultimately, 83% of ND nurses are educated regionally, defined as ND, MN, or SD here (Figure 5.4).

“Overall, North Dakota nursing programs have educated 59% of nurses currently licensed in the state.”



HOSPITAL AND NURSING FACILITY WORKFORCE SURVEY RESULTS

For this *Fifth Biennial Report*, the North Dakota Hospital Workforce Survey was performed. It provides new 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 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*.

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.

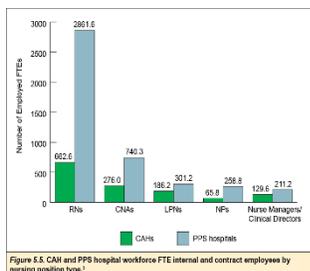
Significant nursing shortages for the hospitals can be ominous for other employment situations because the hospitals are often able to provide higher wages and better job conditions than other employers. Systemic shortages of nurses across North Dakota hospitals are significant in and of themselves because 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, salaries hospitals are willing to pay, availability of employed and unemployed nurses looking for positions, local community conditions and opportunities, the physical condition of the hospital, working conditions, and so forth. 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 5.5 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 type 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

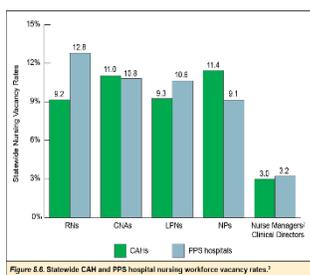
due to the fact that CAHs provide fewer healthcare services, and average facility size is smaller than PPS hospitals. As a result, CAHs employ fewer nursing staff than PPS hospitals.



North Dakota’s December 2017 statewide vacancy rates for the nursing workforce at the CAH and PPS hospitals are presented in Figure 5.6. 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.

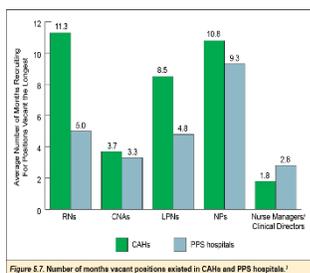
As seen in Figure 5.6, vacancy rates for some of the nursing workforce could be considered high at or above 11%: RNs (12.8%) for PPS hospitals; CNAs (11%) and NPs (11.4%) for CAHs. Clearly, the large number of RN, CNA, LPN, and NP vacancy rates are concerning for the clinical care provided at the facilities. 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.”

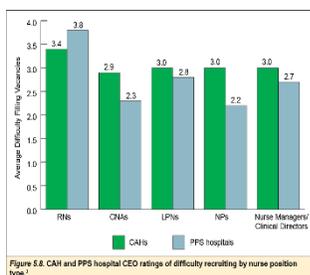


The CAH and PPS hospital CEOs were asked the number of months the facility spent recruiting for vacant nursing workforce positions vacant the longest. Figure 5.7 presents the average number of months spent recruiting for RNs, CNAs, LPNs, NPs, and Nurse Managers/Clinical Directors. For both CAHs and PPS 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.



All 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 5.8, 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 5.8, 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.⁴ NPs can work independently under the exclusive licensure authority of North Dakota's State Board of Nursing.⁴ 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.

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." 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 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 5.9. 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 5.9, vacancy rates for some of the nursing workforce are considered high at or above 11%: NPs (19.2%) and RNs (13.1%). Vacancy rates for CNAs (8.9%), LPNs (10.5%), and Nurse Managers (4.1%) are present, but not considered high. These vacancy rates translate into the following number of FTE vacancies (Figure 5.10): 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.

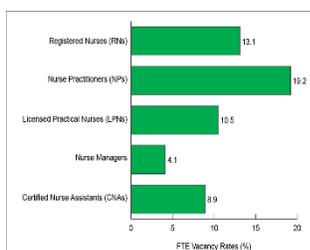


Figure 5.9. Statewide nursing facility workforce vacancy rates.¹

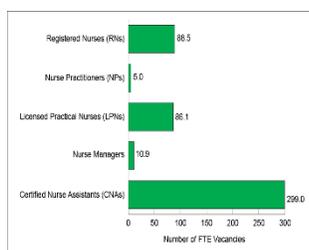


Figure 5.10. Statewide nursing facility workforce FTE vacancies by nursing position type.¹

Figure 5.11 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.

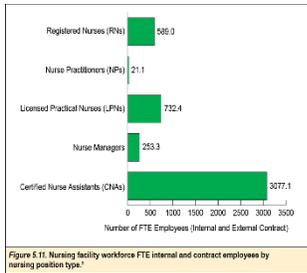
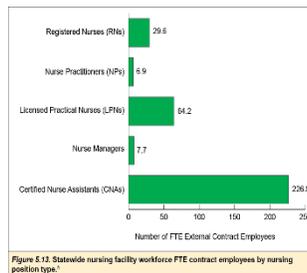
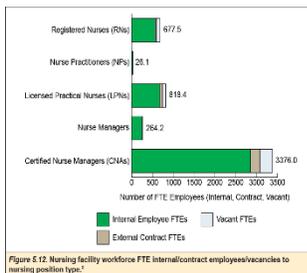


Figure 5.12 is more complex than the first three figures as it shows FTEs for the nursing staff types across three categories: 1) internal employees, 2) external contract employees, and 3) vacancies for which nursing facilities are recruiting nursing candidates to fill. External contract nurses are of 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 5.13. 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.

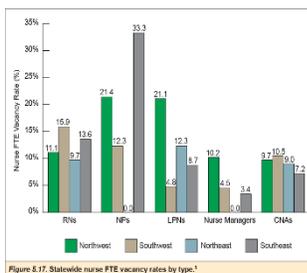
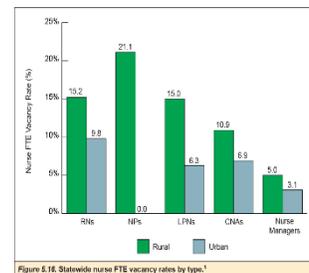
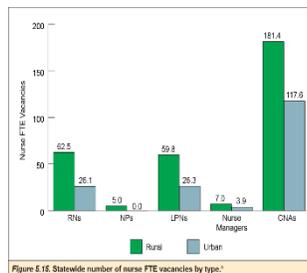
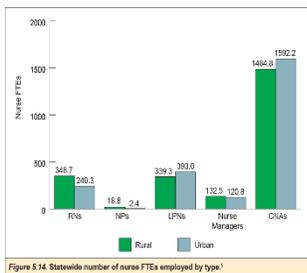


Examining the nursing facility workforce at the aggregated state level misses many of the important intrastate variations in factors such as vacancy rates. Figure 5.14 shows rural and urban differences in the numbers of employed FTEs for four types of nurses: NPs, RNs, LPNs, and CNAs. Neither rural nor 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 5.15. 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).

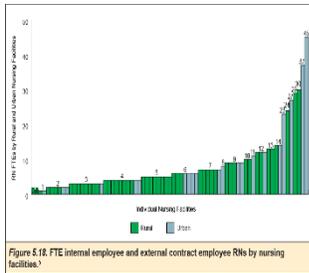
The FTE vacancy rate percentages for the nurse categories are displayed in Figure 5.16. For each of the four nurse types, the rural FTE vacancy rates were higher than for urban. The LPN FTE rural rate of 15% was more than twice as high as the associated urban rate. Clearly, rural nursing facilities are 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.”

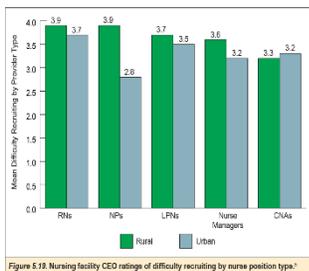
In Figure 5.17, North Dakota’s regional variations in vacancy rates for types of nurses are presented. The NP results in Figures 5.15, 5.16, and 5.17 should be considered with caution because of their low numbers (Figure 5.14). However as compared to other nursing types, fewer NPs are necessary for providing 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 5.18. 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 5.19, 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 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 2016-2017 *North Dakota Board of Nursing Education Annual Report*.

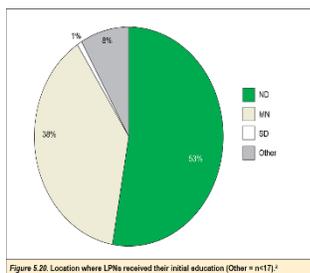
Licensed Practical Nurses (Licensed Vocational Nurses)

Licensed Practical Nurses or Licensed Vocational Nurses (LPNs/LVNs) work at North Dakota's various healthcare facilities, such as hospitals, clinics, and 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.⁶ 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.⁶ The administration and management of nursing by the licensed practical nurse includes assigning and delegating nursing interventions.⁶ Unlicensed assistive persons complement the licensed nurse in the performance of nursing interventions but may not substitute for the licensed nurse.⁶ 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.⁶ 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 2017, there were a total of 3,351 LPNs in North Dakota. 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 (1,774/53%) or Minnesota (1,271/38%) (Figure 5.20). There are fewer LPNs than

Registered Nurses (RNs) in the state since many LPNs continue their education to become RNs. Each year more students graduate from nursing education programs 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 a few 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 in the state’s healthcare workforce. There should be increased effort to recruit 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 eight NDBON-approved practical nurse education programs.⁷ Two of these programs are located at tribal colleges (Sitting Bull College, United Tribes Technical 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, and 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. Graduates from all programs can apply to take the NCLEX-PN examination to become LPNs. Table 5.1 provides information on total enrollment, admissions, and graduates for these programs over the past 5 years.⁸ 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 5.1). A possible explanation for a decrease in graduates is the closing of the practical nursing programs at Fort Berthold Community College in fiscal year 2014-2015 and Turtle Mountain Community College in fiscal year 2016-2017. Closing of the programs could be one factor causing a decline in the state’s number of practical nursing graduates.

Efforts to alleviate the rural and urban nursing shortage must include support for the state’s practical nursing programs. In addition, 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. Enrollment numbers in these programs should increase to meet the current

demand. In addition, retaining all practical nursing graduates and 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 2017, the state’s nursing programs graduated 147 practical nursing graduates (Table 5.1). Based on the 2016 North Dakota Nursing Facility Workforce Survey, these facilities reported 86.1 LPN FTE vacancies (Figure 5.10) and the remaining graduates could help fill the CAHs and PPS hospital LPN vacancies (Figure 5.6).

Practical Nursing Program Trends	FY 2012-2013	FY 2013-2014	FY 2014-2015	FY 2015-2016	FY 2016-2017
Program Admissions	241	266	223	257	275
Total Enrollment	339	354	348	356	379
Graduate/Certificate Program Graduates	109	93	97	91	92
Associate Degree Program Graduates	97	82	78	79	55
Total Graduates	206	175	175	170	147

Information provided is from the 2016-2017 NDSN Nursing Education Annual Report

LPN Employment Settings

North Dakota’s LPNs have identified several areas they currently practice (Figure 5.21). Practice areas are a part of the actual healthcare facility or employment setting. Healthcare facilities can contain several practice areas. The largest number of LPNs (1,346) identified the area “other” as their main practice area. The area of geriatrics was identified as the second most common area of practice (802 LPNs). It is possible that a large number of LPNs practice in geriatrics since many are employed at nursing facilities. It is difficult to determine the “other” areas. However, “other” could be an area not identified in the areas included in Figure 5.21.

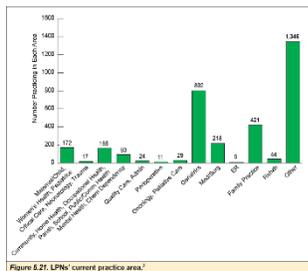


Figure 5.22 illustrates the employment setting for North Dakota’s LPNs. Employment setting is related to the specific type of healthcare facility. The majority of LPNs practice at inpatient facilities – nursing homes and hospitals (1,316) with nursing homes being the highest employer at 876 LPNs with the remaining 440 LPNs employed at hospitals. Outpatient facilities were second to inpatient facilities at 969 LPNs, followed by physician offices at 645 and ambulatory care at 324.

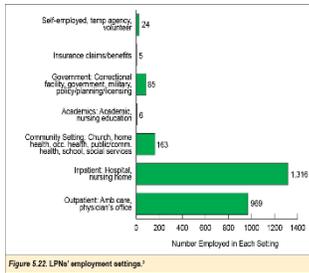


Figure 5.22. LPNs' employment settings.⁷

The state's LPNs vary in employment status as either full-time, part-time, not employed, retired, per diem, or volunteer (Figure 5.23). Most indicated that they are working full-time (2,143/64%) in their current practice. However, 507 (15%) LPNs are not employed (almost as many were employed part-time), adding further to the nursing shortage. Retired LPNs include 34 nurses who are not working, but still maintain their license. Further studies must explore reasons why the LPNs choose not to be employed and/or maintain a license as a retired LPN. Reemployment of these licensed LPNs could decrease the state's LPN vacancies.

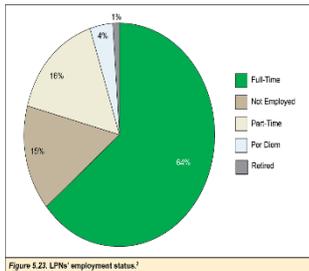


Figure 5.23. LPNs' employment status.⁷

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 (1,883/57%) are working at a facility that is considered urban based on the assigned RUCA code (Figure 5.24). However, only 420 fewer LPNs are employed in a rural area (1,463/43%).

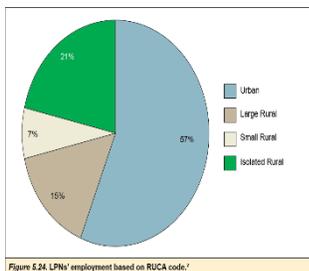


Figure 5.24. LPNs' employment based on RUCA code.⁷

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 2017, the majority of the state's LPNs (3,072/91.67%) are licensed exclusively in North Dakota (Table 5.2). LPNs that

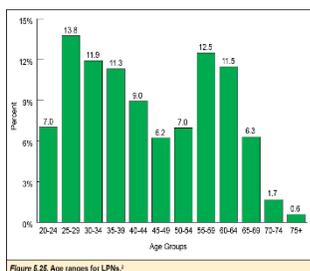
maintain multiple licenses could be contract nurses working at various rural and urban healthcare facilities. Rural and urban facilities hire contract LPNs to help fill vacant positions.

Table 5.2
Number of states in which LPNs are licensed^a

n = LPNs	Number of States Licensed	Percent
3,072	1	91.67
243	2	7.25
20	3	0.60
13	4	0.39
1	8	0.03
1	20	0.03
1	35	0.03

Other LPN Demographics

The age of state LPNs vary. Although the majority of the North Dakota’s LPNs are in the 25-29 age group, the average age of the state’s LPNs is 44.3 years old (Figure 5.25). The state’s LPNs are aging, with 518 (15.46%) of LPNs reporting their age at 62 years and older. 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 ways to meet the workforce needs of the older LPN so that they maintain employment as long as possible and assist with filling vacant positions.

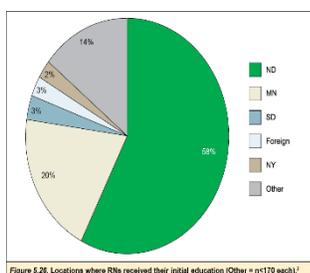


Registered Nurses

Registered Nurses (RNs) work at North Dakota’s various healthcare facilities, such as hospitals, clinics, and 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.⁹ It is not the setting or the position title that determines a nursing practice role, but rather the application of nursing knowledge.⁹ Through the application of the nursing process, the RN practices nursing independently and interdependently.⁹ RNs also practice nursing dependently through the execution of diagnostic or therapeutic regimens prescribed by licensed practitioners.⁹ The administration and management of nursing by RNs includes assigning and delegating nursing interventions that may be performed by others.⁹ The

RN practices within the legal boundaries for nursing through the scope of practice authorized in the Nurse Practices Act and rules governing nursing.⁹

As of December 2017, there were a total of 13,306 licensed RNs in North Dakota. 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 proceed through 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. However, the majority of the state's RNs earned their degrees in North Dakota (7,636/58%) followed by Minnesota (2,618/20%), and various other states. In addition, some of the states in which larger numbers of RNs were initially educated include South Dakota (454), a foreign country (367), and New York (329) (Figure 5.26).



North Dakota's Registered Nurse Education Programs

North Dakota currently has 14 NDBON-approved registered nurse education programs.¹⁰ All graduates are eligible to take and pass the RN NCLEX exam required for initial RN licensure. Four of the state colleges collaborate together and are a 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. Table 5.3 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 5.3) includes some RNs already practicing who earned a previous diploma or Associate Degree prior to their initial RN licensure. While total enrollment overall has increased in these programs the past 5 years, the number of graduates has remained stable. The Baccalaureate programs have had the largest increase in admissions; however, it may take a few years to see the impact on the total number of graduates. These Baccalaureate programs vary on the year they officially admit their students to the nursing programs. In addition, another state university, Mayville State, offers an RN – BSN program. RNs enrolled in the program are already practicing RNs and enroll in their online program to obtain a Baccalaureate degree. Data for Mayville State University’s graduates is not included in the *NDBON Nursing Education Annual report*. Efforts to alleviate the rural and urban nursing shortage must include support for the state’s registered nursing programs. In addition, high school students and community members should be encouraged to pursue a registered nursing education and remain in the state after graduation to practice as an RN. The state’s nursing education programs could consider giving priority to the state’s residents for admission to their programs. More incentives must be implemented to keep the RNs practicing in the state after graduation. In FY 2016-2017, 591 total registered nursing students graduated from North Dakota’s nursing programs (Table 5.3). Some of these graduates are already licensed as RNs, but some are not. These graduates would have a definite impact on the RN vacancies if they remained practicing in the state.

Table 5.3
North Dakota's registered nurse program 5 year trends¹⁾

Registered Nurse Program Trends	FY 2012-2013	FY 2013-2014	FY 2014-2015	FY 2015-2016	FY 2016-2017
Associate Degree Program Admissions	115	123	122	114	122
Baccalaureate Degree Program Admissions	503	540	587	590	639
Total Enrollment	1363	1411	1628	1564	1584
Associate Degree Program Graduates	125	112	106	100	103
Baccalaureate (BSN) Program Graduates	479*	499*	471*	489*	488*
Total Graduates	604	611	577	589	591

Information provided is from the 2017 NDBON Nursing Education Annual Report
Note total includes Basic BSN, LPN to BSN, Diploma to BSN, and ADN to BSN

RN Employment Settings

North Dakota’s RNs have identified several areas they currently practice (Figure 5.27). Healthcare facilities and settings can contain several practice areas. The largest number of RNs (4,634) identified the area of “other” as their main practice area. It is difficult to determine exactly what “other” would indicate; however, one could include that “other” would be any of the areas not classified below in Figure 5.27. Medical/Surgical was the second most common area (1,622). Medical/Surgical practice areas can be found mainly in hospitals and outpatient surgery centers.

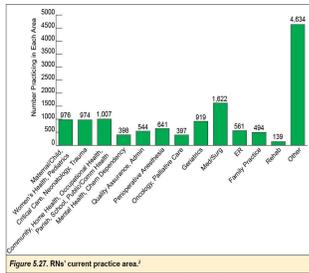


Figure 5.27. RNs' current practice area.⁷

Figure 5.28 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 6,898. However, unlike the LPN workforce most RNs identified that they work in hospitals (5,884) with nursing homes (1,014) included in the rest of the inpatient facility total. 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) (1,800) were identified by RNs as the second most common employment setting. These findings are expected because of the increased utilization of clinics and outpatient settings for patient care.

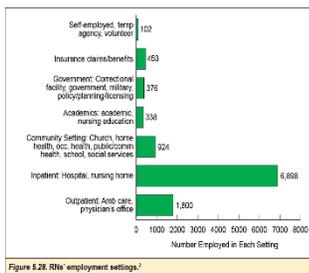


Figure 5.28. RNs' employment settings.⁷

The state's RNs vary in employment status as either full-time, part-time, not employed, retired, per diem, or volunteer (Figure 5.29). Most indicated that they are working full-time (9785/74%) in their current practice. More RNs are working full-time as compared to LPNs (64%). Of interest to note is that 1,061 (8%) of the state's RNs are not employed (almost as many as are working part-time: 1,725) exacerbating the nursing shortage. Retired RNs include 132 nurses who are not working, but still maintain their license. Further studies must explore reasons why the RNs choose to not be employed, work part-time, volunteer, and maintain a license as a retired RN.

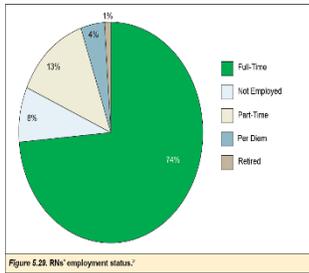
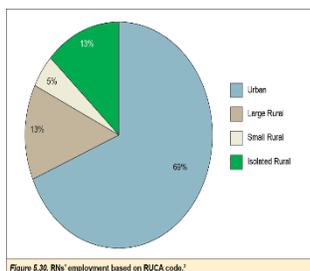


Figure 5.29. RNs' employment status.⁷

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 (9,112/69%) are working at a facility that is considered urban based on the assigned RUCA code. The remainder work in one of the rural areas (4,160/31%) (Figure 5.30).

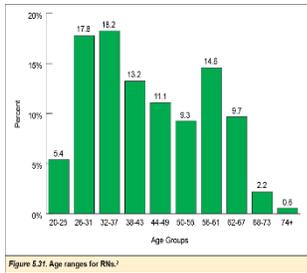


RNs can apply for licensure in more than one state so that they can concurrently practice in several states. The RN may choose to have more than one license because he or she lives on a state border, works under contract, or maintains a residence in more than one state. As of December 2017, the majority of state RNs (10,686/80.31%) are licensed exclusively to practice in ND (Table 5.4). Note that 630 RNs maintain a license in 5 or more states. 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 states included in the compact agreement. Currently there are thirty 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.¹¹

n = RNs	Number of States Licensed	Percent
10,686	1	80.31
1,604	2	12.65
302	3	2.27
64	4	0.63
630	5 or more	4.73

Other RN Demographics

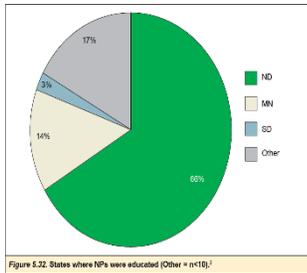
The age of North Dakota's RNs vary, with the majority of state RNs in the age range of 32 - 37 years (Figure 5.31). The average age of the state's RNs is 43.6 years old. In addition, the state's RNs are aging with 1641 (12.33%) RNs reporting their age at 62 years and older. It appears RNs are working in their retirement years, but could retire soon, further contributing to the state's nursing shortage. Further studies are needed to explore reasons RNs continue to work when eligible for retirement and ways to meet the workforce needs of the older RN so that they maintain employment as long as possible to 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 Master's 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."⁴ NPs can work in primary care, specialty care, inpatient, outpatient, and many other practice areas. NPs can work independently in many states and are a significant addition to many interprofessional healthcare teams.

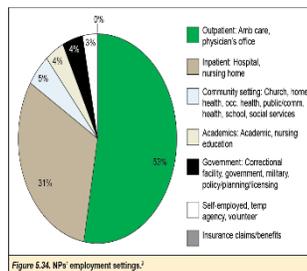
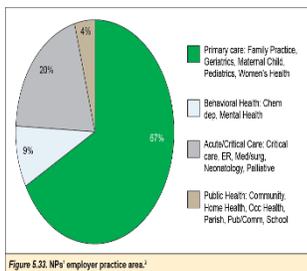
There are currently 248,000 NPs licensed in the U.S.¹² Approximately 23,000 new NPs complete their graduate degrees per year. Eighty-seven percent of NPs are certified in a primary care area, 85% accept Medicare patients, and 82% accept Medicaid patients.¹³ NPs hold prescriptive authority, including controlled substances in all 50 states and Washington, D.C.¹⁴ NPs provide increased access to primary care, especially with rural and underserved populations. There are currently 849 NPs licensed in ND, an increase of 14 since data collection in August of 2016. 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. Of the currently licensed NPs in ND, 66% were educated within the state. Eighty-six percent of NPs licensed in ND were educated regionally, including in ND, SD, MN, MT, NE, WY, and IA. Only 3 NPs were listed as educated outside the U.S (Figure 5.32). Evidence shows 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.¹⁵ North Dakota currently has three Colleges or Universities that offer the nurse practitioner graduate degree (Table 5.5). It is a nationwide issue to have limitations on enrollment in nursing educational programs. This is primarily due to lack of qualified faculty and availability of clinical preceptors. The shortage is evident in North Dakota as well, with 34% of RNs seeking NP training out of state. Some of these NPs will attend primarily online schools but still need to have a preceptor near their home.



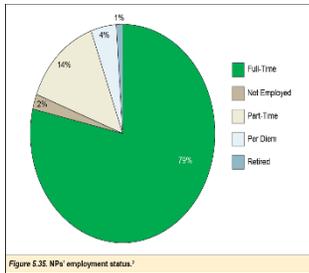
University	Degree	Program	2016	2017
North Dakota State University	Doctor of Nursing Practice	Family Nurse Practitioner	11	11
University of Mary	Doctor of Nursing Practice	Family Nurse Practitioner	8	25
University of North Dakota	Master of Science	Family Nurse Practitioner	26	29
		Adult-Geriatric Primary Care Nurse Practitioner	13	8
		Psychiatric & Mental Health Nurse Practitioner	8	13
Total			66	84

NPs were originally created to be 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.¹⁶ Sixty-seven percent of NPs licensed in ND are working in primary care areas such as family practice, geriatrics, maternal/child, pediatrics, or women's health. Twenty percent are in acute specialty care, 9% work in behavioral health, and 4% in a public health practice (Figure 5.33). Additionally, 53% of NPs practice in an outpatient setting, 31% inpatient or long-term care, and the remainder in a community, government, or academic setting (Figure 5.34).

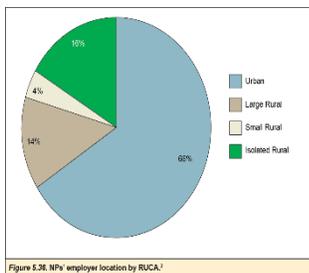
“Sixty-seven percent of NPs licensed in ND are working in primary care areas such as family practice, geriatrics, maternal/child, pediatrics, or women’s health.”



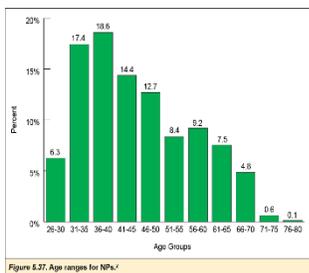
Seventy-nine percent of the NPs in ND are primarily employed full-time. Eighteen percent are either part-time or per diem (flex time), and 3% are either unemployed or retired (Figure 5.35). With such a high demand for NPs, especially in rural primary care areas, it is not uncommon to see such a large component of NPs employed full-time. With the data collection as-is, the NPs can only select an option 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 NP may still contribute through short-term assignments, volunteer status, or other means of providing care.



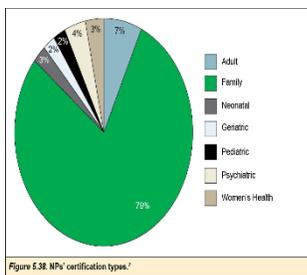
North Dakota NPs are largely urban as most large healthcare facilities are in the state's four urban hubs (Figure 5.36). It is interesting that of the rural designated areas, NPs are highest in the isolated rural areas. As in other states with full scope of practice for NPs, this is a trend. In fact there are 21.4 NPs per 100,000 population in rural areas of full practice states and only 13.9 NPs per 100,000 population in the urban areas of these states.¹⁶ 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.¹⁷ North Dakota's NPs are leading the nation in their service to our rural communities. NPs can practice independently and do so in their rural home areas.¹⁸



The average age of the North Dakota NP is 45 years (Figure 5.37). As with other nursing roles, NPs tend to have a higher percentage of licensed providers in the younger age groups. Fifty percent of NPs licensed in ND are between the ages of 31 and 45. There are a few possible explanations for this. The NP profession was not officially recognized until 1965, and is still working on becoming mainstream with only 22 states having full scope of practice. Likely, there are fewer NPs age 55 and older not only due to retirements, but overall fewer NPs in the field during that genre. The lower numbers of under 30-year-old NPs could be a result of the BSN availability and at least one year of experience required for most NP educational programs. Typically, the youngest any NP could be, if following a traditional path and moving quickly through the process, is age 25.



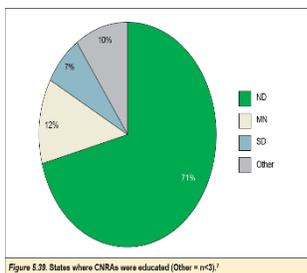
Most area NPs are certified as Family Nurse Practitioners (79%) (Figure 5.38). The heavy reliance on family NPs in North Dakota is likely due to their ability to care for patients across the lifespan. Having many rural facilities in the state, it is most cost effective to employ one provider who can care for all ages. However, the adult and adult-geriatric certification is becoming more of a necessity, as are the psychiatric-mental health NPs. The aging population and increased behavioral health needs can be best served by these two groups. 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 care for all ages with chronic and acute illnesses, as well as prevention, the adult-geriatric and psychiatric NPs are needed for the high-acuity patients and to consult with primary care providers in ways to best treat these types of patients.



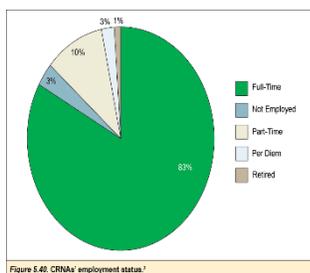
Certified Registered Nurse Anesthetists (CRNAs)

“CRNAs are oftentimes the sole anesthesia providers in rural settings.”

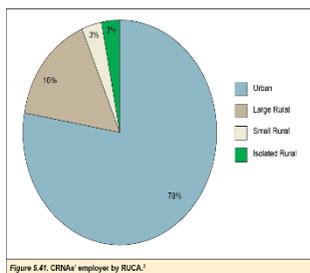
CRNAs are advanced practice registered nurses who administer anesthetics to patients undergoing procedures needing anesthesia and/or pain management. These services include pre-anesthesia evaluation, administering the anesthetic, monitoring and interpreting the patient’s vital signs, and managing the patient throughout the procedure.¹⁹ CRNAs practice in multiple settings, including hospitals, ambulatory surgical centers, and outpatient offices.¹⁹ CRNAs are oftentimes the sole anesthesia providers in rural settings. North Dakota currently has 331 licensed CRNAs. Seventy-one percent of the CRNAs licensed in ND were educated at the University of North Dakota, in the state’s sole anesthesia education program. Overall, 92% of CRNAs are educated within the region, including ND, SD, MN, IA, MT, and NE (Figure 5.39).



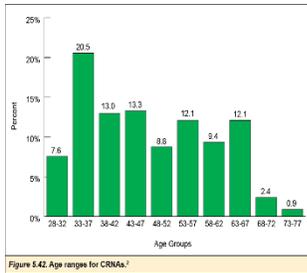
The University of North Dakota has the state's sole CRNA educational program. This has been a Master's degree until the most recent admissions cycle, when the program transitioned to the Doctorate of Nursing Practice (DNP) degree. The program typically graduates 12 new CRNAs yearly, as reflected in the most recent NDBON.⁸ Per the licensure data gathered from the NDBON, 94% of CRNAs licensed in ND are currently working in anesthesia, the remainder are designated as "other" for practice area. Eighty-five percent of the CRNAs licensed in ND work in a hospital setting, 5% are in ambulatory care, 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 (Figure 5.40).



Because most CRNAs are hospital-based, the majority are located in an area designated as urban (78%) (Figure 5.41). However, CRNAs are typically the sole anesthesia provider in rural locations throughout the U.S. Nationwide, 18.6% of CRNAs practice in rural counties whereas only 8.4% of anesthesiologists do so.²⁰ With a much larger proportion, as compared to the nation, (22%) of the CRNA workforce in rural locations, 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 for no CRNAs under the age of 28 in ND. The average CRNA age is 47.5 currently (Figure 5.42). There is slightly less variability in the working 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.²¹ 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.²¹ There are currently only 20 CNMs licensed in North Dakota: 11 are employed in an ambulatory setting or physician's office, 6 are hospital-based, and the remaining 3 are employed in nursing education, community health, or government settings. All 20 CNMs are currently employed, 80% full-time, 10% part-time, and 10% per diem. Eleven of 20 CNMs list ND as the state where they received their education; overall 75% were educated in the region including ND, SD, MN, and MT. There is currently no CNM educational program available in ND. Thirty-five percent of the CNMs are employed in an area designated as rural, the highest rural percentage of all APRN types in ND. The average age of CNMs licensed in ND is 50.

While 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 fewer than 120 obstetricians in ND, all in the major urban centers. 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, pregnancy and delivery care is a definite need area in the state.

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, or 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.²² North Dakota has 49 licensed CNSs, 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". Sixty-five

percent of CNSs are employed full-time, 31% part-time or per diem, and the remainder are unemployed. CNSs are largely employed in urban areas of the state (67%), which is roughly reflective of the aggregate. Thirty-four of the 49 CNSs were educated in ND. There is no longer a CNS educational program in North Dakota since the UND adult-geriatric CNS program closed in the past four years. CNSs can be certified in multiple areas, as can NPs. In ND 57% of the licensed CNSs are certified as psychiatric, providing much needed behavioral health care, many at the human service centers and inpatient facilities. Thirty-one percent 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 58. 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 overburdened and not always able to provide the level of care needed for these two populations. CNSs could fill this gap.

Number of Nurses Compared with Other States

When compared to other states, North Dakota has a higher ratio of nurses per 10,000 population. In 2013, North Dakota's ratio of RNs per 10,000 population was seventh highest among the 50 states at 115.7 (national mean of 92.1) (National Center for Healthcare Workforce, 2013). North Dakota ranks first for LPNs per 10,000 population among the 50 states at 42.1 per 10,000 (national mean was 22.5).²³ 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 state are not considered.

“When compared to other states, North Dakota has a higher ratio of nurses per 10,000 population.”

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 North Dakota 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.²⁴ 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 North Dakota. Again, unequal distribution is seen with heaviest employment of CNMs on the coasts.²⁴ 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 2017, there were 248,000 certified NPs in the U.S. with a mean age of 49.¹² Family NPs make up 60.6% of the overall NP population. Overall, 86.6% of NPs are certified in an area of primary care and 78.8% of all NPs practice in a primary care area.¹² 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.¹⁶ States with full practice authority also tend to have higher numbers of NPs in rural areas.¹⁶ In ND there are 843 NPs with an average age of 45, a smaller number but significantly younger group than nationwide. Ninety-three percent of NPs in ND are certified in an area of primary care, well above the national average; however, only 67% of state NPs currently work in a primary care area. There is a larger percentage (20%) of NPs employed in acute or critical care areas in ND than across the U.S. This may be attributed 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. The North Dakota Board of Nursing is currently using a Minimum Nurse Supply Data Set. However, there is a national nursing data system that would provide a more comprehensive data collection upon licensure and re-licensure of the state's nursing workforce. Unfortunately, this system is cost prohibitive at this time. Use of the national data set could 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 new information from the *2016 North Dakota Nursing Facility Survey and the 2017 North Dakota Hospital Workforce Survey* indicates that the number of nursing staff (RNs, LPNs, CNAs, NPs, Nurse Managers) employed at North Dakota hospitals (PPS and CAHs) and nursing facilities are the highest when compared to other individual healthcare professionals. In fact, healthcare facilities in rural and urban areas many times employ the largest number of individuals in their areas. Of interest is that CNAs account for the largest number of the employed nursing workforce at nursing facilities. However, clearly each type of nursing staff is an important member of the interprofessional healthcare team since each is licensed to perform similar and different roles and responsibilities.

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.

“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 and rural facilities have a greater difficulty filling vacant positions.”

There are numerous practical nursing and registered nursing education programs in the state. Some programs are in rural areas. 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, they could more positively impact the number of vacant nursing positions. Most of the state's nursing workforce receives its initial education in the state. However, many receive initial education from outside the state. Future studies should explore reasons why the state's nursing education program graduates remain in and leave the state to practice. Results should be disseminated to healthcare facilities, nursing education programs, and policymakers. More incentives should be provided by the state and healthcare facilities to keep nurses practicing in the state and recruit nurses from other states.

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Chapter 6: Psychiatrists, Behavioral Health, and Non-Physician Healthcare Workforce

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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.

PSYCHIATRISTS

Psychiatrists are behavioral health professionals who hold a degree in medicine and completed a residency training program in psychiatry, in other words they specialized in behavioral health. They are able to make diagnoses of behavioral health conditions as defined by the Diagnostic and Statistical Manual of Mental Disorder 5th Edition (DSM-5) and are also able to prescribe various medications for the treatment of behavioral health conditions. As psychiatrists are medical doctors, they must follow the licensure requirements for the North Dakota Board of Medicine. These requirements include obtaining a Doctor of Medicine or Doctor of Osteopathy degree, successful completion of any post-graduate training, successful completion of a medical licensure examination, the capability to practice medicine in a manner acceptable to the board, and maintain a practice history free of any discipline from the North Dakota Board of Medicine or other state board of medicine. In North Dakota there are 88 psychiatrists that are licensed to practice in North Dakota. The ratio of psychiatrists is 1.16 psychiatrists per 10,000 North Dakota residents.¹

Demographics

Age

The average age of a psychiatrist in North Dakota is 51 years and 5 months (SD = 12 yrs and 9 mos). This is slightly older than the average age of direct patient care physicians in North Dakota, which is 50 years and 8 months.¹

Gender

Forty-seven (53.4%) psychiatrists are men and 41 (46.6%) are women. This is dissimilar from the gender distribution of direct patient care physicians in North Dakota, which includes 70.7% male and 29.3% female.¹

Education

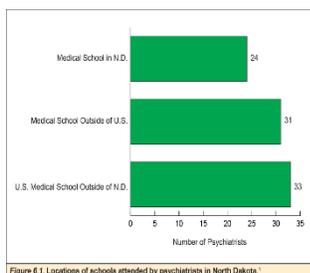
Educational Attainment

The majority (n = 79, 89.9%) of psychiatrists hold a Doctor of Medicine (M.D.) degree while nine (10.2%) hold a Doctor of Osteopathic Medicine (D.O.) degree.¹

State or Country of Education

Most of the psychiatrists who work in North Dakota graduated from US medical schools outside of North Dakota (n = 33, 37.5%), followed by those who graduated from

medical schools outside of the US (n = 31, 35.2%), and those who graduated from the University of North Dakota (n = 24, 27.3%) (Figure 6.1).¹



Number of Years since Graduation

Psychiatrists working in North Dakota graduated from medical school, on average, 23 years and 1 month ago (SD = 12 yrs and 3 mos).¹

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

Practice Characteristics

Primary Workplace

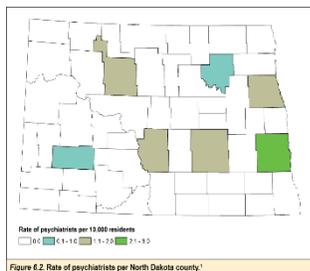
Of the psychiatrists working in North Dakota, nine (10.2%) work in residential settings, 70 (79.6%) work in direct patient care settings, and nine (10.2%) work in other settings.¹

Primary Specialty

Most psychiatrists (n = 68, 77.3%) in North Dakota list psychiatry as their specialty followed by child psychiatry (n = 19, 21.6%). Only one lists addiction psychiatry as their specialty.¹

Rural-Urban Status of Primary Workplace

The majority of psychiatrists in North Dakota work in urban settings (n = 74, 84.1%) (Figure 6.2).¹



PSYCHOLOGISTS

Psychologists are licensed mental health professionals who can treat people with various types of mental illnesses through therapy and are also trained to administer and

interpret various psychometric tests and/or assessments to assist in the diagnosis of mental illnesses. Psychologists hold a doctoral degree in psychology, usually a PhD or a PsyD. The licensure requirements for a psychologist in North Dakota includes adherence to the American Psychological Association (APA) standards and ethics, a doctoral degree from an accredited APA program, completion of at least 2 years of supervised professional experience, and successful completion of both the written and oral examinations. There are 204 licensed psychologists working in North Dakota or 2.7 per 10,000 North Dakota residents.²

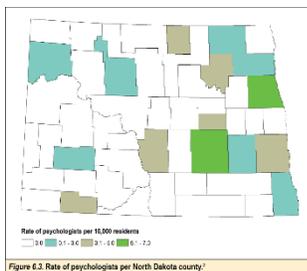
Practice Characteristics

Number of Years Licensed

Psychologists in North Dakota have been licensed for an average of 14 years and 2 months (SD = 10 yrs and 8 mos).²

Rural-Urban Status of Primary Workplace

The majority of the psychologists who work in North Dakota work in urban settings (n = 153, 75%) (Figure 6.3).²



COUNSELORS

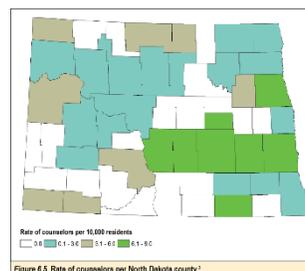
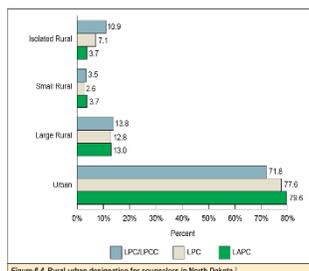
Counselors are licensed behavioral health professionals who treat behavioral health conditions through individual, family, or group therapy. The licensure requirements for counselors in North Dakota include a master's degree in counseling from an accredited school or college, completion of the National Counselors Examination for Licensure and Certification, at least two years of supervised experience, professional recommendations, and a statement of intent to practice which describes the purpose of the license. There are 385 licensed counselors working in North Dakota. Most are licensed as licensed professional clinical counselors (LPCCs) (n = 175, 45.4%), followed by licensed professional counselors (LPCs) (n = 156, 40.5%), and licensed associate professional counselors (LAPCs) (n = 54, 14.03%). Seventy (40%) LPCCs and 12 (7.7%) LPCs work as supervisors.³

Practice Characteristics

Rural-Urban Status of Primary Workplace

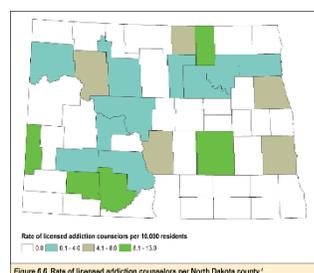
Most counselors work in urban settings with 71.8% of LPCCs (n = 125), 77.6% of LPCs (n = 121), and 79.6% of LAPCs (n = 43) all working in an urban setting (Table 6.1, Figure 6.4, Figure 6.5).³

License Level	RUCA Four	N	%
LAPC	Urban	43	79.63
	Large Rural	7	12.96
	Small Rural	2	3.73
	Isolated Rural	2	3.73
	Urban	121	77.56
LPC	Large Rural	20	12.82
	Small Rural	4	2.56
	Isolated Rural	11	7.05
	Urban	125	71.84
	Large Rural	24	13.79
LPCLPCC	Small Rural	6	3.45
	Isolated Rural	19	10.92
	Urban	125	71.84



LICENSED ADDICTION COUNSELORS

A licensed addiction counselor is a licensed behavioral health professional who specializes in treating individuals with substance related or addictive disorders through individual and/or group therapy. Licensure requirements for addiction counselors in North Dakota include holding a bachelor's, master's, or doctoral degree in addiction studies or a related field, successful completion of specific course work set forth by the North Dakota State Board of Addiction Counseling Examiners, successful completion of a written and oral examination set forth by the board, completion of a clinical training program, and an agreement to adhere to the code of ethics set forth by the board. There are 351 licensed addiction counselors (LACs) in North Dakota. LACs in North Dakota have been licensed for an average of 12 years (SD = 9 yrs and 1 mo) and most LACs work in urban areas (n = 219, 64.8%) (Figure 6.6).⁴



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. Social workers provide a variety of services from helping individuals and families acquire government benefits and working with children in foster care, to providing end of life counseling for families and provide resources for individuals who are involved in the legal system. Licensure requirements for social workers in North Dakota include holding a bachelor's, master's, or doctoral degree in social work, successful completion of an

examination given by the Association for Social Work Boards, an agreement to adhere to an ethical code set forth by the board, successful completion of a criminal history background check, and they must provide authorization for a child abuse information index check.⁵ There are 2,349 social workers licensed in North Dakota. Most are licensed social workers (LSWs) (n = 1,592, 67.8%), followed by licensed certified social workers (LCSWs) (n = 404, 17.2%), and licensed independent clinical social workers (LICSWs) (n = 353, 15%).⁵

Education

Educational Attainment

There are different educational requirements for the different types of social work licensure in North Dakota. These differences are reflected in the statistics for the educational attainment of the various social work professions in North Dakota. The majority of LSWs in North Dakota hold bachelor's degrees (n = 1,200, 98.6%) and the rest hold master's degrees (n = 17, 1.4%). There are a few LCSWs in North Dakota who hold bachelor's degrees (n = 10, 3.3%), however the majority hold master's degrees (n = 289, 96%). There are a small number that hold doctoral degrees (n = 2, 0.7%). Only some LICSWs in North Dakota hold bachelor's degrees (n = 3, 1.2%), most hold master's degrees (n = 254, 98.5%), and only one holds a doctoral degree (0.3%).⁵

Number of Years since Graduation

On average, social workers in North Dakota have been out of school for 13 years and 5 months (SD = 10 yrs and 3 mos).⁵

Practice Characteristics

Rural-Urban Status of Primary Workplace

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). Based on these regions, most social work professionals work in the eastern part of the state. Separate data analyses indicated that most social work professionals work in urban settings with 64.4% of LSWs (n = 908), 72% of LCSWs (n = 257), and 66.9% of LICSWs (n = 216) all working in urban areas.

Data from the defined human service center regions was also analyzed to determine where each type of social work professional works in North Dakota based on defined regions. Those results are listed in the table below (Table 6.2). Note that not all social work professionals in North Dakota listed the region of their primary workplace. The data was also examined to determine the eastern/western split for each of the social work professions. For LSWs, 693 (53.6%) work in the eastern part of the state and 599 (46.4%) work in the western part of the state. Two hundred and three (66.3%) LCSWs work in the eastern part of the state and 103 (33.7%) work in the western part of the state. For LICSWs working in North Dakota, 160 (61.3%) work in the eastern part

of the state and 101 (38.7%) work in the western part of the state (Table 6.2, Figure 6.7, Figure 6.8).⁵

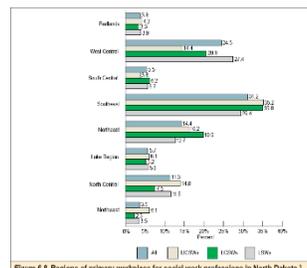
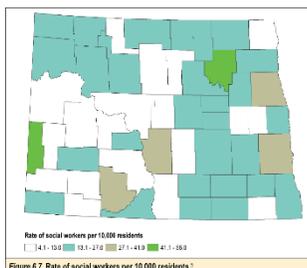
Table 6.2
Region of primary workplace for social work professionals in North Dakota⁵

Region	LSWs		LCSWs		LICSWs		All	
	N	%	N	%	N	%	N	%
Northwest	45	3.5	7	2.3	16	6.1	68	3.6
North Central	150	11.6	23	7.5	37	14.0	210	11.3
Lake Region	75	5.8	16	5.2	16	6.1	107	5.7
Northeast	164	12.7	61	19.9	42	16.2	267	14.4
Southeast	381	29.4	107	35.0	92	35.2	580	31.2
South Central	73	5.7	19	6.2	10	3.8	102	5.5
West Central	354	27.4	63	20.6	37	14.4	454	24.5
Badlands	50	3.9	10	3.3	11	4.2	71	3.8

The data was 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 1,211 (65.1%) of the social work professionals in North Dakota work in urban areas, followed by those in large rural areas (n= 354, 19%), isolated rural areas (n= 208, 11.2%), and then small rural areas (n= 88, 4.7%). The results, categorized by licensure level, are listed in the table below (Table 6.3). The majority of social work professionals in North Dakota work in urban areas with 822 (63.6%) of LSWs, 221 (72.2%) of LCSWs, and 168 (64.1) of LICSWs all working in urban designated areas (Table 6.3).⁵

Table 6.3
Rural-urban designation for social work professionals in North Dakota⁵

License Level	Urban	Large Rural	Small Rural	Isolated Rural	Total
Licensed Social Worker	822	249	59	164	1293
Licensed Certified Social Worker	221	45	13	27	306
Licensed Independent Clinical Social Worker	168	61	16	17	262
Total	1211	354	88	208	1961



BEHAVIORAL ANALYSTS

Behavioral analysts are licensed behavioral health professionals who use experimental and applied analysis of human behavior to develop techniques and treatments that help in evaluating and modifying behavior, especially when that behavior is maladaptive to the specific client. The requirements for licensure as a behavioral professional in North Dakota include holding a bachelor's, master's or doctoral degree from an approved program usually related to the field of psychology or social work, successful completion of the board certification examination, and they must provide evidence of supervised professional experience.² There are 19 licensed behavioral analysts and two registered behavioral analysts in North Dakota.² Behavioral analysts are an important part of the healthcare system in North Dakota because in order for a child to be diagnosed with autism, the diagnosis must be made/ approved by a behavioral analyst.

PHYSICIAN ASSISTANTS

University of North Dakota Physician Assistant Program

In May of 2017, the Department of Physician Assistant Studies at the University of North Dakota graduated 33 students. Summarized below are workforce survey responses of 29 graduates who passed the national certification, thus were eligible for state licensing, and employed as a physician assistant. Four students, two located in Texas and one each from Montana and South Dakota, did not pass the national certification exam after one attempt. Of eligible respondents, 27 completed the abbreviated workforce survey in the form sent, one was contacted via telephone to verbally complete the survey, and the last respondent's information was gathered from the healthcare institution website of their current employer.⁶

The Physician Assistant Class of 2017 graduated 33 students, 29 (87.9%) of whom were eligible for state licensing and employment as a physician assistant. Home states of graduates eligible for state licensing and employment include Minnesota (n = 9, 31%), North Dakota (n = 8, 27.6%), South Dakota (n = 2, 6.9%). The following states were home to one student each, or 3.4% of graduates eligible for state licensing and employment: Alabama, Idaho, Illinois, Indiana, Kansas, Michigan, Montana, Utah, Virginia, and Wisconsin. When the survey was administered, 26 (89.7% those eligible for employment) were employed – 25 (86.2% of those eligible for employment) were employed full-time and 1 (3.4% of those eligible for employment) was employed part-time (Figure 6.9). The 26 graduates currently employed are working in the following states: Minnesota (n = 8, 30.8%), North Dakota (n = 7, 26.9%), and Indiana (n = 2, 7.7%). Additionally, one graduate, or 3.8% of employed graduates, is working in each of the following states: Alabama, Idaho, Kansas, Michigan, Montana, South Dakota, Utah, Virginia, and Wisconsin.⁶

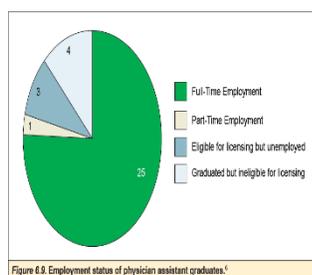


Figure 6.9. Employment status of physician assistant graduates.⁶

“Approximately 46.2% of the employed physician assistant graduates are practicing in rural areas. Of the graduates practicing in North Dakota 50% are in rural areas, 50% are in primary care, and 38% are practicing in rural primary care.”

The majority of employed graduates reported working in a primary care setting (n = 13, 50%) – 9 of the 13 work in family medicine, 2 work as a hospitalist, and 2 worked in urgent care. The next most common employment setting is in surgical specialties including orthopedics and cardiovascular (n = 5, 19.2%), followed by cardiology (n = 2, 7.7%) and dermatology (n = 2, 7.7%). Graduates also found employment in the following settings: gastroenterology (n = 1, 3.8%), pulmonology (n = 1, 3.8%), radiology

(n = 1, 3.8%), and urology (n = 1, 3.8%). Most work in a group multispecialty practice (n = 20, 76.9%), followed by those working in a hospital (n = 4, 15.4%), and a Rural Health Clinic (n = 1, 3.8%). One respondent reported 'undeclared' regarding their practice type.⁶

Approximately 12 (46.2%) of the 26 employed graduates are practicing in rural areas (communities with a population of <25,000). Of the graduates practicing in North Dakota 50% are in rural areas, 50% are in primary care, and 38% are practicing in rural primary care. The starting salary range for graduates of the Physician Assistant Studies program at the University of North Dakota is from \$75,000 to \$120,000 per year.⁶

Practice Characteristics

Number of Years Licensed

Physician assistants in North Dakota (both PAs and PA-Cs) have been licensed on average for 10 years and 9 months (SD = 8 yrs and 7 mos). Those who are PAs have been licensed on average for 16 years and 7 months (SD = 7 yrs and 2 mos) and those who are PA-Cs have been licensed on average for 5 years and 6 months (SD = 6 yrs and 1 mo).¹

State of Primary Workplace

Most of the physician assistants in North Dakota who are licensed as PAs work in North Dakota (n= 147, 92.45%). There are six (3.77%) that work in Minnesota, five (3.14%) working in South Dakota, and one (0.63%) that works in Florida (Table 6.4). For those who are licensed as PA-Cs in North Dakota there is a little more variety as to the state of their primary workplace. Again, most work in North Dakota (n= 166, 82.18%), followed by South Dakota (n= 13, 6.44%), and Minnesota (n= 10, 4.95%). California, Missouri, Montana, and Utah each have two (0.99%) PA-Cs while Alaska, Arizona, Iowa, Michigan, and Washington each have one (0.50%) (Table 6.5).¹ North Dakota has 42.6 PAs per 100,000 North Dakota residents giving the state an average ranking in terms of the rate of PAs based on the population with a ranking of 22 out of the 50 states.⁷

Table 6.4
State of primary workplace for PAs licensed in North Dakota¹

State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Florida	1	0.63	1	0.63
Minnesota	6	3.77	7	4.40
North Dakota	147	92.45	154	96.86
South Dakota	5	3.14	159	100.00

Table 6.5
State of primary workplace for PA-Cs licensed in North Dakota¹

State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Alaska	1	0.50	1	0.50
Arizona	1	0.50	2	0.99
California	2	0.99	4	1.98
Iowa	1	0.50	5	2.48
Michigan	1	0.50	6	2.97
Minnesota	10	4.95	16	7.92
Missouri	2	0.99	18	8.91
Montana	2	0.99	20	9.90
North Dakota	166	82.18	186	92.08
South Dakota	13	6.44	199	98.51
Utah	2	0.99	201	99.50
Washington	1	0.50	202	100.00

Rural-Urban Status of Primary Workplace

The majority of physician assistants in North Dakota work in urban areas (n= 196, 62.62%). Of the rural designations, isolated rural areas have the largest number of physician assistants (n= 56, 17.89%), followed by large rural areas (n= 43, 13.74%), and small rural areas (n= 18, 5.75%). When the rural-urban designations were broken down by the specific licensure suffixes it was found that the majority of PAs work in an

urban area (n= 94, 63.95%), followed by isolated rural (n= 29, 19.73%), large rural (n= 16, 10.88%), and small rural (n= 8, 5.44%). For those who are PA-Cs the majority also work in an urban area (n=102, 61.45%), followed by an even split between those that work in large rural areas (n= 27, 16.27%) and isolated rural areas (n= 27, 16.27%), and finally there are 10 PA-Cs (6.01%) that work in small rural areas (Figure 6.10, Figure 6.11).¹

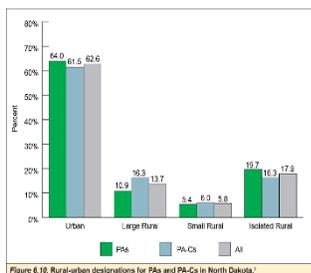


Figure 6.10. Rural-urban designations for PAs and PA-Cs in North Dakota.¹

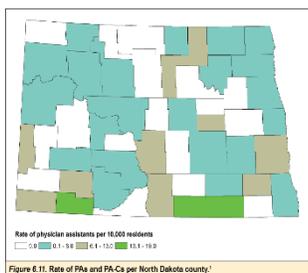


Figure 6.11. Rate of PAs and PA-Cs per North Dakota county.¹

OCCUPATIONAL THERAPY

University of North Dakota Occupational Therapy Program

The Occupational Therapy program at the University of North Dakota graduated 53 students in May of 2017, five students in August of 2017, and one student was on track to graduate in December of 2017. Of the 58 students who graduated in May and August of 2017, 49 (84.5%) responded to an exit interview. Of the 49 students, 6 (12.2%) chose to take traveling positions. The majority of the graduates were originally from Minnesota (n = 18, 36.7%), followed by Wyoming (n = 11, 22.4%), North Dakota (n = 7, 14.3%), and other states (n = 13, 26.5%). Occupational Therapy graduates currently live in Minnesota (n = 9, 18.4%), Wyoming (n = 9, 18.4%), North Dakota (n = 5, 10.2%), or other states (n = 26, 53.1%). Other states include Arizona, California, Colorado, Idaho, Nevada, Ohio, Oregon, South Carolina, South Dakota, and Utah.⁸

Of the 49 graduates who completed the exit interview, 22 (44.9%) were working full time, four (8.2%) were working per diem/prn, three (6.1%) were not yet employed, two (4.1%) were working part time, and 18 (36.7%) did not report employment status. Starting salary for the Occupational Therapy Class of 2017 was reported as hourly wages by 15 students and annual salaries by seven students. Starting hourly wages ranged from \$24.50/hour to \$42/hour. Annual salaries ranged from \$43,000/year to \$68,000/year. Starting salaries for the six students contracted by a traveling company were not included in the analyses.⁸

Practice settings for occupational therapy graduates include: school systems, outpatient clinics, rehab facilities, home health settings, inpatient settings, and skilled nursing facilities. Influential factors in selecting employment were reported by graduates and included: positive experience on fieldwork, stayed on, loan repayment, rural population and offered loan reimbursement, close to family, mentorship, diversity of populations served, salary and benefits, and only position open in my rural area. Those students who took traveling position did so to explore the US. They also have

a diversity of experiences and the opportunity to payback student loans with housing and food stipends.⁸

INTRODUCTION

Currently, there are 840 occupational therapy professionals (OTs, OTAs) licensed in North Dakota, 641 occupational therapists and 199 occupational therapy assistants.⁹ Based on the population of North Dakota, there are 8.5 occupational therapists per 10,000 North Dakota residents and 2.6 occupational therapy assistants per 10,000 North Dakota residents licensed in North Dakota. The data was also examined based on those professionals working in North Dakota and it was found that there are 491 occupational therapists and 160 occupational therapy assistants. That amounts to 6.5 occupational therapists per 10,000 North Dakota residents and 2.1 occupational therapy assistants per 10,000 North Dakota residents working in North Dakota.⁹

Education

Number of Years since Graduation

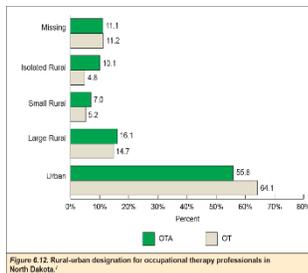
On average, occupational therapy professionals (OTs, OTAs) have been in practice in North Dakota for 12 years (SD = 10 yrs, 8 mos). Broken down by profession, it was found that occupational therapists have been practicing, on average, for 12 years (SD = 10 yrs, 8 mos) and occupational therapy assistants have also been practicing, on average, for 12 years (SD = 10 yrs, 8 mos).⁹

Practice Characteristics

“Of the occupational therapists working in North Dakota, 64.1% work in urban areas and 24.7% work in rural areas.”

Rural-Urban Designation of Primary Workplace

The majority of the occupational therapy professionals (OTs, OTAs) in North Dakota (n = 522, 70%) work in urban areas, followed by large rural areas (n = 126, 16.9%), isolated rural areas (n = 51, 6.9%), and small rural areas (n = 47, 6.3%). Ninety-four (11.2%) had no designation.⁹ Of the occupational therapists working in North Dakota, 411 (64.1%) work in urban areas and 158 (24.7%) work in rural areas. For occupational therapy assistants, 111 (55.8%) work in urban areas and 66 (33.2%) work in rural areas (22 had no designation). Rural and urban designation was missing for 72 (11.12%) of occupational therapists and 22 (11.1%) of occupational therapy assistants. Rural areas can be further broken down to large rural, small rural, and isolated rural areas. For occupational therapists, 94 (14.7%) work in large rural areas, 33 (5.2%) work in small rural areas, and 31 (4.8%) work in isolated rural areas. For occupational therapy assistants, 32 (16.1%) work in large rural areas, 14 (7%) work in small rural areas, and 20 (10.1%) work in isolated rural areas (Figure 6.12).⁹



PHYSICAL THERAPY

University of North Dakota Doctor of Physical Therapy Program

The UND School of Medicine & Health Sciences Doctor of Physical Therapy program graduated 48 individuals in May 2017. An electronic survey was distributed to the graduates approximately four months after graduation. A total of 45 students responded to the survey for a response rate of 94%. The class included 15 (34%) students from North Dakota, 23 (52%) from Minnesota, and the remaining students were from South Dakota (2%), Wyoming (7%) and other states (5%). The majority (91%) of graduates were employed as physical therapists in a full time (97%) or part time (3%) position. There were 7 (21%) of graduates employed in North Dakota while the remainder of the class reported employment in Minnesota (44%), Montana (3%) and Wyoming (9%). The primary area of practice for the graduates was an outpatient clinic. Notably, the graduates reported a mean initial salary of \$68,260.

INTRODUCTION

Physical therapist (PT) and physical therapist assistant (PTA) licensure data, October 2017 through January 2018, were obtained from the North Dakota Board of Physical Therapy. The complete data set contained 1,005 licensed providers including 837 PTs and 168 PTAs. Of the 837 PTs, 803 (96%) were employed as a physical therapist.¹⁰ The remaining 34 PTs were retired (n=9), employed in another field (n=4), or unemployed, seeking work within or outside of physical therapy (n=21). Of the 168 PTAs, 148 (88%) were employed as PTAs. The remaining 20 PTAs were unemployed, seeking work within or outside of physical therapy. The following summary will address the 951 PT and PTAs who were working in physical therapy at the time of licensure.¹⁰

Demographics

The demographic data of gender and race/ethnicity determined 77% of providers were female including 71% of PTs and 86% of PTAs. Ninety-six percent of PT and 95% of PTA providers were white (non-Hispanic).¹⁰

Education

“Fifty-three percent of all licensed PTs in North Dakota graduated from the University of North Dakota.”

Physical therapists graduate with a Doctor of Physical Therapy (DPT) degree. The DPT, first introduced in ND in 2006, has become the required entry-level degree nationally as of 2015. The majority of PTs practicing in ND have a Doctor of Physical Therapy degree (55%), followed by a master's degree (26%) and bachelor's degree (19%).¹⁰ The entry-level degree for physical therapist assistants is the associate degree. A majority (97%) of PTAs in ND have this degree. (Table 6.6) Fifty-three percent of all licensed PTs in North Dakota graduated from the University of North Dakota.¹⁰

Table 6.6
Educational attainment for North Dakota physical therapists and physical therapy assistants¹⁰

Degree	PT		PTA		Total	
	N	%	N	%	N	%
Associate's	0	0.0	144	97.3	144	15.1
Bachelor's	150	19.7	2	1.4	152	16.0
Certificate	8	1.0	2	1.4	10	1.1
Master's	205	25.5	0	0.0	205	21.6
Doctor of Physical Therapy	440	54.8	0	0.0	440	46.3
All	803	100.0	148	100.0	951	100.0

State or Country of Education

A majority (72%) of all practicing PTs and PTAs in North Dakota graduated from a North Dakota school.¹⁰ Specifically, 79% of physical therapists obtained their degree from a ND school, 8% graduated in Minnesota, and 8 individuals were Foreign Educated Physical Therapists. The ND Board of Physical Therapy reported 53% of all licensed physical therapists in ND were graduates of the University of North Dakota. The PTAs practicing in ND included 38% educated in ND and 43% educated in MN.¹⁰

Practice Characteristics

Survey respondents were able to select multiple responses for the primary workplace site if applicable. Of the 951 PTs and PTAs, 85% reported having only one employment setting, 14% reported two employment settings, and the remaining 2% reporting three employment settings.¹⁰ Most PTs (90%) are employed by their organization or institution; 7% are self-employed. Similarly, 98% of PTAs are employees and 2% are self-employed.¹⁰ Notably, virtually none of the PTs or PTAs were utilizing telehealth to provide physical therapy services.

Primary Workplace

Multiple practice settings were identified by the PT and PTA data set. The majority of PTs practice in an outpatient setting (55%), while a majority of PTAs practice in an extended care setting (41%), followed by the outpatient setting (28%) (Table 6.7).¹⁰

Table 6.7
Primary workplace for North Dakota physical therapists and physical therapist assistants¹⁰

Primary Workplace	PT		PTA		Total	
	N	%	N	%	N	%
Academic institution (post secondary)	38	4.5	0	0.0	38	3.8
Acute Care Hospital	78	9.7	12	8.1	90	9.5
Home Care	48	6.1	7	4.7	55	5.8
Inpatient Rehabilitation Facility	11	1.6	8	5.1	25	2.1
Institution	1	0.1	0	0.0	1	0.1
Non-patient care or non-clinical environment related to physical therapy	10	1.2	0	0.0	10	1.1
Outpatient clinic (affiliated with a hospital, health system, military or other government agency)	297	33.3	28	19.8	292	31.0
Outpatient clinic (not affiliated with a hospital, health system, military or other government agency)	174	21.7	14	9.5	188	19.8
Private care (non-same based)	25	3.1	4	2.7	29	3.0
Skilled Nursing Facility, Long Term Care Facility, Assisted Living Facility or Group Home	88	10.7	63	43.3	148	15.4
Other System	27	3.4	3	2.1	30	3.0
Other	30	3.8	5	3.4	44	4.6
All	803	100.0	148	100.0	951	100.0

The majority of all PTs (83%) identify their primary responsibility as direct patient care. Others work in administration (9%), and teaching (3%). Similarly, the majority of PTAs (90%) provide direct patient care, and 4% work in administration (Table 6.7).¹⁰ PTs and PTAs in ND work with a multitude of individuals with various diagnoses, injuries or conditions; e.g., most do not work solely with individuals requiring one type of care. Thus, the following percentages will not total 100%. Most PTs see individuals with orthopedic sports conditions or injuries (63%), followed by those individuals with neurological conditions or injuries (56%).¹⁰ A majority of PTAs see neurological conditions or injuries (63%) followed by individuals with cardiovascular or pulmonary injuries or conditions (51%) and orthopedic sports injuries or conditions (46%) (Figure 6.13).¹⁰ The primary patient ages reported by PTs and PTAs are presented in Figure 6.15. The majority of all PTs (74%) report providing care to adults ages 20-64 years and 68% report providing care to adults ages 65+. A majority of PTAs (84%) report providing care to older adults and 50% report working with adults ages 20 – 64.¹⁰

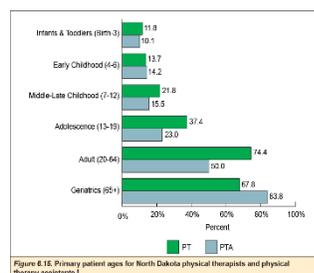
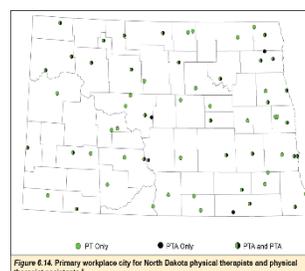
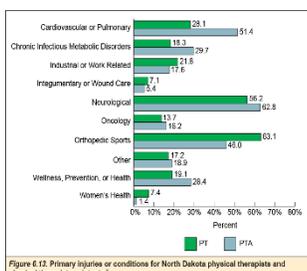
“A majority (65%) of all PTs were found to practice in an urban area while the majority (51%) of PTAs practice in a rural area.”

Rural-Urban Status of Primary Workplace

The zip code of the primary practice area was used to “map” the location of PTs & PTAs within the state. A majority (65%) of all PTs were found to practice in an urban area while the majority (51%) of PTAs practice in a rural area.¹⁰ (Table 6.8, Figure 6.14)

Table 6.8
Rural-urban status of primary workplace for North Dakota physical therapists and physical therapist assistants¹⁰

Rural-Urban Status	PT		PTA		Total	
	N	%	N	%	N	%
Urban	519	65.2	7	49.3	592	62.3
Large-Small/Isolated Rural	277	34.8	75	50.7	362	37.0
All	796	100.0	148	100.0	951	100.0



A majority of PTs (91%) reported no planned changes in the near future. Some (5%) expect to increase their hours of physical therapy or direct patient care while 4% expect to decrease their hours or leave the field of physical therapy. A majority of PTAs (88%) reported no planned changes, 9% expect to increase their hours of physical therapy or direct patient care, and 3% expect to decrease their hours or stop working in physical therapy (Table 6.9).¹⁰

“A majority of PTs (91%) reported no planned changes in the near future. Some (5%) expect to increase their hours of physical therapy or direct patient care while 4% expect to decrease their hours or leave the field of physical therapy.”

Table 6.9
Future plans for North Dakota physical therapists and physical therapist assistants^a

Future Plans	PT		PTA		Total	
	N	%	N	%	N	%
Decrease my hours in the field of physical therapy	17	2.1	3	2.0	20	2.1
Decrease my hours of direct patient care	16	2.0	1	0.7	17	1.8
Increase my hours in the field of physical therapy	31	3.9	10	6.8	41	4.3
Increase my hours of direct patient care	11	1.4	4	2.7	15	1.6
No planned change	725	90.5	129	87.8	854	90.1
Stop working in the field of physical therapy	1	0.1	0	0.0	1	0.1
All	801	100.0	147	100.0	948	100.0

NUTRITION AND DIETETICS

LICENSED REGISTERED DIETITIANS

In North Dakota there are 441 licensed registered dietitians.¹¹ Currently there are 5.8 licensed registered dietitians per 10,000 North Dakota residents licensed in North Dakota and 4.4 licensed registered dietitians per 10,000 North Dakota residents working in North Dakota.

Education

Licensed registered dietitians working in North Dakota have been practicing for an average of 14 years, 5 months (SD = 10 yrs, 7 mos).¹¹

Practice Characteristics

“Most licensed registered dietitians working in North Dakota work in urban areas (70.8%), followed by large rural areas (14.6%), isolated rural areas (7.6%), and small rural areas (7%).”

Employment Status

The majority of licensed registered dietitians are employed. Only ten (2.3%) stated their employment status as retired and two (0.5%) stated they were unemployed.¹¹

Rural-Urban Status of Primary Workplace

Most licensed registered dietitians working in North Dakota work in urban areas (n = 233, 70.8%), followed by large rural areas (n = 48, 14.6%), isolated rural areas (n = 25, 7.6%), and small rural areas (n = 23, 7%). Overall, 96 licensed registered dietitians (29.2%) work in a rural area.¹¹

LICENSED NUTRITIONISTS

In North Dakota there are 32 licensed nutritionists.¹¹ That amounts to 0.5 licensed nutritionists per 10,000 North Dakota residents licensed in North Dakota and 0.4 licensed nutritionists per 10,000 North Dakota residents working in North Dakota.

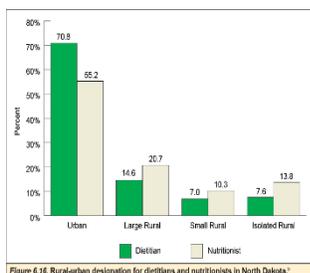
Education

Licensed nutritionists working in North Dakota have been practicing for an average of 14 years, 4 months (SD = 11 yrs, 10 mos).¹¹

Practice Characteristics

Rural-Urban Status of Primary Workplace

Most licensed nutritionists working in North Dakota work in urban areas (n = 16, 55.2%), followed by large rural areas (n = 6, 20.7%), isolated rural areas (n = 4, 13.8%), and small rural areas (n = 3, 10.3%). Overall, 13 (44.8%) licensed nutritionists working in North Dakota work in rural areas (Figure 6.16).¹¹



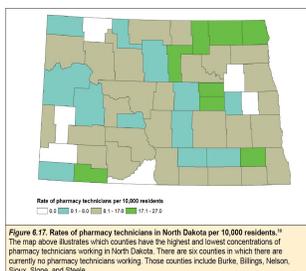
PHARMACY

PHARMACY TECHNICIANS

Practice Characteristics

Nine hundred and fifty-nine pharmacy technicians are licensed to work in North Dakota, 882 (92%) are currently working in North Dakota (Table 6.10).¹² Most pharmacy technicians work in urban areas (n = 460, 52.2%), followed by isolated rural areas (n = 207, 23.5%), large rural areas (n = 149, 16.9%), and small rural areas (n = 66, 7.5%) (Figure 6.17). Pharmacy technicians in North Dakota have been licensed for an average of 9 years and 9 months (SD = 7 yrs).¹²

State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Florida	1	0.10	1	0.10
Iowa	1	0.10	2	0.21
Minnesota	65	6.78	67	6.99
Montana	2	0.21	69	7.19
North Dakota	882	91.97	951	95.17
Oregon	1	0.10	952	95.27
South Dakota	4	0.42	956	95.69
Texas	2	0.21	958	95.90
Washington	1	0.10	959	100.00



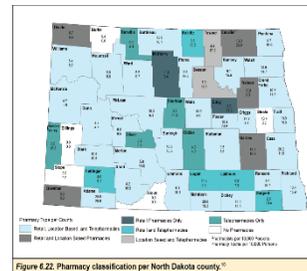
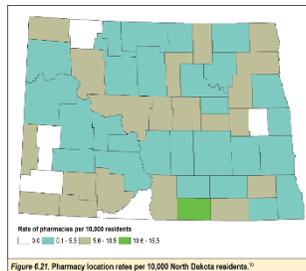
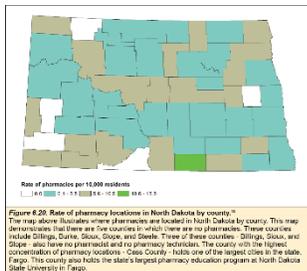
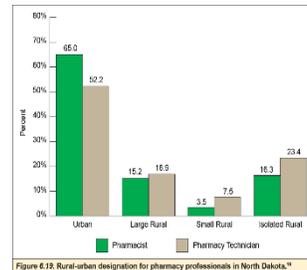
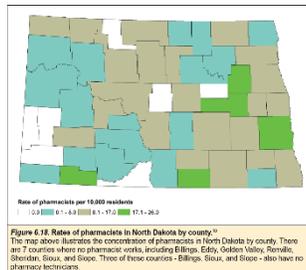
PHARMACISTS

Practice Characteristics

Twelve hundred and nineteen pharmacists are licensed to work in North Dakota, however only 981 (77.7%) of those currently work in North Dakota (Table 6.12).¹² Most pharmacists in North Dakota work in urban areas (n = 638, 65%). The next most common area in which pharmacists in North Dakota work is isolated rural areas (n = 160, 16.3%), followed by large rural areas (n = 149, 15.2%), and small rural areas (n = 34, 3.5%) (Figure 6.18, Figure 6.19).¹² Pharmacists in North Dakota have been licensed for an average of 18 years and 3 months (SD = 14 yrs, 1 mo).¹²

“Most pharmacists in North Dakota work in urban areas (65%). The next most common area is isolated rural areas (16.3%), followed by large rural areas (15.2%), and small rural areas (3.5%).”

State	Pharmacists	Percent	Estimated Pharmacist ¹²
Alabama	1130	100%	1130
Arizona	7	0.05	8
California	6	0.45	14
Colorado	7	0.43	16
Connecticut	1	0.08	20
Florida	5	0.40	25
Idaho	1	0.08	28
Illinois	1	0.08	27
Indiana	52	4.12	70
Iowa	3	0.24	82
Kansas	1	0.08	85
Kentucky	2	0.16	88
Maine	133	10.53	218
Massachusetts	5	0.40	233
Michigan	10	0.78	230
Minnesota	1	0.08	234
Missouri	883	72.07	1212
Montana	2	0.16	1217
Nebraska	1	0.08	1218
Nevada	3	0.24	1221
New York	2	0.16	1223
Ohio	1	0.08	1227
Oklahoma	1	0.08	1228
Oregon	4	0.32	1262
Texas	1	0.08	1263
Virginia	1	0.08	1265



CLINICAL LABORATORY PROFESSIONALS

INTRODUCTION

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

There are 1133 clinical laboratory professionals licensed in North Dakota.¹³ Clinical laboratory professionals are licensed in three categories, as scientists/technologists, technicians, or specialists. Most of the clinical laboratory professionals 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%).¹³ Currently there are 15 clinical laboratory professionals per 10,000 North Dakota residents licensed in North Dakota and 12.3 clinical laboratory professionals per 10,000 North Dakota residents working in North Dakota.

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.¹³ 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 scientist/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.¹³

Education

Number of Years since Graduation

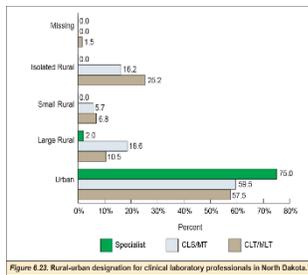
Clinical laboratory scientist/medical technologists working in North Dakota have been in practice, on average, for 14 years, 6 months (SD = 10 yrs, 4 mos). Clinical laboratory technicians/medical laboratory technicians have been in practice, on average, for 15 years, 5 months (SD = 10 yrs, 7 mos). Specialists have been in practice, on average, for 8 years, 11 months (SD = 8 yrs, 2 mos).¹³

Practice Characteristics

Rural-Urban Status of Primary Workplace

Most clinical laboratory professionals 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 an rural-urban designation.¹³ 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.¹³ 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.¹³ For specialists working in North Dakota, 6 (75%) work in urban areas and 2 (25%) work in large rural areas.¹³

“Most clinical laboratory professionals 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%).”



DENTISTRY

INTRODUCTION

“There are 447 licensed dentists in North Dakota which amounts to 5.9 dentists per 10,000 North Dakota residents and 5.4 dentists per 10,000 North Dakota residents working in North Dakota.”

Dental professionals such as dentists, dental hygienists, and dental assistants are important health care providers in North Dakota. There are 792 dental hygienists that hold a license to practice in North Dakota.¹⁴ There are 10.5 dental hygienists per 10,000 North Dakota residents licensed in North Dakota and 8.7 dental hygienists per 10,000 North Dakota residents working in North Dakota. There are 706 dental assistants licensed in North Dakota with 9.3 dental assistants per 10,000 North Dakota residents licensed in North Dakota and 8.1 dental assistants per 10,000 North Dakota residents working in North Dakota.¹⁴ Finally it was found that there are 447 licensed dentists in North Dakota which amounts to 5.9 dentists per 10,000 North Dakota residents licensed in North Dakota and 5.4 dentists per 10,000 North Dakota residents working in North Dakota.¹⁴

Education

Number of Years since Graduation

Licensed dentists have been practicing, on average, for 21 years, 2 months (SD = 16 yrs, 9 mos). Dental assistants working in North Dakota have been in practice, on average, for 10 years, 10 months (SD = 11 yrs, 9 mos). Dental hygienists working in North Dakota have also been in practice, on average, for 10 years, 10 months (SD = 11 yrs, 1 mo).¹⁴

Practice Characteristics

Primary Specialty

Over half of the dentists in North Dakota reported working in specialty areas. Twenty-one (4.7%) reported oral and maxillofacial surgery, 19 (4.3%) reported orthodontics, 15 (3.4%) reported pediatric dentistry, 14 (3.1%) reported forensic odontology, 6 (1.3%) reported periodontics, and 5 (1.1%) reported prosthodontics.¹⁴

Table 6.12
Specialty areas for dentists in North Dakota¹⁴

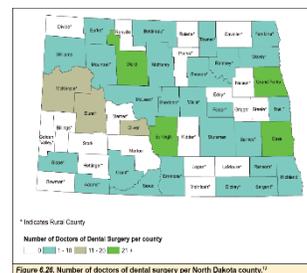
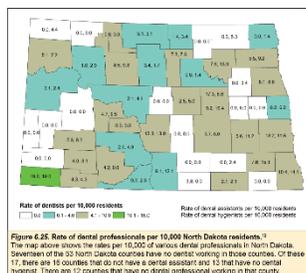
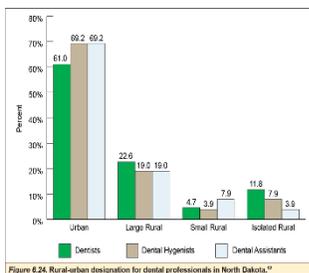
Specialty ADA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Endodontics	12	5.56	12	5.56
Forensic Odontology	1	0.46	13	6.02
General Dentistry	142	65.74	155	71.76
Oral and Maxillofacial Surgery	16	8.33	173	80.09
Orthodontics	18	8.33	191	88.43
Pediatric Dentistry	15	6.94	206	95.37
Periodontics	6	2.78	212	98.15
Prosthodontics	4	1.85	216	100.00

Frequency missing = 192

“Most licensed dentists working in North Dakota work in urban areas (61%), followed by large rural areas (22.6%), isolated rural areas (11.8%), and small rural areas (4.7%)”

Rural-Urban Status of Primary Workplace

Most licensed dentists working in North Dakota work in urban areas (n = 249, 61%), followed by large rural areas (n = 92, 22.6%), isolated rural areas (n = 48, 11.8%), and small rural areas (n = 19, 4.7%).¹⁴ Overall, 159 (39%) of the dentists working in North Dakota work in rural areas. Most dental hygienists working in North Dakota work in urban areas (n = 422, 69.2%), followed by large rural areas (n = 116, 19%), isolated rural areas (n = 48, 7.9%), and small rural areas (n = 24, 3.9%).¹⁴ Overall, 188 (30.8%) dental hygienists work in rural areas. Most dental assistants working in North Dakota work in urban areas (n = 422, 69.2%), followed by large rural areas (n = 116, 19%), isolated rural areas (n = 48, 7.9%), and small rural areas (n = 24, 3.9%).¹⁴



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CHAPTER SEVEN: Healthcare Facility Workforce in North Dakota

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

INTRODUCTION

This chapter addresses two overarching components of North Dakota's healthcare system – 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 2018. These surveys are updates from previous surveys, providing new information on the rural and urban hospital workforce.^{1,2} 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 7 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 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 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, etc. 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 7.1. 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. 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 nonetheless are 4.0 for PAs, 1.5 for grounds-keeping, and 6.0 for dietitians.

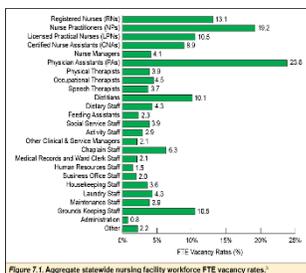
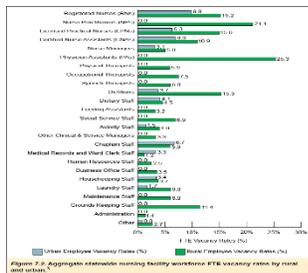


Figure 7.1. Aggregate statewide nursing facility workforce FTE vacancy rates.²

“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

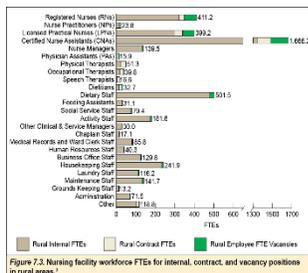
example, Figure 7.2 shows FTE vacancy rates differentiated between rural and urban facilities. Rural nursing facilities have a more difficult time recruiting and retaining the various types of nurses than do urban facilities.

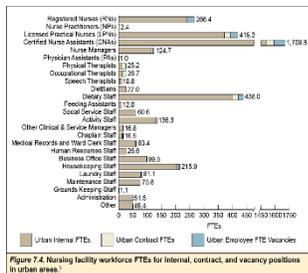


Among clinical providers, there were no reported urban vacancies for physical therapists, occupational therapists, speech therapists, or physician assistants. Excluding physician assistants, the rural vacancy rates for these positions were also quite low, ranging from 5.9% to 7.5%. The rural vacancy 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 7.3 and 7.4 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, dietary staff was the 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 was true for their urban colleagues.





Rural and urban clinical provider FTEs, including physician assistants, physical therapists, occupational therapists, and speech therapists are also shown in Figures 7.3 and 7.4. 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 7.3 and 7.4. Here, the most numerous 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. Among the two urban areas that listed FTEs, one was higher than the average, while the other was lower; in rural facilities, seven had ratios below the average, whereas four were higher than it. 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.

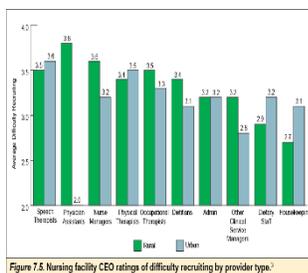
Length of Vacancies

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.



The CEOs were asked to rate the difficulty of recruiting each of the employee types along a four-point Likert scale (Figure 7.5). 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

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.¹ 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 at <https://ruralhealth.und.edu/assets/2498-9184/nd-hospital-assessment-chartbook-2014.pdf>.

Limitations

While the findings from the North Dakota Hospital Workforce Survey tell us much about short-term general hospital workforce, they may not be generalizable to all North Dakota providers' nonhospital employment sectors (e.g., nursing homes and physicians' office practices). However, significant shortages for the hospitals can be indicative of other employment situations because hospitals are often able to provide higher wages and better job conditions than other providers.

Care needs to be taken when interpreting data findings because some vacancy rates are based on small numbers of healthcare employees, and many factors influence vacancy rates. For instance, health-provider-type vacancy rates are influenced by hospital need, salaries hospitals are willing to pay, availability of employed and unemployed providers looking for positions, local community conditions and opportunities, the physical condition of the hospital, working conditions, and so forth. 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 a provider type.

Because one PPS Hospital did not complete the current survey, their 2014 results were interpolated in order to garner a more complete picture of healthcare facilities in North Dakota. As such, the resulting data for this facility may not be completely up-to-date; however, we assumed that the hospital has not experienced

significant shifts in terms of the workforce factors assessed since the previous survey collection in 2014.

SURVEY FINDINGS

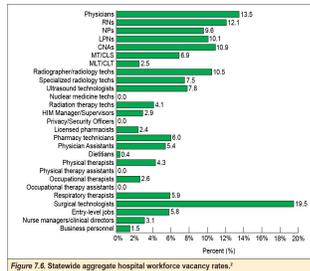


Figure 7.6. Statewide aggregate hospital workforce vacancy rates.¹

North Dakota’s 2018 statewide vacancy rates for hospital-staff types are presented in Figure 7.6. The statewide rates were calculated by dividing the FTEs currently being recruited by the sum of FTEs currently being recruited and current FTEs employed, then multiplying the quotient by 100, which resulted in the percentage of vacant positions.² The highest statewide vacancy rates were for surgical technologists (19.5%), physicians (13.5%), and radiographer/radiology techs (10.5%). When interpreting vacancy rates, it is important to consider the magnitude of provider numbers represented by the rates. For instance, vacancy rates for physicians were based on a 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).²

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

(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.²

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 7.7. 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 7.7. 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.²

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.

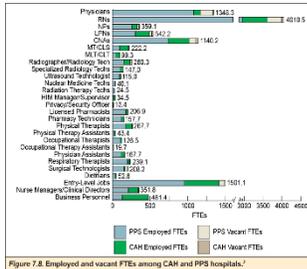


Figure 7.8 shows the respective employed FTEs and vacant FTEs among the different employee types for both CAHs and PPS hospitals. Here, the number of vacancies upon which the CAH vacancy rates were based ranged from 0.0 FTE vacancies (specialized radiology techs, nuclear medicine techs, radiation therapy techs, 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.²

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.²

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).² 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.²

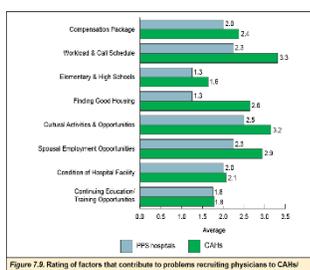


Figure 7.8. Rating of factors that contribute to problems recruiting physicians to CAHs/ PPS hospitals.²

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 7.9). 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).²

“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.²

References

1. Center for Rural Health. (2014). 2014 North Dakota Hospital Workforce Survey (Data File).
2. Center for Rural Health. (2018). 2018 North Dakota Hospital Workforce Survey (Data File).
3. Center for Rural Health. (2016). North Dakota Nursing Facility Workforce Survey (Data File).

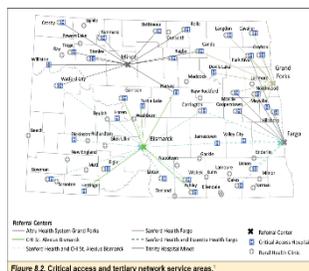
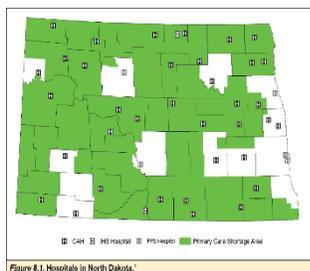
CHAPTER EIGHT: Healthcare Organization and Infrastructure in North Dakota

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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 (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 8.1 and 8.2 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 these 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.² Nationally, about 74% of all rural community hospitals have converted to CAH status (1,348 out of 1,825 as of February 2018).^{2,3} 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.⁴

All 36 CAHs have important networking relationships with the Big Six hospitals that are located in the four largest cities in North Dakota. Each city thus forms a tertiary care geographic region (Figure 8.2, Tables 8.1 and 8.2). Most of the CAHs are located

an hour or more by surface transportation from their tertiary referral center; in inclement weather, 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 8.2).

Table 8.1
Tertiary hospital geographic regions related to critical access hospitals^a

Tertiary Hospital	Square Miles	People per Sq. Mi.	Number of CAHs	Average Distance
Bismarck	26,315	7.3	10	110.5
Fargo	12,492	18.2	5	95.3
Grand Forks	10,555	11.1	10	66.6
Minot	20,419	7.5	11	84.5

^aMinot 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 tertaries 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.

The hospital market continues to consolidate nationally, and in North Dakota. 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 8.2
Tertiary hospital cities and CAH demographics^a

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	50.9
Grand Forks	277	197	34.7	41.9	41.4	50.4
Minot	416	233	36.4	50.5	50.7	51.3

^aHospitals 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.

Virtually 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.

Healthcare administrators, providers, and community members have expressed concerns over the financial viability of CAHs. Most hospitals can survive a year or two of negative margins; however, if the trends are downward over a number of years they are tapping reserves and most likely have other negative indicators such as liquidity measures such as a low number of days cash-on-hand or a higher number of days in net or gross accounts receivable. Financial viability is a critical issue. The actual financial condition of North Dakota's CAHs adds credence to this general concern. Operating margin is an accepted financial measure of performance that compares revenues and expenses associated with patient care. In 2016, CAHs in North Dakota had operating margins of +.03%, which compares with a national CAH operating margin rate of +1.79% (North Dakota was reported as +0.1% in 2014 and +0.68% in 2012). Data from 2016 shows that North Dakota, in comparison to the national data, has smaller operating margins; however, while 2016 in comparison to 2014 and 2012 is slightly smaller, it is marginal. The last reported operating margins that were negative were recorded in the 2013 *Report*. The data cited here is the statewide aggregate, and individual hospitals with steep, either negative or positive, margins can influence these numbers. For example, the most recent data identified two CAHs with negative operating margins of -28% on one end, and one CAH with a positive margin of +9% and another with +8%. Another way to view the financial data is to look at the number of CAHs with negative or positive margins over the years. In 2016, there were 18 CAHs (exactly 50%) with operating losses. In 2014 there were 17 CAHs with operating losses (47%) and in 2012 there were 28 CAHs with operating losses (78%).

A study by the North Dakota Rural Health Association looked at 27 CAHs that had reported data for ten consecutive years. Of these original 27, five had operating losses in all ten years, and eight had losses in nine of ten years. The best years were 2015, with 14 of 27 (52%) having positive operating margins, and 2016, with 12 (44%) having positive operating margins.⁵ In comparison to other states and the nation, the financial operations of North Dakota CAHs associated with patient-care services are problematic. The most recent financial data shows that 28 states had positive margins, (aggregate) and 17 states had negative margins (aggregate) with five states not qualifying for CAH designation).

Another common performance measure is total net margin, which looks at all revenue and expense sources for a hospital and includes investments, donations, tax revenue, grants, and other revenue sources. Statewide, the 2018 *Report* finds that North Dakota CAHs had a total margin of +2.29% (North Dakota was reported as +3.1 in the 2017 *Report* and +2.33 in the 2015 *Report*). North Dakota total net margins fall below the national average of +3.09 and well below its neighbors (Minnesota, +3.40, Montana +3.34, and South Dakota +4.57.⁶ Under both the operating margin and the total net margin measures, North Dakota's CAHs finances have declined North Dakota. CAHs also have fewer days' cash on hand and lower return on equity than found at the national level or its neighboring states.

In a comparison between 2014 and 2016 data, the North Dakota Rural Health Association found financial changes. The years are significant given that 2014 was when much of the Affordable Care Act (ACA) was implemented and 2016 is the first comparison year. For the CAHs, operating revenue grew by +22% from 2014 to 2016, and total net margin revenue increased by +18.2%. Expenses increased by +13%.

What is interesting is the change in bad debt/charity care expenses. One of the primary aims of the ACA is to address cost structures. Policy efforts on lowering readmissions and increasing health insurance rates were meant to improve access and to provide better care and produce better health outcomes. The health policy assumption is if population health improves, there can be a lowering of some unnecessary costs for the hospitals.

From 2014 to 2016, bad debt and charity care for North Dakota CAHs did decline by almost 14 percent (-13.8%). This turnaround is recent. Overall, from 2010-2016, bad debt costs rose by over 100 percent from \$15.9 million to \$32.5 million. The drop during the two years was from \$37.7 million to the \$32.5 million level.⁵ The business model, including payer case mix for providers and the type or level of treatment for rural hospitals, has changed over the years. There has been a steady movement away from traditional inpatient care to outpatient services. Aging populations, technology, treatment modalities, payermix, and public policy, particularly in the form of health reform with a goal of producing better care, better health, and restrained costs, have been a catalyst. Cumulatively, this has an impact on the bottom line for all hospitals, including rural.

In 2016, outpatient care accounted for about 55% of all state CAH operating revenue. Inpatient care accounted for only about 16 percent of CAH operating revenue, followed by clinic (15%) and other (12%).⁵ The case mix for North Dakota CAHs breaks down as follows: 39% Medicare, 28% Blue Cross Blue Shield of North Dakota, 15% other revenue, 8% Medicaid, 6% self-pay, and 4% Medicaid Expansion. Medicaid Expansion is relatively new. State CAHs have gained an additional \$27.4 million through Medicaid Expansion, which was part of the Affordable Care Act.⁵ Statewide, Medicaid Expansion has brought into the state \$190 million, according to the North Dakota Hospital Association.⁷

Experts on CAH finances have found some other changes in federal law that have benefited CAHs, especially states like North Dakota. One of these is the federal prescription drug discount purchasing program, called the 340B program (a reference to Section 340B of the Public Health Service Act of 1992 that created the discount). This program requires pharmaceutical manufacturers participating in the Medicaid and Medicare Part B programs to provide specific discounts on covered outpatient drugs purchased by some organizations. This includes providers such as CAHs (added under the Affordable Care Act), disproportionate share hospitals, sole community hospitals (a common designation used by rural PPS hospitals or non-CAHs), rural referral centers, family planning programs, homeless programs, federally qualified health centers (or FQHC look-alikes), and other outpatient clinics. However, federally certified rural health clinics (RHCs) are not covered. These organizations are frequently referred to as the “rural safety net” of providers.

In 2005, there were fewer than 600 hospitals in the country participating (none were CAHs). In 2014, there were 2,140 hospitals involved, with 940 being CAHs.⁴ In North Dakota, in 2014, only eight CAHs had positive operating margins, but as of 2016, 18 have positive margins. Ten of the 18 utilized the 340B outpatient drug discount program.⁵ While an estimate for the dollar value of benefit to state CAHs is not available, nationally the discount is about 45-50% on branded medications used on an outpatient basis, meaning that the impact, even in a rural hospital, would be significant.⁸

The effect is substantial enough that there appears to be an association between expansion of 340B by North Dakota CAHs and positive margins.

The financial situation for North Dakota CAHs appears to be fluid, and slightly improving; however, there are federal policy efforts being advocated by the pharmaceutical industry to constrain the 340B program that if successful could negate some of the positive financial change being experienced by CAHs and other rural hospitals. Nationally, since 2010, over 80 rural hospitals have closed, and the National Rural Health Association (NRHA) reports another 670 are vulnerable to closing, including some in North Dakota. The NRHA does point out, however, that the majority of the closures occurred in states that did not enact Medicaid Expansion under the Affordable Care Act. North Dakota did opt to take advantage of Medicaid Expansion. The NRHA finds that roughly one-third of rural hospitals are financially vulnerable and that at the current closure rate as many as one quarter of all rural hospitals could close in fewer than ten years.⁹

Recent research, published in *Health Affairs* in 2018, substantiates the impact of being a rural hospital in an expansion state vs. non-expansion. The research found that closure rates were higher in non-expansion states (expansion states were 84 percent less likely to have hospital closures). As the authors state: “Our analysis of hospital closures in the period 2008-16 reveals that the ACA’s expansion of eligibility for Medicaid for childless adults was associated with significant reductions in the probability of hospital closures.” Furthermore, the authors found, for rural hospitals, “improved total, operating, and Medicaid and uncompensated care margins related to the ACA’s Medicaid Expansion.”¹⁰ This would appear to have some bearing in North Dakota as prior to the Medicaid Expansion and the expansion of 340B access (both approved under the ACA), there were eight North Dakota CAHs with positive margins in 2014 but 18 in 2016.⁵

Hospitals have also been affected by other public policy changes. Under the 2011 Budget Control Act (effective in 2013), Congress, in an effort to address federal deficit concerns, mandated sequestration cuts in federal spending amounting to \$1.2 trillion over 10 years. This included mandatory programs such as Medicare and discretionary programs. Medicare cuts are set at two percent per year deleted in provider payments. In North Dakota, the National Rural Health Association, using analysis from iVantage Health Analytics, in 2015 found that over a ten-year period the Medicare sequestration cost North Dakota CAHs \$25.6 million and 64 jobs. Yearly individual hospital losses ranged from a low of \$27,580 to a high of \$201,000. Most CAHs experienced annual Medicare payment reductions of around \$40,000 to \$60,000.¹¹ Federal and state policy, particularly as it relates to reimbursement, has a profound impact on hospitals, including rural hospitals and associated provider groups.

Rural communities have made significant commitments to their hospitals throughout the state, which can have an effect on the total margin rates. In 2005, only four CAHs had some level of local tax support (e.g., mill levy, sales tax). By 2011, tax support had increased to 13 CAHs or 36% of all CAHs. The Center for Rural Health’s *2014 North Dakota Hospital Workforce Survey* found this had increased to 17 CAHs (47%). By 2018 there was a decline to 14 CAHs that had local tax support (39%). Most of the tax measures have a sunset clause requiring voters to renew or sunset the tax, so some communities may have either not voted to continue, and/or some may simply

have let the clause sunset on its own. The significant decline in both oil and agricultural commodity prices may have been factors as well. The survey did identify three additional CAHs that indicated it was likely their community would enact local tax support over the next five years, but there were also three that specified it was not likely and four that showed that it would not happen. The support raised by a hospital tax ranged from \$37,000 a year to \$360,000. It depends on the part of the state.¹²

In a similar fashion, in 2005, 18 CAHs had the support of a local hospital foundation; this increased to 26 CAHs (72%) in 2011 and 29 CAHs (81%) in 2014.^{13,14} The 2017 survey also found some decline here, as well, with 28 CAHs (79%) having a hospital foundation.¹² While CAHs experience financial stress in many rural communities, local citizens are showing their support through their willingness to tax themselves or to make financial contributions to maintain local access to care.

North Dakota CAHs are complex organizations. In almost all rural communities with a hospital, the CAH is a hub of health services that goes well beyond acute care by offering primary care, long-term care, basic care, assisted living, health promotion and disease prevention services, and other services that are important to the community. Only one of the 36 CAHs is a stand-alone, sole entity hospital offering exclusively traditional hospital services. In the past five years, 35 of the 36 CAHs owned and operated other health service organizations. In 2014, 31 CAHs had other health operations. In a way, this represents how hospitals operated or presented themselves years ago: the hospital as a hospital as opposed to today's rural health or medical center offering acute, primary care, and other community-based services frequently as part of a multi-organization system.

As rural hospitals start to transition from a volume-based system to a value-based system with alternative payment models such as ACOs, patient-centered medical homes, and integrated systems with bundled payments, the focus broadens to a population health-driven system. There is already a high level of acute care and primary care integration in rural North Dakota in the form of hospitals and clinics in one organizational structure, so networks already exist. Most CAHs own and operate a primary care clinic, usually organized as a provider-based RHC, a nursing home, or both, and many offer additional services. CAHs are a central access point to primary care services because 32 CAHs (89%) operate 53 primary care clinics, with 42 of them being RHCs. Thus, these 32 CAHs are providing direct clinic access not only in these 32 communities with hospitals but in an additional 21 other communities. Moreover, 13 CAHs (36%) operate nursing homes, eight operate ambulances, eight own senior apartments, eight offer assisted living, six operate basic care centers, and two provide home-care services.⁵

The changes in ownership over time show that the type and level of community or regional integration is fluid. The role of a rural hospital, especially in North Dakota, is to represent an integrated local system. If a rural hospital closes, a community loses its ability to sustain access to primary care, which can impair the viability of long-term care, corresponding aging services in general, and emergency services. This is why policy makers and community development advocates place a premium on rural hospital viability. It is both a health and health access issue, along with one that has deep implications for the local economy. The hospital or health system has to monitor changes in the environment in order to make decisions that simultaneously advance

health in the community and protect the financial framework of the institution.¹⁵ These integrated health-delivery systems are a commonly accepted organizational arrangement in North Dakota. It is important to understand that CAHs in North Dakota are diversified in their service base and the types of services they provide to rural North Dakota citizens; it is this diversification that presents a complex set of policy issues.

Almost all (97%) of North Dakota CAHs provide services beyond the traditional acute-care and emergency-care base, which means tens of thousands of rural citizens benefit from an organizational arrangement where the rural hospital is a hub provider for essential community health services. However, North Dakota CAHs are still financially vulnerable. The statewide averages show some financial improvement, but there is no guarantee that federal policy will continue to be amenable to some policy efforts that work to the benefit of rural providers (e.g., 340B and Medicaid Expansion). There are still 18 CAHs (50%) with negative operating margins and 11 CAHs (31%) with negative total net margins. The fragile nature of these critical health providers is a concern for policymakers.

In rural North Dakota, if a rural hospital closes, this is a threat to not only accessing hospital care but also primary care, long-term care, and other important community health services. Nationally, since the beginning of 2010 through November 2018, 83 rural hospitals have closed in 25 states. About two-thirds were in the South (13 in Texas and 8 in Tennessee alone).¹⁶ This represents the largest wave of rural hospital closures since the early 1990s. At the national level, the number of new closings is contributing to a growing concern over access to essential rural health services.^{17,18}

Federal policymakers recognize that certain impediments may exist in service provisions, regulatory structures, and reimbursement. New national policy is offering alternative structural and organizational arrangements that may over time produce positive results. One of these is the Frontier Community Health Integration Project Demonstration (F-CHIP). This federal three-year initiative 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. F-CHIP is authorized in the ACA, and only CAHs are eligible. Through F-CHIP, CAHs in five eligible states would have the opportunity to increase access to services that are often unavailable in frontier communities with the goal of avoiding expensive patient transfers to larger hospitals. The eligible states must have more than 65% of counties designated as frontier. Eligible states are Alaska, Montana, Nevada, North Dakota, and Wyoming. Six North Dakota CAHs applied in early 2014 to address at least one of these four areas: (1) telemedicine, (2) nursing home care within the CAH, (3) home healthcare, or (4) ambulance services.

Awards were announced in May 2016, and three of North Dakota's six CAH applicants were accepted: Bowman, Elgin, and Watford City. There are only 10 CAHs from North Dakota, Nevada, and Wyoming involved in F-CHIP. Bowman is addressing ambulance restructuring; Elgin's intervention involves expanded nursing home capacity; and Watford City has telehealth/ telemedicine. The Center for Rural Health, through its Medicare Rural Hospital Flexibility (Flex) Program (i.e., a federal program to states that provides assistance to CAHs and improves the rural health system), provided technical assistance to the North Dakota applicants, hosting statewide meetings to discuss the option for CAHs, and providing grant application assistance. Since then, the CRH

through its CAH Quality Network has been assisting the three F-CHIP hospitals on gathering and monitoring quality related metrics that are then provided to Center for Medicare and Medicaid Services (CMS). The CRH and the North Dakota Hospital Association will continue to work with the three F-CHIP sites.

In response to the rural hospital crisis, the National Rural Health Association is supporting federal legislation called the Save Rural Hospitals Act. The bill has many elements addressing Medicare cuts (including sequestration), regulatory reform, new grant programs, and a new hospital model. The latter, the Community Outpatient Hospital (COH), is part of the continuing evolution of the rural hospital. Critical Access Hospitals represented an effort to modify both the reimbursement process (i.e., returning to an allowable cost method) and the service delivery model. COH goes further as the reimbursement methodology expands allowable costs, changes the service delivery by eliminating inpatient care while allowing swing bed and observation beds, and emphasizing outpatient, prevention, and other essential community services. A COH would likely look like most North Dakota CAHs without the inpatient services. However, cost reimbursement would be increased and there would be federal grants, available only to the COH that would be used to address population health.¹⁹

Critical Access Hospitals work within healthcare networks to provide better access to essential health services. They use networks to gain greater efficiency and effectiveness, provide cost savings, share services or personnel, build capacity, and achieve a higher level of organizational performance. The *2017 North Dakota Hospital Workforce Survey* found that the areas that North Dakota CAHs network around included quality improvement, HIT, staff education, staff and board development, medical education, medical coverage and support, health professional recruitment and retention, and supply management. The tertiary hospitals have established strong networks with the rural hospitals, particularly in the areas of quality and HIT; however, it is important to understand that North Dakota CAHs also work in a number of CAH-exclusive networks. In many respects, the rural hospitals are using networks as a means to also address federal health policy. Quality improvement and HIT development, for example, are significant national health objectives with corresponding federal policy directives and requirements.¹²

It is important to understand some of the issues facing rural North Dakota hospitals. A survey conducted in 2018 asked hospital CEOs to review 22 common issues facing rural hospitals. There were 15 issues (out of 22) that 50% or more of the CEOs viewed as problem issues:

1. Access to mental health inpatient services (94.5% of 36 CAH administrators rated it as a problem, moderate problem, and severe problem)
2. Access to substance use disorder inpatient treatment services (91.7%)
3. Access to substance use disorder outpatient treatment services (91.4%)
4. Access to mental health outpatient services (86.2%)
5. Transport of patients with mental health/substance use disorders to treatment service (80.5%)
6. Hospital reimbursement (Medicaid) (69.4%)
7. Impact of the under-insured (69.45%)

8. Impact of uninsured (68.6%)
9. Service area economic change (66.75)
10. Hospital reimbursement (third party payers) (63.9%)
11. Optimizing the capacity of the Electronic Health Records (EHR) (63.9%)
12. Service area population change (61.1%)
13. Addressing community health and wellness (52.9%)
14. Understanding and transitioning to value-based care (52.7%)
15. Hospital reimbursement (Medicare) (50.0%)

Out of the top 15 issues, the top five all revolve around behavioral and/or mental health access. Three of them, including access to substance use disorder inpatient treatment services, access to mental health inpatient services, and access to substance use disorder outpatient treatment services, were the only issues that over 50% of respondents characterized as a severe problem. These issues encapsulate problems such as finding appropriate inpatient and outpatient care, and even the transportation of patients.

Where to send people and whether or not the facility/agency has room for those people was a common issue in rural communities and for the CAHs. Findings from 2018 are similar to those from 2014 with behavioral/mental health superseding traditional hospital concerns such as payment (hospital reimbursement from Medicaid, Medicare, and private payers), and whether people have (adequate) insurance.

The previous discussion focused on hospital finances such as operating and total margins, the impact of the ACA and Medicaid Expansion and the 340B drug buy-down program, and the general financial environment. The financial viability of the hospital is of concern to CEOs, CFOs, and board members. Thus, it is intriguing that a community need like accessing behavioral and/or mental health is viewed by business oriented CEOs as the most compelling issue they face. When the CEOs had the opportunity to expound on their concerns in an open ended question asking “What one issue are you most concerned with?” there was more nuance. With that question, 11 CEOs identified reimbursement and finance as the most compelling issue and 9 responded with behavioral/mental health as their biggest issue. There were concerns about lower reimbursement, potential loss or changes to 340B, growing needs for more non-operating revenue to offset patient services, impact on patient care, and access to capital. Behavioral and mental health comments centered on finding and accessing services, bed availability, and support systems. As important as health workforce is in the state, only four CEOs said this was the most compelling issue. This generally related to recruitment and retention of providers, physicians, nurses, and other health workers.

The survey findings, based on the perspective of CAH CEOs, conform to results from other research efforts. In the Community Health Needs Assessments (CHNA) process mandated under the ACA for all nonprofit hospitals, the most pressing community health need was found to be behavioral health/mental health. The 2014-2016 CHNA process is completed, and behavioral health was the most common need, as it was in the 2011-2013 period (the first round of ACA required CHNAs). Of the 41 completed CHNAs, behavioral health was identified as a community health concern in 23 (56%) and mental health in 20 (49%). Similar to the CAH CEO survey,

behavioral/mental health supplanted conventional issues like health workforce, health conditions (e.g., obesity, cancer, diabetes, and more), healthcare costs, and other traditional community health concerns. While behavioral health may be a relatively new problem plaguing communities, families, and providers, it has, as measured through a variety of means, become a dominant issue.^{20,21}

“The CEO survey found access to behavioral and mental health service to be the highest-rated concern on the part of CAH CEOs, which was supported by community members who in the most recent CHNA process likewise found behavioral/mental health to be the foremost issue. The behavioral health issue has become a paramount policy issue, at both the national and the state level.”

Another research effort validated the issue of mental health. In a series of interviews of rural physicians and others in 22 rural North Dakota hospitals from 2010 to 2016, researchers found that the lack of mental health services in rural areas was the second-highest-rated impediment to the recruitment of rural physicians. This manifested itself in two ways: 1) if the physician believed that the primary care provider was to serve as the principal provider of mental health services, and 2) if the primary care provider was to serve as the gatekeeper or referral source to a mental health provider. Access to mental health is a rural health issue from the perspective of hospital CEOs, the general public, and rural physicians.^{22,23}

Since rural hospitals are pivotal members of a rural health delivery system, it is helpful to understand both the relationship of the rural hospital to other community organizations and the association of rural hospitals within a health network. All CAHs must maintain formal relationships with general acute care hospitals for patient transfers and communication. A 2018 hospital workforce survey asked CAH CEOs about the quality of these community relationships. Seventeen local, community organizations were identified that would be likely partners or collaborators for community activities. The top rated partners were, in descending order: Local law enforcement, school systems, pharmacy, faith-based organizations, and local government. Over 86% rated law enforcement as above average and excellent. The only other local organizations that had high relationship scores were the local ambulance and public health. The community organizations with the lowest ratings were providers of mental health/substance abuse disorders, human service centers, and the IHS/tribal health. Over 41% of CAH CEOs rated the quality of the relationship with mental health/substance abuse providers as poor and below average. Since the CEOs also rated mental and behavioral health issues as the most serious issues, it is not surprising they view relationships with such providers poorly.

The tertiary-CAH relationship is critical. In the next chapter we will discuss the role and importance of the CAH Quality Network, a network of CAHs working together to address quality of care and/or quality improvement subjects. The Network was created by the CRH and involves, from an educational perspective, the six tertiary hospitals. While most CAHs operate independently, they need additional administrative, educational, and technical resources that they may not possess. Networks are a way to build and/or support capacity.

CAH CEOs were asked to rank their primary tertiary partner, as some CAHs maintain multiple partnerships. CAH-tertiary networks were measured for strength of the network, flexibility found within the network, service comprehensiveness, trust between partners, and optimism for the future of the relationship and positive impact on the CAH. All the measures had positive responses. When the agree and strongly agree responses were combined, all five relationship measures were above 50 percent with the highest being “the CAH/tertiary relationship is strong” at 63.9%. Both service comprehensiveness and trust scored 50%. Some North Dakota rural hospitals have been CAHs since 1999 and all became CAHs in the first decade of this century, so there is a long history of CAHs and tertiaries forging relationships. The first CAH CEO survey was in 2005, and the same questions from this 2005 survey were used in 2018. In all cases, with the exception of one, the 2018 results were higher. The one exception is “optimistic for the future of the relationship” and “positive impact on the CAH.” In 2005, 58% of CAHs agreed and strongly agreed to this statement; however, in 2018, 53% agreed. This is still a majority but a slight downturn. The greatest differential is perceptions of the strength of the network. In 2005, 54% agree and strongly agreed that the network was strong; however, by 2018, 64% perceived it as strong. The fact that after almost 20 years urban and rural hospitals have, over time, cemented overall positive relationships is testimony to how the hospital industry has changed.

A final note on rural hospitals is that while they experience significant pressures in the form of financial, workforce, and regulatory pressures, they also make forward strides. For a number of years, iVantage Health Analytics (a national strategic advisory firm that offers healthcare providers an integrated Web-based business intelligence platform for strategic planning, payment optimization, and performance benchmarking), has identified the top-performing CAHs in the country. Every year North Dakota has CAHs in the top 20 and in the top 100 based on a number of performance metrics or hospital strength indices. In 2018, 10 CAHs in Bottineau, Carrington, Cavalier, Devils Lake, Dickinson, Hettinger, Jamestown, Linton, and Mayville were in the top 100 out of more than 1,300 CAHs in the country. Mayville has been in the top 100 in 2013, 2014, 2015, 2016, and 2018; Carrington in 2013, 2014, 2016, 2017, and 2018; Jamestown in 2014, 2016, 2017, and 2018; Bottineau in 2017 and 2018; and Hettinger in 2017 and 2018. Only Kansas (15) Iowa (14), and Nebraska (13) had more CAHs on the list. However, they have more total CAHs than North Dakota meaning that North Dakota had a higher percentage (28% of all ND CAHs in the top 100). In spite of these issues, North Dakota CAHs perform at a high level.

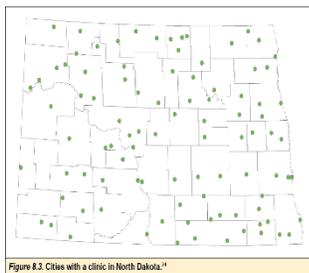


Figure 8.2. Cities with a clinic in North Dakota.**

AMBULATORY CARE

There are approximately 300 primary care and specialty clinics in the state (Figure 8.3). Rural and urban hospitals or health systems account for more than 55 percent of these clinics.^{25,26} There are 53 rural based clinics with 42 being federally certified RHCs 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.²⁷

There are five FQHCs 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). Northland Community Health Center, whose main clinic is in Rolla, has expanded into the rural communities of Bowbells and Ray, and has a dental and primary care clinic in Minot. Northland operates clinics in eight communities (Bismarck, Rolla, Rolette, McClusky, Turtle Lake, Minot, Bowbells, and Ray). Valley Community Health Centers moved their central site from Northwood to Grand Forks and operates clinics in Grand Forks and Larimore. The Grand Forks site is also a dental site. Coal Country Community Health Center has a central clinic in Beulah and serves three other west-of-the river rural communities: Center, Hazen, and Killdeer. Northland CHC and Coal Country CHC are primarily rural-based with Valley CHC and Family HealthCare Center (Fargo) having more of an urban presence. Grafton is served by the Moorhead, Minn.-based Migrant Health Center, another form of FQHC, and is named Community Health Service, Inc. All four of North Dakota's largest communities are now served by a CHC (Bismarck, Fargo, Grand Forks, and Minot). Bismarck is a new site since 2017.^{28,29}

The federal RHC program was created in 1977 by Congress to help address rural healthcare provider shortages; thus, the program requires that the RHC employs a nurse practitioner, physician assistant, or a certified nurse midwife for at least 50 percent of the time the clinic is open. The 50 percent rule allows a hub clinic to operate satellites because it can move non-physician providers (e.g., nurse practitioners, physician assistants, or nurse midwives) from site to site more efficiently. The non-physician providers may be supervised by a physician (e.g. physician assistants) and in a collaborative relationship with the nurse practitioners as established under the Board of Nursing and consistent with state and federal laws. As the title implies, an RHC can only operate in a federally recognized rural area that is a federally designated healthcare professional shortage area, medically underserved area, or governor-designated area.

The development of RHCs was slow, both nationally and in North Dakota. As recently as 1989, there were no RHCs in North Dakota, but the program expanded rapidly in the 1990s. At one point, there were about 90 RHCs in North Dakota; however, by 1996 there were only 78, and now there are only 42. RHCs can be for-profit or not-

for-profit, public or private, and RHCs receive special Medicare and Medicaid reimbursement. The number of RHCs in the state has declined in part because of changes in reimbursement structure and rates. Medicare visits are reimbursed based on allowable costs, and Medicaid visits are reimbursed under the cost-based method or an alternative PPS. In addition, the regulatory environment has become more complicated with a corresponding adjustment in the clinic market. Between a decline in rural population, reimbursement issues, and regulatory matters, some clinics have closed or have converted to other models.

The first survey of RHCs was conducted in 2016. Thirty-three facilities responded to questions regarding structure and needs. Some of the key findings were as follows:

- 100% were accepting new Medicaid patients
- 100% were using an EHR
- 96% were participating in the statewide North Dakota Health Information Network (NDHIN)
- 83% were using a patient portal
- 74% collected benchmarking data for operations and finances
- 70% offered a sliding fee (similar to what FQHCs are required to offer)
- 62% were affiliated with a Provider Network Organization
- 50% used telehealth
- 46% were not aware of USAC funding
- 41% provided behavioral health services
- 39% participated in a care coordination model
- 25% applied for and received Universal Service Administrative Company (USAC) funding (a \$10 billion Universal Service Fund to expand broadband and connectivity to rural areas)
- 20% were a member of the National Association of Rural Health Clinics
- 17% reported Clinician and Group Consumer Assessment of Health Provider and System (quality measure)
- 17% employed a care coordinator

In addition, the survey found strong interest from RHC administrators in securing a wide range of technical assistance. The following were all highly rated: fee schedule, cost reporting, recruitment and retention, management/leadership skills, grant writing, best practices, provider recruitment, and quality improvement.

Many RHCs recognize the need for more education and training, and 7 in 10 offered a sliding fee scale to clients. All of them were using an EHR, and they were accepting new Medicaid clients with positive results. The RHCs are striving to meet needs but recognize their limitations. It is less encouraging that only 41 percent provide behavioral health, 17 percent use a care coordinator (strongly encouraged under the ACA), 20 percent are members of a national association representing RHCs, and only 25 percent applied for and received federal funding to improve broadband (46 percent were unaware of the funding). Overall, there is room for change. Learning new skills, seeking new funding, and expanding essential services.

The FQHC model dates back to the Johnson Administration's War on Poverty, which was created in the mid-1960s as an effort to increase access to care, particularly

for lower-income groups (although all income groups can avail themselves of FQHC services). FQHC is a generic category of provider groups that can be organized as community health centers, migrant health centers, or healthcare for the homeless centers (health centers). Health centers receive an annual federal grant to assist them in providing services to low-income groups. RHCs do not have federal appropriation. Health centers can offer services based on a sliding-fee scale, so if a client's income is low enough, there are no out-of-pocket costs. In essence, the federal grant can offset clinic costs in providing care to lower-income clients; this is the health center feature that addresses income access to services.

In 2016, more than 1 in 3 persons in the United States who were living in poverty were seen for care in a health center. In addition, health centers served 1 in 4 rural Americans, 1 in 5 uninsured persons, 1 in 6 Medicaid beneficiaries, and 1 in 14 people in the U.S. In comparison to private physicians, 47 percent of a health center's patient base is comprised of Medicaid whereas for a private physician it is 13 percent. Likewise, 28 percent of the health center's patients are uninsured while private physicians have a base of only 5 percent uninsured. Nationally, in 2016, 84 percent of a health center's patient base was either uninsured or covered by public sources such as Medicaid, Children's Health Insurance Program, or Medicare. While health centers serve all age groups, they do serve a disproportionately younger cohort as 41 percent of patients are 24 years of age or younger. Only 8 percent are 65 and older.

Health centers count over 1.1 million homeless, 900,000 agricultural workers, 430,000 public housing residents, and 290,000 veterans as their patients. From 2005 to 2014 (most recent data) there was a 62 percent increase in the number of health center patients, growing from 14 million in 2005 to 23 million in 2014. While utilization associated with Medicare, Medicaid, private pay, and uninsured increased from 2008 to 2014, the greatest rate increases were noted for Medicaid (expanding from 13.5 to 17.3 percent) and uninsured (14.7 to 17.2 percent). This is likely associated with the implementation of the ACA because health centers are primary "safety net" providers for low-income/economically disadvantaged individuals and families. Additionally, many health centers employ certified application counselors to assist the uninsured in finding and enrolling in a health plan through the Marketplace or into Medicaid Expansion. This growth trend will likely continue.^{30,31}

In North Dakota, for 2017, more than 41,000 North Dakotans received care from a health center which was a 14% increase from 2015. This included over 16,000 dental patients (an increase of 23%). In total, there were almost 134,000 total patient visits (an increase of 14%). Because of dental access issues for low- or lower-income residents, health centers play an important role in oral health. About 33% of the patient base is people 19 years of age and younger. The largest age cohort for service in North Dakota are young adults (20–24) who constitute 34% of patients. The North Dakota numbers for people 65 and older is comparable to the national numbers, with only about 10% in that age cohort. Private pay is the largest payer, narrowly topping Medicaid (32.9% and 29.1%, respectively). While Medicare is a significant payer for rural hospitals and RHCs, it makes up only 10% of the North Dakota health center market.^{32,33}

Health centers, in contrast to RHCs, have to offer a sliding-fee scale. In addition, health centers can be located in urban as well as rural areas, whereas RHCs are only located in accepted rural designations. Like RHCs, health centers can be private or

public nonprofit organizations. A health center is reimbursed from Medicare and Medicaid based on a cost model that uses an all-inclusive reimbursement rate. FQHCs are required to offer a wider scope of services than are RHCs. These more comprehensive services include diagnostic and lab, pharmaceutical, behavioral, oral, hospital and specialty, after-hours care, case management, transportation, and interpretative services. RHCs are only required to address outpatient, emergency, and lab services; however, they are not precluded from offering a wider array of service.^{28,34}

EMERGENCY MEDICAL SERVICES

Emergency medical services (EMS) are an essential and fundamental service and health delivery function in the overall health system. 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 believes constitute a medical emergency.³⁵ 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.³⁶

EMS continues to change and evolve both in terms of new skill sets, requirements and expectations, and even classification of personnel. The number of

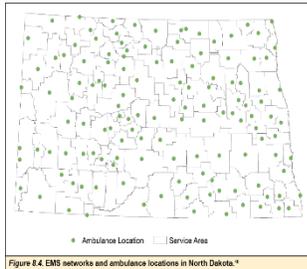
paramedics in North Dakota continues to expand from 346 paramedics in 2005 to 604 in 2017.³⁷ It is difficult to determine how many paramedics are working in rural versus urban areas in North Dakota, as the data only lists their place of residence. A large number of paramedics list an out-of-state address; however, there are no data on where they serve as approximately 25 percent do not list a service location. Emergency medical responder (EMR) is a newer category of provider created in the past six years. Most of the EMS personnel that used to be thought of as first responders have been reclassified as EMRs, who typically render care to the sick or injured while an ambulance is in route. They are usually part of a quick-response unit, fire department, or law enforcement. The advanced emergency medical technician (AEMT) is a level of intermediary training formulated by the National Registry of Emergency Medical Technicians in 1985. They provide more invasive procedures than found at the EMT-basic (EMT-B) level, including intravenous therapy, the use of advanced airway devices, suctioning of an already intubated patient, initiation of peripheral intravenous therapy, and advanced assessment skills. The advanced emergency medical technician (AEMT) is considered a mid-level provider of pre-hospital emergency medical services and is a transition from the EMT-I, who has somewhat less training. The state identifies 77 medical directors, 1,473 CPR/drivers, and 308 emergency medical dispatchers.³⁷

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.³⁸ 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.

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.³⁷ 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.³⁹



Advanced EMS support is typically available around the four major cities (Figure 8.4). Most of the EMS support throughout the state is ground-based and provides basic services (Table 8.3). 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.^{37,41}

Table 8.3
Number and type of EMS units in North Dakota⁴²

	Air	Ground	Substation	Total
Advanced Life Support	6	-	-	22
Basic Life Support	0	86	14	100
Critical Care	2	-	-	2

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 call.
- 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.⁴²

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. 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.”⁴³

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.^{41,44}

Two elements are vital to any EMS transformation. One 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.⁴⁵

The second 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.”⁴⁶ 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 8.1 shows, the average distance from a CAH to a tertiary hospital is 89 miles, with the longest being 182 miles.¹

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^{45,47} 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 will closed in 2018. The transfer protocols have been implemented.⁴⁸

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.⁴⁹

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.^{49,50}

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.⁵¹

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.⁵⁰ 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.⁵² 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%.⁵³ 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.⁵⁴

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.⁵⁴

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.⁵⁵

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.⁵⁶

TRAUMA SYSTEM AND CENTERS

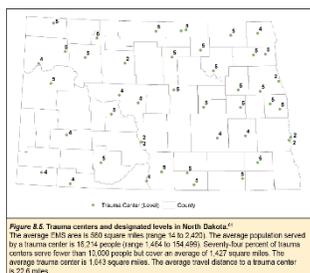
In the United States, traumatic injuries are estimated to be responsible for more than 192,000 deaths a year, with an estimated death rate of 66.6 per 100,000 persons.⁵⁷ Trauma ranks as the third-leading cause of death and is the leading cause of death for people 46 years of age or younger, or 47% of 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.⁵⁸ 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.”⁵⁹ 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.⁶⁰ 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.⁶⁰

All hospitals, including all 36 CAHs, with the exception of one IHS hospital, are designated as trauma centers (Figure 8.5). 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.⁶² 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:⁶³

- 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

ELECTRONIC HEALTH RECORDS AND HEALTH INFORMATION TECHNOLOGY

Health information technology (HIT) is a relatively new entry into the health lexicon. The focus began in the early 2000s, and HIT is an outgrowth of slightly older concepts called telemedicine and telehealth. The term telemedicine refers specifically to patient and healthcare provider encounters for diagnosis and treatment. The term telehealth is a broader term that includes telemedicine but also includes using technology for preventive, educational, and health related administrative activities. Both telemedicine and telehealth involve interactive medical equipment, computer technology, and telecommunications technology.⁶⁴

Telemedicine is the use of technology to deliver healthcare at a distance. Within that delivery structure, HIT focuses more on enabling the transfer of patient information and data over distance. HIT is critical to improve patient care quality, safety, and outcomes. It can serve as a vehicle to move critical information quickly and efficiently, improving organizational performance. It may involve electronic health records (EHR); electronic clinical systems such as computed radiography, computerized provider-order entry, picture archiving, and communication systems; clinical decision support systems; and the overall management of health and medical information.

HIT received an important boost in January 2004 when former President George W. Bush called for the widespread adoption of EHR within 10 years.⁶⁵ Since then, there has been significant growth throughout the country, although it has been harder in rural areas because of cost, staffing issues, technology access, and other concerns. Both

federal and state policies have been engaged. Overall, North Dakota health organizations have done well in acquiring and adapting technology, including HIT.

At the federal level, the Office of the National Coordinator (ONC) for Health Information Technology was established in the U.S. Department of Health and Human Services. The American Recovery and Reinvestment Act (ARRA) provided more than \$30 billion in investments to hospitals, clinics, and physicians to develop HIT systems through the Health Information Technology for Economic and Clinical Health (HITECH) Act. HITECH also provided incentive payments and funding to assist health organizations and professionals to meet meaningful use objectives for electronic health records; created the HIT Extension Program that supports state-based HIT Extension Centers that provide technical assistance, including HIT staff development to providers and health organizations; and provided federal funding in the form of grants and loans.^{66,67}

North Dakota has developed a state policy to support HIT development. In 2006, the first statewide HIT summit was held, which provided an opportunity for health providers, policymakers, state associations, educators and researchers, and others to gather to better understand key concepts and statewide needs. In 2007, the North Dakota HIT Steering Committee, including 22 private and public entities, was created to establish a formal process for the state to assess needs and to develop operational plans. This has been renamed the HIT Advisory Committee (HITAC). One of the steps supported was a provider-needs survey in 2008 administered by the Center for Rural Health.

Since 2016, North Dakota providers' investment in and implementation of electronic health records has accelerated, spurred for the most part by the Medicare and Medicaid incentive programs and penalties included in the HITECH Act. Also contributing to the advancement of EHR implementation is the work of the state HIT director, staff, and the HITAC through the state HIT loan program established in 2009, administered through the Information Technology Department, to assist healthcare providers with the purchase and implementation of an EHR system. All recipients of state HIT loan funds are required to complete a satisfaction survey as a term of their loan agreement. The survey results indicated that 70% of providers would not have been able to purchase an electronic health record system without the loan funding. To date, 27 loans have been made at a cost of \$13.7 million.

In addition to the previously mentioned resources available for providers, the Center for Rural Health and Quality Health Associates of North Dakota partnered with Key Health Alliance, an association of Stratis Health; National Rural Health Resource Center; and The College of St. Scholastica to form the Regional Extension Assistance Center for HIT (REACH), which was funded by the ONC of HIT. Since June 2010, REACH served both North Dakota and Minnesota in providing technical assistance for the implementation of EHRs and in assisting them in attaining the various requirements to meet meaningful use Stages 1 and 2.

The regional extension center (REC) program and REACH concluded on April 7, 2016. During the six years of service to improve care by implementing and using EHR systems, the REACH program worked with nearly 5,100 clinicians at 662 clinic locations, and assisted 121 CAHs and rural hospitals in Minnesota and North Dakota to achieve Stage 1 meaningful use through the federal incentive payment program for

healthcare providers. Stage 1 meaningful use focused on using the EHR to capture and share data. REACH worked across North Dakota and Minnesota, primarily with small healthcare organizations and those providing care to the underserved, such as community health centers and rural care providers. These providers generally lagged behind in EHR adoption because of their size and resource limitations. REACH achieved its goal of bringing 3,600 clinicians to Stage 1 meaningful use.

The program supported an additional 1,489 clinicians in adopting and optimizing their EHRs and nearly all (98%) of the 5,089 clinicians implemented certified EHRs, e-prescribing, and quality reporting critical stepping stones to using EHRs to improve care delivery through meaningful use. As of December 2015, North Dakota ranked 4th with 68% of office based physicians having demonstrated meaningful use through the Medicare EHR Incentive Program. Nationally in 2014, 32.5% of office-based physicians with a certified EHR system were electronically sharing patient health information with external clinicians. North Dakota ranked the highest at 58.8% of these physicians sharing information with external clinicians.

REACH was key to bringing EHR meaningful-use incentive dollars to clinicians and CAHs throughout the two states. From January 2011 to January 2016, combined Medicare and Medicaid payments to North Dakota clinicians through the EHR Incentive Programs totaled \$78 million. At the conclusion of REACH technical assistance, of the 632 priority primary care providers (PPCPs) as defined by the ONC, REACH clients in North Dakota had experienced the following effects:

- 567 (90%) had adopted a certified EHR, using it for e-prescribing and quality reporting
- 360 (57%) attested to achieving Stage 1 meaningful use (many PPCPs were ineligible to attest)
- 65 (10%) were working to adopt a certified EHR

REACH worked with all 36 CAHs in North Dakota. When the REACH program concluded:

- 35 (97%) had adopted a certified EHR, and were using it for computerized provider order entry and quality reporting (95%); and
- 32 (89%) had attested to achieving Stage 1 meaningful use.
- 1 (3%) was still working to adopt a certified EHR

Of the 62 regional extension centers across the country funded by the ONC for HIT, REACH ranked 7th in the nation for the number of priority primary care providers it assisted to achieve Stage 1 meaningful use. REACH clients obtained the technological capabilities and companion change management skills needed to advance clinical processes and improve outcomes. They are more prepared to participate in quality incentive payment programs as a result of the changes made to achieve meaningful use and most importantly to deliver high- quality, safe, and cost-effective care to their patients. For clinics, the meaningful use objectives of the Medicare EHR Incentive Program will roll into the Merit-Based Incentive Payment System in 2019, along with the Physician Quality Reporting System and the Value Modifier Program.⁶⁸

NORTH DAKOTA IN COMAPRISON TO THE NATION

A 2014 data brief identified the use and characteristics of EHRs among office-based physicians between 2001 and 2013. Adoption of EHR systems has been steadily increasing across the United States and North Dakota has experienced a high rate of implementation. The *report* states that “in 2013, the percentage of physicians who had a system meeting the criteria for a basic system ranged from 21% in New Jersey to 83% in North Dakota. The percentage of physicians who had a system meeting the criteria for a basic system was higher than the national average in nine states (IA, MA, MN, ND, SD, OR, UT, WA, and WI).”⁶⁹

Since 2005, every licensed ambulance service is required to submit data to the NDDoH. However, the DEMS explains the electronic reporting among ambulance units “is not an aggregate health record but rather a record of every patient care encounter.” All patient care encounters are collected into a Statewide Online Ambulance Reporting (SOAR) system. Hospitals have the capability to log onto SOAR and download patient-care reports in instances where that facility is listed as the destination.” The majority (65%) of the ambulance units responding to the state survey indicated no plans to electronically send or receive patient care summaries to other healthcare entities. In contrast, there was significant interest in exploring the North Dakota Health Information Network (NDHIN), which can be used to electronically exchange health information. Therefore, more education is needed among EMS personnel about the potential use of the NDHIN.

BARRIERS TO EHR ADOPTION

In addition to the financial burden of implementing and upgrading electronic health record systems, other barriers and challenges that organizations face are listed in Table 8.4. The remaining North Dakota healthcare entities recently surveyed had limited response rates; therefore, no overarching conclusions can be drawn as to the progress of EHR implementation among these types of providers. However, the state HITAC and HIT staff within the North Dakota Information Technology Department will increase efforts to work with these as well as other providers to continue growth of the electronic exchange of health information in the future.

Table 8.4
Barriers to EHR implementation identified as having the greatest impact among health entities in 2012-2013*

	Ambulance	Clinical	Healthcare	Physician	LTC	Outpatient	Pharmacy	Public Health
Insufficient funding	X							
Difficulty with data integration across systems		X						
Difficulty maintaining systems in current state		X	X	X	X	X	X	X
Complex user interface and usability of records		X	X					X
Difficulty changing the data format				X		X		
Current infrastructure issues			X					
Unclear roles and responsibilities				X	X			
Difficulty integrating to existing systems								X
Insufficient implementation								X

HEALTH IT WORKFORCE

While all healthcare entities are at varying levels of EHR implementation and use, there remains a great need in the area of workforce with health IT expertise and

skills. The two top skill sets needed for a majority of the health entities are assistance inputting data and assistance to design, maintain, and customize the EHR, which has been identified as a significant need every year among those who have been surveyed.⁶⁹

While most healthcare entities have implemented an EHR, workforce needs have changed with regard to supporting the existing EHR. In 2016, the Marketplace needs to have resources and experts, which can assist with facilitating ongoing security requirements, change management skills, workflow design, data analytics, and optimization of EHR to better serve the patient and allow providers to more easily and effectively utilize the EHR.

NORTH DAKOTA HEALTH INFORMATION NETWORK

The state health information exchange program, the North Dakota Health Information Network (NDHIN), promotes innovative approaches to the secure exchange of health information within and across state lines. NDHIN allows providers to obtain accurate and complete patient health information, which can yield benefits such as better coordination of care, quicker diagnoses of health problems, reduced medical errors, and safer care at lower costs. NDHIN is overseen by the HITAC. The HITAC consists of representatives from the governor's office, Legislature, Information Technology Department, NDDoH, and Department of Human Services, as well as stakeholders appointed by the governor, who represent providers, consumers, payers, and trade associations. The HITAC's vision is "quality healthcare for all North Dakotans anywhere, anytime."

The HITAC has implemented the NDHIN in two phases: direct secure messaging (DSM), known as Communicate, and query-based services. Communicate is a simple, secure method for participants to send encrypted health information directly to known, trusted recipients. A total of 573 individuals have accounts set up to use DSM. Some examples of information that providers and payers exchange include documents, images, Health Level 7 message strings, claims attachments, and continuity-of-care documents.

There are 104 healthcare organizations with signed participation agreements with NDHIN. The Clinical Portal is the query-based component, which allows authorized individuals to use a robust bidirectional health information exchange to obtain medical information from numerous facilities with one query by securely connecting providers' EHR systems. The portal provides authorized users with a complete summary of care, including information such as allergies, medical history, diagnostic results, immunizations, and other medical information. All of this information can be used by healthcare providers to make the right decisions for patients. Additionally, the infrastructure allows providers to automatically report immunizations, reportable conditions, and syndrome surveillance to the NDDoH.

At the end of June 2016, more than 500 users were accessing query-based services, and more than 900 messages were sent through the NDHIN weekly. Additionally, as the NDHIN and EHR systems mature, the amount of information being shared continues to increase. To minimize the number of places providers need to go to

obtain information, clinical portal users can also query the North Dakota Immunization Information System and the Prescription Drug Monitoring Program.

Another feature includes subscription and notification services, which allows a provider that has a medical treatment relationship with another provider to subscribe to a patient and receive notifications when an event is triggered. Event triggers may include an inpatient admission or discharge, abnormal lab result, panic results, new final radiology result, and emergency room admittance. Future enhancements include adding medication information to the clinical portal, as well as partnering with other healthcare providers, such as long-term care and behavioral health providers. NDHIN has also expanded the image exchange in the state, improving access to patient information from other states and federal agencies. Lastly, an advance directive repository is currently in a trial phase. The repository will allow citizens to upload an advance directive and give permission for authorized users, such as their provider, to access it. The NDHIN team continues connecting, training, and testing with providers on the query-based clinical portal infrastructure.⁷¹

In the past three years, NDHIN has made significant progress. The planning, development, and implementation of NDHIN has been supported, to date, with state and federal funds. The future of NDHIN is now at a crossroads, where participants will be expected to contribute financially. In order to inform the future direction of NDHIN, the North Dakota Information Technology Department contracted with CedarBridge, a consulting firm, on behalf of the of HITAC to conduct an environmental scan of the operations and service offerings of NDHIN as part of a larger endeavor to develop a business plan for future health information exchange services, accompanied by an analysis of the expected return on investment. The environmental scan was completed June 2016, and a business plan was completed October 2016.

TELEHEALTH

According to the Great Plains Telehealth Resource and Assistance Center (GPTRAC), funded by HRSA, telehealth and telemedicine may appear to be very similar, but there are some important differences. This includes clinical, educational, and administrative uses and applications. Telemedicine is specifically the use of these technologies to deliver patient-care services. Through technologies such as videoconferencing and other online applications, telehealth allows care providers to reach more people.

Providers interest and utilization in, and patients' acceptance of, telemedicine continues to grow beyond meetings and educational purposes. The results of a 2018 statewide survey of CAHs, indicate the top areas of interest in exploring telemedicine are for stroke, speech therapy, dermatology, oncology, and dialysis consult. However, challenges remain related to equipment costs, lack of clear or standardized regulatory guidelines for reimbursement, and perceived patient acceptance.

One of the most-used telemedicine applications in North Dakota is for tele-emergency, currently in place in 29 of the 36 CAHs. This innovative service is provided by Avera Health's eEmergency program in South Dakota. Using bi-directional video technology, board certified emergency physicians and emergency trained nurses and other health care team members are immediately available, at a push of a button, to

support rural providers in treating trauma, heart attack, stroke, and other critical conditions. The eEmergency Care team can support the rural team with the following:

- Access specialty support during difficult and multiple emergency cases
- Initiate diagnostic testing sooner
- Streamline emergency transfers when needed
- Keep the patient near home, as appropriate

The second most frequently used telemedicine service is telepharmacy. In 2001, North Dakota was the first state to pass administrative rules that allowed retail pharmacies to operate in certain remote areas without requiring a pharmacist to be present.

Telehealth is being used to meet mental and behavioral care needs as well. One successful model in North Dakota is a project through the Catholic Health Initiatives (CHI), funded by a HRSA Rural Healthcare Outreach Grant, to provide telepsychiatry services in the emergency rooms in 11 North Dakota CAHs and three outpatient clinics. A 2017 statewide telebehavioral health survey indicated a good number of long-term care facilities are also using telehealth to provide behavioral health services to their residents.

Telehealth has the potential to increase access to care for patients, minimize their need to travel to receive specialty care, alleviate healthcare workforce shortages, and bring specialty care to consumers through real time, bidirectional video technology that is secure and HIPAA compliant. In response to the growing need to better coordinate telehealth efforts within the state, HITAC established a Telehealth Workgroup in 2014, which serves to identify telehealth services being provided in the state; reviews state and federal regulations and makes recommendations for potential policy changes to achieve harmonization of state and federal laws; and informs and educates HITAC and interested stakeholders about telehealth. This workgroup provided comments related to telehealth to the North Dakota Board of Medicine, as well as testimony during the 2017 legislative session relating to individual and group health insurance coverage of telehealth services.

LONG-TERM CARE AND AGING SERVICES

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.⁷²

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.^{72,73,74}

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.⁷² 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.⁷⁵ Currently, North Dakota ranks 7th in the nation with the highest proportion of individuals 85 years and older.⁷⁶

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.

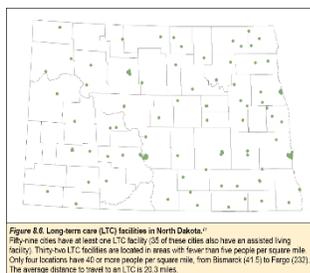
A basic-care facility is a congregate residential setting with private rooms and semiprivate rooms, providing 24-hour supervision with a comprehensive care plan. Basic care provides an all-inclusive rate providing room, meals, personal care services, supervision, activities, transportation, medication administration, nursing assessment, and care planning. The average age of a basic care resident in North Dakota is 79 (40 to 105 yrs). 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 (33 to 109 yrs). 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%.⁷²

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 2006.⁷²



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

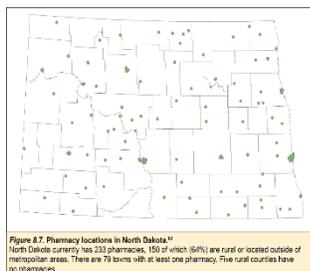
nursing facilities' residents are served by a workforce of their peers. The oldest employee in a LTC facility is 90 years of age.⁷²

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.⁷⁸ 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 2018.⁷⁹

At the state level, the Aging Services Division with the North Dakota Department of Human Services administers programs and services that enhance the quality of life and help elders and people with physical disabilities live independently in their homes and communities. Aging Services provides a number of services including the following: dementia care services program, adult family foster care licensing, Older Americans Act supportive services, Older Americans Act nutrition services, payment for the establishment of guardianship services, LTC ombudsman program, senior community service employment program, telecommunications equipment distribution program, and vulnerable adult protective services.⁸⁰

PHARMACIES AND PRESCRIPTION DRUGS

North Dakota has more than 233 pharmacies with 150 (64%) being located in rural areas (Figure 8.7). Five counties, all rural, have no pharmacies.⁸¹ Rural pharmacies, like other rural health providers, have felt the pressure of reimbursement and workforce issues. Rural pharmacies typically pay more to drug manufacturers per prescription and sell a relatively low volume of medications, so the resulting profit can be very low. There is increasing competition from mail-order and internet suppliers, who are able to sell at large volume and negotiate lower prices from drug manufacturers and may pass part of these savings on to customers. Rural pharmacies frequently have to purchase medications at a retail class of trade and do not have access to mail-order, Internet, or government pricing models from drug wholesalers.



Some third-party payers have low payment rates for prescription drugs, so pharmacies may actually lose money supplying medications paid for by these programs. It has become commonplace that pharmacies lose money supplying medications on a daily basis due to low reimbursement models implemented by pharmacy benefits managers. This is particularly hard on independent pharmacies which tend to be the rural model as 80% of independent pharmacies are located in communities of 50,000 or fewer.⁸³

Independent pharmacies tend to be more dependent on revenue from prescription medication sales, making them more vulnerable to decreases in prescription volume. Rural pharmacists tend to work longer hours than their urban counterparts. This is due to the fact that the rural pharmacist is also the bookkeeper, store manager, inventory manager, etc., and has to do much of this work after normal pharmacy hours. Relief coverage for vacation and illness is often difficult for rural pharmacists to find, which can result in overwork or temporary pharmacy closings. The combination of lower wages and longer hours make it difficult for rural areas to recruit and retain pharmacists. In addition, rural pharmacies face the same issues as do other rural providers from declining population bases to volatile economic conditions to changes in technology. From March 2003 to December 2013, there was a net closure of 924 (12.1%) independent rural community pharmacies. Many rural communities have only one pharmacy, so maintaining access to these services is also an issue.

The number of rural community pharmacies where there was only one pharmacy in the community declined by 15% from 2003 to 2009 (from 2,063 to 1,767). Since then, the number has remained relatively unchanged. In 2013, there were 1,773 rural retail pharmacies operating as solo retail pharmacies. However, 490 rural communities that had one or more retail pharmacy in March 2003 had no pharmacy in December 2013.⁸⁴ During this period, two federal policies were enacted related to the payment of prescription medications. In 2004 Medicare-approved private companies started to offer Medicare prescription drug discount cards. These were offered to Medicare Part A and Part B participants, and they provided discounts on outpatient prescription drugs. In 2006, a new Medicare benefit was created in the form of Medicare Part D, the prescription drug benefit.

There is some evidence of an association between the sharp decline in the number of independently owned retail pharmacies in rural communities and the implementation of Part D.^{85,86} One study found that the gross margin for community pharmacies declined by 22% following the implementation of Medicare Part D, which led to a decline in total owner compensation by about 21%. Some community pharmacies dealt with this loss by limiting the number of Part D plans they accepted, signing with plans that provided an adequate margin, which could lead to even more limited access for rural citizens. This presents a conundrum: Everyone wants to pay less for prescription drugs; however, the benefit to the individual can sometimes be a detriment to the provider. The North Dakota Pharmacists Association observed that margins continue to decline even as prescription drug costs continue to decline. Although, volume increased from 2% to 4% and the profit margins declined. This is associated with the low reimbursements for independent pharmacies, which, if it is severe enough, will force the provider out of business.⁸⁷

In North Dakota, the large majority of rural pharmacies accept Part D plans even if there is a cost structure that is unfavorable to the practice. However, there are signs that this is decreasing as some rural pharmacists have had to decline plans that negatively affect the viability of the pharmacy. Nevertheless, virtually all rural North Dakota pharmacies work with Medicare beneficiaries, free of charge, to assist them in navigating the maze of competing plans by providing free Medicare Part D plan counseling. This extra assistance allows the pharmacist to help beneficiaries choose a plan that is best for them.⁸⁸

A positive feature of the ACA is that over time it addresses one of the problems associated with Medicare Part D. The prescription drug benefit has a coverage gap. Specifically, once a Medicare recipient reached a certain level (in 2018, this was \$3,750 in drug costs), Medicare prescription drug coverage ceased until it reached a higher level (\$5,000) and coverage kicked in again and would be considered catastrophic coverage. The uncovered cost is referred to as the “donut hole.” The ACA gradually fills in the donut hole until 2020 when there will be a more traditional co-payment of 25%. In 2018, the co-payment is set at 35%. Before the ACA, the beneficiary paid 100% of the “donut hole” gap in coverage out of pocket; however, under the ACA, the filling in means that in 2018, the beneficiary would pay 35% of the cost for brand names and 56% for generic medications. This drops in 2019, and then settles at an out-of-pocket rate of 25% for both brand name and generics in 2020.

The gradual elimination of the donut hole is positive policy; however, there has been a corresponding increase in the cost of generic prescriptions so while the out-of-pocket may settle at 25% the consumer benefit is hampered by price increases. For example, if in 2018, with an out-of-pocket co-pay of 35%, if a prescription costs \$100 the consumer would pay \$35. As drug prices increase that same prescription may cost \$150 in 2020 or even \$200; with a co-pay of 25% the cost to the consumer would be \$37.50 or \$50, respectively.^{88,89} Policy analysts see a continuing expansion in the role of the pharmacist in care consultation with patients because of the ACA, and as the donut hole shrinks, it is anticipated that these consultations will help the individual Medicare recipient through lower out-of-pocket costs and thus help the retail pharmacy.

Since 2000, there has been an increase of two rural pharmacies in North Dakota, with others at risk of closing. Similar to rural hospitals and clinics, rural pharmacies are essential to health care access, and like these other providers, they face reimbursement issues. A number of rural and/or independent pharmacies are merely maintaining their existence on shoestring margins and experience little to no growth. Similar to rural physicians, nurses, and others, rural pharmacists serve a critical need, and in spite of reduced reimbursements, low volume, and more regulations, they work to meet the needs of rural community members.

Each year, more pharmacists retire and new pharmacist-owners do not always replace them. This can contribute to access-to-care issues, particularly in rural areas where one pharmacy may serve an expanding geographic area. In response to increasing challenges, a telepharmacy pilot project was initiated in 2001. Now a national model, this has helped to maintain services at retail businesses, nursing homes, and rural hospitals across the state.

A final area of policy interest is the federal discount drug program, the 340B Program. The purpose of the discount was to expand access to affordable medications

for low income populations and support the operation of healthcare safety net organizations such as FQHCs, disproportionate share hospitals, tribal contracts/compacts with IHS, Ryan White AIDS clinics, family planning programs, and other organizations. These all meet federal goals in maintaining access for vulnerable populations such as Medicaid and Medicare recipients, populations in underserved areas, or people who have economic or health disparities.

The law was enacted in 1992 as section 340B of the Public Health Service Act. Under the Affordable Care Act (2010), Medicaid eligibility was expanded, and new types of hospitals were added: Critical Access Hospitals, rural referral centers, and sole community hospitals. Generally speaking, hospitals need to be government based or non-profit. Pharmaceutical manufacturers whose drugs are covered by Medicaid are required to sell drugs to covered entities at 340B discounts. In 2005, the dollar value of the medications handled through 340B was \$2.4 billion, increasing to \$19.3 billion in 2018.⁹⁰ Since 2010, the program grew at an annual rate of 21%.⁸ In 2014, there were 2,140 participating hospitals;⁴ by 2017 the number increased to 2,457.⁹⁰ Currently, 71% of CAHs participate in 340B.⁴

It is estimated that the discount from the wholesale acquisition cost or gross cost was about 45-50% from 2012 to 2016, which is a significant savings that can be used for better access to care for low-income patients.⁸ The 340B discounts represent 8% of the \$379 billion branded or non-generic pharmaceutical market, or about \$30 billion. There has been some recent push-back from the pharmaceutical industry over lost revenue because of the discounts. Advocates for rural health and low-income patients argue that the discount is necessary to provide access to needed medications and to alleviate some of the cost differential faced by rural health providers.

New rules enacted by CMS (effective January 1, 2018) cut Medicare payment rates by about 23% to hospitals, or about \$1.6 billion.⁹¹ There is less direct impact in North Dakota as CAHs were excluded from these changes. At the national level some-to-much of the financial impact of 340B Medicare cuts is muted by a simultaneous change that increases Medicare Part B (which would cover outpatient reimbursements) payments to hospitals with the average hospital gaining about 1.5% increase in Part B and rural hospitals netting about 2.7%. Eighty-five percent of hospitals would receive Medicare payment increases.⁹²

As of 2018, Congress is reviewing additional “tightening” of the program with one effort being to target discounted medications exclusively for uninsured patients. Another bill would enact a moratorium on new hospitals entering the program, and a third would require more reporting on the amount of savings and how they are used.⁹³

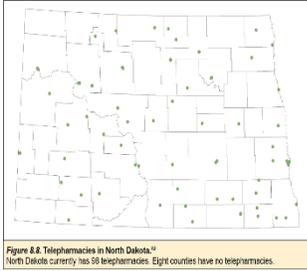
The number of 340B participants had increased significantly as the ACA expanded the number of approved safety-net providers to include CAHs, sole community hospitals, rural referral centers, freestanding children’s hospitals, and some cancer hospitals.⁹⁴ By lowering the cost to the healthcare provider, costs can be lowered for the patient, and health facilities can use the cost savings to make other important adjustments. From a rural perspective, the 340B drug program has been generally viewed as a positive federal effort, especially with the inclusion of CAHs. It appears that the 340B drug discount program has contributed to a better bottom line for a number of North Dakota CAHs, as witnessed by the association of improved margins and participation in the discount program.

There have been policy discussions to consider the inclusion of federally certified RHCs; however, as of 2018, federal policy has not changed. At the rural community level, rural hospitals have used the financial savings to address health access issues for both the uninsured and those with low incomes. A 2017 study by 340B Health, an advocacy group, found that 87% of their rural hospital members reported that 340B was used to maintain operations and “keeping the doors open,” to fund charity care and uncompensated care, provide financial assistance programs, maintain a sliding fees scale co-payment program, and initiate and maintain specialty clinics for lower income patients faced with chronic conditions such as diabetes and mental health issues.⁹⁵

From a rural perspective, the Medicare beneficiary is advanced by both a cost reduction in medications and by stabilizing the financial condition of the local hospital and/or clinic to further maintain access to safety net providers. A final policy note relates to state policy. Since 2015, all administration of the first dose of medication to a hospitalized patient must be first reviewed by a pharmacist. This has been initiated to ensure greater patient safety. The review does not have to be on-site; it can be done through telepharmacy applications. A federal Rural Health Network Development grant that addressed CAH quality improvement both as it related to an emergency function and as it related to medications was funded from 2016 to 2018. The goal of the grant was to assist CAHs in improving quality and patient safety. Under this grant, the CAH Quality Network secured a vendor to assist the 10 CAHs that did not have 24-hour pharmacy coverage. This was to not only gain coverage but also to lower costs through group purchasing rates; provide training and education to all 36 CAHs on remote pharmacy reporting, increasing efficiencies, and best practices; and provide technical assistance for developing policies and procedures to ensure compliance of pharmacist first-dose review and to share information between CAHs on evidence-based practices.

TELEPHARMACY

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.^{88,96} Telepharmacies have become a practical means to keep access to medications available in a growing number of rural locations (Figure 8.8). 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.⁹⁶



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.⁹⁶

E-PRESCRIBING

Pharmacists have the capacity to participate in electronic health information exchange through e-prescribing—an electronic transmission of prescription or prescription-related information between a prescriber, dispenser, pharmacy, benefit manager, or health plan, either directly or through an intermediary, including an e-prescribing network. In 2012, North Dakota ranked 15th in e-prescribing activity;⁹⁷ as of 2013, North Dakota was ranked 6th.⁹⁸ There is a significant challenge facing the nation today related to the drug abuse epidemic, specifically opioid abuse. While the use of e-prescribing has increased, overall adoption and enablement of electronic prescribing for controlled substances (EPCS) has also grown. All 50 U.S. states and Washington D.C. are ranked based on the number of pharmacies and prescribers enabled for EPCS. In 2017, North Dakota ranked in second place.⁹⁹

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 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.

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.”¹⁰⁰ 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.”¹⁰¹ 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.¹⁰² 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 evidence 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.”¹⁰³ 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 8.9). 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 8.5). 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.

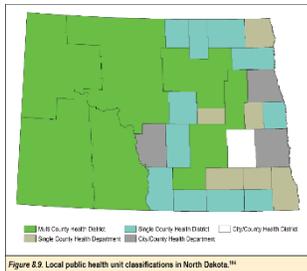


Figure 8.9. Local public health unit classifications in North Dakota.¹⁰⁴

Table 8.5
Public health units by type and number of counties¹⁰⁴

Type	Counties
City/County Health Department	3
City/County Health District	1
Multicounty Health District	32
Single County Health Department	6
Single County Health District	11

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.¹⁰⁵

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.

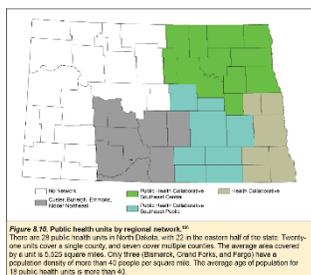
REGIONAL PUBLIC HEALTH NETWORKS

The 2009 North Dakota legislative assembly passed a law authorizing Local Public Health Units (LPHUs) to form regional public health networks through a joint powers agreement. The intent of the law was to build on the existing regional identity and provide legal authority for the shared delivery of public health services throughout the region. Part of the impetus for this change was to foster greater collaboration between public health districts. More collaboration sets the stage for more comprehensive planning to address regional needs and prepare for public health accreditation. While the individual units or districts maintain their autonomy, the regional process represented an initial step in both a rethinking and a restructuring for public health.

North Dakota law allows for flexibility, along with some standardization, by requiring networks to create a work plan that include activities around the core public health activities identified by a national steering committee for “Public Health in America.” The core activities include: 1) prevent epidemics and spread of disease; 2) protect against environmental hazards; 3) prevent injuries; 4) promote healthy behaviors; 5) respond to disasters; and 6) assure the quality and accessibility of health services. Identified work plan activities should also meet the community needs or reflect a community health assessment. Networks are also required to serve a minimum

population of 15,000 or be comprised of at least three local public health units. As of 2018, four regional public health networks have been established and approved by the state health officer; they were approved by 2015. The networks comprise 24 of the 28 LPHUs in the state (Figure 8.1). Each network has developed an annual performance plan indicating strategies for shared services which align with the health needs of their communities. Common strategies include accreditation readiness, environmental health, and chronic disease prevention, including substance abuse prevention.

The state appropriation (about \$700,000) and some additional funding from the Bush Foundation have contributed to the network development: Custer Health’s regional network covering eight counties in the central-west, including Burleigh and Morton; Southeast Central Collaborative, also covering eight counties including Stutsman; Southeast Public Health Collaborative, covering six counties including Cass and Richland; and Northeast Public Health Collaborative covering 12 counties including Grand Forks and Ramsey. The Public Health Network option comes at an appropriate time as most health provider organizations need to contemplate how they fit and function in a quickly changing health delivery system.



BEHAVIORAL HEALTH

The Federal Substance Abuse and Mental Health Services Administration (SAMHSA) has encouraged states to adopt the terminology of behavioral health to encompass both mental health and substance use. The Substance Abuse and Mental Health Services Administration (SAMHSA) defines behavioral health as, “service systems that encompass prevention and promotion of emotional health; prevention of mental health and substance use disorders, substance use and related problems; treatments and services for mental and substance use disorders; and recovery support.”¹⁰⁷ North Dakota has made this shift in terminology by updating the relevant century code language and the renaming the North Dakota Behavioral Health Planning Council and the Department of Human Services’ (DHS) Behavioral Health Division. The Behavioral Health Planning Council consists of 30 members appointed by the governor to monitor, review, and evaluate the allocation and adequacy of behavioral health services in North Dakota.¹⁰⁸

The DHS Behavioral Health Division provides administration for the Planning Council and overall leadership for the development and oversight of the state's behavioral health system. In April 2018, DHS released a *report* by the Human Services Research Institute, “North Dakota Behavioral Health System Study.” This *report* provides a comprehensive review of behavioral health in North Dakota and identifies recommendations relevant to behavioral health policy covering common themes such

as outpatient and community-based services, enhancing and streamlining the system of care for children and youth, workforce development, and tele-behavioral health.

BEHAVIORAL HEALTH PREVALENCE

Behavioral health conditions have a profound impact not only on individuals, but also families, communities, and North Dakota. Lower rates of employment, education, and quality of life are associated with these conditions. Higher incidence of preventable medical conditions and lower life expectancy are also associated factors. Those who have experienced publicly supported behavioral health services die, on average, 25 years earlier than the general population.

It was estimated that 17% of adults (18 and older) met a definition of mental illness in North Dakota in 2016, compared to the national average of 18.3%. Approximately 4% of North Dakota adults were classified as having a serious mental illness in 2016, about the same as the national average. The North Dakota Behavioral Health System Study *report*, indicates that of the remaining 83% with no diagnosed mental health issues may include individuals who have an undiagnosed issue and who could benefit from services; thus, the 17% is likely understated. The *report* further finds that about 12 to 25% of students in North Dakota have an emotional or behavioral health disorder.¹⁰⁹ Research indicates that 7% of the population with a substance abuse disorder and/or a serious mental health condition are in prison or jail each year. The economic costs associated with behavioral health due to lost earnings, public assistance, and health care outlays amount to about \$318 billion per year or about \$1,000 per person, nationwide.

SUICIDE

Suicide is the second leading cause of death for young people between ages 15-24 in North Dakota;¹¹⁰ it is the ninth leading cause of death in the state.¹¹¹ In 2016, North Dakota's crisis-line service, managed by First Link in Fargo, reported it fielded 2,512 calls related to suicide.¹¹² Men typically die by suicide four times more frequently than do females. Firearms are the leading means of suicide in both the U.S. and North Dakota. Groups at higher risk for suicide include veterans, adolescents, young adults, LGBTQ+ individuals, American Indians and older adults.^{111,113}

According to the CDC, suicide rates increased across most states from 2014-2016. During this time, North Dakota was one of 25 states that had a suicide rate increase of more than 30 percent, with an increase of 57%.¹¹⁴ Leadership for state suicide prevention efforts are provided through the North Dakota Suicide Prevention Coalition (NDSPC) and the North Dakota Department of Health (NDDoH) Suicide Prevention Program.¹¹¹

The behavioral health system in North Dakota has traditionally relied on the DHS to provide publicly available behavioral health services. The DHS Field Services Division provides direct services through regional human service centers (HSC) and the North Dakota State Hospital in Jamestown.¹¹⁵ The eight HSCs are located in Bismarck, Devils Lake, Dickinson, Fargo, Grand Forks, Jamestown, Minot, and Williston, with satellite clinics located in Grafton, Rolla, Valley City, and Watford City. The HSCs

provide identified core services including crisis stabilization, behavioral health services, state hospital admission screening, vocational services, and disability services. In 2017, 18,967 North Dakotans received at least one behavioral health service at a human service center.

The State Hospital provides medical and psychological services and is licensed for up to 125 beds with average daily count of 70-95, which includes 25 beds for substance abuse treatment. Inpatient psychiatric services are also delivered by five private hospitals that have psychiatric units. These include Trinity in Minot, Sanford in Bismarck and Fargo, Prairie St. Johns in Fargo, and Red River Behavioral Health in Grand Forks. These six facilities make a total of 323 psychiatric inpatient beds in the state, or 42.6 beds per 100,000 individuals. This is close to twice the US average of 23.6 beds per 100,000 populations. The recently released Systems Study identified that in fiscal year 2017 a majority of publicly funded behavioral health services were delivered in inpatient, residential, and long-term care settings. This number is most likely much higher because it did not include data from the State Hospital or the Life Skills Transition Center in Grafton.

CRISIS SERVICES

Support for individuals in behavioral health crisis is a critical need for communities. Each of the regional human service centers operates a 24-hour crisis line and the statewide Firstlink crisis-line service is available for individuals in crisis. The Fargo region has a mobile crisis team funded by Southeast Human Service Center and run by a private provider to provide a triage and rapid response by behavioral health professionals within the community. Efforts to expand this program outside of the Fargo area have been unsuccessful and maybe difficult to recreate with more limited community providers in other regions of the state. Unfortunately, crisis support is often provided by first responders and emergency departments. In FY 2017, there were 962 behavioral health-related ambulance claims made by 323 individuals (an average of 3 claims per person). There were also 13,499 behavioral health related emergency department Medicaid claims for 5,638 individuals (an average of 2.4 claims per person). These numbers show a high use of these emergency services by a limited number of individuals. The individuals using these services were more likely to be female, and roughly one in four individuals who used one of these services was American Indian.¹⁰⁹

SUBSTANCE USE DISORDERS

The DHS Behavioral Health Division manages licensing for substance use disorder (SUD) treatment programs and opioid treatment programs in North Dakota. The regional human service centers provide most of the publicly funded substance use disorder treatment. Additional SUD services are provided by more than 50 private programs across the state. In 2015, the 64th North Dakota Legislative Assembly created an SUD treatment voucher program to address underserved areas and gaps in the treatment system and to offer participants greater choice in service providers. The voucher can reimburse participating private licensed substance abuse treatment programs for screening, assessment, individual, group, and family therapy; room and

board; recovery coaching; urine analysis; and transportation costs. There are 12 programs across the state that have been approved to provide services through this program.

North Dakota was awarded a \$2,000,000 federal State Targeted Response to Opioid grant in April of 2017 to address opioid prevention and treatment and a focus on increasing the access to medication assisted treatment across the state. This grant is administered by the DHS Behavioral Health Division and includes both statewide and community efforts. The project entails a two-pronged framework, which will enhance statewide services and capacity in addition to focusing on nine communities with high need, including tribal communities. The community efforts have included prevention efforts and increasing access to treatment. Statewide efforts have included increasing the use of medication assisted treatment (MAT) for opioid in the state. One method to increase MAT was the development of training through Project ECHO (Extension for Community Healthcare Outcomes), operated through the Center for Rural Health. ECHO is a medical provider education program, based on a “hub and spoke” model where medical providers (both rural and urban) use telehealth for case-based learning.

The opioid crisis is both a national and rural concern. In 2016, there were almost 64,000 overdose deaths (all drugs) nationally compared to about 40,000 in 2010; a 60% increase from 2010 to 2016.¹¹⁶ In 2016, opioids accounted for about two-thirds of all drug overdoses.¹¹⁷ In 2017, over 20,000 were attributed to synthetic opioids other than Methadone (including fentanyl); over 15,000 deaths from heroin; over 14,000 from natural and semi-synthetic opioids; and over 3,000 from methadone.¹¹⁶ The National Institute on Drug Abuse states that there are about 115 deaths associated to opioids every day.¹¹⁸ The USDA claims there are about 197 deaths every day and that opioid deaths are more than the number of deaths associated with car accidents or gun homicides.¹¹⁹ Opioids commonly include prescription pain relievers, heroin, and fentanyl. It is estimated that the total economic impact of this disease is over \$78 billion a year.¹¹⁸

Between 21 and 29% of patients prescribed opioids for chronic pain misuse them; and 8-12% develop an opioid use disorder. About 4-6% of those who misuse opioids will move on to heroin and 80% of people who use heroin had first used and misused opioids. Regionally, the Midwest saw opioid overdoses increase by 70% in one year (2016-2017); and, overall, opioid overdoses increased by 30% during 2016-2017 in 45 states.¹¹⁸

It is a national and a rural crisis. The American Farm Bureau Federation and the National Farmers Union, in a co-sponsored survey, found that 74% of farmers or farm workers are, or have been, directly impacted by opioid addiction. The same survey found that only 31% of rural Americans saw the opioid problem as more a rural than an urban problem.¹²⁰ According to the CDC, the opioid death rate has quadrupled in rural areas (ages 18-25) from 1999-2015; and tripled for rural women in this same age group.¹²¹

BEHAVIORAL HEALTH SERVICE ACCESS

Access in North Dakota means the availability of providers and, especially in rural North Dakota, getting people to the provider. Behavioral health includes disparities

in access, availability of culturally appropriate treatment, quality, disparities in rural areas, and special populations. The unmet needs tend to be elevated in various subsets of the population, including older people, racial and ethnic minorities, lower socioeconomic status cohorts, and the rural population.¹⁰⁹

The UND SMHS is using telemedicine technology as a way to increase both educational preparation and rural access. The SMHS added one additional psychiatry resident a year with much training being done remotely, relying in part on telemedicine. The telemedicine experience now has been added to the curriculum of all psychiatry residents. In their first year, residents will receive training in Fargo, including the human service center there. Training in years two and three are split between Fargo and a rural location (one-third of the training at a rural site), where the resident would be working with a primary care physician. The fourth year of the residency is one-half rural and one-half in Fargo.¹²² Behavioral Health Workforce Education and Training (BHWET), funded by the federal Health Resources and Services Administration and the federal Substance Abused and Mental Health Services Administration, is a stipend program for six disciplines, inter-professional, who would serve in rural underserved.

RECENT LEGISLATIVE ACTIONS RELATED TO BEHAVIORAL HEALTH

In 2015 the 64th Legislative Assembly approved HB 1396, which provided a \$700,000 appropriation to be used for student loans for certain health professions, including those engaged in the area of behavioral health. The loans are available for physicians, clinical psychologists, advanced practice nurses and physician assistants, licensed addiction counselors, professional counselors, registered nurses, and licensed social workers. In 2015 the 64th Legislative Assembly's HB 1049 also was a loan bill. The law developed a revolving loan fund for addiction counseling internships with \$200,000 of appropriated funding. The internship sites were coordinated by the Area Health Education Center. This law also called for a continuing study of behavioral health needs, which continued a focus during the 2015–2016 interim legislative process. Additionally, the 2015 64th Legislative Assembly increased services for the seriously mentally ill by 35 slots; created the SUD voucher, supported a 10-bed crisis residential unit/ transitional living unit in the north-central region serving Minot and Williston; and supported a 15-bed expansion to the Tompkins Rehabilitation and Corrections Center, an addiction treatment facility.

The 2017 65th Legislative Assembly had 16 bills that directly influenced behavioral health. A significant outcome from the legislative session was \$7,000,000 funded to the Department of Human Services to partner with the Department of Correction in the creation of a community based behavioral health program to divert individuals from the criminal justice system. This legislation led to the creation of the Free Through Recovery (FTR) program. This program is the result of many years of study regarding the need to establish programming that will support the behavioral health needs in the community rather than criminalizing behavior. FTR is managed by the DHS Behavioral Health Division through contracts with vendors in all eight regions of the state to provide comprehensive care including care coordination and recovery support services.¹²³

Additionally, the 65th Legislative Assembly passed legislation to establish a four-tiered classification system for mental health professionals based on training and scope of practice. This included modifying the duties allowed by mental health professionals in the ND Century Code to reflect a new-tiered system. Legislation was also passed to expand the role of addiction counselors to include nicotine and gambling, create a masters level addiction counselor and improve training and licensing processes for social workers, professional counselors, marriage and family therapists, and psychologists. SB 2038, addressed behavioral health training for school teachers, administrators, and ancillary staff. This included specific reference to training on bullying, trauma, suicide prevention, and social and emotional learning. Furthermore, the law established a task force on children's behavioral health and described membership and duties, including the development of a state children's behavioral health plan.

It is clear that of the discussion around behavioral health is transforming. A number of new reports and programs are in beginning stages of implementation to address behavioral health, the most comprehensive being the 2018 North Dakota Behavioral Health System Study done by the Human Services Research Institute. This *report* also includes two additional behavioral health *reports* done by the Center for Rural Health.

ORAL HEALTH

Access to oral healthcare is problematic for millions of Americans because of a variety of factors, including financial barriers, transportation difficulties, problems with navigating government assistance programs, workforce supply, and the funding of those programs. Rural residents, for example, report poorer oral health than people in urban areas. Other disparate groups include the elderly, low-income, those who are publicly insured, and racial minorities, including American Indian and Alaska Natives.¹²⁴

Inadequate access to a dental professional may be heightened by typical hours of operation. Dentists in the state generally work four-day weeks, Monday through Thursday. While only 13% of dentists in the state reported working 40 hours or more, it did not seem to have an effect on wait-time. Roughly 48% of dentists reported that a new patient could make an appointment for an exam within a week of calling their office, and 71% reported a patient would be seen within two weeks of calling. Only 13% said a patient would wait more than four weeks.¹²⁵ The wait time may be for those patients who are insured.

There is growing concern regarding access to oral healthcare for the uninsured and Medicaid recipients. In 2013 (most recent data), 249 dental practices billed for at least one Medicaid patient in the calendar year; only 65 (26%) of these practices saw more than 100 Medicaid patients. The number of dental practices that see no Medicaid patients and do not bill Medicaid is unknown. It is also important to note that in the North Dakota Medicaid file, there is no distinction between a dental practice that employs one dentist and a dental practice that may employ 10 or more.

A majority of North Dakota dental practices that had billed Medicaid in the past calendar year (58%) saw 50 or fewer Medicaid patients. Those dental practices accounted for only 11% of Medicaid patients that visited a dentist in 2013. More than

50% of Medicaid patients who saw a dentist in 2013 received care from one of only 21 North Dakota dental practices; this means that 8% of the dental practices billing Medicaid in 2013 provided care to 52% of the Medicaid enrollees accessing dental services.¹²⁶

Inadequate access to oral healthcare services for North Dakota rural, tribal, and low-income residents has significant impact on individual oral health status. Not only do these groups have less access to oral healthcare services but typically report lower oral health literacy as well. There is an array of data that supports the contention that access to oral health is a continuing problem facing the people of this state. In 2016, 37.2% of North Dakotans ages 65 and older reported severe tooth loss compared to 36.7% nationally (BRFSS). In 2016, 64.9% of North Dakotans age 65 and older reported a dental visit in 2016 compared to 66.7% nationally. North Dakota is in the top five states nationally for community water fluoridation with 96.7% of the population receiving fluoridated water. Nationally the rate is 72.6%. North Dakota is one of only 11 states with a comprehensive State Oral Health Plan and one of 20 States tracking oral health status of older adults through a basic screening survey.¹²⁷ North Dakota is among the states with the highest percentage of third grade students with dental caries (72.5%).¹²⁸

Tooth decay is one of the most common, chronic childhood conditions in the United States. Untreated tooth decay can cause pain and infections that may lead to problems with eating, speaking, playing, and learning. There are several contributing factors that lead a child to develop tooth decay, some of which include infrequent brushing, not flossing, consuming sugary drinks or soda, not visiting a dentist annually, and not having access to oral hygiene products like a toothbrush or toothpaste. In North Dakota, American Indian adolescents are significantly more likely to have these poor oral health predictors than their non-Hispanic white peers. Rural adolescents are at a greater disadvantage than urban adolescents, and students who attend schools with a larger percentage of the population participating in the National School Lunch Program (NSLP) are less likely to have a toothbrush and less likely to have brushed on the day of assessment.¹²⁹

While 96% of all North Dakota non-Hispanic white third grade students have a toothbrush, the same is true for only 49% of their American Indian peers. As a result, only 32% of American Indian youth brushed their teeth on the day of assessment compared to 66% of non-Hispanic white adolescents. Likewise, children attending lower-income schools (>50% of children eligible for NSLP) are less likely to have access to a toothbrush and subsequently less likely to have brushed (48%) on the day of assessment than students attending schools with <50% of children eligible for NSLP. Rural adolescents are slightly less likely than their urban peers to brush their teeth, to have been to the dentist, or to own a toothbrush. American Indian, other racial minorities, and lower-income students have always reported poorer oral health predictors than non-Hispanic white and higher-income adolescents.¹³⁰

Poor oral health literacy, and inadequate access to a dental team or dental supplies, result in poor oral health. In 2015, (most recent data) roughly 73% of all third-grade students in North Dakota had experienced decay, though only 28% had untreated decay. The rate of untreated decay was significantly higher for American Indian (51%) and other minority children (41%) than their white peers (24%). Compared with non-Hispanic white children, American Indian and other minority third-graders have

significantly lower rates of dental sealants, higher prevalence of rampant decay, and higher need for early or urgent care.

Among North Dakota's middle-school students, American Indians are less likely than their non-Hispanic white peers to have visited a dentist in the past 12 months and more likely to have never been to a dentist. American Indian and other minority middle-school students also report more cavities than their non-Hispanic white peers. This has been a consistent trend between 2007 and 2015.¹²⁹

American Indian high school students are also below the state average for the percentage of students who have visited a dentist in the past 12 months. However, the rate has been slowly increasing from 2007 (55%) to 2013 (62%). North Dakota adolescents have seen an increase in the percentage of youth with no cavities. However, this trend is not evident among American Indian high school students. This population has yet to have more than 23% of individuals cavity-free.

State health policy has addressed a number of oral health issues over the last three legislative sessions. The 2013 Legislative Assembly supported a study resolution on oral health. The Interim Health Services Committee had jurisdiction over this matter during the 2013–2014 interim, and again in the 2015–2016 interim. With financial support from the Pew Charitable Trusts, the Center for Rural Health was commissioned to conduct an extensive study on oral health needs and policy recommendations; funding has continued through 2016. The 2015 Legislature approved additional policy to extend the oral health study with more analysis of the feasibility of dental therapy and the effect of the North Dakota Dental Association's case management proposal (Senate Concurrent Resolution No. 4004).

During the 2017 Legislative Assembly, HB 1256 proposed to license dental therapists. The bill failed as did a similar bill in 2015. The dental therapy concept is relatively new but engenders strong feelings, both in favor and in opposition. Currently, three states have codified dental therapy in state law and regulations. An additional three states have authorized tribes to hire the mid-level dental provider (Figure 8.11). Though there are varying models of dental therapy in the United States, all of the new provider types serve as a member of the existing dental team. In partnership with a providing dentist, a dental therapist may provide preventive and basic restorative care for patients, providing this care with or without the dentist physically being present. Utilizing a dental therapist to provide basic and common restorative care allows a dentist to then provide more complex care, and accept more underserved and Medicaid patients. A mid-level oral health provider is one that has graduated from an accredited program, and provides primary oral healthcare directly to patients to promote and restore oral health through assessment, diagnosis, treatment, evaluation, and referral services. In comparison with dentists, these mid-level providers require less education, perform fewer procedures, and command lower salaries. Under this model, a dental team consists of a dentist (providing restorative care and leading the dental team); a dental therapist (primarily providing preventive and basic restorative care, and serving the underserved/Medicaid patients); a dental hygienist (primarily providing preventive care); and a dental assistant (assisting members of the dental team as the team member provides direct patient care).¹³¹

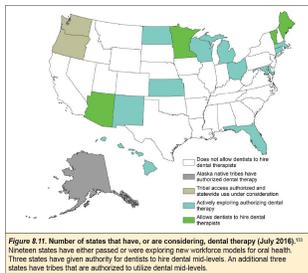
In response to previous and current legislation, the Center for Rural Health developed a survey in 2017 to assess dentists' knowledge of proposed oral health

workforce legislation, support the proposed workforce models amongst dentists, and the willingness of dental providers to participate in each. The survey results found that North Dakota dentists reported more knowledge about dental therapy (40% had significant knowledge) than any other proposed access solution. Ninety eight percent of the dentists indicated more support for increasing Medicaid reimbursement than for any other initiative, though only 23% identified significant knowledge on the topic. However, only 15% of dentists would participate in some level in dental therapy. Dental therapy was the only model with a statistically significant difference in level of participation between rural and urban dentists (23% of rural DDS would participate on some level compared to only 11% of urban). Only two models had more than 50% agreement that they would increase access to dental care for rural, American Indian, Medicaid, or low-income residents in North Dakota. Nearly 66% of dentists agreed that case management would increase access, and 76% agreed that expanding the reach of safety-nets would increase access.

Representatives of the Center for Rural Health have shared research on oral health outcomes, workforce dispersion, and analyses of proposed models with the Interim Health Services Committee during the interim sessions in 2016 and 2018. Many fact sheets and policy briefs have been developed and disseminated on request of the committee. These resources may be accessed on the Center for Rural Health's website at <https://ruralhealth.und.edu/what-we-do/oral-health>. Oral health access will continue to be a significant policy area and the 2019 Legislature will review it for further policy change.

There are other oral health endeavors that are developing. A significant accomplishment for North Dakota partners in oral health during 2017 included the establishment of the North Dakota Older Adult Oral Health Work Group and the development of a new screening tool to be employed nationally in long-term care settings.¹³²

Recognizing the need, and the lack of national standards on the topic, the Center for Rural Health was funded during 2017-18 to work with State and national partners to develop a promising practice for screening nursing home residents' dental needs. This guide provides a national template for nursing home administrators and dental professionals in an effort to ensure that all nursing home residents, upon admission, have dental screenings completed by dental professionals. This initial dental screen should inform a resident's daily plan of care for oral hygiene. This new resident dental screening tool was developed utilizing international research on existing assessments and through review of federal regulations, state requirements, and both private and public insurance coverage of dental services for nursing home residents. The North Dakota Older Adult Oral Health Work Group also identified this as a 2017-18 priority. A dental hygienist will complete the dental screen in the nursing home facility within 14 days of admission of a new resident and the unit charge nurse will complete an oral health screen and develop the daily dental care plan based upon the recommendation in the screening tool. The hygienist will provide the screening under the general supervision of a dentist. The billing will occur under the supervising dentist. The dental hygienist will indicate that a dental exam is to be scheduled within six months of the screening with a practicing dentist.



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 NINE: 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.¹ 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.^{2,3,4}

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.³ This *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.³

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 addresses both the need for change and the cost associated with the resistance to change in 2012.

In a 2013 *IOM report*, the argument is made that the pace of change is 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 is inconsistent.⁵ The IOM finds that the healthcare delivery structure is still too complex; costs are too high and efficiency is sacrificed; unacceptable outcomes are 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 is hindered. If the commitment to, pace of, and instruments for change are 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 so as to leverage its experiences, rather than creating a set of parallel infrastructures and processes.⁶

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.⁷ This work incorporates 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 incorporates 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; the actors who serve as agents for change. The latter point, from the National Academies, is 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, as 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.⁷

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.⁸

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

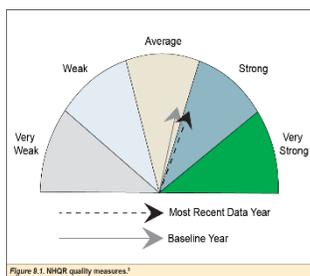
There are different public and private organizations that analyze state-specific quality data. Such analysis can be instructive for state and local officials, providers, employers, payers, and individuals who are interested in understanding effective interventions and healthcare status. Such data can 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 a recent *report*, the AHRQ rated North Dakota as strong in comparison with other states in regard to overall healthcare (Figure 9.1).^{9,10} In previous *reports*, North Dakota was reported as average. (States are graded as very weak, weak, average, strong, and very strong.¹¹) On all health care quality measures, North Dakota was ranked seventh. South Dakota was ranked thirty-fifth and Minnesota was ranked fifth.¹² 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 51¹³, which is improved from its position of 26 in 2015¹⁴, but still below its ranking of 14 in 2014¹⁵. North Dakota ranked 9 overall in 2009, which shows a decline over time.¹⁶ 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 9.1 for 2014, 2015, and 2018. 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 42 indicators, more states showed improvements over declines.¹⁴

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 a metric like access is so pivotal in understanding health and is important within the context of health reform, we will review some findings. 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 9.1
North Dakota rankings associated with Commonwealth Fund State Scorecard, 2016¹⁷

Category	2014	2015	2016
Access	8 th	25 th	24 th
Prevention and treatment	17 th	19 th	21 st
Avoidable hospital use and costs	4 th	22 nd	9 th
Equity	18 th	36 th	27 th
Healthy lives	28 th	27 th	28 th

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%.¹⁷ 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* show that North Dakota CAHs exceed other CAHs on some measures and rated lower on other measures. North Dakota CAHs are 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 is 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 U.S. 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 is consistent across the board is CAHs are 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 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 is 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 is 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 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 is 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 than the national rate that was about 15.3. This placed North Dakota at 17th overall. North Dakota in 2015-2016, for both CAH and PPS, outperformed the 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 is comparable to South Dakota where the rates are 12.4 for CAHs and 12.3 for PPS. Nebraska, on the other hand, has a mortality rate for heart failure for CAHs of 13.2, and PPS has a rate of 12.8. The national rate is just below 12.0, and North Dakota ranks 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 are compared nationally with other CAHs, there is no significant difference or North Dakota CAHs outperform the national rates.¹⁸

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.¹⁹

NORTH DAKOTA QUALITY IMPROVEMENT AND VALUE-FOCUSED ORGANIZATIONS, NETWORKS, AND PROGRAMS

The following efforts indicate that North Dakota has invested resources into building a culture of support and organizational design to improve healthcare quality, health outcomes, organizational performance, and efficacy for patients, providers and systems, and payers.

Medicare Quality Improvement Organization (QIO)

The national QIO network, whose mission is to monitor and analyze the quality of care provided to Medicare and Medicaid recipients, comprises organizations operating in each state. In North Dakota, the QIO is QHA, a private, nonprofit organization located in Minot. QHA has expertise in quality improvement, data analysis, quality and utilization review, and health information technology (HIT). The goal of QHA is “to improve the quality of care for the people of North Dakota by successfully balancing the needs of providers, consumers, stakeholders, and payers.”²⁰ It operates under a contract with the Center for Medicare and Medicaid Services (CMS). QIOs are essential instruments within the ACA as healthcare reform is implemented in a substantially rural state like North Dakota. QHA has placed significant emphasis on working to advance quality of care for rural citizens. QHA has actively participated with the North Dakota CAH Quality Network by providing data analysis and consultations. At times when a focus on CAHs has not been a high priority under the CMS’s scope of work, QHA has continued to provide support to North Dakota rural providers and is an active partner with the Center for Rural Health in addressing rural hospital quality improvement issues. In collaboration with the Center for Rural Health and the Flex Program, QHA formed the North Dakota Patient-Centered Medical Home Coalition.

In addition to acquiring, analyzing, and reporting data, QHA provides technical assistance to all CAHs for collecting and reporting inpatient and outpatient CMS quality measures in the areas of congestive heart failure, pneumonia, acute myocardial infarction, outpatient measures, and the Surgical Care Improvement Project (SCIP). This work with CAHs includes helping them install the CMS Abstraction and Reporting Tool and all updates; encouraging participation in Hospital Compare; providing training on the quality measures and abstraction specifics; providing hospital-specific quarterly reports on their performance; disseminating updates; providing phone support for any issues; and completing on-site visits as needed. The QHA offers training and assistance for CAH quality-improvement efforts relative to hospital-acquired infection prevention, improved care transitions, and reduced avoidable readmissions.

QHA has played a significant role in assisting rural health providers to adapt to the world of technology as it is used to advance quality. QHA collaborated with Stratis Health, the National Rural Health Resource Center, the Center for Rural Health, and the College of St. Scholastica in the Regional Extension Assistance Center for HIT (REACH), which was a non-profit federal Information Technology Regional Extension Center developed to assist providers in clinics, small hospitals, and other settings in Minnesota and North Dakota. As a result, North Dakota’s rate of adoption of electronic health records (EHR) system among rural hospitals and physician offices was successful, exceeding national averages consistently. QHA serves as the North Dakota

subcontractor to the Great Plains Quality Innovation Network, the Center for Medicare and Medicaid Services Quality Innovation Network Quality Improvement Organization (CMS QIN-QIO) for the region encompassing North Dakota, South Dakota, Nebraska, and Kansas. In this role, the North Dakota QHA leads QIN-QIO efforts in North Dakota, including facilitating learning and action networks, convening communities, and teaching and providing technical assistance to healthcare providers and consumers to improve healthcare, encourage healthy communities, and lower costs. Currently, QHA facilitates the North Dakota Health Research & Educational Trust (HRET) Hospital Engagement Network called the North Dakota HRET Hospital Engagement Network on behalf of the North Dakota Hospital Association (NDHA). This includes providing technical assistance to 34 North Dakota hospitals with a goal of reducing preventable hospital admissions by 20% and reducing harm by 40%. QHA also holds a contract with the North Dakota Department of Human Services (NDDHS) to provide inpatient and outpatient hospitalization utilization review as required by federal regulations to ensure that Medicaid patients are only receiving hospital care necessary to meet their medical needs.²⁰

North Dakota CAH Quality Network

The mission of the North Dakota CAH Quality Network, which is composed of all 36 CAHs, is to support ongoing performance improvement of North Dakota's CAHs. Started in 2007 by the Center for Rural Health and a group of CAHs, the network serves as a common place for North Dakota's CAHs to share best practices, tools, and resources related to providing quality care. The network's staff supports quality improvement activities of network members and assists them with the CMS Conditions of Participation (CoP), benchmarking data, analysis of data, administration of an active e-mail listserv (connecting statewide and national quality-of-care-oriented committees and taskforces to facilitate communication and less duplication), and general technical assistance to the CAHs.

The CAH Quality Network has emphasized assistance to the CAHs by offering a number of services. The network has developed an easy-to-follow checklist that assists CAHs in tracking their efforts to meet the CMS CAH regulations. These standards are the foundation for improving quality and protecting the health and safety of patients. CoPs apply to all areas of a healthcare organization. Network staff update the document for the CAHs when the CMS releases change to the CoPs. The network works closely and collaboratively with the North Dakota Department of Health (NDDoH), serving as a liaison to facilitate communication between CAHs and the NDDoH. North Dakota CAHs share their survey deficiencies on a network-hosted, quarterly, technical assistance webinar. The meetings serve as a platform for CAHs to share their survey deficiencies and plan for correction. The CAHs learn from each other by reviewing the deficiencies and determining how to make corrections. The network developed a state-shared uniform credentialing form. The collaboration was statewide with stakeholders such as Blue Cross Blue Shield of North Dakota (BCBSND); Medicaid; Medica; Tri-West (an insurance company); the NDHA; the NDDoH; all North Dakota tertiary hospitals; and one CAH representative from each of the four state regions. The network developed a Virtual Library of Shared Tools, an online repository of CAH-specific resources that serves as a one-stop-shop for resources, policies, protocols, and best practices related

to CAH quality and state-survey resources. The network also developed a Healthcare Safety Zone Portal, a Web-based data management and reporting tool that improves communication within the healthcare setting and facilitates long-term care and CAH-specific benchmarking efforts. As of 2018, 29 state CAHs participate. The network works with CAH staff to provide consultation (on- or off-site) with hospital clinical data abstraction, research, and networking. The network developed a CAH listserv used to share information and post questions among CAHs. It serves as a one-stop approach and provides timely responses from CAH colleagues. The network hosts educational speakers, webinars, and other training opportunities to members on pertinent topics.

A goal of the network is to improve information sharing at the regional and state level among tertiary facilities and stakeholders to prevent duplication of efforts. The network contributes not only to the development of rural-based solutions and systems but also the development of healthcare professional staff skills and resources. Only North Dakota CAHs belong to this network, although it coordinates closely with the six tertiary hospitals in the state. These tertiary hospitals have quality improvement agreements, and services are provided to the CAHs. The network is staffed by the UND Center for Rural Health personnel and supported by the Federal Office of Rural Health Policy (FORHP), the U.S. Health Resources and Services Administration (HRSA), and Flex Program funding. Oversight and direction are provided by an eight-member executive advisory board composed of representatives from CAHs in each region of North Dakota including hospital CEOs, directors of nursing, and quality coordinators or directors.

The Network either facilitates or participates in a number of statewide partnerships. Some of these are new since 2017 and include initiating a statewide CAH Directors of Nursing (DON) Networking Call system. These monthly phone calls are developed as a safe space where no minutes are kept, or recordings made so DONs can share experiences, and ask questions of each other in a secure manner. The Network coordinator facilitates the calls, identifies an outside expert when needed, and performs follow-up. The focus is on helping each other. This process has been identified as one of the important successes of the CAH Quality Network. The Network works with the Rural Palliative Care Project. The North Dakota Uniform Credentialing Process Work Group was first convened in 2017 and is comprised of representatives from BCBSND, NDHA, North Dakota Medical Association (NDMA), ND Health Information Technology, the Center for Rural Health, and one CAH. Initially it addressed methods and systems used by tertiary hospitals, including costs and challenges in credentialing. One of the issues identified was physicians and other providers found the hiring process to be a challenge in North Dakota for CAHs. Currently nine CAHs will test a process that is financially supported by the Flex program including annual fees for one year that will rely on online access. More CAHs will be added. Under this method providers enter their credential information only once (streamlined) instead of several times for multiple requests. Others, such as payers, can access the site for a small fee.

The Network, through the Center for Rural Health, has added more than 60 new resources to the CAH Quality Virtual Library of Shared Resource Tools. To facilitate communication and information exchange, the network operates a listserv. A formal program evaluation of the network found the listserv to be an effective way for CAHs to ask questions of each other in an anonymous way because the questions are read first

by the coordinator who then sends out the questions to network members. Each year, 50 to 60 people participate in an annual Flex CAH meeting. In addition, the network supports CAH-tertiary hospital meetings three times a year by webinar and one time a year face-to-face in central North Dakota. Participation from North Dakota CAHs continues to be strong.

The CAHs and the six tertiary hospitals plan the quarterly meetings to discuss hospital quality on a regional basis. The agendas include other stakeholders (NDHA, NDDoH, ND Health Information Network, Quality Health Associates, and others) who leverage the platform of the network for communicating with CAHs and reducing duplication of meetings. This has proved to be one of the most supported efforts of the network, by CAHs and networking tertiaries alike. The level and quality of interaction between the CAHs and regional tertiary partners solidifies the importance of mutual, shared learning. The CAH Quality Network has helped to foster stronger, positive relationships between the CAHs and the tertiary hospitals. Even in regions where there are two tertiaries, there is a willingness to share information on quality-related subjects.

In 2017, the CAH Quality Network's Executive Committee, with the assistance of an outside facilitator, conducted strategic planning for the Network. The new Network objectives include developing and managing the ND CAH Quality Network, facilitating best practice sharing, highlighting workforce development initiatives and resources, engaging in rural advocacy, enhancing professional development, and optimizing technology utilization.

The Network had operated, since its inception in 2007, with more general objectives focusing on supporting quality improvement activities and developing and managing the Network--with one specific objective related to assisting CAHs with Conditions of Participation. The new objectives better reflect contemporary concerns such as workforce development, professional development, technology, best practices, and advocacy, but continue to focus on the development and management of the Network. These objectives now guide the work of the Network.²¹

Currently, there are 10 quality-improvement efforts or programs in which North Dakota CAHs participate. The 10 are either administered through the network and have the organizational support of the Center for Rural Health Flex Program, including staff support, or they are multi-organizational, in which the Network and CAHs participate.

Medicare Beneficiary Quality Improvement Program (MBQIP). MBQIP is funded by the FORHP and HRSA. It is a Flex Program initiative charged with increasing CMS Hospital Compare participation rates for CAHs and dedication to quality-improvement initiatives.²²

Hospital Compare is a CMS initiative that collects quality-related data on more than 4,000 CMS-certified hospitals. An active website allows hospital users to review quality-related data to help inform their decision-making. Participation in MBQIP initially was voluntary; however, the FORHP has implemented a phased approach that now requires all CAHs nationwide to participate in MBQIP in order to be eligible to receive Flex funds. This means education, webinars, meetings, and funds for quality improvement, finance and operations, Community Health Needs Assessments, and emergency medical services work are dependent upon CAH participation. The MBQIP seeks to increase attention on quality healthcare for all CAH Medicare beneficiaries, both inpatient and outpatient. The network staff works with CAHs to increase data

more inclusive and responsive to the consumer, and to incorporate patient perspective on the quality of care into determinants of organizational performance. While many hospitals had collected information on patient satisfaction with their care, there had previously been no national standard for collecting this information that would yield valid comparisons across all hospitals. The intent of the HCAHPS initiative is to provide a standardized survey instrument and data-collection method for measuring patients' perspectives on hospital care.

The HCAHPS survey contains data from patients covering the following: doctor communication, nurse communication, staff responsiveness, hospital environment, pain management, medication communication, discharge information, food services, and the overall rating of the hospital from a score of 1 to 10. The North Dakota CAH Quality Network coordinator helps CAHs to understand the HCAHPS process, complete contracts, submit data, review reports, and review data regionally, statewide, and nationally to identify areas for quality improvement and best practices.

The Flex Program supports partial funding to a number of North Dakota CAHs, and as of 2018 all 36 CAHs participate. In 2017, all 36 CAHs had submitted Influenza Vaccination Coverage among Healthcare Professionals data. In 2016, North Dakota CAHs ranked 18 (out of 51) on inpatient-related scores and 16 on outpatient.

Pilot HCAHPS Transition of Care with ICAHN (Illinois Flex Quality Network) – Indiana, Illinois, and North Dakota. This pilot project focuses on improving transitions of care: medication management, discharge instructions, and transitions of care measures. HCAHPS scores are collected and measured. Education sessions are held via quarterly webinars and monthly communication. Five North Dakota CAHs volunteered to participate. The hospitals are using a tablet for patients to answer questions to better understand the ED experience from the patient's perspective. Twelve questions were selected by the pilot group and represent a scaled-down version of the CMS proposed questions. Data is shared quarterly, high performers identified, and best practices shared.²⁵

Electronic Clinical Quality Measure (eCQM) Pilot Project (with Stratis Health). This pilot works with State Flex Programs and selected CAHs to complete eCQM submissions that align with the 2017 Medicare EHR Incentive Program requirements. Through this process, barriers are identified and understanding of technical assistance needs to support CAHs in eCQM submission are determined. Participating CAHs self-select at least 3 eCQMs with patients that meet the denominator criteria and report on these measures. eCQM aligns with the requirements of the 2017 EHR incentive program. The benefit to CAHs is that it helps to prepare them for the requirements that are forthcoming.²⁵

State Stroke System of Care and Cardiac Care Program. The CAH Quality Network works collaboratively with the NDDoH, emergency medical services (EMS), and other stakeholders to reduce the death and disability associated with heart disease. The network has been a key entity in the development of a statewide system of care in the treatment of stroke patients. The guidelines developed assist healthcare providers in the care of stroke patients. The network secured a subcontract under the NDDoH's Heart Disease and Stroke Program from 2010-2016 to assist CAHs with efforts to adapt statewide stroke guidelines. Since the ending of the contract, the CAH Quality Network has stayed involved in the Stroke System efforts. The CAH Quality Network coordinator

serves on the Statewide Stroke Task Force. The State Stroke Program facilitates the on-boarding of North Dakota CAHs to participate in the project by agreeing to utilize a stroke patient management tool, self-attest to stroke readiness CAH designation, and implement the state stroke algorithm in treatment of stroke care. The network has provided ongoing assistance and support to registry participants. The Center for Rural Health and the network collaboratively work with the American Heart Association and the North Dakota Department of Health to establish contracts for the Get with the Guidelines Stroke Patient Management Tool.

Under the program, the network does the following: 1) assists CAHs to establish use of the patient-management tool, 2) facilitates sharing between state stroke program participants, 3) establishes ongoing communication with state stroke program participants (e.g., monthly meetings with the participating hospital advisory council [PHAC]), and 4) facilitates regional discussions on stroke system opportunities, tools, and trainings. The NDDoH Stroke Task Force continued to hold meetings during the current biennium (2017-2018). The network assisted in developing state stroke educational training modules for CAH providers and staff, stroke protocols, CAH stroke readiness assessment, acute-stroke treatment guidelines, and other functions. As of 2018, 27 North Dakota hospitals had achieved stroke-ready designation, with three more having submitted an application. All rural hospitals that have a CT have been designated, with the exception of one hospital.

There are 5 communities that are designated Cardiac-Ready Communities and another 25 that are signing onto the initiative. The Stroke/Cardiac System is collaborating with Mission: Lifeline on educational meetings which are done regionally with continuing education credit.²⁶

Much of the cardiac effort was facilitated and initiated through a \$7 million grant secured by the Midwest Affiliate of the American Heart Association in 2011. The funds originated from the Leona M. and Harry B. Helmsley Charitable Trust with a \$600,000 match from the state of North Dakota. This allowed the state to implement Mission: Lifetime, a community-based initiative to improve the system of care for heart attack patients in North Dakota. Mission: Lifeline is a strategic initiative to save lives and reduce disability by improving emergency readiness and response to all heart attack patients while focusing on ST-elevation myocardial infarctions (STEMIs). A STEMI is caused by the sudden, total blockage of a coronary artery—the deadliest type of myocardial infarction. North Dakota has ranked in the top ten states from STEMI deaths; thus, statewide efforts to curb the onset of a STEMI in urban and in rural areas is a high priority. In 2014, as the original Helmsley Charitable Trust initiative ended, the Mission: Lifeline effort became part of a larger umbrella called the North Dakota Cardiac System of Care, with oversight from the NDDoH's Division of EMS. The Cardiac System of Care includes STEMI, chest pain, and cardiac arrest (this was discussed in Chapter 8).²⁷

North Dakota hospitals have developed a cardiac system of care for acute coronary syndrome guidelines. This means no matter where you are in North Dakota, you will receive the same diagnostic care for a heart attack. Guidelines direct hospitals to timing of an electrocardiograph, calling ahead to arrange transfer to a hospital that can perform a percutaneous coronary intervention, dispatching EMS, and following the

American College of Cardiology/American Heart Association clinical guidelines to definitive care.

Health Care SafetyZone Portal–Clarity Group. The Health Care SafetyZone Portal is a browser-based data collection and communication tool to address adverse events management. It is used by North Dakota CAHs to track and analyze infection reports, medication events, equipment, employee incidents, facility and security events, falls, procedural and clinical events, patient and family concerns, Health Insurance Portability and Accountability Act (HIPAA) violations, and other measures. The North Dakota CAH Quality Network, through financial support from the Flex Program, hosts monthly user-group meetings, helps identify areas for improvement in the data, and assists in information sharing and identification of best practices.

Participating hospitals now cover the expense of the event reporting tool; however, when the effort began in 2008, Flex funds supported the access cost to the Clarity Group platform. Clarity Group is a national organization that provides management assistance, including technology, to healthcare organizations. Clarity Group worked with the North Dakota Flex Program to initiate a demonstration project to address CAH needs to collect and analyze quality and patient-event data. Since then, other states have joined, and the CAHs can benchmark their data with that of other CAHs. In 2018, 19 of the 36 CAHs use the Health Care SafetyZone Portal, and through Sanford Health System, two CAHs use a similar event reporting tool (Midas); seven Catholic Health Initiatives (CHI) facilities use Intelligent Resources Informed Strategies (IRIS). Thus, 28 CAHs are providing event reports. The network coordinator works to identify shared event measures across different systems and tools or data platforms to develop a more comprehensive understanding of quality measures across North Dakota. The network assists with bimonthly meetings of Health Care SafetyZone Portal users via webinars, where data and best practices are shared along with feedback on the tool. Four national user-group meetings were held to review functionality of the tool. The quality event reporting through the portal has helped to inform other initiatives in North Dakota, such as the Hospital Improvement and Innovation Network work being done through a Health Research & Educational Trust (HRET) of the American Hospital Association. Collaborative efforts have focused on education and quality improvement to reduce duplication of work.²¹

Benchmark for Excellence in Patient Safety (BFEPS). This is a program within the Health Care SafetyZone Portal through the Clarity Group; North Dakota CAHs can elect to participate in benchmarking and data sharing with all CAHs in the nation that use the event-reporting system. In North Dakota, 16 of the 19 CAHs using the Portal are participating in this program. Over the past year, quarterly data meetings were hosted by Clarity Group, the vendor.²⁷

Credentialing Committee. In 2018 the Credentialing Committee reviewed a system called the Council for Affordable and Quality Healthcare ProView which is a reliable electronic software that reduces duplicative paperwork for capturing and sharing health care provider credentialing data, a provider profile. If initiated in North Dakota, five CAHs would use the software. The subscription and provider fees, for the first test year, could be supported by the Flex program.²⁵

STRIVE – Strategies Targeting Reduction in Infections via Engagement. This is a national Centers for Disease Control and Prevention (CDC) and Health Research and

Educational Trust (HRET) pilot that ND Flex is participating in, along with other ND stakeholders, including QHA and NDDoH in 2017-2018. Four ND CAHs and two nursing home facilities agreed to target reduction for infections. Each participant completed an infection control assessment which was used to focus improvement, provide coaching, and identify top needs. The highest need identified is knowledge deficit for environmental services. The six participants report data on infection to the CDC National Health Safety Network (NHSN) quarterly.²⁵

Rural Health Network Development (RHND) Grant Program for pharmacist first-dose review of medication within 24 hours and Emergency Department Transfer Communications (EDTC). The CAH Quality Network was awarded a FORHP Network Development grant in 2014, covering the years 2014–2017. This three-year initiative focused on two important quality steps. The first was telepharmacy to better facilitate pharmacist review of medication orders within 24 hours. The second was improved care coordination related to outpatient EDTC and enhanced data collection tools and methods such as pharmacy reviews and outpatient EDTC. This grant facilitated North Dakota's ability to address a CAH statewide regulation that requires CAHs to review first-dose medication by a pharmacist within the first 24 hours. North Dakota CAHs were surveyed and 10 North Dakota CAHs did not have 24/7 access to pharmacy coverage. The RHND grant assisted CAHs in supporting telepharmacy within their facility. In addition to the Center for Rural Health, the ePharmacist program provided expertise and education on telepharmacy. QHA assisted with EDTC data abstraction and analysis. The network shared benchmarking EDTC data at quarterly CAH region meetings. The evaluation showed that the grant facilitated the 10 CAHs in meeting state rules on 24/7 access for pharmacy coverage for the first-dose medication. With regard to the EDTC, all ND CAHs have a process in place to report elements to transferring facilities for patient safety. The grant established a shared platform/protocol such that all ND CAHs are transferring and communicating the same throughout the state. The overall result is that all 36 CAHs have processes in place and report elements related to transferring ED patients; there is also pharmacist review of all first-dose medication.²¹

Health Research and Education Trust (HRET) Hospital Improvement and Innovation Network (HIIN) A continuation of the Hospital Engagement Network (HEN), the Centers for Medicare and Medicaid Services (CMS) Partnership for Patients (PfP) program awarded two-year Hospital Improvement and Innovation Network (HIIN) contracts to 16 organizations across the country, including the American Hospital Association's (AHA) Health Research and Education Trust (HRET). HRET in turn filters this down to 32 state hospital associations (including North Dakota). QHA then provides statewide leadership for this network. Thirty-one CAHs have joined the ND HRET HIIN. The focus is to reduce all-cause inpatient harm by 20 percent and readmissions by 12 percent by 2018. Great Plains QIN (of which QHA is a partner) opened up a Quality Payment Program Service desk in 2017. This provides technical assistance to practitioners who are subject to the new payment system created under the federal Medicare Access and CHIP Reauthorization Act (MACRA) policy. MACRA also requires technical assistance to be provided to small, underserved, and rural providers. Telligen (an Iowa based firm) will provide technical assistance to such providers in ND, SD, IA, and NE.

North Dakota Rural Community Based Palliative Care

The North Dakota Rural Community-Based Palliative Care project is a multi-state, multi-faceted project to increase access to palliative care services in rural communities to improve quality of life and quality of care for those with advanced illness and complex care needs. The project was one of three projects chosen by Stratis Health in a multi-state effort to increase access to palliative care services in rural communities. Stratis Health is a Minnesota non-profit organization that leads collaboration and innovation in health care quality and safety. Like QHA it serves as a state quality improvement organization. Under the North Dakota Rural Community-Based Palliative Care project, community teams receive support to build rural community-based palliative care services. Technical support is provided through the Center for Rural Health. In 2016 the project completed a state environmental palliative assessment with the North Dakota Palliative Care Task Force; eight rural communities were identified to participate in the project; a community based team of interdisciplinary representatives from rural hospitals, clinics, home health programs and other community-based organizations, for each of the eight communities, was formed; each of the eight community groups will complete an asset and gap analysis of services, and each of the eight will develop an action plan. Workshops and mentoring assistance are provided. The project operates through 2020.²⁸

STATEWIDE PROGRAMS TARGETING BETTER CARE, BETTER HEALTH, AND LOWER COSTS

The following programs all operate in North Dakota. Some are from the public sector, some are from the private sector, and some are a public-private partnership. Each in their own way has a focus and mission that works to improve health, improve care, and control costs. Some are focused on a subset of the population or a set of conditions, while others are broader in scope.

Meaningful Use of EMG Clinical Quality Measures

The American Reinvestment & Recovery Act (ARRA), enacted in February 2009, targeted American investment in infrastructure following the Great Recession of 2008. As part of the focus on infrastructure, there was a recognition of the role technology plays in healthcare, including the linkage with the health system and a corresponding recognition that technology was a means to help improve quality of care. This is an outgrowth of the work discussed earlier in this chapter pertaining to the Institute of Medicine. The Health Information Technology for Economic and Clinical Health (HITECH) Act was part of this policy transformation igniting a health system-wide quest for the “meaningful use of interoperable electronic health records throughout the United States health care delivery system as a critical national goal.”²⁹ Meaningful use means using EHR technology in a meaningful manner such as electronic prescribing or sharing data and information to improve quality of care. This national effort, through the federal Office of the National Coordinator for Health Information Technology, is administered in the North Dakota HIT office. By defining a set of measures for meaningful use, federal

policy is attempting to determine the overall set of metrics that will be used. Providers who reach meaningful-use objectives receive incentive payments and the clinical quality measures (CQMs) are the outcome measures. Nationwide, as of 2016, over 95% of all eligible hospitals for the Medicare and Medicaid EHR Incentive Program had achieved meaningful use of certified health IT. (About 80% of CAHs achieved meaningful use.³⁰) As of 2016, 35 of 36 CAHs had met meaningful use requirements.³¹ “Meaningful” has three stages. Stage 1 in 2010 had 15 core set objectives with a mandatory requirement that at least one population/public health measure be selected. Stage 2 in 2014 called for eligible professionals, eligible hospitals, and CAHs to include 17 core objectives. A modified Stage 2, which ran from 2015 to 2017, had 10 objectives and measures that advanced clinical practices and promoted information sharing, replaced the core and menu structures of Stages 1 and 2 with a single set of objectives and measures, and established several other changes to the EHR Incentive Program. Stage 3, covering 2017 and 2018, represents an effort to streamline standards and offers providers more flexibility concerning aspects of regulatory compliance.^{29,32}

The linkage of HIT with clinical quality measures is another significant step in the transformative process, whereby technology is a tool not only to facilitate quality measurement and improvement but also to apply the elements of pay-for-performance or value-based purchasing, along with other APMs as the country moves into a value frame of payment.

Healthy Steps

Healthy Steps is a children’s health insurance plan that BCBSND administers for North Dakota. It is the Children’s Health Insurance Program (CHIP) for North Dakota. DHS has the responsibility to monitor, evaluate, and improve the quality of care delivered to the members. Healthy Steps seek to provide healthcare coverage to eligible enrollees, ages 18 and younger, in a manner that produces better health outcomes in a financially efficient way. Accepted concepts such as case management and care coordination have been brought into the process to ensure patient-quality outcomes and higher-performing structures producing greater value.

BCBSND identifies Healthy Steps enrollees with special healthcare needs by using a health-risk assessment, provider referral, and claims data. The program provides case management services to enrollees to facilitate care coordination and to secure medical services. Nurse case managers assess, facilitate, and advocate for options and services to meet CHIP participant needs to promote quality and cost-effective outcomes. The case management process used by CHIP has been reviewed and approved by the External Quality Review Audit. In North Dakota, this case management process, for the CHIP program, is part of a Medicaid Managed Care Organization (MCO) arrangement. DHS also contracts with Delta Dental of Minnesota on a private dental services program for Healthy Steps children.

In November 2018 there were more than 44,600 North Dakota children enrolled in Medicaid out of about 95,000 North Dakotans enrolled in Medicaid.³³ About 5,000 North Dakota children have coverage through Healthy Steps, not counting another 5,000 having coverage through the ACA Marketplace.³⁴ The high numbers reflect the large number of at risk children in North Dakota. Fully 47% of all Medicaid/CHIP enrollees in North Dakota are children. This is slightly lower than the U.S. rate of 51%.³³

In North Dakota, about 14% of all children (13,000) are covered by Medicaid/CHIP and 8% are uninsured.³⁵ Children, represent a large number of enrollees, but account for little cost to the program. Nationwide, children accounted for only 19% of Medicaid spending with an average annual expenditure per child of \$3,389.³⁴ Healthy Steps covers uninsured children in families who do not qualify for standard Medicaid and earn up to 175% of the federal poverty level or \$35,735 annually for a family of three.³⁶

The CHIP program had its start as part of the Balanced Budget Act of 1997, and the ACA extended federal funding through September 2015. The ACA increased the federal matching rate by 23%, which was extended until fiscal year 2017, and extended again in January 2018.^{37,38} This added more than \$3 billion in additional CHIP funding for states; the average federal matching rate is 88%. The eligible rate for North Dakota and Minnesota is 88% in comparison with South Dakota with a 91% rate. The ACA also provided an additional \$40 million in federal funding to continue efforts to promote enrollment in Medicaid and CHIP, but in 2017 experienced some complications. Federal funding for CHIP expired on September 30, 2017, but in December 2017 Congress provided a short-term extension under a continuing resolution. The uncertainty had forced some states to consider coverage reductions. However, on January 22, 2018, Congress passed a six-year extension of CHIP funding as part of another continuing resolution bill.³⁹

Medicaid Primary Care Case Management Program (PCCM)

The purpose of the PCCM, which is a managed care model, is to provide adequate access to primary care for certain Medicaid populations that are required to participate. This is a Medicaid effort to address access, quality, and cost-effectiveness. The PCCM provides coordination of care and continuity of healthcare services, works to avoid duplication of service, emphasizes high-quality care, and ensures efficacious healthcare services. The program requires that all non-emergent healthcare services be provided through the client's primary care provider. Either recipients choose a primary care provider or the program assigns them to one.⁴⁰

Medicaid Health Management Program (HMP)

In 2007, DHS initiated a Medicaid disease management program. The program focused on asthma, diabetes, chronic obstructive pulmonary disease (COPD), and congestive heart failure. This program was transitioned in 2011 into the HMP. The new program allows providers to offer additional care coordination services in the form of a health management program for the previously listed health conditions. Providers may qualify for an additional per-member, per-month payment. The HMP offers an integrated service package such as high-risk screening and assessment, care coordinator, triage, a referral system that includes tracking referrals and results, a recall system for appointments, pharmacy review, inpatient and discharge transitions, education, and emergency department diversion. Patients receive an individualized care plan, a personal primary care provider, and education and training to help the Medicaid patient better understand their condition and self-management.⁴⁰

North Dakota State Plan to Prevent and Manage Chronic Disease

The NDDoH developed and issued this plan in 2012 with partner organizations. The plan focuses on collaborative activities that are meant to accomplish specific goals, objectives, and strategies to improve the health of the population. The plan addresses surveillance and evaluation and environmental approaches that promote health, and supports programs to reinforce healthful behaviors, healthcare systems and quality improvement, personal health and self-management, health inequities capacity, and capacity.

In 2013, the NDDoH formed a coordinated chronic disease evaluation team and in 2014, the team issued a set of prioritized chronic disease indicators to guide data analysis and to report on statewide outcomes. An epidemiologist specializing in American Indian data was hired and works with North Dakota tribes.⁴¹ In collaboration with the NDDoH, the Center for Rural Health issued a statewide report.⁴² In 2018, the department offered a number of programs: coordinated chronic disease prevention, heart disease and stroke prevention, comprehensive cancer prevention and control, tobacco prevention and control, tobacco cessation services, tobacco surveillance, behavioral risk-factor surveillance, and a youth risk-behavior system. The department conducts both the Youth Risk Behavior Survey (YRBS) and the Behavioral Risk Factor Surveillance System (BRFSS).⁴³

Money Follows the Person

This federally funded grant program helps transition Medicaid clients from institutions to home and community-based settings. During the 2015-2017 biennium, 128 older adults and others with either physical or intellectual disabilities were transitioned from institutions to community living arrangements and provided services and support systems to facilitate independent living. Since the program began in 2008 there have been almost 400 transfers. The program offers a website and has used statewide awareness campaigns to build awareness. Quality assurance metrics are used to assure “continuous quality improvement” for the services.⁴⁴

Medicaid Access Monitoring Plan

In 2016, DHS implemented a Medicaid Access Monitoring Plan. The plan’s objective is to strategize a coordinated approach between access monitoring and quality monitoring, to benchmark access data, monitor data indicators, to use the data to guide decision making, and to pursue continuous improvement actions. In conjunction, North Dakota has implemented a new Medicaid Management Information System with a new EHR system for field services implemented in 2017 and to be operationalized in 2018.^{45,46,47}

Worksite Wellness Programs

Worksite wellness has become a focus to foster better, more affordable, healthcare. Healthy North Dakota (NDDoH, BCBSND) and the Dakota Medical Foundation initiated a statewide effort in 2009 to create an online toolkit to help the business community initiate worksite wellness activities. According to the NDDoH, more than 80% of North Dakota employers believe in the benefits of worksite wellness but seek more support and guidance. The toolkit covers management support, creation of a team, collection of data, creation of an operating plan, choice of appropriate

interventions, creation of a supportive environment, and evaluation. Each of the subjects has a resource section that can help businesses find tools, models, and samples.⁴⁸

A guiding principle of health reform and delivery system transformation is better care, better health, and lowered (or controlled) costs, emphasizing both the need to change cultural norms to health (our own personal attitude) and the health system's ability to foster some of that change, to be engaged with the change, and to ultimately improve health status. The concept of health in both our personal and work lives is changing. To that end, the Ninth Annual Worksite Wellness Summit, was held in Bismarck in May 2018 and was tasked with a goal of providing information to improve employee health, productivity, and morale.⁴⁹

Blue Elements

Blue Elements operates as a platform of services, offering services to the general public while others are products that the employer community may purchase for workers. The platform covers a continuum of services that range from maintaining good health to slowing the progression of disease to managing high cost care. The well-being philosophy associated with prevention, wellness, care management, and other elements cover a wide range of subjects such as the following: physical, emotional, social, financial, environmental, and professional health. Under the Blue Elements platform, screening assessments, workshops, and online libraries are hosted and wellness planning and consulting is provided. Also included are the Blue Alliance program, case management techniques, rare and complex disease management functions, health coaching, health club credits, specialty drug management, a worksite wellness tool kit, running/walking events, and other events.⁵⁰

Blue Alliance is a new payment structure that operates much like an accountable care organization (ACO). Blue Alliance is a payment-based structure, operated in partnership with employers and providers "that pays for the value not the volume of care."⁵¹

HealthyBlue Online Wellness Center starts with a personalized health assessment. Support and educational resources are available, including healthy eating, exercise, online workshops, inspirational articles, trackers, and a point system whereby participants can redeem points accumulated by their level of activity for rewards.

Disease Management Program focuses on helping covered employees be proactive in managing specific, complex conditions. The Program works with an employee's providers to offer tips, tools, and support. It covers a range of assistance such as reminders, motivational encouragement, tracking medicines and utilization, learning about health risks and coping, and access to specialized nurses via phone consultations. Conditions include seizure disorders, rheumatoid arthritis, multiple sclerosis, Crohn's disease, ulcerative colitis, Parkinson's disease, dermatomyositis, ALS, cystic fibrosis, Lupus, and other conditions.

Prenatal Plus provides a range of services, including one-on-one help from a BCBSND case manager for high-risk pregnancies.

Blue Distinction Centers are designations awarded by the BCBS to medical facilities that demonstrate expertise in the delivery of quality healthcare. This is an example of how the health system is blending quality, performance, and cost factors for

a redesigned delivery system mindful of creating value. Blue Distinction includes the national program, Total Care, which recognizes doctors and hospitals that focus on prevention and wellness, coordinating care, and helping patients to better manage chronic conditions.⁵²

HEALTH REFORM

The Affordable Care Act (ACA) represents a significant change in the healthcare landscape for America. The formal Patient Protection and Affordable Care Act was enacted in March 2010 with parts of the new law being immediately implemented that year. For example, providing payments to Medicare recipients to begin the process of closing the “doughnut hole” in the prescription drug benefit, making it illegal for insurance companies to deny health insurance for children if they have a preexisting condition, and forbidding insurance companies from rescinding insurance coverage or denying coverage to someone insured based on a technical mistake. Other parts have been rolled out systematically, allowing for some elements of incrementalism.

Background

The background of health reform is in some ways simple: too much cost and too much consumption, as well as too few resources and too few positive health outcomes relative to the cost. Healthcare expenditures accounted for about 17.9% of the gross domestic product (GDP) in 2016, compared with only 8.9% in 1980. In 2018, it continued to increase slightly to 18.2%.⁵³ In 2008, most other industrial countries had health expenditure/GDP rates between 8.5% and 11.2%.⁵⁴ Health spending was estimated to be \$2.3 trillion in the U.S. in 2008,⁵⁵ and on a per-capita basis the United States spent \$7,538 in comparison with \$3,923 spent in 15 similar countries that year.⁵⁴ In 2016, the U.S. spent over \$3.3 trillion which increased to \$3.5 trillion by 2017.^{56,57} Per capita spending in the U.S topped \$10,000 in 2016. By 2018, this had increased to a per capita rate of \$11,193.⁵⁸ CMS forecasts health care spending to account for 19.7% of GDP by 2026.⁵⁹

The growth rate in spending for the U.S. has significantly outpaced most other countries. About two out of five people spent 10% or more of their disposable income on out-of-pocket medical costs, and healthcare costs were the number one reason for personal bankruptcy.^{60,61} Before 1960, healthcare consumed about 3% of private sector employment, but by 2008, that figure was 11%. As deep as the 2007 to 2009 recession was, healthcare actually added 559,000 jobs.⁶² Almost 15% of the population was without health insurance, compared with about 11% in 2016. The uninsured rate peaked at 17.1% just before the rollout of the individual mandate for insurance in late 2013.⁶³ In 2008, the U.S. had the lowest physician-to-population ratio in comparison with 10 other industrialized countries. The U.S. ratio was 2.43 physicians per 1,000 population compared with the median of 3/1,000 for the other countries. Out of 12 industrialized countries, the U.S. per-capita spending for pharmaceuticals was about 2 times the median (\$897 versus \$461). Pharmaceutical use in the U.S. was much higher as well, with 61% of U.S. adults taking at least one prescription medication in comparison with the median for comparison countries of 54%.⁶⁴ U.S. health outcomes were also worse

with lower life expectancy figures and higher infant mortality relative to comparable countries.⁶⁵

For some, healthcare reform is simply an access-to-care issue best represented by increasing insurance coverage through Medicaid expansion or the “Marketplace” for purchasing private insurance. The goal of increasing coverage is an important, fundamental aspect of healthcare reform; however, healthcare reform is much broader than insurance access. Between 2016 and 2018, there was a significant level of implementation of several ACA provisions. Medicaid enrollment in North Dakota, increased by more than 20% as a consequence of the ACA.⁶⁶ Implementation of the ACA has had effects nationally, and North Dakota has experienced the effect of healthcare reform as much as any other state. The combination of access through Medicaid expansion and the new insurance marketplace or “exchange,” lowered the uninsured rate significantly. Those two features, combined with a drug purchasing discount program (340B) made available to CAHs through the ACA, also had a profound impact on the state’s rural hospitals.

Health Reform at the National Level

The Marketplace was rolled out in 2014 and reached full capacity by 2016. Due to administrative changes, there was more complexity in 2017, such as a shorter period to sign up through the Marketplace, reductions in program marketing, and significant reductions to the technical assistance effort to help people sign up. Nationally, the rate of uninsured declined by seven percentage points, from a high of 18% in 2014 to a low of 10.9% in 2016. By 2017 the rate was 12.2%.⁶⁷ In 2016, when the Marketplace enrollment is combined with Medicaid Expansion, in addition to young adults being able to stay on their parent’s health plan until they are 26, there are more than 21 million Americans now covered who did not have insurance prior to the ACA. Some of the subgroups experiencing the largest reductions in uninsured rates include:

- People earning \$36,000 a year or less, which was 30.7% of the uninsured in 2013 and 20% of the uninsured in 2016 for a reduction of 10.7 points.
- People ages 26–34, where 28.2% were uninsured in 2013 and 18.5% were uninsured in 2016 for a reduction of 9.7 points.
- Blacks were 20.9% uninsured in 2013 and 11.4% uninsured in 2016 for a reduction of 9.5 points
- Hispanics were 38.7% uninsured in 2013, and 28.3% in 2016 for a reduction of 10.4 points.

With the advent of the Marketplace, the percentage of Americans who purchase insurance on their own or through a family member has increased from 17.6% in 2013 to 21.8% in 2016. The percentage who have insurance through their employer has dipped from 44.2% in 2013 to 43.4% in 2016. Medicaid has increased from 6.9% in 2013 to 9.4% in 2016.⁶³ By 2018 there were some declines. For example, the uninsured rate among working age people between the age of 19 and 64 stood at 15.5%, up from 12.7% in 2016. The uninsured rate among adults in states that did not expand Medicaid increased from about 16% in 2016 to 22% in 2018. For Medicaid Expansion states it rose slightly from about 10% to 11%. Thus, the uninsured rate in states not expanding

Medicaid is two times that of Medicaid Expansion states. The uninsured rate for people 19-34 declined from 2016 to 2018, 18% to 17%; however, the rates for people 35-49 rose 11% to 18%, and for people 50-64 from 9% to 12%. The uninsured rate rose for people in poverty too as individuals at or below 250% of the federal poverty level experienced an increase from 21% in 2016 to 26% in 2018. There were regional changes as well. The region with the largest increase in uninsured was the South where the rate rose from 16% in 2016 to 21% in 2018; most southern states did not expand Medicaid. The West witnessed a 1% increase from 13% to 14% with both the Midwest and Northeast experiencing increases of 3%, from 8% to 11%.⁶⁸

One group of the uninsured are people in non-Medicaid expansion states who are in a coverage gap. The original intent of the ACA was that Medicaid expansion would be national in scope, all states being required to participate; however, the Supreme Court ruling in June 2012 said it was optional. Nineteen states have not expanded Medicaid. Medicaid eligibility for adults in non-expansion states is stringent. The median income limit is 44% of poverty or an annual income of \$8,985 for a family of three in 2017. Additionally, in almost all the non-expansion states, childless adults are ineligible. In expansion states, this was significant given that the ACA amended Medicaid, allowing childless adults to gain Medicaid coverage. Because the ACA was enacted with the idea that Medicaid expansion would be national, the law does not offer financial assistance in the form of federal subsidies for people below the poverty level to obtain subsidized insurance in the Marketplace or elsewhere. This is the coverage gap: incomes that are above the Medicaid eligibility limits but below the limit of the Marketplace tax credits. This affects about 2.5 million Americans. Of these, 47% are white, non-Hispanic; ages 35–54 comprise 37%; and those in excellent or very good health are 47%. A majority are male, at 52%, and do not have children, 77%. They hold down jobs with 39% working full-time and 21% working part-time. A total of 50% work for a small employer with 50 or fewer employees.⁶⁹

These low income people would be eligible for Medicaid if their states had expanded it. About 29% of the people affected live in Texas, 17% in Florida, 11% in Georgia, and 9% in North Carolina. About 89% of the coverage gap is distributed throughout the southern states. Wisconsin, another non-expansion state, does not have uninsured adults in the coverage cap as their state law provides Medicaid eligibility to adults up to the poverty level under a Medicaid waiver.⁷⁰

Nationally, hospitals' uncompensated-care burden has declined, with much of that decline attributed to ACA-mandated changes such as Medicaid expansion. A study published 2016 estimated that uncompensated-care costs decreased from 4.1% to 3.1% of operating costs in Medicaid Expansion states; furthermore, the estimate for non-expansion states was a decrease from 5.7% down to 4% of operating costs if they had participated in the expansion. Some of the difference is associated with the nature of the patient base. There have been greater savings associated with hospitals that had a higher uncompensated-care base before the enactment of the law. Many of the states that have not expanded Medicaid are states that have a higher uncompensated-care level; thus, if they had participated in the program the benefit to those hospitals and states would likely be even higher than noted in the states that did implement Medicaid expansion.⁷¹

The American Hospital Association observed that in the first year of Medicaid expansion, hospital uncompensated-care costs declined for the first time since 2001. The decline was by about \$4 billion, from \$47 billion to \$43 billion.⁷² The Office of the Assistant Secretary for Planning and Evaluation for the U.S. Department of Health and Human Services estimated that the ACA reduced hospital uncompensated-care spending by 21%⁷³ and the Kaiser Family Foundation released an analysis showing a decline of 17% or almost \$6 billion for 2014.⁷⁴ A recent study of rural hospitals in 2016 found that the percentage of revenue associated with uncompensated care for rural hospitals was lower in Medicaid expansion states, 8% versus 10%–11% in non-expansion states; thus, there is a higher financial burden borne by rural hospitals in non-expansion states.⁷⁵ Another estimate was that the uncompensated care burden decline from 2013 to 2015, in expansion states, from 3.9% to 2.3% of operating costs, producing savings to the hospitals of \$6.2 billion.⁷⁶ This \$6 billion increase in expansion states is offset by a possible cost of over \$8 billion in one state due to uncompensated care: Texas. Texas, as a large state with a large population, also has a high uninsured rate, about 15%.⁷⁷ A 2018 study published in Health Affairs isolated the impact on rural hospitals, especially on hospital closure rates. The study found “that the ACA’s Medicaid Expansion was associated with improved hospital financial performance and substantially lower likelihoods of closure, especially in rural markets and counties with large numbers of uninsured adults before Medicaid Expansion.”⁷⁸ While these studies may have slightly different financial savings and sometimes cover different time frames, the general conclusion is that the ACA, particularly the Medicaid expansion, is associated with a decrease in uncompensated-care costs and can stabilize rural hospitals. The requirement for at least nonprofit hospitals, while most hospitals are nonprofit, is that they invest in what is called a community benefit for better health in their communities. As hospitals experience financial savings by having lower levels of both charity care and bad debt, public policy requires that they offset those savings through a financial commitment for a stronger community by improving population health. This advances the goal of better health, better care, and lower costs.

Health Reform at a Crossroads in 2017 and 2018.

Some discussion needs to dissect the health reform policy actions that dominated U.S. domestic policy in 2017. Since most of that policy discussion, or at least that part that warranted media coverage, revolved around financial access, the review will be addressed primarily in this section on “Insurance and Financial Coverage.” Elements that are more germane to system change will follow. As was implied before, President Trump and the Republican Party did campaign on a platform to “repeal and replace” the ACA. In 2017, a Republican President, a large Republican majority in the House, and a smaller majority in the Senate, set the stage for repeal. What ensued was a political battle, generally between the two parties, but at times within parties; the result, in some ways, reflected a continuing division of perspectives, values, and philosophies. It is natural that a subject of such significance, one that accounts for 18% or our gross domestic product (GDP), is both complicated and controversial.

As of this writing, the ACA remains. Yet, the ACA has changed. Some people say what we have in health reform is “Obamacare” (the nickname worn by the Act from its inception). Others call it “Trumpcare” to represent changes such as the elimination of

the individual mandate in 2019, structural changes to the federal subsidies in the Marketplace (Cost Savings Reductions or CSR payments), and the likely advent of association health plans and short term-short duration plans. Regardless, the health system is different today than it was when the ACA was enacted in 2010. From a policy perspective, it is helpful to realize that public policy always changes and transforms – it is not static. Ultimately, political forces shape policy formulation. That is the result of elections.

The following is a brief review of significant policy efforts discussed and debated in 2017 and beyond. On March 7, 2017, the American Health Care Act (AHCA) was introduced in the U.S. House of Representatives. Almost immediately, on March 8, 2017, the two committees with primary jurisdiction for the bill—the House Energy and Commerce Committee and the House Ways and Means Committee--approved it on a straight party line vote. Key provisions of the bill included the following:

- Repeal the ACA individual mandate.
- Modify ACA premium tax credits (i.e. Marketplace subsidies) to reduce the amount for younger people but increase them for older people.
- In 2020, replace the ACA income based tax credit with a flat tax credit adjusted by age (effectively lowering the credits for older people).
- Eliminate the cost sharing subsidies (Cost Sharing Reduction or CSR).
- Modify the age rating whereby insurance companies can charge more by age groups (reduced to a 3:1 ratio under the ACA, but increased to 5:1 under the AHCA which would permit charging older, sicker patients more). The age rating impacted people age 50-64 and the change in the ACA from a ratio of 5:1 to 3:1 was seen as having reduced the uninsured rates for older, but pre-Medicare aged people by 50%.
- To offset some costs to the states, offer a state stability fund of \$115 billion that states could use to create state-based “high-risk pools” to cover costs for high-risk individuals (e.g., people with pre-existing conditions who may no longer have private insurance). Additionally, the AHCA would have established a fund of \$15 billion for a state reinsurance fund (to protect insurance companies from costs associated with high-risk subscribers).
- Maintain 10 essential health benefits as established in the ACA; however, states can apply for waivers to change them (correspondingly maintain prohibition on lifetime and annual costs; however, only for the 10 essential benefits, and states can possibly waive those benefits).
- Add a work requirement for Medicaid.
- Change the formula to fund Medicaid more as a block grant to the states.
- Encourage more Health Savings Accounts.
- Repeal tax increases and other revenue enhancements sanctioned by the ACA.

The bipartisan Congressional Budget Office (CBO analyzes the implications of federal policy, both financial as well as other areas) issued a review of the AHCA that projected the legislation, if enacted, would leave 52 million Americans uninsured over

10 years. At the time of this legislative debate there were about 26-27 million Americans who were uninsured so this would represent an increase of about 25 million more without insurance. It would lower the federal deficit by \$119 billion over 10 years, and insurance rates would increase 20% in 2018 and 25% in 2019. The CBO found that under the AHCA older individuals would likely see “much higher premiums with younger individuals enjoying lower ones.” Furthermore, it would have reduced federal Medicaid spending but increase state spending, in states that did not expand Medicaid by \$8 billion over 10 years. CBO also projected that 15% of Americans would lose access to health care.

The House contemplated various amendments from March to early May, including more state waivers, additional money for state risk pools, and more. On May 4, 2017, the House passed the bill on a straight party line vote, with amendments. On the same day, the Senate notified the House that it would not take up the House passed bill, but would instead pass its own bill. A 13-member work group was developed. The Senate produced the second major bill, the *Better Care Reconciliation Act (BCRA)*, which was similar to the House bill, but different. Similarities were found in scope—repealing the essential elements of the ACA—but differences were more in degree and process. Key features of this bill included the following:

- Remove the individual mandate as did the AHCA, but with a stipulation that a penalty would apply to individuals who had a break in continuous coverage of 63 days or more starting in 2019 (Disadvantage was it would keep sicker people out of the insurance market and thus increased uncompensated care in emergency departments).
- Addressing the Marketplace, it would keep in place a form of federal subsidy but it would adjust the income factors. Tax credits would be extended up to 350% of FPL not the 400% in the ACA. Unlike the House’s AHCA, the BCRA would have factored in age and income to determine the subsidy.
- A Medicaid Expansion phasedown whereby expansion would remain the same in the first three years but starting in 2020 it would phase down the federal share from 90% in 2020 by increments of 5% each year to 75% by 2023. In 2024, the rate would drop to traditional Medicaid federal-state share which ranges from 50% to 75% (average is 57% federal match).
- Keep the Medicaid block grant in the House bill, excluding children, elderly, and the disabled.
- Offer an optional work requirement for states under Medicaid.
- Repeal of the medical device tax and most ACA revenue enhancements.
- Create a short term state stability and innovation fund for reinsurance of \$50 billion over 4 years to assist states with high risk individuals.
- Create a long-term state stability and innovation program with \$54 billion in federal aid for 2019-2026 to address lowering copays, or coinsurance deductibles, or other out-of-pocket costs.
- Like the AHCA, it would modify the age rating whereby insurance companies can charge more by age groups (reduced to a 3:1 ratio under

the ACA, but increased to 5:1 under the AHCA which would permit charging older, sicker patients more).

- Permit insurers to sell non-ACA compliant plans outside of the Marketplace (affects community rating, prohibition on pre-existing conditions, essential health benefit requirements, limits on out-of-pocket costs, and preventive benefits).

Similarly, to the AHCA, the BCRA was criticized for its potential impact on insurance access and costs. Standard and Poor found the age rating change to potentially increase insurance premiums by 30%. The changes in Medicaid expansion, by lowering the federal match, would likely force many states to drop the expansion. As the CBO stated in its letter to Senator Enzi, Chairman of the Senate Committee on the Budget, July 20, 2017, "...some states will roll back their expansion of eligibility and others that would have expanded eligibility under current law would choose not to do so." The CBO score found the BCRA to increase the number of Americans without insurance, but at a lower number than the AHCA. BCRA would likely increase the number to 48 million (roughly where the country was at the passage of the ACA) while the AHCA would increase it to 52 million. Quoting the CBO/Enzi letter, "In 2026, an estimated 82 percent of U.S. residents under age 65 would be insured, compared with 90 percent under current law." The CBO and the Joint Committee on Taxation (JCT) found the BCRA to reduce the deficit by up to \$420 billion due in large part to a lowering of the federal responsibility under Medicaid and a corresponding shift to the states. There would be about a \$772 billion cut in Medicaid spending. Federal Medicaid spending would decrease by 26% by 2026 and 35% by 2036. Nursing homes could face cuts in services and payments due to the Medicaid changes. CBO determined that tax credit changes (Marketplace subsidies) would cut about \$424 billion in insurance subsidies and shift from covering about 70% of an individual's health care deductible (out-of-pocket) costs to about 58%. This would result in lower premium costs for the benchmark plan, but out-of-pocket costs would increase. However, "some people enrolled in nongroup insurance would experience substantial increases in the net premiums that they paid for insurance. For example, under this legislation, 64-year-olds could be charged five times as much as 21-year-olds, CBO and JCT expect, compared with three times as much under current law, resulting in higher premiums for most older people."

However, the Senate was not done. On June 27, 2017, the Senate voted to delay the bill. This garnered more time for amendment consideration. Much of the debate was in the Senate Republican caucus as Majority Leader McConnell worked to "nuance" a bill that was conservative enough for some Senators on the right, but could appeal to some moderates such as Senator Collins of Maine and Senator Murkowski of Alaska (and at times Senator Capito, West Virginia). On July 13, 2017, the Senate added amendments from Senator Cruz of Texas affecting minimal coverage plans establishing that they did not have to meet current ACA standards on benefits and would also block Medicaid expansion to the states. Conversely, both Collins and Murkowski said if this was in the final bill they would vote against it. By July 17, 2017, more Republicans came out against the Republican bill (Senators Lee of Utah and Moran of Kansas). This prompted President Trump to say the Republicans should "let Obamacare fail" and that

they would replace the ACA only when the markets collapsed. This prompted discussion of a “repeal only” bill leading Senators Collins, Murkowski, and Capito to say they would oppose a repeal only bill; this effectively ended that discussion. On July 19, 2017, CBO issued an update on the “repeal only” bill which on one hand increased the estimate for people who would lack insurance under the BCRA from the 48 million figure to 52 million (about the same as the AHCA), but on the other hand increased the estimate for deficit reduction to about \$473 billion (from 2017-2026). Amendments were made to a final bill (including the Cruz amendments and additional tweaks to the bill). On July 26, 2017, voting on the bill commenced, including voting down additional amendments that included a repeal only amendment, the “Obamacare Repeal Reconciliation Act” (ORRA) and another one, coming from the liberal section of the Senate, from Senator Bernie Sanders, calling for a single payer system. July 27, 2017, produced what was described as the “skinny bill” as it condensed the work of roughly two months in the Senate to a mere eight pages. This final bill did the following:

- Repeal the individual mandate.
- End the employer mandate.
- Eliminate medical device taxes.
- Defund Planned Parenthood.
- Eliminate the Prevention and Public Health Fund (funds various innovative initiatives).

CBO preliminary review was adding an additional 16 million to the ranks of the uninsured for a total of 44 million, and would spur about a 20% increase in premiums.

On July 27, 2017, the so called “skinny bill” (The Health Care Freedom Act) fell short in a vote of 49-51 with three Republicans voting against it: Collins, Murkowski, and John McCain, of Arizona (the famous thumbs down sign from Senator McCain).

However, after two major bills, one repeal only bill, and one final skinny bill all failing to replace the ACA, efforts were not done. Calling for an effort in bipartisanship, on August 2, 2017, Senator Alexander (R-TN), chair of the Senate Health, Education, Labor, & Pensions (HELP) Committee, called for a move away from the partisan approach, which had failed. The Senator Lamar Alexander and Senator Patty Murray (Democrat of Washington) alliance worked to restore the cost savings reductions (CSR) for two years and to provide reinsurance options to the states (for high cost subscribers). Their efforts secured 24 Senate sponsors (12 Republicans and 12 Democrats). Nevertheless, there was serious opposition from the more conservative House, particularly the conservative Freedom Caucus. President Trump referred to the Alexander-Murray bill as “an insurance company bailout” meant to help the “dying Obamacare law.” In the final months of 2017 Congress was engaged on many seemingly unrelated policy fronts (but health was embedded in all of them) as there was a concerted effort on the part of many Republicans, including the leadership, to work on a new tax law. In exchange for her support of the tax bill, Senator Susan Collins essentially joined the Alexander-Murray team to push for reinsurance (which was an idea in her own bill co-sponsored with Democratic Senator Bill Nelson of Florida). The Collins bill was part of the omnibus appropriations bill that was also being finalized (a tax bill, appropriations bill, and a smaller bipartisan health reform bill all in the final

months). Before Christmas, more clarity was realized when on December 19, 2017, the Senate and the House passed the Tax Cuts and Jobs Act with the President signing it on December 22. The new tax law had significant health implications. First, while Senator Collins gave her vote for the tax bill, that same tax bill did not establish either reinsurance or an extension of federal support for CSR. Furthermore, the new tax bill did repeal the individual insurance mandate by eliminating the tax penalty (starting in 2019) for not having health insurance. The new year (January 2018) opened with Senator Lamar Alexander discussing plans to work a bipartisan health care reform measure into the next omnibus spending bill. And in May 2018, Senator Lindsey Graham (R-SC) was working on a bill to repeal and replace the Affordable Care Act.

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.⁷⁹ In March 2016 that number was 20,536 and in 2015 it was 18,171.⁷⁹ Of the over 20,000 people with Marketplace coverage, 85% are receiving a federal subsidy.⁷⁹ 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.^{80,81} 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 2013.⁸² The uninsured rate was 6.9% as of 2015. North Dakota had the 8th 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.⁸³

Seven of the ten states with the largest reductions in the uninsured rates had expanded Medicaid.⁸³ In 2017, 17 states saw their uninsured rate rise by what is 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%.⁸⁴ The NDHA has estimated the economic impact of Medicaid Expansion to North Dakota at \$542 million. The vast majority of this total \$534 million is 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. There is the lessening of bad debt and charity care, and increased Medicaid reimbursement both in terms of increased volume and increased payment rates.

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.^{85,86,87} 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, anecdotally, commented 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.”⁸⁸

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.^{89,90} 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%).⁶⁸ An implication of people declining insurance is 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.^{91,92,93}

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.⁹⁴

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 closes by 2019, and at that point, under the ACA, the co-pay moves 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.⁹⁵

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.⁹⁶ 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.⁹⁷ This includes over 70,000 people who are age 55-64, which is over 80% of that age cohort.⁹⁸ 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.⁹⁹ 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 and 2018 and will again in 2019. The average increase, nationwide, in 2017 was about 25%, although this can vary 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.¹⁰⁰ 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.¹⁰¹

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 2019.¹⁰¹ 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.^{102,103}

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.¹⁰⁴

HEALTH SYSTEM REFORM

Health Reform at the National Level

One message that may be missing for the general public is how health reform is significantly changing the American healthcare delivery system and how we as a nation, and as individuals, approach and contemplate health. Under the push from the ACA, particularly the work associated with Medicare, including the Centers for Medicare and Medicaid Innovation Center (CMMI), and with natural market forces, the U.S. health delivery system is changing. This includes attempting to increase access, restructure the delivery system to focus on population health, and realign payment structures.

Higher-cost services such as inpatient care, readmissions to the hospital, and excess use of the emergency department as a substitute for primary care are scrutinized to target appropriate care. In a way, the dual concepts guiding health reform are insurance access and the allocation and management of financial risk by increasing insurance coverage and spreading more financial risk to the provider class. Thus, the Three Aims of better health, better care, and lower or controlled costs are addressed through this focus.

There are a number of new or alternate payment methods generally referred to as APMs (designed to reduce health costs via a value and risk sharing mechanism). One definition of an APM is "payment models that create incentives for clinicians to provide high-quality, cost-effective care for a specific clinical condition, episode of care, or population."¹⁰⁵ In 2017, APMs were discussed within the rather narrow range of the

following: Accountable Care Organizations (ACOs), bundled payment models, patient-centered medical homes, pay for performance (such as value-based purchasing), and in the physician area, the Medicare Access and CHIP Reauthorization Act (MACRA) of 2015, which offers the Merit-based Incentive Payment System (MIPS). The latter is an effort to integrate quality and better patient management into the physician reimbursement system. MACRA, which was enacted in 2015, was not formally part of the ACA. Today the performance-value transformation has advanced with modifications to the above-mentioned APMs and even more models. While the politics of access, particularly financial access, dominated discussions, the delivery system moved steadily on a path of innovation and change. The ACA authorized the development of new APMs based on the recognition that transforming the delivery of care meant a significant redesign of payment structures so as to couple medical or health outcomes for the patient and efficiency and performance for the organization with payment. There is growing evidence that the marketplace, is now driving change as much as public policy first instigated it. The first wave of change was likely the marketplace responding to new incentives, new care models, new directives. In 2018 and 2019, the marketplace is propelling change. It is oriented toward seeking cost control, care coordination across a continuum, having providers incentivized to manage both quality and cost, and being patient focused--all while being focused on aligning with the triple aim, guided by population health principles.¹⁰⁶

The structural redesign of the American health delivery system brings into the framework of discussions essential elements: financial conditions and constraints, health professional workforce demand and supply, organizational arrangements and systems, health quality metrics and analytics, quality of care and patient safety improvement, and health information technology, such as electronic medical records. Health reform is pervasive, systemic, and complex, encapsulating needs and wants that have meaning for the private and public sectors, and individual and collective levels, and involve the tangible and conceptual. Essentially, what we are attempting to do is gradually adjust our payment structure from one that relies on and reinforces paying for more services on a fee-for-service basis to a payment structure that rewards positive, measurable outcomes. So, what are some of the significant changes in pursuit of better care, better health, and lowered costs? Former U.S. Department of Health and Human Services Secretary Sylvia M. Burwell (Obama administration) announced in January 2015 some ambitious goals to shift Medicare payments into a value-based framework. The first goal was to have 30% of Medicare payments paid through an APM by the end of 2016 and 50% by the end of 2018. The second goal was to have fee-for-service (FFS) payments linked to quality and value with 85% by 2016 and 90% in 2018. The secretary announced in March 2016 that the goals for that year were already met, well ahead of the end of the year. Thus, 30% of Medicare payments involve an APM, and 85% of FFS is connected to quality and value. As of January 2016, CMS estimated that approximately \$117 billion in Medicare FFS payments were linked to APMs. This is out of \$380 billion or 31%, right above the goal of 30%.^{107,108} MACRA (discussed in more detail later) created incentives for physicians to participate in APMs and a pathway to first reach the 30% goal (met) and the 50% goal by 2018 (progressing). Current CMS Administrator, Seema Verma sums up the pursuit of better quality and performance in this statement, made in December 2017, "We need to empower patients with

information so they know when they're picking a provider...is this a high value doctor? What's the cost of the service and what are the outcomes? What's the value for it?" She ties the change back to the consumer, in terms of not only benefit to the consumer for health status and cost, but also more rational decision-making. The Trump administration appears squarely focused on the continuation of a value-driven health system under the new U.S. Secretary of Health and Human Services, Alex Azar (after some pull-back from former Secretary Price). Secretary Azar has outlined four key points to a value-based transformation:

- Experimental models in Medicare and Medicaid – the Secretary said he would use the “tremendous power to experiment with new payment models” developed from the ACA’s Center for Medicare and Medicaid Innovation (CMMI) and through MACRA.
- Consumers should have more control of health information – this would involve new technology such as the administration’s new MyHealthEData initiative meant to give patients more access to their data and greater flexibility in taking it with them. This also entails use of a new Medicare platform Blue Button 2.0 which allows beneficiaries more access and control to their health data covering prescriptions, primary care treatment and cost, and even more say on who can use their data.
- Transparency from providers and payers – the Secretary called for more transparency to empower the consumer. Physicians, hospitals, drug companies, and pharmacies should be more transparent about pricing and outcomes.
- Remove governmental burdens obstacles– the Secretary identified certain “Medicare and Medicaid price reporting rules” and other impediments to value-based transformation. While not part of the Secretary’s remarks, at two national rural health conferences, in 2018, CMS officials made statements about using a “rural health lens” when issuing or reviewing rules and regulations. The point being that rural would be taken into consideration in the regulator process.

For hospitals—or at least PPS hospitals, with a lesser effect on CAHs—there are a number of federal policy efforts supported by the ACA that can be characterized as paying for value and are part of the redesign from a volume-based system to a value-based system. One is the Hospital Readmissions Reduction Program, where hospitals that have excess readmissions are penalized. This initiative started in October 2012. Readmissions have been identified as a significant and unnecessary cost to the system. Since the start of the effort to curb them, readmissions rates have declined almost 20% for patients hospitalized for heart failure, pneumonia, and heart attack.¹⁰⁹ For fiscal year 2018, CMS will reduce reimbursements to 2,573 hospitals for higher-than-expected readmissions.¹¹⁰ This covers readmissions from July 2013-June 2016, with the penalties being applied to the hospitals during FY2018. For 2017, hospital penalties amounted to \$528 million, an increase of \$108 million from 2016. The total amount in penalties since 2012 has been \$1.9 billion.^{111,112} PPS hospitals are affected by the readmissions efforts; however, while CAHs are exempt under the ACA, some CAHs are engaged in other

efforts to reduce readmissions. A second PPS effort is the Hospital Value-Based Purchasing (VBP) Program, where part of a hospital's inpatient Medicare payments are directly linked to quality or outcome metrics (the 85% goal). Hospitals are given an incentive on a pay-for-performance method wherein a portion of reimbursement is influenced by how well the hospital performs on a set of measures compared with other hospitals or how much they improve their performance on each measure compared with their baseline performance period. There are more than 3,000 hospitals (including North Dakota PPS hospitals) involved with value-based purchasing. The VBP program is designed to promote better clinical outcomes for inpatients and to improve their care experience.¹¹³ A third ACA value effort is the Hospital-Acquired Condition Reduction Program (HAC). This ACA effort reduces Medicare payments for hospitals that rank in the lowest or worst performing quartile for hospital-acquired conditions. For FY2018, Medicare will penalize over 750 hospitals for poor performance based on HAC scores, in that same year the HAC Reduction Program data will be publicly available in Hospital Compare, including scores for each measure and total HAC score. Each year about 700 or so hospitals are penalized.^{114,115} All three of these initiatives are indicative of the drive to correlate quality with payment and to emphasize value and outcomes.¹¹⁶

The fourth financial option to control or lower costs based on a value- and provider-risk model is called bundled payments. This was first implemented by the Center for Medicare and Medicaid Innovation, which was created by the ACA to develop and test new models through the Bundled Payments for Care Improvement Initiative (BPCI), which is based on aligning financial and performance accountability for a single episode of care. In other words, payment follows the patient as one payment allocation is made to be shared by all the providers for an episode of care. This contrasts to the traditional approach, where each provider receives a separate payment directly from the payer. The single-source payment is “bundled” and then allocated to the providers. The theory is that a bundled payment may be more efficient and is awarded based on value or outcome as opposed to each provider receiving a payment for specific services. CMS has found that 20%–40% of Medicare costs are associated with waste, overtreatment, and lack of care coordination, and the bundled payment method is one of many new tools to be employed to create a system based more on value than volume. The Model 1 program operated from 2013-2015. As of November 2018, the BPCI Model 2 had 462 participating organizations. The BPCI Model 3 had 605 participating organizations, and the BPCI Model 4 had 2 participants as of November 2018.^{117,118,119}

Under the BPCI, there have been four inpatient models used covering a range of options: hospital services only, hospital and physician services, and inpatient and post-acute care. BPCI is another form of provider risk, where the provider assumes some of the financial risk in treating the patient. Some healthcare experts have cautioned that one of the unintended implications is that the bundled payment structure may change relationships with post-acute-care providers. For example, if a bundled payment is operating through an urban-based ACO or other APM, it is to the financial benefit of the APM to contract with a post-acute provider that has high quality and low cost. If they determine that a rural CAH swing-bed program or nursing home meets the threshold, they will likely contract with the rural facility; however, if they find another facility in a different community that is a better quality and cost partner, they will likely contract with that entity. Unless the patient specifically says they want to go back to their home

provider, the post-acute care does not have to take place in the originating community. The decision rests with the primary facility. Experts feel this will lead to changes in some facility-to-facility relationships.^{120,121} The BPCI has operated through four models with Model 1 ending in 2016 and Models 2-4 continuing. Each model has had different concentrations of clinical episodes. The BPCI involves hospitals, skilled nursing facilities (the most common participant), physician groups, home health, rehabilitation facilities, and long term care hospitals.¹²² In January 2018, the administration announced its first Advanced APM, BPCI Advanced, which will have 32 types of clinical episodes and adds outpatient episodes which had not been part of the previous package. The new model builds on lessons learned over the years from previous bundled payment models. In announcing the new Advanced APM, CMS stated, “An episode model such as BPCI Advanced supports healthcare providers who invest in practice innovation and care redesign to improve quality and reduce expenditures.” The program’s first cohort started in October 2018.^{123,124}

A fifth example, patient centered medical homes (PCMH), is in some ways the oldest APM. The American Academy of Pediatrics pioneered the idea in 1967 to create a new medical approach that strove to include patients and families in the treatment process by emphasizing primary healthcare that was accessible, family-centered, coordinated, comprehensive, continuous, compassionate, and culturally effective. It emphasizes the role of primary care, and sometimes is called the primary care medical home model. The IOM first focused on the concept in the 1990s and described it as “patient centeredness,” which was defined as a partnership between providers, their patients, and their patients’ families to acknowledge and respect the wants and needs of the patient and to provide the patient and family with the information to make an informed decision. An early 2000’s *report* called for everyone to have a personal medical home.¹²⁵ In the PCMH model, the primary care provider is the focal point for care delivery central to a team of providers that can include nurses, mid-level or non-physician providers, medical assistants, nutritionists, social workers, pharmacists, and care coordinators. Mental or behavioral health and other specialty services can be woven into the application of the model. It is meant to be holistic, yet driven by the personal physician. From a payment perspective, the PCMH also moves beyond the traditional fee-for-service arrangement. With the patient at the center of the model—and all efforts being focused on patient improvement—the PCMH payment scheme seeks to acknowledge that FFS does not compensate the provider for the additional work done to coordinate a patient’s care (e.g., patient education, provider communication, support services, and interactions with the patient outside of the clinical setting). PCMH enhances FFS with evaluation, management, and additional codes for medical home activities. It can also incorporate per-member, per-month medical home payments and allows for risk adjustment. Like the ACO, there are both public and private PCMH models operating.

The Geisinger Health Plan program was found to have reduced hospital admissions by 18% and readmissions by 36% per year. The Group Health Cooperative of Puget Sound was found to have reduced emergency department visits by 29%. The National Committee for Quality Assurance (NCQA), a national non-profit organization that works on health care quality, has found in a range of studies reductions in outpatient ED visits of 11%, that Medicare beneficiaries had lower total annual Medicare

spending, resulted in lower payments to acute care hospitals, lower utilization of both specialists and emergency services, and fewer inappropriate prescriptions. The NCQA studies also found “significant improvements” in receiving evidence-based screenings and treatment for diabetes and “modest improvements” in clinical outcomes such as blood pressure and cholesterol.¹²⁶ The ACA encourages the PCMH through Center for Medicine and Medicaid Services Innovation (CMMI) demonstration projects that emphasize prevention, care coordination, HIT, and shared patient-provider decision-making. CMMI has supported multi-payer initiatives such as the Multi-payer Advanced Primary Care Practice (MAPCP) Demonstration, the Comprehensive Primary Care (CPC) Initiative, and the Comprehensive Primary Care Plus (PC+).¹²⁷ The experiments with APMs are still relatively new, and it will take time to isolate what works best and under what conditions; however much has been learned in this field since the passage of the ACA.¹²⁸

The origins of the ACO model (the sixth value and risk model) are found in the ACA. ACOs are the most prevalent APM. An ACO is a network of providers. It can be physicians only, hospitals only, physicians and hospitals, or other health providers. The ACO is accountable for the cost and quality associated with coordinating care for a defined patient population. ACOs are strongly associated with the Medicare program; however, there are also private ACOs. As of 2018, there were 923 public and private ACOs in the United States, which was an increase of 18% over the previous year. Medicare accounts for 61% with 665 in 2018, an increase from 534 in 2017. There are 12.3 million Medicare beneficiaries in an ACO. ACOs, while a type of APM, are themselves broken down into subcategories of models. Out of the 665 Medicare ACOs, there are 561 Shared Savings (up from 480 in 2017), 58 Next Generation ACO, 9 Pioneer, and 37 Comprehensive End-Stage Renal Disease Care models. The number of Pioneer ACOs has remained the same; however, in 2016 eight transitioned into the new Next Generation ACO. There were more than 32 million people served by either a private or public ACO in 2017, up from 28 million people in 2016, and 22 million in 2015. More than 10% of all Americans are now receiving healthcare within this model.^{129,130,131}

Out of the almost 925 ACOs, 665 are Medicare-sponsored with the most common model being the Shared Savings ACO (561 or 84% of all Medicare ACOs, which is down from about 91% from 2016). The majority of Medicare Shared Savings ACOs involve a network of hospitals, physicians, and other facilities (324 or 58%). Another 171 (30%) are physician-only ACO networks and 66 (12%) are FQHC/Federally Certified Rural Health Clinics (RHCs).¹³²

The Shared Savings and the Pioneer models are the two oldest models and were announced in 2011, and while they each concentrate on improving care and quality for Medicare beneficiaries along with reducing healthcare costs, they do differ in their construction. The Shared Savings Model accepts risk for at least 5,000 beneficiaries; it can be one sided or two sided, but the Shared Savings model has to have a minimum of 5,000 covered lives. For 2018, the vast majority of Shared Savings ACOs were non-risk sharing one-sided networks where they could share in cost savings if their goal was met with Medicare; however, if there were losses, there was no risk to the ACO, that would be absorbed by Medicare. The one-sided model is an appropriate entry model into a value-driven system, as it does not present risk; thus, it has the advantage of a learning experience with minimal consequence. The National Rural Accountable Care

Consortium, a 501(c)(3) nonprofit, and Caravan Health are organizations that provide assistance to rural health organizations (e.g., CAHs, clinics, and others) interested in exploring and becoming part of an ACO.^{133,134}

There is also the Pioneer ACO model, for which there are nine in operation¹³⁵ new expansions ended in 2016 and the new Next Generation includes 51 in 2018.¹³⁶ The Pioneer Model accepted risk for at least 15,000 beneficiaries with 5,000 in rural areas. The Pioneer ACO had four alternative payment options that involve varying levels of risk for savings and loss, but in the third year they transition to a population-based payment plan.¹³⁷ The Next Generation model requires even more risk allocation to the providers, above what is found in the Pioneer Model. This also means that the Next Generation model provides for more opportunity to share in cost savings with bonuses for better care coordination and care management. The networks entering this model tend to be experienced, having been either part of a Pioneer or a Shared Savings model.¹³⁶ Next Generation also employs prospective rather than retrospective benchmarks and tests beneficiary incentives. This model stresses coordinated care, stable and predictable benchmarks, and appropriate and consistent fiscal targets.¹³⁸ The Next Generation version of the ACO represents the slow evolution of this value-based model, one where more experience may lead to higher tolerance for financial risk. Risk means potential loss, and in 2016 seven Next Generation ACOs lost money. Still, in that year 61% of these models earned shared savings of about \$71 million and under the risk formula they shared in \$58 million in bonus money which is money they earn for showing they saved Medicare money--that is the financial incentive in a two-sided risk model. The ACO's earning bonus money had scored 100% on their quality metrics. The Next Generation model is an Advanced Alternative Model (APM) under the Quality Payment Program under MACRA and may be MIPS (Merit-based Incentive Payment System) exempt.¹³⁶ The fundamental difference between the Shared Savings, Pioneer, and Next Generation models rests with risk. The Pioneer Model has a higher level of financial risk assigned to the providers than the Shared Savings Model, and the Next Generation Model can assume even more risk than the Pioneer Model. It is a combination of experience, including positive financial incidents and operating within a network of providers working in the same direction, and risk tolerance that facilitates where a provider or network of providers may be on this risk continuum. One-sided risk models and two-sided risk models are applied. As is implied, the one-sided model operates in a manner where the providers are eligible for payment bonuses for meeting quality measures and reducing spending; however, they do not experience penalties if those benchmarks are not achieved. In a two-sided model, providers experience greater risk and can not only benefit from bonuses but can also be subject to penalties. The penalties are the difference. The Shared Savings Model is the least risk-oriented as 82% in 2018 of Shared Savings ACOs are one-sided, which is down from 2015 when the figure was 96%. Shared Savings has three tracks that start with no risk; one-sided and evolves into more risk; two sided). Under Track 1, the ACO shares in the savings but not the losses: one-sided risk to Medicare. Track 2, the ACO shares in the savings but also incurs some risk: two sided. In the Track 3 model of Shared Savings, the ACO can receive a higher level of savings, beyond Track 2, if they also agree to assume a greater share of the losses. This is also a two-sided model. Under the Track 1 model, the ACO can share in savings, up to 50%; under Track 2, 60% of savings; and Track 3

up to 75% of the savings. In the Shared Savings model, the health organizations that comprise the ACO must agree to participate for at least 3 years.^{135,139}

Participation in an ACO is entirely voluntary. Providers decide if they should seek to develop an ACO and determine their comfort level with financial risk; it is not decided by Medicare or Medicaid. There are Medicaid ACOs in 12 states, including Minnesota, as of 2018, and another 10 states are reviewing the model.¹⁴⁰ The one-sided model is the most common for both public and private ACO arrangements. This is likely because of a natural tendency for organizations to be cautious and conservative when approaching a new effort, especially one where a decision can have significant implications for the financial viability of the organization. However, since 2017 there has been a significant growth in providers assuming more risk (more experience builds more confidence). There is also speculation that Medicare seeks to move even more vigorously into additional shared risk endeavors whereby if providers have been in a one-sided model for six years they will then transfer into a two-sided model.¹⁴¹ Thus, contemplating financial risk and how much to assume is a compelling idea. All APMs, including ACOs, are complex, and providers are investing time and effort to understand these new models.

Under Medicare, ACOs must accept responsibility for at least 5,000 beneficiaries. Private ACOs are not required to follow the 5,000 threshold, but data indicate that most do. Private and public ACOs differ. Private ACOs have been found to be more experimental by incorporating other APMs into their structures such as ACO with bundled payment features and payer subsidies; private ACOs have contracts that may offer greater flexibility and customization features for providers and payers' patient populations; and private ACOs have had a tendency to take on more financial risk.

To date, the financial implications associated with ACOs overall are encouraging. The 925 or so ACOs are all individual networks with some experiments being successful and others not. From 2012 to 2016, the Shared Savings ACO model generated more than \$3.4 billion in savings to Medicare; however, after the bonus payments were made the savings dropped to just over \$1 billion. The Department of Health and Human Services Office of the Inspector General (OIG) found that about one-third of the Shared Savings ACOs reduced spending enough to receive a portion back in bonus payments and two-thirds of the ACOs reduced spending in at least one of the three years they participated. ACOs use the bonus payments to invest in new care programs, efforts to improve quality, and updating EHRs, which are required. The OIG determined that in 2015, 57% of ACOs in the program for three years had reduced spending leading the OIG to conclude that more experience leads to learning how to earn greater savings. Savings are also associated with the quality metrics, and 82% improved quality on 33 individual quality metrics. This exceeded the fee-for-service providers where the ACO providers scored higher on over 80% of the metrics. In 2014, the average quality score was 86, which was scored from 0 to 100, and this average increased to 91 in 2015. About 74% of the ACOs had a score of 90 or higher in 2015 in contrast to 29% in 2014.¹⁴²

One of the possible weaknesses of the model is that the responsibility or accountability rests with the providers, not patients. Generally, there are no incentives or penalties given to patients for following or not following healthful behaviors. The Next Generation model has started to incorporate some beneficiary incentives at least in the

sense that it will offer \$50 reward payments to beneficiaries who receive a set percentage of their care from the ACO. This is a small start; it is an inducement to participate in a network focusing on quality and improved outcomes. Additionally, except for some private ACOs, patients can stay or leave the ACO; they are not in a closed network. This is likely positive for the patient, but it reduces the ability of the health system to maintain a core patient base.^{128,138,143}

Medicare unveiled a rural option in 2016 called the ACO Improvement Model (AIM), which ended in 2018. This too is a CMMI or CMS Innovation Center initiative. Rural ACO activity has been slower to develop for a variety of reasons, including concerns over meeting a threshold of 5,000 beneficiaries, experience with networks, workforce, and overall capacity. In 2015, only 31 CAHs were formally part of an ACO, but by 2017 this had grown to over 150, during the same time about 12% of hospitals that are in ACOs are CAHs. Federally certified rural health clinics (RHCs) and federally qualified health centers (FQHCs) are also eligible to be part of an ACO; however, data were not available on the number of participating RHCs or rural-based FQHCs. The AIM initiative placed a significant effort on first building capacity in rural ACOs (technical assistance grants, training on care coordination, collection of patient data, and data analytics) to ensure greater success. These arrangements lasted for three years before the rural ACO became fully operational. This, too, is a Center for Medicare and Medicaid Services Innovation (CMSI) initiative.^{144,145}

There are also other federal efforts to promote better care and safety, quality and performance, and ultimately to achieve value. One ACA-sponsored activity is Partnership for Patients. In North Dakota, this is addressed through the Hospital Improvement and Innovation Network (HIIN), involving the hospital association and Quality Health Associates. Nationwide there are 16 Partnership for Patients programs engaged with HIINs working to reduce by 20% all-cause patient harm to Hospital-Acquired Conditions (HACs) and 12% reductions in the 30 day readmissions. The Partners for Patients is a quality-of-care and patient-safety initiative focused on the goals of making care safer and improving care transitions. U.S. Department of Health and Human Services studies indicated that in 2015, there was a 21% decline in hospital-acquired conditions since 2010 or a reduction of over 3,000 HACs. This represented a cost savings of about \$28 billion.^{146,147}

A second effort is the Comprehensive Primary Care Initiative which is a precursor to Comprehensive Primary Care Plus (CPC+), a four-year multi-payer initiative designed to strengthen primary care initiated in 2012. It involved a multi-payer partnership between Medicare, Medicaid, and primary care physicians in eight states, (Arkansas, Colorado, Kentucky, New Jersey, New York, Ohio, Oklahoma, and Oregon). As of 2018, there were 502 practice sites involved with over 2,800 providers serving 2.7 million patients over seven regions. There were 38 separate public and private payers involved. Under the project, primary care providers received non-visit-based care management fees from the payers by focusing on care management for patients in most need. It focused on care coordination, improved access, patient experience tracking, better coordination with hospitals and specialists, and the use of HIT. Researchers from Mathematica Policy Research and the CMMI analyzed the data after four years, including over 565,000 Medicare beneficiaries in CPC practices and a comparison group from other practices of over 1.1 million. Measures of care delivery

found improvement especially in risk-stratified care, access, and continuous improvement. The CPC group had a slower growth in ED visits and 30 day ED revisits compared to the non-CPC group. “However, there was no significant difference shown in spending growth.”

A third ACA program to address better care and safety was the Multi-Payer Advanced Primary Care Initiative (MAPCP). This demonstration was the first patient centered medical home model of CMS. While similar to the Comprehensive Primary Care Initiative, this model was managed by the eight states involved, not Medicare (Maine, Minnesota, New York, North Carolina, Pennsylvania, Rhode Island, and Vermont). The program commenced for some states in 2011 and others in 2012. Three of the states ended their involvement in 2014 with the remaining five ending in 2016. There were 6,000 providers at more than 800 practices providing primary care services to over 3 million individuals and 700,000 Medicare recipients participating. The demonstration explored more effective ways to address the following: practice transformation, quality care and patient safety, access to care, coordination of care, beneficiaries’ experiences with care, and effectiveness or utilization of health services and expenditures. During the course of the program, CMS provided enhanced payments to address the services, about \$125 million. An evaluation was conducted by two partners: The Urban Institute and the National Academy for State Health Policy, with the evaluation showing somewhat mixed results. On the positive side, practices exhibited significant transformation, including restructured staff roles, improving patient flow, adopted HIT, and hired and included care managers such as wellness nurses, social workers, and/or dietitians. There was also an increase in patient engagement and involvement. As time went by there was more focus on high cost patients and integration of behavioral health. Care managers were identified as the “most central, transformative activity of the MAPCP demonstration.” However, the “initiatives had limited impacts on claims-based measures of quality of care, coordination of care, access to care, utilization of services, and expenditures.” The demonstration encountered issues with HIT, poor algorithms and data lags, lack of engagement with non-primary care (hospitals and specialists), and hiring enough care managers.¹⁴⁸

A fourth effort is the Transforming Clinical Practice Initiative (TCPI), which will support 140,000 clinicians over a four-year period from 2016 to 2020 by creating peer-based learning networks to develop quality-improvement strategies. The initiative is part of the ACA’s effort to strengthen quality of patient care and spend health funds more efficiently. These learning networks are called Practice Transformation Networks (PTN), which were previously discussed under the rural AIM grant. PTNs are operating in North Dakota and will be addressed in the last section, “Health Reform in North Dakota.” The ACA has initiated a number of programs to move from a volume-based system towards a patient-centered, quality health care services focused system, value driven. This has included Accountable Care Organizations, Value-based Purchasing, bundled payments, PCMH, Partnership for Patients, and more. The TCPI represents an expansion on those efforts by investing in a collaborative of peer-based learning initiatives, designed to ensure that clinicians are gaining the knowledge and skill for practice transformation, including understanding of APMs quality metrics and best practices. The PTN aspect represents that learning community and is a factor that is so important for CAHs, rural physicians, and others that are learning how to be an ACO. For the rural providers,

there is a steep learning curve as they lack the specialized financial, management, technological, and other skills that are more common in large systems. So the PTN for clinicians and others is critical.¹⁴⁹

The CPC+ or Comprehensive Primary Care Plus model is a fifth effort. The CPC+ initiative grew from the original Comprehensive Primary Care project. It is a national advanced primary care medical home model involving a “regionally-based, multi-payer payment reform and care delivery transformation.” There are five goals: 1) ensure access and continuity of care, 2) provide comprehensive care delivery and management, 3) improve care coordination, 4) enhance patient and caregiver engagement, and 5) deliver planned care and improve population health. The CPC+ includes two primary care practice tracks and while each addresses the five goals, payment structures are somewhat different. While each track is paid based on performance with risk adjustment, Track 2 will have Comprehensive Primary Care Payments (CPCP) with more risk and Track 2 participants are expected to provide more comprehensive care. As of November 2018, there are approximately 2,900 primary care practices taking part in CPC+ across 18 regions.¹⁵⁰

MIPS, or the Merit-based Incentive Payment System, and the Alternative Payment Models (APM) are the sixth and final effort. These quality payment models are central in how we pay clinicians in a value-focused system. They originate from the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). MACRA essentially repealed the older Sustainable Growth Rate (SGR) and moves to “rewarding clinicians for value over volume.” It streamlines a range of quality programs (Meaningful Use, the Physician Quality Reporting System (PQRS), and the Value-Based Payment Modifier (VBPM), and adds a new performance category called improvement activities (IA) into the MIPS formula, and provides bonus payments through an alternative payment model or Advanced Alternative Payment Model (AAPM). The Quality Payment Program (QPP), within MACRA, is an umbrella categorization that covers both MIPS and the AAPM. In many ways, health policy reform efforts through the ACA were leading up to a new clinician payment platform. MACRA becomes the federal health policy to address more clinician issues (such as paying clinicians for performance). It is important to realize the ACA was one Act or law, while MACRA was another Act or law, but there is a level of amalgamation. The ACA needs MACRA to implement some of the specific provider functions, and MACRA gets some of the practice structure it needs from the ACA.

First, a review of MIPS. Most clinicians will be involved with MIPS. How MIPS works is it takes the three previously mentioned quality reporting programs and the new IA and uses the scores, from the four, to compose a final composite score. This final score is used to determine the physician payment adjustment, or payment. The scores are weighted. Over a three-year period, the weighting is modified to reflect changes. For example, quality has a weight of 50% in 2018 and 30% in 2020; cost is 10% in 2018, and 30% in 2020; promoting interoperability (Meaningful Use), 25% in 2018 and 25%, 2020; and improvement activities, 15% in 2018 and 15% in 2020. Under the Quality Payment Program (QPP), MIPS is one option, but the other option is the Advanced Alternative Payment Models (AAPM). If a clinician is in an alternative payment model that means they are already using electronic health records, have taken some level of financial risk, and report quality related data. If they meet volume thresholds, such as 25% of their Medicare revenue or 20% of their Medicare patients pass through one of

those three conduits, they are eligible for AAPM. A key with the AAPM is it is a financial risk model, and with risk goes reward, so the long-term benefit can exceed that found under MIPS. However, provider risk tolerance is a consideration. From 2019-2014, providers who qualify for AAPMs will get an annual 5% bonus. In addition to the AAPMs, there are also payment structures that are called MIPS APM which apply if either patient thresholds or the nominal risk criteria are not met. This includes CPC+; Medicare Shared Savings Program Tracks, 1, 2, and 3; Medicare ACO Track 1+; Next Generation ACO; the Vermont Medicare ACO initiative (part of a state all-payer ACO model); and additional CMS models that will be announced. While all of this—MIPS, AAPM, MIPS APM, the Quality Payment Program, and MACRA—is very complicated and confusing, the essence of the changes is to develop payment structures for clinicians that move away from the traditional fee-for-service based system to be based on quality and performance or “volume to value.” There are experts who can work with individual clinicians, clinics, hospitals, and the overall local health system to help with the overwhelming amount of information.

The rapid change (both from public policy but also the market) in terms of how we think about and approach health status and population health, the fundamental nature of quality metrics, the need for sound reliable data, how we deliver that care, and how we pay for it have all become more clear. Even for CAHs, nationally about 85% are posting inpatient data and over 60% are posting outpatient data into Hospital Compare. In North Dakota, about 95% posted for inpatient and 70% for outpatient in 2016. CAHs are posting such data basically to prepare themselves for the day when they can participate more directly in this national movement to leverage better care, better health, and lowered costs. CAHs are starting to provide measures even though they are not required to post quality-related indicators in Hospital Compare, are not eligible for quality- or outcome-related reimbursement, and are not required to be part of an ACO.

Rural providers have made huge advances in technology via Meaningful Use, and nationwide there are hundreds of CAHs and rural providers involved with ACO's and other instruments. Some are taking a chance; others are lagging behind. In the next section, which focuses on North Dakota, we will discuss some of the direct experience rural providers are having with value-based systems. It should also be pointed out that this transformation built on quality and outcomes linked to payment is not easy. Not only will there be winners and losers along the path to reform, but also there will be approaches or models that will be modified or even rejected. ACOs, for example, are sanctioned under the ACA to be a delivery-and-payment model (which is different than the heavily structured and constrained managed care models from the 1990s), but still emphasize quality, care coordination, and payment associated with better outcomes. Still, many health experts express the view that the APMs being demonstrated today may not be here in 10 years. This is a flexible and transformative period with much experimentation. It will take time and dedication, mixed with a high tolerance for failure, to find approaches and methods that work. “The ACO may not survive, but a focus on population health will,” noted one health expert.¹²¹

Finally, for providers in North Dakota and in other states with a significant rural population, or even remote or frontier populations, the key question is how open and accommodating the new value-focused delivery system will be to very small community facilities. Places likely not part of a larger system with system supports (e.g., solo

physician practices, solo nurse practitioner practices, Rural Health Clinics, and other providers where the practice or facility is simply trying to provide the best care they can) may struggle to stay open for the communities they serve, to be that primary access to care point. Health policy generally, plus the specific rules and regulations issued on MIPS, AAPMs, ACOs, and CPC+, all sounds both intriguing and intimidating. As a North Dakota health expert stated, “Our missions are changing in rural hospitals to be leaders for better population health and prevention, no longer just a hospital for acute care but now a real health center for the entire community. But our [hospital] boards need to be willing to change.”¹²¹

Health Reform in North Dakota

Since 2012, there has been a significant level of activity involving not only how we deliver and pay for healthcare, but also how we think about health, including a greater recognition of social determinants of health, population health, and our individual and societal role and responsibility. The Three Aims are taking root in North Dakota too. One statewide health expert recently said, “We are used to there being new rules for the game. In healthcare, we learn those new rules could be a regulatory change, could be a new program, or could be a new reimbursement stream and we learn how to apply those new rules, to play by them. But now we are seeing in health reform that it isn’t that the rules have changed again; it is that the game has changed permanently.”¹²¹ That is a rather profound observation and examination of a dynamic and possibly transformative change in U.S. health and the health delivery system. Others have remarked that what is being implemented today will evolve over time and be very different in five or 10 years.

Another health industry leader remarked, “The national agenda has slowed down the ACA [reference to insurance access such as the individual mandate, short term plans, etc.] but [we] will continue to see the pursuit of value. Market forces are leading to value, data driven [care], and are accepted by all the parties.”

The previous statement that the ACO model may not prevail, that it may morph into another model, shows a continued focus on population health. Even some of the changes to health access or financial access such as eliminating the individual mandate, while profound, likely will not slow down the health system transformation. As one North Dakota health leader commented on the changes, “We are seeing mixed signals from the national picture. But the bigger picture is health reform is being driven from many directions now. At first it was seen as a policy driver [the ACA] but now it is driven by every element in the system.” Health plans, themselves, are being scored and rated on clinical quality, member satisfaction, and accreditation survey results. A value focus places everyone—health plans, clinicians, health systems, facilities, and others—under some form of review to isolate quality and performance. Hopefully, this leads to not only more transparency and accountability within the U.S. health system, but also actual improvements in health status.

Regardless of the model invoked, there is profound change in North Dakota. North Dakota’s six tertiary hospitals, paid under the PPS formula, are participating in value-based purchasing, or pay-for-performance and reduced readmission efforts. Health plan efforts by Blue Cross Blue Shield of North Dakota and Sanford Health Plan to work with employers, employees, and providers on population health initiatives such

as prevention and wellness, chronic disease management, and the application of better metrics are in place and developing. Statewide collaborations through HRET/HIIN, the CAH Quality Improvement Network, and state agencies are working to both better understand the environment to not only build a value-based system, but to also provide technical assistance to providers, particularly small, rural providers are in operation. In addition, the ACO model is being applied not only in urban systems but in rural as well. BCBSND has offered a new alternative payment plan, and clinical settings are adapting to the new physician-quality-based model MACRA. There is a great deal of adjustment, and while it is not necessarily pervasive in North Dakota, there is enough on the surface that a general sense of a directional change can be noted. We will look at the fledgling ACO experience first.

There are seven CAHs involved in ACO's supported by Caravan Health, a Kansas City based company that develops ACO's in rural areas. Nationwide, Caravan Health was developed in 2013 by a group of rural hospital administrators and rural physicians to develop and implement a redesigned rural model for better care and health, and one that could be economically viable within the context of a reduced-cost structure. Caravan has brought 250 hospitals into the Medicare Shared Savings Program ACO model, serving more than 460,000 Medicare beneficiaries as of 2018.¹⁵¹ Five North Dakota CAHs, along with a community health center, and the CAH-associated Rural Health Clinics are participating in a Caravan ACO venture that includes CAHs and other providers in California and Arizona. This is the High Sierras-Northern Plains ACO.¹⁵² The geographical proximity of providers to one another is not important for the operation of an ACO, it is the covered lives that make the difference. Thus, North Dakota ACO participants can have some far-flung partners. Many health providers, urban and rural, have experience in networks and partnerships. There is usually a proximity factor where partnerships with neighbors is important. The ACO network neither requires, nor necessitates a geographically based network.

There are 14 organizational members in the High Sierras-Northern Plains ACO, including the five North Dakota CAHs. Caravan Health accessed \$46 million in AIM funds in 2015.¹⁵³ The funds are used to assist the rural facilities in developing and adapting ACO operations, including care coordination training, data analytics, provider and facility collaboration, utilization management, and other core features. It is a Medicare Shared Savings one-sided model with no risk, but if savings are gained, the rural facilities can share in those savings with Medicare. In addition, the ACO has developed a PTN via another ACA-supported effort.¹⁵⁴

For the High Sierras-Northern Plains ACO, the PTN component, which is clinical, involves training and preparing the medical providers on quality and outcome measurement and techniques. It provides the skills, training, and tools for clinicians to participate in a shared savings program and other APMs. In short, it helps providers transition from a fee-for-service system to a value-based care system.¹⁵⁵ This integrates medical providers in the community health center and the RHCs into the ACO operation. A shared process that interconnects the ACO and the Practice Transformation Network (PTN) within the same network shows the comprehensive nature and the complexity of this transformation. Caravan Health and the National Rural Accountable Care Consortium, another organization that works with rural health systems and providers in ACO development, have both used federal CMS CMMI PTN

grants to assist rural providers to adapt their ambulatory practice to a value-based system, including skill transfer and technical assistance.¹⁵⁵ As a rural effort, some of the earlier commentators expressed concern about the applicability of the ACO model is being tested. When interviewed on his experience with the model, one North Dakota hospital CEO stated, two years ago, that “the attraction [to the ACO model] is the shift to quality and health outcomes, and linking the reimbursement to quality and outcome, the value over the volume. Attractive, too, are the resources provided [in getting started], data, and education from the AIM dollars. I believe we will see the ACO model to have the positive impact on better quality and lowered costs, reducing emergency department visits, reducing admissions to the hospital, and with better health to the patient.” The same CEO, in a 2018 interview, elaborated on his experience after two years. “We have slowed the frequent use of the ED and combined with the chronic disease management process and reimbursement. For doing that, we have seen a significant drop in ED ‘frequent flyers.’”¹⁵⁶ He explained that the focus under the ACO model is on wellness, prevention, and seeing patients more often, not less--but now for prevention and/or disease maintenance. Furthermore, he stipulated that under the ACO, while a health system does not hospitalize patients as frequently, they are being paid for wellness visits, assessments, chronic disease management, and basically the time and services to help people stay well or maintain a health status. The focus and mindset has changed. Ultimately, it lowers the cost of care. He pointed out, “that for the aggregate [High Sierras-Northern Plains ACO] we saved Medicare \$1.6 million, but we didn’t meet the required threshold, so we do not share in the cost savings. I have no regrets that we didn’t share [in the cost savings] as it is good overall, and it benefits the patient. Better care.” Another North Dakota CAH CEO addressed the idea that structural change contributes to a culture change when he commented, “I feel invigorated. We [hospitals] are the pariah of society because when things go bad [for people], the hospital does well [makes money], so this feels good. We are doing the right thing, which is my prime motivation.”

The AIM grant, operating from 2016 to 2018, essentially is a trial run in developing an ACO, as it builds capacity and operates as a learning environment. There are four essential services provided by Caravan Health through the AIM grant to the CAHs. One is a data warehouse/analytic center. CAH CEOs have stated that data elements are essential to understanding their patients so as to better develop an appropriate care plan that improves their health and lowers costs. As one CEO said, “Robust data [on the patient] are available, like cost per member per month, who is high risk and high cost, who has had wellness checks, what services were provided. It gives me a comprehensive set of data that I never had before.”

The AIM grants end in 2018. What will be the impact of the loss of the financial support? A North Dakota CAH CEO who is part of the High Sierras-Northern Plains ACO said, “As we are coached to improve wellness and manage chronic care, there is a reimbursement fee for those services – there is enough in reimbursement now to make up the difference in the loss of the AIM start-up [funds]. We are signed up for 2019 even though the AIM ended” (personal contact, May 24, 2018). Another CEO commented, “We have as a primary focus to position ourselves...for the shift to value, to better transition for how we will be paid in the future. Shared savings is good but doing better

for the patient is the real goal...Even if [there were] no savings I would do it again because of the better care for the patient.”¹⁵⁷

The AIM grant was not available for the Great Care ACO, so those hospitals pay a subscription fee to Caravan for development and technical assistance services. The Medicare wellness visit payments and CDM payments are a critical facet for these ACO members, and there has been a significant increase in patient visits for wellness; thus, patients are experiencing the benefits. “Chronic care management is a big help and wellness numbers are high. We have had good physicians for many, many years who have focused care on people who are sick. So the change in culture to prevention is difficult, but by having the nurses more involved for the wellness visit, that helps in the change. The physicians see that as helping.” The same CEO commented that another difference is “the data is more and better”; before it was just market share, but now they receive data that is more patient-oriented, which is important for better care.

One core element of a value-focused care system is the emphasis on wellness. One of the CAH CEO’s in the High Sierras-Northern Plains ACO explained the process as the wellness visit, which is reimbursable, “sets the base line for patient care.” For example, A1c rates for diabetics are collected and analyzed, blood pressure, weight, and other factors go into the base. The patient receives education and consultation; it is determined how often they need to be re-checked, and care coordination helps the patient remember what they are to do, when, how, and where. “They navigate the system with the patient, not for them, but with them. By providing better care including navigating the system, we hope the cost of care goes down.” The wellness visit is not like a traditional annual physical, as the wellness visit is much more involved, deeper and more comprehensive, and used as an education tool. The introduction of care coordination and how that can help the patient is a new concept for many as well. Another difference is the significant use and reliance on health data. Providers feel they have a better understanding of their patients because of the metrics. It is in the actual development and application of models such as an ACO that the significance of all the effort to establish Meaningful Use in rural areas is more readily apparent.

Care coordination is another core service. The concept of care coordination is fundamental within an ACO model because it is the effort where real cost savings can accrue because of better engagement with the patient, monitoring and management of their conditions, and integration with other providers and specialists. Awareness of the social determinants of health such as poverty, housing, transportation, and social contact come into play in addressing better population health. Care coordination, integrated with an annual wellness visit and patient data analytics, drives improved patient management. Health experts and analysts have stressed the importance of the annual wellness visit. It is much more than a physical exam since it is a planning process for the patient. During these encounters, the provider can assess and code or recode the patient and the conditions. Patients who are not seen on an annual basis can result in the facility losing revenue. The care coordination and wellness visits obviously help the patient, but they also contribute to the facility’s bottom line. As much as 75% of chronic diseases are not coded or miscoded every year, resulting in significant revenue loss. A consultant has commented that “high-cost patients [are] an opportunity to control costs,” which now leads to a better bottom line. The High Sierras-Northern Plains ACO nurses and others receive 27 hours in care coordination training,

including patient coaching, motivational interviewing, the relationship of social determinants of health to patient/population health, and more. Following this, they are certified, which is part of the formal ACO process. A CAH CEO commented, “There is a change in mentality for the staff and the providers. You shift practice patterns and there is a gradual change in attitude [as providers see results]. Physicians now look at the CDM [chronic disease management] nurse as making their lives easier.” For at least one of the CAHs, the care coordinator accompanies the providers when they do rounds in the nursing home as it makes for a “good hand-off between the hospital and nursing home, it is a warm hand-off.”

A third service provided from Caravan Health is a 24-hour nurse advice hotline, which assists in addressing health needs of patients with comorbidities and high users of the health system. Workflow redesign is a fourth service and is essentially the umbrella concept for specific services like care coordination, using quality and utilization metrics and annual wellness visits. This entails learning how a health facility organization can better manage care for the patient and the facility.^{158,159,160}

A final note on the High Sierras-Northern Plains ACO: based on an insight from a financial consultant working with the ACO relates to the idea of the type of patient interaction and cost. Granted “volume to value” implies that frequent patient contact adds cost to the system. In reality, it is the type of contact that is important. In order to have better patient outcomes, there is a need for appropriate care services that are seen as investments in health status, are less costly to the system, and produce better outcomes and cost savings. The consultant summed it up in this manner: “We are seeing a lot more follow-up care. You do see more clinic visits, but that is good because ambulatory is cheaper than an inpatient stay, readmission, or heavy [emergency department] use. So more clinic contact is good, with more contact leading to [a] better opportunity to monitor and manage the patients. Then you have better outcomes, which means an increase in revenue. Physician compensation needs to tie into wellness and incentivize the physician to do more wellness.”¹²¹

One potential change in the evolution of the “rural ACO” may be the development of “mega” ACOs. Because the smaller ACO’s have had difficulty in achieving savings at a threshold level where they are large enough that Medicare can provide a portion back as bonus payments, there is a developing movement to create large scale or “mega” rural ACOs. Caravan Health has indicated they are looking at taking the 38 rural ACOs they have created and forming four mega ACOs. Their assessment is having more covered lives in one system, such as 60,000 or 100,000, contributing to a more realistic formula allocation, one that cannot be met at a 5,000 lives level and one where the savings threshold is lower and more achievable to produce bonus payments. From Medicare’s perspective, a different savings goal is desirable; thus, Medicare gets the achieved savings they seek, and rural providers gain more access to the Medicare bonus. CMS seems oriented to wanting to see providers assume more risk. Currently the North Dakota CAHs are all part of a one-sided Shared Savings model where if there are savings of a set level, some of the savings revert back to the ACO; however, if there are losses, they all belong to Medicare. CMS seeks to encourage more ACO’s to move into full two-sided risk programs where the ACO shares in both gains or losses. The mega model may have more risk elements. It is possible that such a development will pull into a mega ACO more providers, both rural and now urban. Additionally, in 2017,

there were discussions revolving around the idea of a larger North Dakota-based ACO, with just North Dakota providers; however, the discussions in 2018 are more concentrated on a possible North Dakota, Minnesota, and Wisconsin ACO. There may be larger health systems, some urban-based, that would explore joining that model. This too is an example of how quickly the environment is changing.¹⁶¹ In about two years, North Dakota has gone from minimal awareness of what ACO's are, to early experimentation on the part of some rural CAH leaders with a fundamentally new and different delivery-payment model, to actively seeking growth and movement into higher risk arrangements.

A second Medicare Shared Savings ACO, directly involving rural providers, while it has closed, operated in North Dakota. The Primecare Select ACO involved the tertiary PPS and clinic system, along with 10 North Dakota CAHs and their related clinics and a CAH in South Dakota. The ACO operated for about one year, and closed in 2016 due to organizational changes. Medicare had assigned 14,000 Medicare beneficiaries to the Primecare ACO. As was previously stated, geographical location is immaterial for ACO operations. For its one year of operations, the Primecare Select ACO was able to produce and show a significant savings; however, it was below the "3% save." The Primecare Select ACO had \$1.6 million in savings owing to increased efforts in care coordination, patient management, and readmission, and emergency department interventions. However, the 3% save rate was set at \$2.5 million. If they would have met that level, Medicare would have awarded \$1.25 million as a bonus to Primecare Select. Even though this ACO ceased operations, it is a good example of how the restructuring can work to the benefit of the providers. Still, the ACO produced \$1.6 million in savings for the Medicare program, which is significant. As part of the ACO framework, Medicare determines per member/per month (PMPM) costs for a patient. One of the hurdles for North Dakota providers is that the economic efficiency attributed to North Dakota healthcare can be problematic. The PMPM for the Primarcare Select ACO was \$8,200–\$8,500 in comparison with many other places with a \$16,000 or more PMPM. It has been stated that it is harder to show savings in North Dakota because the efficiency is already high enough; it is more difficult to identify ways to save resources.

Another ACO model was started in July 2016 by Medica, a nonprofit health company operating health plans, a foundation, and research efforts. It is in operation in 2018 and acts as a private ACO. Nationally, about 39% of all ACOs are private or non-Medicare. MACRA has been driving some of the growth in ACOs, including private models. The ACO is marketed to businesses and groups and as of 2018 had about 7,500 enrolled lives. This private ACO operates through an integrated service model or network. It accepts all insurance plans, so employers could have insurance with one company but contract with the ACO for service delivery for their employees. The ACO works to provide better coordination and care management for the employees. As was previously stated, the private-based ACOs appear more open to accepting some level of financial risk. Under this private ACO, risk is gradually phased in, with the local health system being open to 15% risk in year one, 30% in year two, and 50% for year three and the following years. In 2018, it is at 50% and is comfortable at that level. ACO contacts indicated that interest from the business community in northeastern North Dakota and northwestern Minnesota, the market area, has been high. This ACO is "relying heavily on [data] analytics to look at the best outcomes for the patient and

productivity for the facility.” They are using the ACO model to better understand care and quality metrics to provide better care and to improve health status. The ACO stated that the “view of the health business is changing as there is movement from a volume payment to outcome payment. You need to grow outside your market not through hospital inpatient services but other services like outreaching occupational therapy, physical therapy, and more. Hospital inpatient [revenue] will continue to decline, but there is a need for revenue, so you have to find other non-inpatient services that benefit the patient, make their health better, and lower the overall cost.”¹⁶²

How this private ACO works to help the patient is emphasizing the workflow redesign. There is health coaching with a certified health and wellness coach to address nutrition, fitness, stress, sleep, and more; a weight management program; a bone and joint program, including joint replacement, cartilage restoration, concussion management, and more; the My Health online patient portal for medical records and communication; and online care options such as E-visits and telehealth for rural and urban patients. The private ACO is also offering a lifestyle education program. This private ACO has continued to evolve over the last two years with more patient-data tools. Readmission analytics are stronger due to better information systems. Congestive Heart Failure (CHF), COPD, and sepsis cases tend to have higher readmissions; however, the ACO analytics can examine when the readmission happens (1 week from discharge, 2 weeks, etc.), where were patients discharged to (home or another health facility or level), what was the treatment of care post-discharge, and other factors. Then a course of action that can help the patient and lessen the need for a readmission can be determined and applied. The ACO is also entering a stage of predictive analytics that relies on population science and can estimate the chance for and rate of readmissions. Those patients can receive customized care that may entail additional direct care, even home-based care. Regardless, population health concepts are operationalized through both mathematical models and technology, to produce better health, better care, and lowered costs.¹⁶³

In July 2016, BCBSND unveiled its new Blue Alliance, which is another type of APM, and is in operation in 2018. Technically, it is not an ACO; however, it is an APM. BCBSND describes this effort as a process of transitioning to a value-based system, moving from a disease model, like the data in MediQHome, to a population-based model. All BCBSND beneficiaries can participate, but it is voluntary for the providers. This is not a Medicare model; it is developed by BCBSND for its business and to benefit its subscribers. The model employs a care-management fee so providers can use funds to cover new services that are required in working with the patient base. This can cover care coordination and patient coaching. It is a data-driven process. BCBSND recognizes that providers are in different places with regard to their ability to adapt to system changes; thus Blue Alliance is offered at three levels with each level building on the previous level, and Level III providing the most risk (and potential benefit) to the provider. Level I focuses on prevention and patient satisfaction and does not include financial risk to the providers. It operates as a patient-centered medical home and includes a number of process measures that relate to how the patient experiences care, the type and number of services provided, and more. At this stage, it is not focused on outcomes, because it is the introductory level and concentrates on doing and measuring the process steps. A care-management fee is provided. The program concentrates on

changing the nature of the provider-patient relationship by incorporating care coordination and data analytics to lower inpatient utilization, readmissions, and emergency department visits. Level II builds on Level I in that it operates as a patient-centered medical home, provides care management, and does not include risk. The difference is that it also incorporates shared savings. Each provider, such as a hospital, has its own target or share for a “save.” This is based on the history of the provider in terms of services and costs. Thus, if the provider meets its target, maybe a reduction in costs of 1%, it shares in that savings with BCBSND. Some funds are returned to the hospital. Level III is a risk model. This is Level I and Level II with the addition of risk sharing. Under this, the provider would not only have the opportunity to share in financial savings but would be held accountable if costs increase. The additional costs would be deducted in payments.¹⁶⁴

A final North Dakota example of health system transformation is found in the community health centers (CHCs) or FQHCs. North Dakota has five FQHCs with four being CHCs operating in 17 communities (13 rural and 4 urban). The five FQHCs are involved with a TCPI, are in a PTN, and involve CMS, so Medicare and Medicaid services and payments are impacted. These are clinic-based networks set up as learning networks designed to coach, mentor, and assist clinicians in developing core competencies specific to practice transformation. This includes clinician-patient communication, care coordination, use of the emergency medical record, patient information/data analytics, and more. The CHCs have been early adopters of quality metrics for integration into care planning and management. They have been using 16 quality metrics for a number of years. The CHC model has been steered more directly via public policy into adopting quality metrics than federally certified RHCs or CAHs. Thus, the CHCs have more experience and built-in capacity to adapt to the APM climate. For example, the FQHCs in North Dakota have worked to improve care such as a reduction of specialty care visits, 22%; spending on specialty care, 33%; inpatient admissions, 25%; and lower total spending, 24%. One health center, which is part of the High Sierras-Northern Plains ACO, participates in a BCBSND value-based purchasing effort that rewards providers on a set of treatments such as emergency department utilization, avoidable inpatient admissions, and readmissions. The health center and local facilities are collaborating on improved transfers and in-home services.¹⁵⁹

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CHAPTER TEN: 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 *Fifth Biennial Report: Health Issues for the State of North Dakota 2019* concludes with a similar takeaway bottom line message as the *First, Second, Third and Fourth 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.

As Chapter 2 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 17 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 four previous *Biennial Reports* that were released in 2011, 2013, 2015, and 2017, 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 *Fifth 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 four 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 3 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 four 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 *Fifth 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 *Fifth 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.
- Increased attention to oral and dental health issues (especially in the

more rural regions of the state), presumably centered on the five core action items contained in a report prepared in 2014 by the UND SMHS Center for Rural Health with support from the Pew Charitable Trust.

CHAPTER ELEVEN: Healthcare Workforce Development

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All four prior editions of the *Biennial Report* have considered healthcare workforce issues in considerable detail. The *Fourth Report* in 2017 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 62nd, 63rd, 64th, and 65th 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 2017-19 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.¹ 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.¹

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 (89th percentile), primary care (75th percentile), or practice in a rural area (98th percentile) than graduates of all other medical schools).²

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.¹ 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.³ 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 1,606 or 212 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 594 or 78 per 100,000 population, which is lower than the U.S. median of 83.⁴ 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.⁴ 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.⁵ 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.⁶ 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:³

- 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.⁷

- 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 4th out of the 50 states.⁴ 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 44th out of 50 states, but had 84 primary care residents, ranking 24th out of 50.⁴ 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.⁸ The UND SMHS has done very well in producing primary care physicians (75th 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.^{9,10} In North Dakota, the number and percentage of residents who are IMGs is 57 and 41.9%, which ranks 4th 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.^{4,7} 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.⁹

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 report¹¹ 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:^{11–15}

- 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.¹² The most successful outcomes for addressing the rural physician shortage have been the employment of comprehensive medical school rural programs.¹² 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.^{13, 14}

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:¹⁴

- 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.¹⁵ 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:^{16, 17}

- 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.¹⁶ 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.¹⁸

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,¹⁹ 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.¹⁹

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:²⁰

- 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.²⁰

Approaches to Improving Retention

Using repeated surveys, a study by Pathman and colleagues²⁰ 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.²¹

Another international study addressed whether compulsory programs such as the National Health Service Corps are effective in retaining providers in rural or remote areas.²² 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.²³ 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.²⁰ 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.²⁴ 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 TWELVE: Recommendations: Healthcare Planning for North Dakota

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The proactive approach taken by the last four North Dakota Legislative Assemblies to address the current and especially the anticipated future healthcare workforce and healthcare delivery challenges facing the state should begin to have a positive effect as the Healthcare Workforce Initiative (HWI) becomes more impactful over the next few years. However, because of the current budgetary uncertainty, 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 (the family medicine residency slots in Fargo subsequently have been funded by Sanford Health and the program now is 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 new 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).
- Donald Jurivich, DO, has been successfully recruited as the chair of a new academic Department of Geriatrics.

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.² In fact, these health-related behaviors account for nearly 40% of all deaths in the United States.² 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.³

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 2017.⁴ 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.¹ 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/fellowships: family medicine, geriatrics, hospitalist, psychiatry, 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 current budget shortfall, fortunately these slots have all been 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 66th 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 66th 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.

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 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 further anticipated that the UND SMHS will generate \$2 of additional revenue for every \$1 appropriated by the Legislative Assembly. This is deemed a conservative estimate, since current data indicate an even greater return on investment of \$2.34 for every state dollar committed. The additional revenue is composed of \$0.57 as a result of tuition, \$.91 in grants and contracts (usually federal funds), and \$.86 in ancillary income, such as from physician practice plans and contributions from the federal government to fund certain residency training costs. Currently, the UND SMHS generates above \$150 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 will be expended in areas other than Grand Forks County. A final positive direct impact of the HWI (specifically because of the new building) 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 66th Legislative Assembly, the highest imperative is to continue full and stable funding of the HWI as well as the UND SMHS. An important component of such stable HWI funding is for the ND Legislature to ensure that all of the funding is in “base” (rather than have a portion of it inappropriately designated as “one-time” funding as currently the case).

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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: Career and Technical Education (CTE)—Crash Courses. **Description:** Area Health Education Center (AHEC) staff provide information related to health careers. North Dakota College Access Network has developed partnerships across North Dakota to help navigate postsecondary preparation and opportunities. **Target Audience:** Students (Grades 7–12) and parents. **Partner(s):** North Dakota CTE. **Total Participants:** 411. **Communities Reached:** Devils Lake, Ellendale, Garrison, Hillsboro, and Towner. **Lead SMHS Program/Funding Source:** AHEC (federal: Health Resources and Services Administration [HRSA] Bureau of Health Workforce [BHW]) (AHEC no longer participates).

Activity: Health in Partnership with Education (HIPE) Week. **Description:** Teachers, healthcare providers, and organizations team up to promote health careers. March 9–13, 2015, and March 14–18, 2016. **Target Audience:** All ages. **Partner(s):** Schools, healthcare facilities. **Total Participants:** Numbers not available. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** Center for Rural Health (CRH)/AHEC (federal: HRSA BHW and Office of Rural Health Policy [ORHP]).

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:** High school students. **Partner(s):** AHEC. **Total Participants:** 3,002. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** High school students.

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:** 548 high school members, 16 middle school members, 21 advisors, with a total of 585 participants and 16 chapters. **Communities Reached:** Bismarck (Bismarck High School, Century High School, Legacy High School, Missouri River Area Career and Technical Center), Killdeer, Langdon, Mandan, North Valley Career & Technology Center (Grafton), West Fargo (Sheyenne High School & West Fargo High School), Hettinger, Grand Forks (Red River and Grand Forks Central high schools), SRCTC (Oakes). **Lead SMHS Program/Funding Source:** AHEC, federal: HRSA, state: ND DOC, Sanford Health, ND Rural Health Association, Jamestown University, US Army, CRH/AHEC: federal: HRSA & ORHP, and UND SOM

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, etc. **Target Audience:** Grades 4–12. **Partner(s):** CRH/AHEC. **Total Participants:** Numbers not available. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** Grade school and middle school students.

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 2018, the program has graduated 238 medical doctors. The program has also graduated 445 students in nursing, clinical psychology, and various other health sciences. A total of 683 Indian health professionals have graduated through the program, in addition to 48 Summer Institute, seven Med Prep, and four Pathway (which has now been discontinued). **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: Market Place for Kids. **Description:** An opportunity to explore creativity and inspire entrepreneurship in students. AHEC staff participate by providing health-career-related information and resources. **Target Audience:** Upper-elementary and middle-school students. **Partner(s):** N/A. **Total Participants:** 2,206. **Communities Reached:** Bottineau, Devils Lake, Dickinson, Jamestown, Minot, Northwood, Wahpeton, and Williston. **Lead SMHS Program/Funding Source:** Market Place for Kids is a nonprofit established by elementary teachers in North Dakota and Minnesota.

Activity: North Dakota Science Teachers Conference. **Description:** Introduced AHEC to North Dakota Science Teachers Association in a breakout session. **Target Audience:** High school science instructors. **Partner(s):** North Dakota Science Teachers Association. **Total Participants:** 8. **Communities Reached:** Valley City. **Lead SMHS Program/Funding Source:** AHEC (federal: HRSA BHW) (Did not participate 2016/2017).

Activity: Other health career fairs. **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:** 1,871. **Communities Reached:** Bismarck, Fort Totten, Dickinson, and Devils Lake. **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:** 60 camps to date hosted a total of 4,212 students 2010: 14 camps funded; 1,016 students from 61 communities; 2011: Nine camps funded; 433 students from 36 communities; 2012: Nine camps funded; 407 students from 54 communities. 2013: Nine camps funded; 680 students from 58 communities; 2014: Nine camps funded; 672 students from 70 communities. 2015: Nine camps funded; 844 students from 56 communities. 2016: 10 camps funded, 891 students from 63 communities 2017: 10 camps funded 1004 students from 51 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, Edmore, Egeland, Elgin, Dahlen, Dakota Prairie, Dawson, Devils Lake, District 8, Dunseith, Ellendale, Fairmont, Fessenden, Finley, Flasher, Fort Totten, Four Winds, Galesburg, Garden Valley, Glen Ullin, Grenora, Hamar, Hankinson, Hatton, Hazen, Hettinger, Hope, Jamestown, Killdeer, Kloten, Kenmare, Kramer, Lakota, Langdon, Leeds, Lemmon, SD, Lidgerwood, Lisbon, Maddock, Mandaree, Mayville, Maxbass, McVile, Michigan, Milton, Minnewaukan, Mott, Munich, Newburg, New England, New Leipzig, New Rockford, New Town, Niagara, Northwood, Oberon, Oakes, Osnabrock, Page, Palermo, Park River, Parshall, Pekin, Petersburg, Pettibone, Plaza, Portland, Powers Lake, Ray, Reynolds, Robinson, Rolla, Rolette, Ross, Round Prairie, Rugby, St. Michael, Scranton, Sharon, Sheyenne, Souris, Stanley, Stanton, Starkweather, Steele, Tappen, Tate Topa, Tioga, Trenton, Tokio, Tolna, Tuttle, Upham, Wahpeton, Walhalla, Warwick, Watford City, Westhope, Whitman, Wildrose, Willow City, Williston, Wolford, and Wyndmere. **Lead SMHS Program/Funding Source:** AHEC/CRH (federal: HRSA BHW and ORHP); (state) appropriated funds designated for workforce development.

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):** AHEC. **Total Participants:** Seven Scrubs Academies have been held at the UND SMHS with a total of 356 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: 55 students from 27 communities; 2016: 55 students from 26 communities 2017: 56 students from 21 communities. **Communities Reached:** Argusville, Arthur, Ayr, Beach, Beulah, Bismarck, Bottineau, Carrington, Cavalier, Courtenay, Devils Lake, Dickinson, Drayton, East Grand Forks, MN, Ellendale, Emerado, Enderlin, Esmond, Fargo, Fishers, Fordville, Frontier, Grafton, Grand Forks, Grandin, Harvey, Harwood, Hazen, Horace, Hunter, Jamestown, Lakota, Leeds, Leonard, Mandan, Manning, Mayville, McKenzie, Mekinock, Milnor, Minot, Minto, Mohall, Mott, New Rockford, New Town,

Northwood, Oakes, Oriska, Park River, Pembina, Powers Lake, Reile's Acres, Rolla, Ross, Rugby, Stanley, Towner, Valley City, Voltaire, Wahpeton, West Fargo, Wilton, and Ypsilanti. **Lead SMHS Program/Funding Source:** CRH (federal: HRSA ORHP) and State Office of Rural Health Grant program; (state) appropriated funds designated for workforce development; UND and Education Council grant.

Activity: Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL-Health) Scrubs Academy II. **Description:** This three-day, two-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 2013. **Target Audience:** Grades 9–11. **Partner(s):** Schools statewide, CRH. **Total Participants:** Two Scrubs Academies have been held at Bismarck State College. 2013: 23 students from 14 communities; 2014: 21 students from 14 communities; 2015 No Scrubs Academy II; 2016 No Scrubs Academy II; 2017 No Scrubs Academy I. **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. **Lead SMHS Program/Funding Source:** AHEC (federal: HRSA BHW).

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. **Communities Reached:** 2013 Mandan (statewide participation); 2014 Grand Forks (statewide participation); 2015 Minot (statewide participation); 2016 Grand Forks (statewide participation); 2017 Minot (statewide participation). **Lead SMHS Program/Funding Source:** CRH: Funded by sponsorship and registration.

Activity: Rural Clinical Rotation Support. **Description:** Travel assistance for rural clinical rotation. **Target Audience:** Post-secondary health profession students. **Partner(s):** N/A. **Total Participants:** 44. **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. **Lead SMHS Program/Funding Source:** AHEC (federal: HRSA BHW).

Activity: Simulation Training. **Description:** Healthcare training using human simulators. **Target Audience:** Post-secondary education. **Partner(s):** Mayville State University, Lake Region State College, VA Hospital, Dickinson State, North Dakota State University. **Total Participants:** 157. **Communities Reached:** Mayville, Dickinson, Bismarck, and Fargo. **Lead SMHS Program/Funding Source:** AHEC (Federal: HRSA BHW).

Activity: Mind Matters Conference on Brain Injury. **Description:** Conference to share assistive technology for survivors; covers vestibular disorders and brain injury, pediatric brain injuries, sports concussions, effects of brain injury on vision and substance abuse; also loss, grief and passion fatigue felt by family members and caregivers; neuropsychological exams, and the importance of hospital rehabilitation. **Target Audience:** Survivors, family members, caregivers, and professionals. **Partner(s):** Head Injury Association of North Dakota, North Dakota Protection and Advocacy, St. Alexius and MedCenter One (2013); Sanford Health (2014). **Total Participants:** 2013: 111 attendees; 2014: 112 attendees; 2015: 110 attendees; 2016 130 attendees; 2017: 100 attendees; 2018 110 attendees. **Communities Reached:** 2013: Bismarck (statewide participation); 2014: Fargo (statewide participation); 2015: Grand Forks (statewide participation); 2016: Fargo (statewide participation); 2017: Bismarck (statewide participation); 2018: Fargo (statewide participation). **Lead SMHS Program/Funding Source:** CRH funded through a subcontract with the North Dakota Department of Human Services.

Activity: North Dakota Mission: Lifeline STEMI and Acute Stroke Conference. **Description:** State conference to share and discuss best-practice models from across North Dakota with reference to the American Heart Association's Mission: Lifeline and North Dakota Department of Health (NDDOH) stroke initiatives; and pre-hospital STEMI and stroke assessment to augment rural and urban hospital clinicians in diagnosing and triaging patients to improve myocardial infarction and stroke outcomes for North Dakota patients. **Target Audience:** Cardiologists, emergency medicine physicians, nurse practitioners (NPs) and physician assistants (PAs). Nurses, nursing leadership and administration. EMS providers, leadership and medical directors. **Partner(s):** NDDOH, Mission: Lifeline, American Heart Association. **Total Participants:** 2013: 250 attendees; 2014: 280 attendees; 2015: 111 attendees; 2016: 198 attendees. **Communities Reached:** 2013: Bismarck (statewide participation); 2014: Fargo (statewide participation); 2015: Bismarck (statewide participation); 2016: Fargo (statewide participation). **Lead SMHS Program/Funding Source:** CRH: Funded through a subcontract with the NDDOH Division of Emergency Medical Services (EMS) (No longer occurring through FLEX).

Recruitment and Retention

Activity: Community Apgar Project. **Description:** A study of recruitment and retention issues using five focus areas: geographic, economic, scope of practice, medical, hospital and community support. **Target Audience:** Rural hospital administrators, board of directors and lead primary care physicians involved in recruitment. **Partner(s):** Boise State University, Idaho, and Boise Family Medicine Residency Program. **Total Participants:** Completed 2nd round in August 2016: 7 CAHs participated. **Communities Reached:** 22 (rural) critical access hospitals (CAHs) total. **Lead SMHS Program/Funding Source:** CRH (federal: HRSA, ORHP, and State Office of Rural Health Grant Program); (state) appropriated funds designated for workforce.

Activity: Community Paramedicine Workshop. **Description:** Two workshops held to explore the expanded role of a paramedic; CRH staff participate in ongoing subcommittee meetings. **Target Audience:** EMS and other stakeholders. **Partner(s):** N/A. **Total Participants:** 75. **Communities Reached:** Statewide. **Lead SMHS Program/Funding Source:** CRH (federal: HRSA, ORHP) and State Office of Rural Health Grant Program. Main funding through NDDOH Division of EMS (No longer occurring through FLEX).

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 (federal: HRSA, ORHP, and Rural Hospital Flexibility Grant Program) (No longer occurring through Flex).

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:** 149 providers currently serving (40 NHSC loan repayment; 61 state healthcare professionals' loan repayment; 16 Federal State Loan Repayment; 32 J-1 visa providers). **Communities Reached:** 149. **Lead SMHS Program/Funding Source:** UND SMHS Department of Family and Community Medicine: 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:** 3,081 health profession candidates connected to rural healthcare entities. 35 providers placed in communities. (MD, PA, NP) providers placed in communities. **Communities Reached:** 36 (rural) CAHs, three IHS, and five federally qualified community health centers. **Lead SMHS Program/Funding Source:** CRH (federal: HRSA, ORHP) State Office of Rural Health Grant Program; (state) appropriated funds—designated for workforce.

Appendix B

Acronym	Meaning
3RNet	National Rural Recruitment and Retention Network
AAMC	Association of American Medical Colleges
AAPM	Advanced Alternative Payment Model
ACA	Affordable Care Act
ACO	Accountable Care Organizations
ADA	American Dental Association
AED	Automated External Defibrillators
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
AISS	American Indian Student Services
ALS	Advanced Life Support
ALS	Amyotrophic Lateral Aclerosis
AMA	American Medical Association
AMI	Acute Myocardial Infarction
AoA/ACL	Administration on Aging/Administration on Community Living
APM	Alternative/Advanced Payment Model
APRN	Advanced Practice Registered Nurse
ARRA	American Recovery and Reinvestment Act
ASCP	American Society of Clinical Pathology
ATV	All-Terrain Vehicle
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
BHW	Behavioral Health Workforce
BHWET	Behavioral Health Workforce Education and Training

BLS	Basic Life Support
BPCI	Bundled Payments for Care Improvement Initiative
BPHC	Federal Bureau of Primary Healthcare
BRFSS	Behavioral Risk Factor Surveillance System
BSN	Bachelor of Science in Nursing
CAC	Certified Application Counselor
CAH	Critical Access Hospital
CBO	Congressional Budget Office
CBOC	Community-Based Outpatient Clinic
CDC	Centers 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
CHI	Catholic Health Initiatives
CHIP	Children's Health Insurance Program
CHIP	Community Health Improvement Plan
CHNA	Community Health Needs Assessment
CISM	Critical Incident Stress Management
CLP	Clinical Laboratory Professional
CLS	Clinical Laboratory Scientist
CLS/MT	Clinical Laboratory Scientist/Medical Technologist
CMMI	Centers for Medicare and Medicaid Innovation
CMS	Centers for Medicare and Medicaid Services
CMSI	Center for Medicare and Medicaid Service Innovation
CNA	Certified Nurse Assistant
CNM	Certified Nurse Midwife
CNS	Clinical Nurse Specialist
COGME	Council on Graduate Medical Education
COH	Community Outpatient Hospital
CoP	Conditions of Participation
COPD	Chronic Obstructive Pulmonary Disease
CPC	Comprehensive Primary Care Initiative
CPC+	Comprehensive Primary Care Plus
CPCP	Comprehensive Primary Care Payments

CPR	Cardiopulmonary Resuscitation
CQM	Clinical Quality Measures
CRC	Cardiac Ready Community
CRC	Conflict Resolution Center
CRCAIH	Collaborative Research Center on American Indian Health
CRH	Center for Rural Health
CRNA	Certified Registered Nurse Anesthetist
CSR	Cast Savings Reduction
CT	Computerized Tomography
CTE	Career and Technical Education
CVD	Cardiovascular Disease
DA	Dental Assistant
DDS	Doctor of Dental Surgery
DEMS	Division of Emergency Medical Systems
DH	Dental Hygiene/Hygienist
DHHS	Department of Health and Human Services
DHS	Department of Human Services
DNP	Doctor of Nursing Practice
DMHSA	Division of Mental Health and Substance Abuse
DO	Doctor of Osteopathy
DoH	Department of Health
DON	Director of Nursing
DPI	Department on Public Instruction
DSM	Direct Secure Messaging
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5 th Edition
DUI	Driving Under the Influence
ECHO	Extension for Community Healthcare Outcomes
eCQM	Electronic Clinical Quality Measures
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/85	Emergency Medical Technician-Intermediary/85

EMT-I/99	Emergency Medical Technician-Intermediary/99
EPCS	Electronic Prescribing of Controlled Substances
ERS	Economic Research Services (USDA)
EVE	Escaping Violent Encounters
EVENT	EMS Voluntary Event Notification Tool
FAR	Frontier and Remote
F-CHIP	Frontier Community Health Integration Project Demonstration
FFR	Federal Financial Report
FFS	Fee-For-Service
FIPS	Federal Information Processing Standard (5-digit code)
FLEX	ND Medicare Rural Hospital Flexibility Program
FNP	Family Nurse Practitioner
FORHP	Federal Office of Rural Health Policy
FQHC	Federally Qualified Health Center
FTE	Full-Time Equivalent
FTR	Free Through Recovery Program
FY	Fiscal Year
GDP	Gross Domestic Product
GME	Graduate Medical Education
GRTRAC	Great Plains Telehealth Resources and Assistance Center
HAC	Hospital-Acquired Condition
HB	House Bill
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HELP	Senate Health, Education, Labor, & Pensions Committee
HEN 2.0	Health Engagement Network
HHS	United States Department of Health and Human Services
HIIN	Hospital Improvement and Innovation Network
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
HIV	Human Immunodeficiency Virus
HMO	Health Maintenance Organization
HMP	Medicaid Health Management Program
HOSA	Health Occupations Students of America

HPSA	Health Professional Shortage Area
HRET	Health Research and Education Trust
HRQOL	Health-Related Quality of Life
HRSA	Health Resources and Services Administration
HSC	Human Services Center
HUD	United States Department of Housing and Human Development
HWI	Healthcare 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
INBRE	Idea Networks for Biomedical Research Excellence
INMED	Indians into Medicine
IOM	Institute of Medicine
IRIS	Intelligent Resources Informed Strategies
IRS	Internal Revenue Service
IT	Information Technology
JCAHO	Joint Commission on the Accreditation of Healthcare Organizations
JCREC	Joint Committee on Rural Emergency Care
JCT	Joint Committee on Taxation
LAC	Licensed Addiction Counselor
LAPC	Licensed Associate Professional Counselor
LCSW	Licensed Certified Social Worker
LICSW	Licensed Independent Clinical Social Worker
LN	Licensed Nutritionist
LPC	Licensed Professional Counselor
LPCC	Licensed Professional Clinical Counselor
LPHU	Local Public Health Unit
LPN	Licensed Practical Nurses
LRD	Licensed Registered Dietitian
LSW	Licensed Social Worker
LTC	Long-Term Care
LT/MLT	Laboratory Technician/Medical Laboratory Technician
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	Medicaid Managed Care Organization
MD	Doctor of Medicine/Medical Doctor
MFT	Marriage and Family Therapist
MHFA	Mental Health First Aid
MIPS	Merit-based Incentive Payment System
MLT/CLT	Medical Laboratory Technician or Clinical Laboratory Technician
MMA	Medicare Modernization Act
MN	Minnesota
MSA	Metropolitan Statistical Area
MT	Montana
MT/MLS	Medical Technologist or Medical Laboratory Scientist
MUA	Medically Underserved Area
NAM	National Academy of Medicine
NARCH	Native American Research Center for Health
NASEMSO	National Association of State EMS Officials
NCHS	National Center for Health Statistics
NCHSC	North Central Human Services Center
NCI	National Cancer Institute
NCLEX-PN	National Council Licensure Examination for Practical Nursing
NCLEX-RN	National Council Licensure Examination for Registered Nurses
NCMHD	National Center on Minority Health and Health Disparities
NCQA	National Committee for Quality Assurance
NCRR	National Center for Research Resources
ND	North Dakota
NDBIN	North Dakota Brain Injury Network
NDBON	North Dakota Board of Nursing
NDCAWS	North Dakota Council on Abused Women's Services
NDCC	North Dakota Century Code
NDCPD	North Dakota Center for Persons with Disabilities
NDDA	North Dakota Dental Association
NDDHS	North Dakota Department of Human Services
NDDoH	North Dakota Department of Health
NDEMSA	North Dakota EMS Association

NDFFCMH	North Dakota Federation of Families for Children's Mental Health
NDHA	North Dakota Healthcare Association
NDHA	North Dakota Hospital Association
NDHEN	North Dakota Hospital Engagement Network
NDHIN	North Dakota Health Information Network
NDMA	North Dakota Medical Association
NDNA	North Dakota Nurses Association
NDPERS	North Dakota Public Employees Retirement System
NDRHA	North Dakota Rural Health Association
NDSCS	North Dakota State College of Science
NDSPC	North Dakota Suicide Prevention Coalition
NDSU	North Dakota State University
NE	Nebraska
NEHSC	Northeast Human Services Center
NHQR	National Healthcare Quality Report
NHSC	National Health Service Corps
NHSN	National Health Safety Network
NICOA	National Indian Council on Aging
NIEJI	National Indigenous Elder Justice Initiative
NIH	National Institute of Health
NOSORH	National Organization of State Office of Rural Health
NP	Nurse Practitioner
NPP	National Priorities Partnership
NPTEC	Northern Plains Tribal Epidemiology Center
NQS	National Quality Strategy
NRCNAA	National Resource Center on Native American Aging
NRHA	National Rural Health Association
NSLP	National School Lunch Program
NWHSC	Northwest Human Services Center
Ob/Gyn	Obstetrician/Gynecologist
OECD	Organization for Economic Cooperation and Development
OIG	Office of the Inspector General
OMB	Office of Management and Budget
ONC	Office of the National Coordinator for Health Information Technology
ORRA	Obamacare Repeal Reconciliation Act
OT	Occupational Therapist

OTA	Occupational Therapy Assistant
PA	Physician's Assistant
PCCM	Medicaid Primary Care Case Management Program
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
PHI	Protected Health Information
PMHNP	Psychiatric Mental Health Nurse Practitioner
PMPM	Per Member/Per Month
PPACA	Patient Protection and Affordable Care Act
PPCP	Priority Primary Care Providers
PPO	Preferred Provider Organization
PPS	Prospective Payment System
PQRS	Physician Quality Reporting System
PT	Physical Therapist
PTA	Physical Therapy Assistant
PTN	Practice Transformation Networks
QHA	Quality Health Associates
QHAND	Quality Health Associates of North Dakota
QI	Quality Improvement
QIN-QIO	Medicare Quality Innovation Network-Quality Improvement Organization
QIO	Medicare 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 Service Assistance
RHC	Rural Health Clinic
RHND	Rural Health Network Development
RN	Registered Nurse
ROME	Rural Opportunities in Medical Education Program
RUCA	Rural-Urban Commuting Area
RUPRI	Rural Policy Research Institute

SAMHSA	Substance Abuse and Mental Health Services Administration
SCHIP	State Children's Health Insurance Program
SCIP	Surgical Care Improvement Project
SD	South Dakota
SEOW	State Epidemiological Outcomes Workgroup
SHIP	Small Rural Hospital Improvement Grant Program
SIDS	Sudden Infant Death Syndrome
SIM-ND	Simulation in Motion-North Dakota
SMHS	School of Medicine and Health Sciences
SOAR	Statewide Online Ambulance Reporting
SORH	State Office of Rural Health
STEMI	ST-Segment Evaluation Myocardial Infarction
STRIVE	Strategies Targeting Reduction in Infections via Engagement
SUD	Substance Use Disorder
SVS	Statewide and Vision Strategy for a Healthier North Dakota
TA	Technical Assistance
TBI	Traumatic Brain Injury
TCPI	Transforming Clinical Practice Initiative
UND	University of North Dakota
UNDSMHS	University of North Dakota School of Medicine and Health Sciences
USAC	Universal Service Administrative Company
USDA	United States Department of Agriculture
USMG	U.S. Medical Graduate
VA	U.S. Department of Veterans Affairs
VBP	Value-Based Purchasing Program
VBPM	Value-Based Payment Modifier
WHO	World Health Organization
WSI	Workforce Safety Insurance
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: 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.
- ACO Investment Model: an initiative designed for organizations participating in accountable care organizations in the Shared Savings Program. It is a model of pre-paid shared savings that builds experience with the Advanced Payment Model to encourage new ACOs to form in rural and underserved areas and to encourage current Medicare Shared Savings Program ACOs to transition to arrangements with greater financial risk.
- 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.
- Acute Stroke Ready Hospital Certification: a certification that recognizes hospitals that meet standards to support better outcomes for stroke care as part of a stroke system of care.

- **Addiction Counselor:** a mental health professional who specializes in helping patients with addictions.
- **Adjacencies:** noun form of adjacent; refers to something being next to or adjoining something else.
- **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.
- **Affordable Care Organizations:** healthcare delivery organizations that utilize payment and care delivery models that link provider reimbursement to quality outcome measures and a reduction in the overall cost of care for a specified population of patients.
- **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.
- **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.

- **Alternative Payment Model:** a form of payment reform that incorporate quality and total cost of care into reimbursement rather than a traditional fee-for-service structure.
- **Amalgamate:** 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 Academy of Actuaries:** a professional association whose mission is to serve the public and the U.S. actuarial system. Academy members include consultants, corporate executive and staff, regulators, government officials, academicians, and retired actuaries.
- **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 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.
- **Ancillary:** providing necessary support to the primary activities or operations of an organization, institution, industry, or system.
- **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.
- Assisted Living: a long-term senior care option that provides personal care support services such as meals, medication management, bathing, dressing, and transportation in a residential setting.
- 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.
- **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.
- **Biennium:** a specified period of 2 years.
- **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.
- **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 Primary Health Care:** part of the Health Resources and Services Administration, of the U.S. Department of Health and Human Services. It helps fund, staff, and support a national network of health clinics for people who otherwise would have little or no access to care.
- **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

- **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: 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.
- 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.
- 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.
- Center for Medicare and Medicaid Services Innovation: supports the development and testing of innovative health care payment and service delivery models.
- 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.
- **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.
- **Chiropractor:** a health care professional focused on the diagnosis and treatment of neuromuscular disorder, with an emphasis on treatment through manual adjustment and/or manipulation of the spine.
- **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.
- **Clerkship (medicine):** a course of clinical medical training in a specialty that usually lasts a minimum of several weeks and takes place during the third or fourth year of medical school.
- **Clinical Laboratory Professional**
- **Clinical Laboratory Scientist**

- Clinical Laboratory Scientist/Medical Technologist
- Clinical Laboratory Technician/Medical Laboratory Technician
- Clinical Laboratory Technologist
- 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.
- Colonoscopy: a procedure in which a flexible fiber-optic instrument is inserted through the anus in order to examine the colon.
- 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.
- Commonwealth Fund Health System Scorecard: the first-ever comprehensive means of measuring and monitoring health care outcomes, quality, access, efficiency, and equity in one report for the U.S. healthcare system.
- 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 Improvement Plan: a long-term systematic effort to address public health problems based on the results of community health assessment activities and the community health improvement process.
- 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 Transformation Grant: aims to improve community health through community partnerships and community-based interventions.
- Comprehensive ESRD Care Model: designed to identify, test, and evaluate new ways to improve care for Medicare beneficiaries with End-Stage Renal Disease (ESRD).
- Comprehensive Stroke Center Certification: recognizes hospitals that meet standards to treat the most complex stroke cases.
- 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.
- Contraception: the deliberate use of artificial methods or other techniques, such as using condoms or the contraceptive pill, to prevent pregnancy as a consequence of sexual intercourse.
- Council on Graduate Medical Education: provides ongoing assessment of physician workforce trends, training issues and financing policies, and recommends appropriate deferral and private sector efforts on these issues. They advise and make recommendation to the Secretary of the U.S. Department of Health and Human Services and the Senate Committee on Energy and Commerce.
- Counselor: a person trained to give guidance on personal, social, or psychological problems.
- 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

- Deductible: a specified amount of money that the insured must pay before an insurance company will pay a claim.
- 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: the number of individuals who are economically inactive (younger than 16 years old or older than 65 years old), 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.

- Didactic: intended to teach, particularly in having moral instruction as an ulterior motive.
- Dietitian: an expert on diet and nutrition.
- Direct Secure Messaging: a national encryption standard for securely exchanging clinical healthcare data via the internet.
- 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.
- Division of Mental Health and Substance Abuse: provides leadership for the planning, development, and oversight of a system of care for children, adults, and families with severe emotional disorders, mental illness, and/or substance abuse issues in the State of North Dakota.
- Doctor of Osteopathy: a fully licensed physician who practices in every medical medical specialty. They provide a full range of services, from prescribing drugs to performing surgery.

E

- Electrocardiogram: a record or display of a person's heartbeat produced by electrocardiography.
- 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.
- **Endocrinology:** the branch of physiology and medicine concerned with endocrine glands and hormones.
- **Endotracheal Intubation:** the management of the patient with an airway catheter inserted through the mouth or nose into the trachea.
- **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.

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 Bureau of Primary Health Care:** part of the Health Resources and Services Administration under the U.S. Department of Health and Human Services.
- **Federal Information Processing Standards:** a set of standards that describe document processing, encryption algorithms, and other information technology standards for use within non-military government agencies and by government contractors and vendors who work with these agencies.
- **Federal Office of Rural Health Policy:** created to advise the Secretary of the U.S. Department of Health and Human Service 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.

- Federally Qualified Health Center: outpatient clinics that qualify for specific reimbursement systems under Medicare and Medicaid.
- Fieldwork: practical work experience conducted by a student in a professional working environment, rather than in a classroom.
- Food Insecurity: the state of being without reliable access to a sufficient quantity of affordable, nutritious food.
- 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 less 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 Employment: when an individual works about 35-40 hours per week, typically in five 8 hour days.
- Full-Time Equivalent: 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

- 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: 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 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: 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 Maintenance Organization: a health insurance organization to which subscribers pay a predetermined fee in return for a range of medical services from physicians and healthcare workers registered with the organization.
- 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.
- Healthcare 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.
- Hematology: the study of the physiology of the blood.
- Hepatology: the branch of medicine concerned with the study, prevention, diagnosis, and management of disease that affect the liver, gallbladder, biliary tree, and pancreas.
- 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:** 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.
- **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:** an institution providing medical and surgical treatment and nursing care for sick or injured people.
- **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 Immunodeficiency Virus:** a retrovirus that causes acquired immune deficiency syndrome and is spread through certain body fluids.
- **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.

- Hypertension: abnormally high blood pressure.



- Idea Networks for Biomedical Research Excellence: promotes the development, coordination and sharing of research and expertise that will expand the research opportunities and increase the number of competitive investigators in the Idea-eligible states.
- Immunization: the action of making a person or animal immune to infection, typically through an injection or series of injections.
- Immunology: the branch of medicine and biology concerned with the immune system.
- Incentive: a thing that motivates or encourages one to do something.
- 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.
- 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.
- 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.
- Inpatient Rehabilitation Facility: a facility that provides intensive, multidisciplinary physical or occupational therapy under the supervision of a doctor as well as full-time skilled nursing care.
- 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.
- 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.
- Interprofessional: a group of individuals from different disciplines working and communicating with each other.
- Isolated Rural Area

J

- Joint Commission on Accreditation of Healthcare Organizations: U.S. based nonprofit organization that accredits more than 21,000 U.S. health care organizations and programs.
- 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

- Laboratory Technician/Medical Laboratory Technician
- Large Rural Area

- Licensed Addiction Counselor
- 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 Behavior Analyst
- Licensed Certified Social Worker
- Licensed Independent Clinical Social Worker:
- 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
- Licensed Professional Counselor
- Licensed Registered Dietitian:
- Licensed Social Worker
- Licensed Vocational Nurse: the term used for Licensed Practical Nurse in Texas and California.
- 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.

- 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.
- 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 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.
- 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.
- Meningococcal Conjugate Vaccine: a vaccine used to prevent meningococcal disease (meningitis) which is a serious infection caused by bacteria. This can affect infect the spinal cord and brain.
- Mental Health: a person's condition with regard to their psychological and emotional well-being.
- 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: areas with a core population of 50,000 or more.
- Micropolitan: areas with a core population of 10,000 to 49,999 (also called large rural).

- **Milbank Memorial Fund:** an endowed operating foundation that works to improve the health of populations by connecting leaders and decision makers to the best available evidence and experience.
- **Mood Disorder:** a psychological disorder characterized by the elevation or lowering of a person's mood, such as depression or bipolar disorder.
- **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.
- **Musculoskeletal Disease:** a group of muscle disease that weaken the musculoskeletal system and hamper locomotion through damage or pain in joints, ligaments, muscles, nerves, tendons, and structures that support the limbs, neck, and back.

N

- **Nasogastric Tube:** a tube that is passed through the nose and down through the nasopharynx and esophagus into the stomach.
- **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 Cancer Institute:** an agency within the U.S. Department of Health and Human Services that coordinates the U.S. National Cancer Program, and conducts and supports research, training, health information dissemination, and other activities related to the causes, prevention, diagnosis, and treatment of cancer; the supportive care of cancer patients and their families; and cancer survivorship.
- **National Health Service Corps:** an organization that connects primary health care providers to area of the U.S. with limited access to care.

- National Indian Council on Aging: a non-profit organization that is focused on aging American Indian and Alaska Native Elders. Their mission is to advocate for improved comprehensive health, social services, and economic wellbeing of American Indian and Alaska Native Elders.
- National Indigenous Elder Justice Initiative: organization created to address the lack of culturally appropriate information and community education materials on elder abuse, neglect, and exploitation in Indian Country.
- National Institute of Health: an agency that is part of the U.S. Department of Health and Human Services that focuses on health and medical research.
- National Organization of State Offices of Rural Health: an organization established in 1995 to assist State Offices of Rural Health in their efforts to improve access to, and the quality of, health care for over 60 million rural Americans.
- 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: the branch of medicine that deals with the physiology and diseases of the kidneys.
- Neurology: a branch of medicine or biology that deals with the anatomy, functions, and organic disorders of nerves and the nervous system.
- 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 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 Center for Persons with Disabilities: a university center with the mission to provide service, education, and research which empowers communities to welcome, value, and support the well-being and quality of life for people of all ages and abilities.
- 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 Critical Access Hospital Quality Network: serves as a common place for North Dakota CAHs to share best practices, tools, and resources related to providing quality of care.
- 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 Federation of Families for Children's Mental Health: provides needed support and services to children and youth with emotional, behavioral, and mental health challenges, and their families.
- 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 Hospital Engagement Network: a network of 28 enrolled facilities that focuses on 10 areas of quality improvement. The hospitals are instructed on how to implement best practices and lessons learned through the use of webinars and educational sessions.
- 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 Public Employees Retirement System: part of the North Dakota State Government tasked with designing, communicating, and efficiently administering a viable employee benefits program within the framework of prudent risk-taking, applicable state and federal laws, and professional and ethical standard so as to provide an employee benefit package that is among the best available from public and private employers in the upper Midwest.
- 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 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.
- Office of Management and Budget: the largest office within the Executive Office of the President of the United States. Their most important function is to produce the President's Budget but they also measure the quality of agency programs, policies, and procedures to see if they comply with the president's policies, and coordinates inter-agency policy activities.
- Office of the Nation Coordinator for Health Information Technology: a position within the U.S. Department of Health and Human Service with the purpose of

promoting a national health information technology infrastructure and oversee its development.

- 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.
- Ophthalmology: the branch of medicine concerned with the study and treatment of disorders and diseases of the eye.
- 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).
- Oral Surgery:
- 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.
- Osteoporosis: a medical condition in which the bones become brittle and fragile from loss of tissue, typically as a result of hormonal changes, or deficiency of calcium or vitamin D.
- Otolaryngology: the study of disease of the ear and throat.
- 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

- **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.
- **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.
- **Pediatric Medicine:** a branch of medicine dealing with the development, care, and diseases of children.
- **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.
- **Personality Disorder:** a deeply ingrained and maladaptive pattern of behavior of a specified kind, typically manifest by the time one reaches adolescence and causing long-term difficulties in personal relationships or in functioning in society.

- **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.
- **Pneumothorax:** a condition in which air collects in the space between the lungs and the chest wall. This air pocket puts pressure on the lung and can collapse a portion of the lung.
- **Postulate:** suggest or assume the existence, fact, or truth of (something) as a basis for reasoning, discussion, or belief.
- **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.

- Preferred Provider Organization: a managed care organization of medical doctors, hospitals, and other health care providers who have agreed with an insurer or a third-party administrator to provide health care at reduced rates to the insurer's or administrators clients.
- Prescribe: to advise and authorize the use of a medicine or treatment for someone, usually put into writing (prescription) for documentation purposes.
- 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.
- Primary Stroke Center: a hospital-based center with the resources and processes to care for acute stroke patients.
- 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.
- 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.
- 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.
- 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.

R

- 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.
- Reciprocity: a mutual exchange of privileges; specifically: a recognition by one or two states or institutions of the validity of licenses or privileges granted by the other.
- 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 Analyst
- 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.
- 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.
- Rheumatology: the study of rheumatism, arthritis, and other disorders of the joints, muscles, and ligaments.
- 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 (medical): a period of specialized medical training in a hospital under the direct or indirect supervision of an attending physician.
- 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.
- Robert Wood Johnson Foundation: United States' largest philanthropy organization focused solely on health. The foundations goal is to improve the health and health care of all American's through the use of grants.
- 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 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 Policy Research Institute: provides unbiased analysis and information on the challenges, needs, and opportunities facing rural America. Its aim is to spur public dialogue and help policymakers understand the rural impacts of public policies and programs.
- Rural-Urban Commuting Area Codes: classify U.S. census tracts using measures of urbanization, population density, and daily commuting from the decennial census.

S

- Satellite Clinic: a facility owned by a hospital but operated at a distant site.
- Scoliosis: abnormal lateral curvature of the spine.
- Seal! North Dakota Dental Sealant Program: a school-based program where public health dental hygienists visit schools two times a year, in the fall and spring, to provide direct preventative services, under standing orders of a dentist.
- 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.
- **Small Rural Area**
- **Small Rural Hospital Improvement Grant Program:** a program that assists eligible hospitals in meeting the costs of implementing data system requirements established under the Medicare Program, including using funds to assist hospitals in participating in improvements in value and quality to health care such as value-based purchasing programs, accountable care organizations, and payment bundling. Eligible hospitals must have 49 beds or less.
- **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.
- **Specialist (lab sciences)**
- **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 Epidemiological Outcomes Workgroup:** initiated in North Dakota in 2006 it is a group whose purpose is to identify, analyze, and communicate key substance abuse and related behavioral health data to guide programs, policies, and practices.
- **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 and Vision Strategy for a Healthier North Dakota:** a group composed of key stakeholder groups including the governor's office, state business chamber, statewide health associations, public employee representatives, the UND School of Medicine and Health Sciences, Blue Cross Blue Shield of North

Dakota, large health organizations, and others that developed a statewide health improvement plan for North Dakota.

- **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.
- **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.
- **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

- **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.

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.
- Urban Area
- 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 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

- 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.
- 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