Rural Health Value North Dakota Value Based Care and Payment Project

Environmental Scan

3/20/2023

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Background

In North Dakota "possibility is as endless as the horizon."[1] Long known as a national leader in agricultural output, the state has also become a national leader in oil and energy production and is an emerging center for information technology. Contributing to, and as a result of, these economic changes, the state's population is also undergoing changes. Between 2010 and 2020, North Dakota was the fourth fastest growing state in the nation with a population increase of 15.8%. Much of that growth occurred in the adult (age 18 and over) population which increased by 14.0%.[2] In a shorter timeframe (2016-2021) the proportion of the state adult population with a bachelor's degree increased by 8.3% and the proportion living under 100% of the federal poverty level decreased by nearly 4.5%.

At the same time the state's population is evolving, there are important changes happening in the healthcare environment – both in the state and nationwide. While advances in healthcare technology, growing concerns about the healthcare workforce, therapeutic breakthroughs, and other topics frequently receive the most attention, changes in how healthcare organizations and providers are paid are poised to have an extraordinary impact on the healthcare environment. Transitions from the traditional fee-for-service reimbursement model to one based on quality and value are being developed, adopted, and imposed by a number of the entities (governments, private insurance companies, and others) that actually pay those bills.

Acknowledging those changes, in the summer of 2022, the Center for Rural Health at the University of North Dakota released an RFP soliciting proposals for a Rural Health System Redesign consultant. The consultant was tasked with: 1) Producing a review, analysis and outline of health in the state including demographic and economic trends, health conditions, rural health environment, and state and federal policy trends impacting rural health; 2) Reviewing health market conditions and conducting scenario modeling based on the continuum from fee-for-service to valued-based care and payment; and 3) Developing a set of recommendations to "guide rural health providers' and leaders' decision making to improve accessibility, quality, and delivery of care."[3] A team comprised of members of Rural Health Value and Newpoint Healthcare Advisors was awarded the contract resulting from that RFP.

This document – the Rural Health Value North Dakota (RHV-ND) Environmental Scan – is being released to satisfy the RFP's first requirement and to inform other requirements. It includes two sections – the Physical Environment and the Payment and Policy Environment – with chapters on the state's population, population health, risk factors, health professionals, and hospitals. In addition to providing static numbers, the report provides data on trends where, and as far as, the available data allowed.

Data Sources

A large number of data sources were used in the production of this report. Nearly all of them are publicly available online (one exception is data from the American Hospital Association annual survey, used to identify hospital system membership). In addition to statewide measures, data is reported at the county level where available. All data sources are identified in tables, figures, and appendices. Data from the U.S. Census Bureau's American Community Survey (ACS) is used frequently. The ACS is conducted every year utilizing a randomly selected sample of about 3.5 million addresses and its population estimates are intended to be representative of the U.S. population.[4] Data confidentiality rules preclude the release of data that might risk disclosure of individual respondents so data for lightly populated areas are only released in the form of 5-year aggregates. As a result, ACS rural population estimate data released in 2021 represents data collected in the previous five years (i.e., 2017-2021). Valid trend comparisons for this data must be made using non-overlapping datasets, so this document uses ACS 5-year estimate data from 2012-2016 to display data trends.

Data on hospital admissions (e.g., diagnoses and procedures) are not available for North Dakota. Although the state does have some participation in the AHRQ Healthcare Cost & Utilization Project (HCUP) with data submitted by the Minnesota Hospital Association, data from the State Inpatient Database (SID) for North Dakota is not available. Many states participate in centralized healthcare data repositories and/or all-payer claims databases which allow rich analyses of the population's health care and conditions. The lack of such data resources in North Dakota represents a significant loss of opportunity for examining important state questions like readmissions, potentially avoidable utilization rates, and service patterns.

Comparison states

Although the RFP only specified that the scan should report on data by statewide and rural levels, the project team felt that it would be beneficial to frame these measures in a larger geographic context. Although the use of national comparisons is tempting, there was concern that including data from very distant (and very different) states would not provide an appropriate perspective for understanding data from North Dakota. After several high-level analyses, the team elected to use data only from the adjacent states – Minnesota, South Dakota, and Montana – to form a regional comparison cohort. Note that all data presented herein is done so descriptively, no statistical comparisons were made.

Geography

A popular national (mis) conception of North Dakota is that the state is completely rural. In fact, slightly more than 50 percent of the state's population lives in metropolitan counties. Many reports produce data using an urban/rural or metropolitan/nonmetropolitan breakdown. But that simple distinction frequently obscures the fact that nonmetropolitan counties with small cities can be very different from counties with no city. Approximately half of North Dakota's nonmetropolitan population (i.e., one-quarter of the total) lives in sparsely populated counties with no city of 10,000 or more people.

Much of the data in this document reports county data at three levels of geography: metropolitan, micropolitan, and noncore. Metropolitan counties are those with an urbanized area (e.g., a city) with 50,000 or more population, or those adjacent counties with a high degree of social and economic integration as measured by the proportion of the population that commutes to them for work.[5] Micropolitan counties are those with an urbanized area with 10,000 – 50,000 population or (again) adjacent socially/economically-integrated counties. Noncore counties are those without an urbanized area of population of at least 10,000 and not socially/economically-integrated to a metropolitan or micropolitan county.

This report is designed to inform a broad array of interested parties: policy makers and other state stakeholders that are concerned with statewide and area issues, and individuals interested in their local environment. As such, it provides information at all three of the geography levels described above. State-wide and regional data are presented to provide a general context for all reported measures. Data are also presented for North Dakota and for the region broken down by metropolitan, micropolitan, and noncore counties as there can be significant variation in the opportunities and needs of those populations. Finally, many of the maps and tables at the individual county level allow readers to focus in on specific areas that are of personal interest.

Key Findings

Population Demographics

- North Dakota's population continues to grow, but the geographic pattern of that growth is mixed. Between 2016 and 2021, the population in metropolitan counties increased 8.2% and that in micropolitan counties increased by 5.9%; but the population in noncore counties decreased by 1.5%.
- The median age of North Dakota's population decreased from 37.0 years in 2010 to 35.7 years in 2020. But the proportion of the population over age 65 has increased across all regions of the state and is now 15.3%of the population. The median age of the population in noncore counties (41.8 years) is substantially higher than that in micropolitan counties (34.1 years) and metropolitan counties (33.9 years).
- The proportion of the adult population without a High School diploma has gone down across all geographies in the region, but North Dakota's statewide rate (6.7%) is higher than that of the other states in the region (6.4%).
- North Dakota has a lower median household income than the other states in the region, but that is largely a metropolitan phenomenon. Median household incomes in North Dakota micropolitan and noncore counties exceeded those in similar geographies in the surrounding states.
- The state's population of color increased by 76.0% between 2010 and 2021.

Population Health Conditions

- Between 2017 and 2021 North Dakota saw a 10.5% decrease in the rate of coronary heart disease; however, it also saw an 11.5% increase in the rate of kidney disease, and a 15.2% increase in the rate of cancer.
- The leading causes of death in North Dakota for 2018-2020 were "diseases of the heart" and "malignant neoplasms". Another highly ranked cause of death for the three-year period was COVID-19 – notable because it only became a cause of death in 2020.
- For every leading cause of death in North Dakota, mortality rates are higher in noncore counties than in either micropolitan or metropolitan counties.

Behavioral and Social Risk Factors

- The proportion of North Dakota residents indicating that they were physically inactive in 2019 (27.3%) was substantially higher than the rate in other states. The findings were the same in metropolitan, micropolitan and noncore counties.
- North Dakota rates of binge drinking and smoking both decreased substantially between 2012 and 2021 (to 22.2% and 17.7%, respectively). The state binge drinking rate is comparable to the

rate of the other states in the region, but the smoking rate is higher than that in surrounding states (regional smoking rate: 16.5%).
- The proportion of North Dakota households spending 30% or more of annual income on housing increased 2.6% between 2020 and 2022 (the national rate decreased 4.7%). This "housing burden" effects a higher proportion of North Dakota households than households in surrounding states (10.7% vs. 9.3% in 2022).

Health Professionals

- The North Dakota population to primary care physician ratio is much higher in noncore counties than in micropolitan or metropolitan counties. That ratio improved in all geographies between 2018 and 2022, but the noncore improvement was very small.
- Mental Health professional shortages affect 90.6% of North Dakota counties including 41.3% of the state's residents. Over three-quarters (75.5%) of North Dakota counties have no mental health provider (includes psychologists, psychiatrists, and licensed clinical social workers).
- More than one-third (37.7%) of North Dakota counties have no primary care physicians.

Hospitals

- North Dakota has a higher proportion of critical access hospitals (85.7%) than the surrounding states (68.4%). All North Dakota non-federal hospitals are nonprofits.
- A smaller percentage of the state's hospitals are affiliated with a system than hospitals in surrounding states.
- North Dakota overall has a lower population/bed ratio (404.5 people/bed) than surrounding states (573.3 people/bed), with substantially lower rates in metropolitan (374.8 people/bed) and noncore counties (306.6 people/bed).
- The state has a higher rate of inpatient discharges/1,000 population (101.7 vs. 84.4) and inpatient days/1,000 population (559.8 vs. 425.9) than surrounding states.
- A large majority of the hospitals in North Dakota had a negative operating margin in 2020.
- Outpatient revenue accounted for over 70% of total revenue in all North Dakota hospitals in 2020. That rate was higher in rural hospitals.

Hospital Quality

- Publicly available North Dakota rural hospital quality data is sparse. This is a missed opportunity for rural healthcare organizations. State-wide healthcare quality data for North Dakota critical access hospitals is primarily limited to the Medicare Beneficiary Quality Improvement Program (MBQIP).
- North Dakota critical access hospitals (CAHs) report quality data more frequently than the average of all CAHs.
- For those data that are reported, North Dakota CAHs generally perform similarly or better than all CAHs.

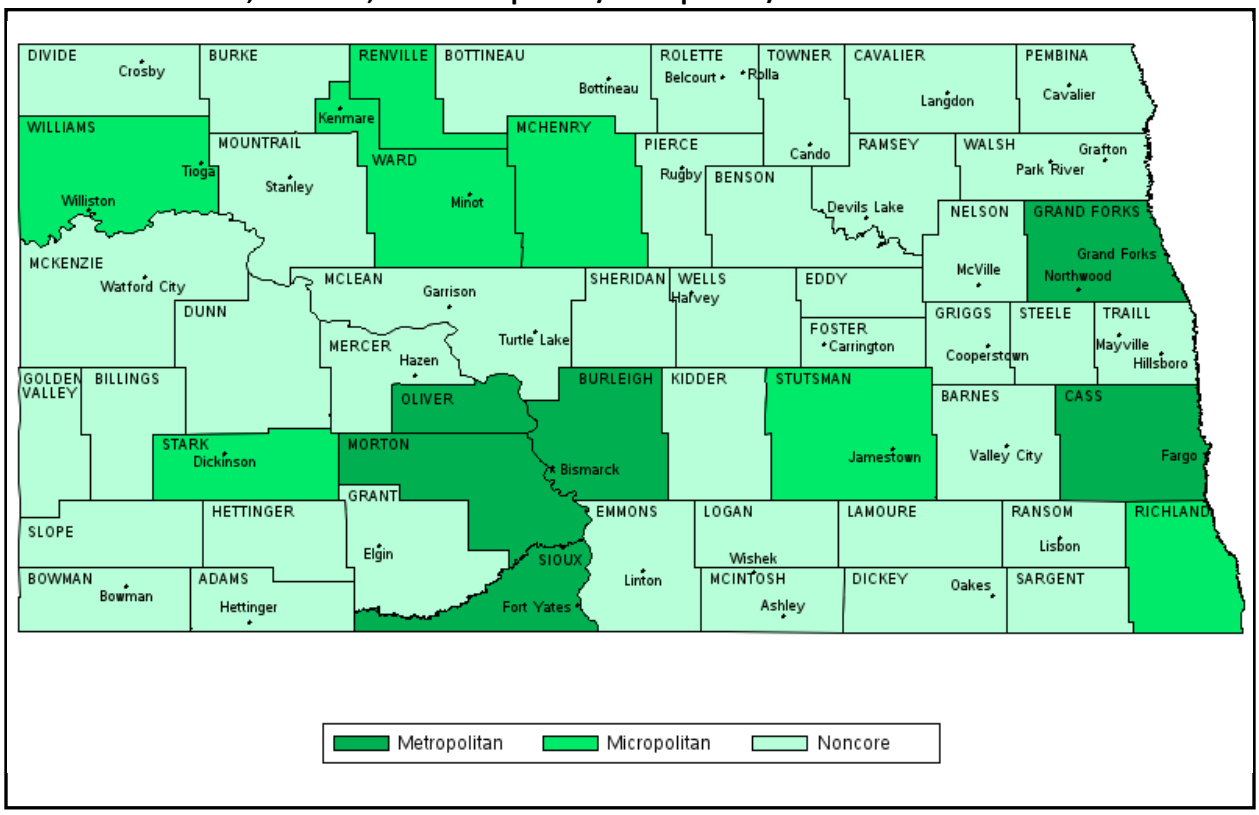
Value-Based Payment

- Value-based payment plans are less prevalent in North Dakota than in adjacent states or in the U.S.
- As in the rest of the U.S., shared savings plans are the most common value-based payment plan in North Dakota.

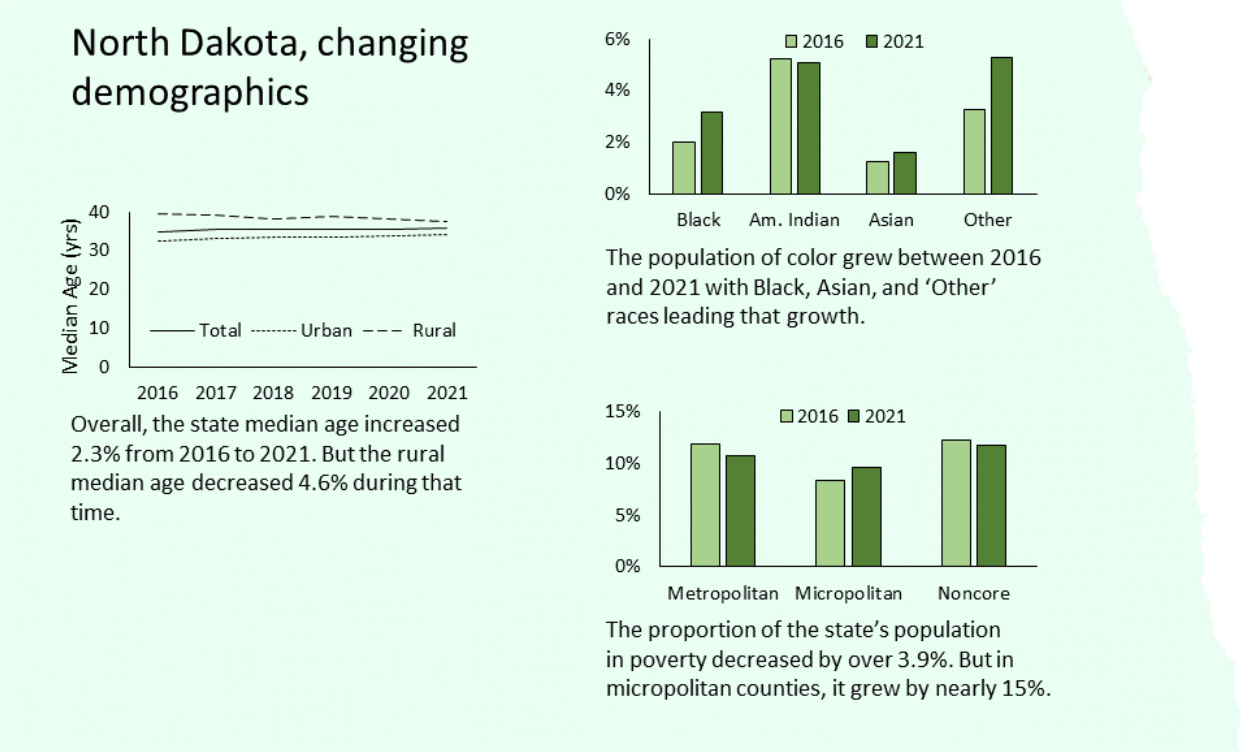
Public Policy Environment and Payment Policies of Commercial Insurers

- North Dakota rural beneficiary enrollment in Medicare Advantage plans grew from 21.7% to 26.0% between 2021 and 2022 but is still lower than the national rural beneficiary enrollment rate of 37.8%.
- There were eight Shared Savings Plan ACOs with assigned beneficiaries operating in North Dakota in 2021.

North Dakota Cities, Counties, and Metropolitan/Micropolitan/Noncore Status



Population Demographics



Data Source: American Community Survey 2016-2021 1-yr and 2016, 2021 5-yr estimates.

North Dakota's population has seen a number of changes over the past decade. While the state's total population increased by 16.0 percent between 2010 and 2020, it also got younger during that period (the only state to do so) with the median age decreasing from 37.0 in 2010 to 35.7 in 2021. Addiionally, North Dakota has gotten more racially diverse with the population of color increasing by 76.0 percent between 2010 and 2021. Although that was the largest percentage change of any state, in 2021 North Dakota remained less racially and ethnically diverse than most other states (42nd of 50).[1]

In 2021, North Dakota's total population was estimated at 773,344, an increase of 5.1% from 2016's estimates:

Metropolitan counties: 392,747 (50.8%), an increase of 8.2% since 2016
Micropolitan counties: 186,828 (24.2%), an increase of 5.9% since 2016
Noncore counties: 193,769 (25.1%), a decrease of 1.5% since 2016

Although North Dakota ranks near the bottom of all states in total population, if ranks higher (in some cases, much higher) compared to other states on a number of population metrics: [2]

- Total Population: 773,344 (48th)
- Percent of the total population who are white alone: 83.1% (43rd)
- Percent of people who are foreign born: 4.4% (38th)
- Percent of people over age 25 that have completed high school: 93.6% (5th)
- Percent of people with a disability: 12.7% (20th)
- Median Household Income: $66,519 (25th)
- Percent of people 16 to 64 years who are in the labor force: 80.0% (3rd)
- Percent of population without health insurance coverage: 7.9% (29th)

Comparisons of these demographic measures between North Dakota and the other states in the region are shown in Table 1:

- North Dakota is less racially and ethnically diverse (other than American Indian) than the surrounding states. But the state saw its proportion of people of color increase across nearly every category between 2016 and 2021. This change took place across all state geographies. Noncore populations of color proportionally lag those in metropolitan and micropolitan counties (again, excepting American Indian populations).

- Median household income in the state grew between 2016 and 2021 across all geographies (metropolitan increased by 12.6%, micropolitan increased by 16.3%, noncore increased by 14.6%). In 2021 the state (overall) had a lower median household income than the other states in the region, but that is largely a metropolitan phenomenon. Median household incomes in North Dakota micropolitan and noncore counties exceeded those in the surrounding states.

- It is frequently observed that North Dakota's population has gotten younger over the past decade – in 2021 the state median age was estimated at 35.9 years (a decrease of 0.2% from 2016). But the state's total population over age 65 increased by nearly 7 percent during that time with that increase heavily driven by the state's metropolitan counties:
    - Metropolitan counties: 13.6% over age 65, an increase of 11.4% since 2016
    - Micropolitan counties: 13.5% over age 65, an increase of 4.3% since 2016
    - Noncore counties: 20.3% over age 65, an increase of 4.8% since 2016

- The proportion of the adult population with less than a High School diploma has gone down across all geographies in the region, but North Dakota's statewide rate (6.7%) is higher than that of the other states in the region (6.4%). That difference is largely driven by the population in micropolitan (7.5%) and noncore (8.9%) counties versus metropolitan counties (5.2%).

Table 1. Population Demographics[a] 2021, North Dakota and Region[b]

Measure	Overall		Metropolitan		Micropolitan		Noncore	
	State	Region	State	Region	State	Region	State	Region
Total population	773,344	7,630,235	392,747	5,228,794	186,828	1,243,709	193,769	1,157,732
Age – Median	35.9	38.6	33.9	37.5	34.1	39.5	41.8	43.1
Under 5 years	6.9%	6.1%	6.7%	6.3%	7.56%	5.8%	6.7%	6.0%
Under 18 years	23.9%	23.3%	22.9%	23.5%	25.2%	22.3%	24.6%	23.3%
Over 65 years	15.3%	16.4%	13.6%	14.8%	13.5%	18.4%	20.3%	21.4%
Race – White	84.9%	81.8%	85.3%	79.6%	86.2%	89.2%	82.8%	84.1%
Black	3.2%	5.3%	4.3%	7.2%	3.2%	1.6%	0.8%	0.6%
American Indian	5.1%	2.5%	3.3%	1.0%	1.9%	2.1%	11.7%	9.7%
Asian	1.6%	4.0%	2.3%	5.3%	1.1%	1.5%	0.6%	0.6%
Hawaiian/Pac. Islander	0.2%	0.1%	0.2%	0.0%	0.2%	0.1%	0.1%	0.1%
Other	1.3%	1.8%	0.9%	2.00%	2.5%	1.7%	0.9%	1.2%
More than one race	3.9%	4.5%	3.7%	4.8%	4.9%	3.9%	3.2%	3.8%
Ethnicity – Hispanic	4.1%	5.3%	3.3%	5.6%	6.1%	5.3%	4.0%	3.8%
Education – Less than H.S.	6.7%	6.4%	5.2%	6.0%	7.5%	6.7%	8.9%	8.2%
High school graduate	26.1%	25.2%	21.3%	22.2%	30.7%	29.0%	30.9%	34.0%
Some College	36.1%	32.3%	35.5%	31.2%	35.7%	33.5%	37.7%	35.6%
Bachelor's degree	22.2%	23.8%	26.4%	26.4%	19.3%	20.5%	17.0%	15.8%
Graduate/Professional	8.9%	12.4%	11.6%	14.2%	6.8%	10.4%	5.6%	6.5%
Income – Median Household	$68,310	$74,992	$68,628	$81,370	$70,597	$64,662	$65,460	$57,286
Under 100% FPL	10.7%	10.1%	10.7%	9.1%	9.7%	10.7%	11.7%	13.8%
Under 150% FPL	6.9%	6.9%	6.4%	6.0%	6.6%	8.3%	8.3%	9.5%
Unemployed	3.2%	3.9%	3.1%	3.8%	3.7%	3.4%	2.6%	4.8%
Insured	92.5%	94.3%	93.9%	95.2%	91.6%	93.6%	90.3%	90.7%
No Vehicle	5.1%	6.1%	5.6%	6.5%	5.1%	5.3%	4.2%	5.2%
Drive more than 1 hr. to work	4.4%	5.0%	3.5%	4.8%	5.4%	4.6%	5.4%	6.5%

2021 measure is 5% or more higher than 2016.
2021 measure is 5% or more lower than 2016.

a. More complete descriptions of the demographic measures are provided in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Data on the characteristics of individual North Dakota counties is presented in Tables 2a-c. Tables show county demographic characteristics and indicate where significant (i.e., >10%) increases or decreases occurred between 2016 and 2021. Counties are presented alphabetically within metropolitan, micropolitan, and noncore classifications, and summary levels are presented at the table bottom. Table 2a presents county demographics related to population age and education. Some notable observations:

- *Population Age (see also Figure 2)*
  - Of the 40 noncore counties, 35 have a median population age more than 10% higher than the state median age.

  - Increases in the proportion of the population under age 18 are spread across the state. Four (of 6) metropolitan counties, 2 (of 7) micropolitan counties, and 7 (of 40) noncore counties saw their population under 18 increase by 10% or more. Five noncore counties saw their population under age 18 decrease by 10% or more with Golden Valley seeing

the largest decline (31.3%). Eleven noncore counties have a population under age 18 significantly smaller than the state level.

- Increases in the proportion of the population over age 65 are also spread across the state. Five (of 6) metropolitan counties, 3 (of 7) micropolitan counties, and 9 (of 40) noncore counties saw their population age 65+ increase by 10% or more. Only five noncore counties saw their population age 65+ decrease by 10% or more.

- *Population Education (see also Figure 1)*
  - Few counties (n=7, all either micropolitan or noncore) saw an increase in the proportion of their adult population without a high school diploma (see also Figure 1). Adams (40.1%) and Towner (35.0%) counties saw the largest increase in adult population without a high school diploma.

  - Many counties (3 of 6 metropolitan, 5 of 7 micropolitan, and 29 of 40 noncore) saw significant decreases in their adult population without a high school diploma.

  - The proportion of the adult population with a bachelor's or graduate/professional degree increased significantly in 39 counties with those changes occurring across all geographies.

Table 2a. Population Demographics[a] – Age and Education 2021, North Dakota Counties

County	Pop.	Population Age				Education				
		Median	<5	<18	>65	<H.S.	HS Grad	Some Coll.	Bach.	Grad Pro
Metropolitan Counties										
Burleigh	97,895	37.3	6.6%	23.7%	16.2%	5.1%	23.1%	34.6%	26.5%	10.7%
Cass	182,992	32.9	6.8%	22.7%	12.2%	4.7%	18.8%	34.7%	28.7%	13.1%
Grand Forks	73,101	30.2	6.7%	21.4%	12.7%	4.6%	21.5%	37.8%	23.5%	12.7%
Morton	32,916	37.1	6.2%	23.2%	16.4%	8.0%	27.2%	37.5%	22.0%	5.3%
Oliver	1,850	48.4	7.5%	25.1%	24.0%	6.3%	28.6%	44.5%	15.3%	5.3%
Sioux	3,993	27.1	9.6%	36.8%	8.0%	15.3%	34.7%	36.3%	9.0%	4.6%
Micropolitan Counties										
McHenry	5,420	42.8	5.6%	23.8%	20.6%	7.8%	33.1%	38.3%	16.1%	4.8%
Renville	2,328	35.9	6.3%	25.9%	17.6%	6.4%	31.7%	38.5%	18.7%	4.7%
Richland	16,546	36.9	5.9%	22.4%	17.9%	7.5%	25.4%	44.5%	18.3%	4.3%
Stark	32,710	34.2	8.3%	27.4%	13.0%	7.8%	32.0%	34.2%	19.1%	6.9%
Stutsman	21,678	40.2	5.9%	20.6%	19.1%	8.5%	36.0%	31.7%	17.9%	5.9%
Ward	69,686	32.1	7.3%	23.9%	12.6%	6.2%	30.0%	34.4%	20.8%	8.6%
Williams	38,460	31.6	9.3%	29.5%	9.2%	8.8%	29.6%	37.2%	18.7%	5.7%
Noncore Counties										
Adams	2,237	46.9	7.5%	23.0%	26.6%	7.3%	37.4%	36.2%	12.0%	7.1%
Barnes	10,869	44.3	4.6%	20.0%	22.1%	5.2%	30.9%	34.6%	22.3%	6.9%
Benson	6,090	29.9	10.5%	36.2%	13.4%	13.4%	29.4%	37.8%	14.0%	5.4%
Billings	839	42.3	6.6%	22.9%	24.1%	5.8%	37.8%	29.7%	17.2%	9.5%
Bottineau	6,442	43.0	5.7%	22.0%	23.1%	6.7%	28.6%	40.0%	19.2%	5.4%

County	Pop.	Population Age				Education				
		Median	<5	<18	>65	<H.S.	HS Grad	Some Coll.	Bach.	Grad Pro
Bowman	3,024	40.9	5.9%	24.7%	21.9%	9.7%	35.3%	36.1%	14.3%	4.5%
Burke	2,177	42.2	6.0%	26.0%	19.5%	6.0%	29.8%	42.5%	17.9%	3.8%
Cavalier	3,725	47.3	6.6%	22.0%	27.3%	5.5%	27.2%	42.4%	21.6%	3.3%
Dickey	5,013	41.1	6.0%	24.4%	20.3%	7.8%	28.2%	38.8%	19.1%	6.2%
Divide	2,196	45.3	8.0%	23.0%	24.7%	7.3%	25.0%	44.3%	18.2%	5.2%
Dunn	4,054	43.6	6.8%	23.1%	17.8%	10.8%	34.6%	34.9%	14.5%	5.1%
Eddy	2,378	44.2	7.1%	22.4%	26.8%	10.4%	31.4%	33.6%	18.9%	5.8%
Emmons	3,316	52.1	5.5%	19.2%	28.7%	11.3%	36.6%	34.1%	13.2%	4.8%
Foster	3,396	44.2	6.0%	22.8%	22.6%	7.6%	27.8%	41.6%	18.6%	4.3%
Golden Valley	1,812	45.9	7.9%	20.8%	23.1%	5.9%	27.4%	43.2%	17.2%	6.2%
Grant	2,351	49.8	4.6%	21.9%	29.8%	6.7%	34.2%	38.2%	17.0%	4.0%
Griggs	2,242	52.9	5.4%	20.6%	30.2%	7.6%	29.5%	33.0%	22.0%	7.9%
Hettinger	2,502	40.9	6.2%	20.5%	23.7%	11.3%	33.7%	38.2%	13.0%	3.8%
Kidder	2,397	46.6	8.2%	25.2%	23.2%	11.0%	34.6%	35.4%	16.4%	2.7%
LaMoure	4,173	46.9	6.6%	23.2%	26.2%	11.7%	29.5%	35.5%	17.8%	5.5%
Logan	1,814	51.6	5.9%	20.9%	27.7%	10.2%	30.2%	36.9%	18.4%	4.3%
McIntosh	2,568	53.2	4.8%	18.1%	30.7%	15.4%	34.6%	33.8%	11.6%	4.6%
McKenzie	13,762	30.3	10.4%	32.4%	8.7%	6.7%	32.1%	37.2%	18.3%	5.7%
McLean	9,788	45.8	5.9%	22.3%	23.4%	7.6%	32.1%	38.9%	16.8%	4.6%
Mercer	8,405	44.4	6.1%	23.3%	20.0%	9.7%	26.4%	42.7%	15.3%	5.8%
Mountrail	9,717	33.0	9.0%	28.7%	11.2%	10.5%	32.5%	35.6%	14.9%	6.5%
Nelson	3,035	49.6	4.8%	20.4%	25.9%	6.7%	29.8%	38.9%	18.5%	6.1%
Pembina	6,912	45.7	5.5%	21.6%	23.6%	9.4%	31.2%	37.8%	16.7%	4.9%
Pierce	4,038	44.3	4.8%	22.7%	23.4%	6.9%	30.0%	34.1%	18.9%	10.0%
Ramsey	11,638	38.7	6.4%	24.0%	20.4%	8.9%	27.2%	38.4%	18.0%	7.5%
Ransom	5,679	43.2	5.6%	23.0%	20.7%	7.5%	37.9%	33.4%	17.5%	3.7%
Rolette	12,508	30.8	8.4%	34.3%	11.5%	13.5%	26.0%	43.2%	12.3%	5.0%
Sargent	3,839	44.6	5.8%	21.0%	22.3%	6.1%	34.3%	39.5%	15.2%	4.9%
Sheridan	1,328	52.0	3.6%	16.4%	32.0%	12.6%	40.1%	33.3%	13.2%	0.8%
Slope	775	52.1	2.8%	20.3%	25.5%	9.0%	29.8%	35.0%	21.4%	4.8%
Steele	1,870	45.8	5.5%	22.7%	23.8%	3.8%	24.2%	42.5%	26.6%	3.0%
Towner	2,190	50.2	5.9%	21.9%	24.3%	11.9%	31.0%	42.1%	11.4%	3.6%
Traill	8,008	40.8	6.4%	22.9%	19.3%	5.7%	25.1%	38.8%	22.1%	8.3%
Walsh	10,631	44.2	6.4%	23.3%	20.9%	12.9%	34.0%	35.1%	12.3%	5.8%
Wells	4,031	51.0	5.5%	21.8%	25.1%	8.5%	38.2%	31.3%	19.0%	2.9%
Metropolitan	392,747	33.9	6.7%	22.9%	13.6%	5.2%	21.3%	35.5%	26.4%	11.6%
Micropolitan	186,828	34.1	7.6%	25.2%	13.5%	7.5%	30.7%	35.7%	19.3%	6.8%
Noncore	193,769	41.8	6.7%	24.6%	20.3%	8.9%	30.9%	37.7%	17.0%	5.6%
Statewide	773,344	35.9	6.9%	23.9%	15.3%	6.7%	26.1%	36.1%	22.2%	8.9%

County rate increased 10% or more between 2016 and 2021.
County rate decreased 10% or more between 2016 and 2021.

a. More complete descriptions of the demographic measures are provided in the appendix.
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Table 2b presents county demographics related to population race and ethnicity. It indicates where substantial (i.e., >10%) increases or decreases occurred between 2016 and 2021. Counties are presented alphabetically with metropolitan, micropolitan, and noncore classifications, and summary levels are presented at the table bottom. Some notable observations:

- *Population Race (see also Figure 3)*
  - The population of color increased significantly (as evidenced by the decline in the white population percentage) in seven counties (one metropolitan, and six noncore).
  - North Dakota's black population saw significant increases in 33 counties spread across all geographies. But nearly every (39 of 40) noncore county has smaller proportions of black residents than the overall state level.
  - The state's American Indian population increased significantly in 23 counties and decreased significantly in 17 others, both spread across all geographies.
  - The Hispanic population increased significantly in 34 counties (5 metropolitan, 5 micropolitan, and 24 noncore). But 28 of the state's 40 noncore counties have lower proportions of Hispanic population than the state rate.

Table 2b. Population Demographics[a] – Race and Ethnicity 2021, North Dakota Counties

County	Pop.	Race							Hispanic
		Am. Ind.	Asian	Black	Haw Pac	White	2+ Races	Other	
Metropolitan Counties									
Burleigh	97,895	4.5%	0.7%	2.3%	0.2%	87.7%	3.9%	0.7%	2.8%
Cass	182,992	1.1%	3.3%	6.1%	0.0%	85.1%	3.8%	0.6%	2.9%
Grand Forks	73,101	2.7%	2.9%	4.1%	0.5%	84.4%	3.8%	1.6%	4.7%
Morton	32,916	3.7%	0.8%	1.2%	0.1%	89.6%	2.8%	1.8%	3.9%
Oliver	1,850	0.6%	0.3%	0.0%	0.3%	91.8%	7.0%	0.0%	3.0%
Sioux	3,993	85.7%	0.0%	0.2%	0.0%	11.2%	2.7%	0.2%	1.1%
Micropolitan Counties									
McHenry	5,420	0.9%	0.4%	0.6%	0.0%	96.4%	1.5%	0.1%	2.2%
Renville	2,328	0.1%	0.2%	0.0%	0.0%	98.3%	1.1%	0.4%	2.9%
Richland	16,546	2.4%	0.2%	0.7%	0.0%	90.8%	4.0%	1.8%	3.6%
Stark	32,710	1.7%	1.2%	2.2%	0.5%	88.7%	3.7%	2.0%	5.8%
Stutsman	21,678	1.5%	0.7%	1.6%	0.0%	93.1%	2.5%	0.6%	2.7%
Ward	69,686	1.8%	1.5%	4.2%	0.2%	84.2%	6.3%	1.8%	6.6%
Williams	38,460	2.5%	1.2%	4.8%	0.2%	79.9%	5.6%	5.8%	9.0%
Noncore Counties									
Adams	2,237	0.7%	2.3%	1.7%	0.0%	93.9%	1.4%	0.0%	2.2%
Barnes	10,869	1.7%	1.1%	1.8%	0.1%	91.1%	3.7%	0.5%	2.4%
Benson	6,090	56.2%	0.4%	0.2%	0.1%	38.2%	4.6%	0.3%	3.8%
Billings	839	0.0%	0.0%	0.0%	0.0%	100%	0.0%	0.0%	0.0%
Bottineau	6,442	4.6%	0.5%	0.3%	0.0%	91.3%	2.3%	0.8%	2.5%

County	Pop.	Race							Hispanic
		Am. Ind.	Asian	Black	Haw Pac	White	2+ Races	Other	
Bowman	3,024	1.8%	0.0%	0.0%	0.4%	94.4%	2.5%	0.9%	5.6%
Burke	2,177	1.1%	1.7%	0.7%	0.0%	93.0%	2.7%	0.8%	1.1%
Cavalier	3,725	0.8%	0.1%	0.1%	0.0%	93.6%	4.2%	1.1%	0.4%
Dickey	5,013	1.4%	0.5%	0.5%	0.0%	95.3%	1.7%	0.6%	3.3%
Divide	2,196	1.7%	0.0%	3.3%	0.0%	90.7%	4.3%	0.0%	4.9%
Dunn	4,054	12.2%	1.4%	0.7%	0.0%	81.1%	3.1%	1.4%	5.5%
Eddy	2,378	3.9%	0.0%	0.0%	0.0%	90.5%	5.2%	0.4%	2.9%
Emmons	3,316	0.2%	0.3%	0.2%	0.0%	97.5%	1.2%	0.6%	1.3%
Foster	3,396	0.6%	0.1%	0.3%	0.5%	95.4%	3.2%	0.0%	0.5%
Golden Valley	1,812	2.1%	0.0%	0.1%	0.0%	91.4%	6.3%	0.0%	5.0%
Grant	2,351	1.0%	1.7%	0.0%	0.0%	94.8%	2.2%	0.3%	1.2%
Griggs	2,242	0.9%	0.0%	0.0%	0.0%	96.6%	2.5%	0.0%	1.3%
Hettinger	2,502	2.4%	0.0%	0.6%	0.1%	92.6%	2.7%	1.6%	1.8%
Kidder	2,397	2.9%	0.0%	0.5%	0.0%	93.7%	2.0%	1.0%	4.5%
LaMoure	4,173	0.4%	0.1%	0.5%	0.0%	95.7%	2.5%	0.9%	1.9%
Logan	1,814	0.1%	0.1%	0.1%	0.0%	96.7%	1.7%	1.3%	2.5%
McIntosh	2,568	0.5%	0.7%	0.6%	0.0%	95.4%	1.3%	1.5%	2.4%
McKenzie	13,762	10.9%	0.4%	1.9%	0.0%	80.2%	4.8%	1.7%	9.9%
McLean	9,788	7.6%	0.2%	0.6%	0.3%	88.0%	2.6%	0.7%	2.7%
Mercer	8,405	4.0%	0.8%	0.2%	0.0%	92.1%	0.4%	2.4%	2.7%
Mountrail	9,717	31.2%	0.6%	1.8%	0.1%	60.0%	3.6%	2.7%	8.6%
Nelson	3,035	0.2%	1.1%	0.4%	0.0%	93.4%	4.0%	1.0%	3.9%
Pembina	6,912	1.2%	0.4%	0.7%	0.0%	93.2%	4.4%	0.1%	3.8%
Pierce	4,038	4.4%	1.3%	0.3%	0.0%	92.4%	0.8%	0.8%	1.3%
Ramsey	11,638	11.0%	1.5%	0.6%	0.1%	82.0%	4.1%	0.6%	3.1%
Ransom	5,679	0.4%	0.8%	0.9%	0.0%	93.7%	3.9%	0.4%	0.5%
Rolette	12,508	79.2%	0.2%	0.7%	0.0%	16.6%	2.7%	0.6%	2.2%
Sargent	3,839	0.6%	0.2%	2.2%	0.0%	92.9%	3.1%	1.0%	3.2%
Sheridan	1,328	1.9%	0.0%	0.0%	0.0%	96.2%	1.9%	0.0%	0.0%
Slope	775	1.2%	0.0%	0.0%	0.0%	96.3%	2.6%	0.0%	0.1%
Steele	1,870	0.0%	0.0%	0.4%	0.0%	94.7%	4.4%	0.5%	4.0%
Towner	2,190	8.1%	0.3%	0.5%	0.0%	88.3%	2.8%	0.0%	3.4%
Traill	8,008	1.0%	0.3%	0.7%	0.0%	93.0%	3.4%	1.5%	3.5%
Walsh	10,631	1.8%	0.6%	0.7%	0.0%	91.2%	4.5%	1.2%	12.0%
Wells	4,031	0.1%	0.3%	0.0%	0.0%	97.9%	1.2%	0.5%	2.0%
Metropolitan	392,747	3.3%	2.3%	4.3%	0.2%	85.3%	3.7%	0.9%	3.3%
Micropolitan	186,828	1.9%	1.1%	3.2%	0.2%	86.2%	4.9%	2.5%	6.1%
Noncore	193,769	11.7%	0.6%	0.8%	0.1%	82.8%	3.2%	0.9%	4.0%
Statewide	773,344	5.1%	1.6%	3.1%	0.2%	84.9%	3.9%	1.3%	4.1%

County rate increased 10% or more between 2016 and 2021.
County rate decreased 10% or more between 2016 and 2021.

a. More complete descriptions of the demographic measures are provided in the appendix.
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Table 2c presents county demographics related to population income, employment, and insurance status. It indicates where significant (i.e., >10%) increases or decreases occurred between 2016 and 2021. Counties are presented alphabetically with metropolitan, micropolitan, and noncore classifications, and summary levels are presented at the table bottom. Some notable observations:

- *Population Income and Poverty*
    - Median household income in 2021 is significantly lower than the state level in 18 (of 40) noncore counties.

    - The population living at less than 100% of the Federal Poverty Level (FPL) increased significantly in 18 counties (1 metropolitan, 3 micropolitan, 14 noncore) and decreased significantly in 21 counties (3 micropolitan, 18 noncore). Of the 14 counties that have higher proportions of population under 100% FPL than the state level, 11 are noncore. Of the 25 counties that have lower proportions of population under 100% FPL than the state level, 20 are noncore.

- *Unemployment*
    - Between 2016 and 2021, 25 North Dakota counties (5 metropolitan, 5 micropolitan, 15 noncore) saw significant increases in their unemployed population. Similarly, 25 counties (1 metropolitan, 1 micropolitan, 23 noncore) saw significant decreases in their unemployed population. Over half (n=26) of the state's noncore counties have lower unemployment rates than the state overall.

- *Transportation*
    - Table 2c shows that 5.1 percent of the state's population did not have a personal vehicle in 2021. County rates ranged from 0.4 percent in Burke County to 11.7 percent in Sioux County. More than half of noncore counties (n=25) have higher population proportions without a vehicle than the state rate.

    - While the proportion of the population driving one or more hours to work significantly increased in 18 counties, it significantly decreased in 27 others. Not surprisingly, most noncore counties (n=24) have higher rates than the overall state rate.

Table 2c. Population Demographics[a] – Income, Employment, and Insurance 2021, North Dakota Counties

County	Pop.	Median HH Inc.	Poverty <100% FPL	Poverty <150% FPL	Unemp-loyed	Insured	No Vehicle	Travel >1hr
Metropolitan Counties								
Burleigh	97,895	$76,043	7.8%	4.9%	2.8%	94.9%	5.7%	4.3%
Cass	182,992	$68,718	10.4%	6.3%	3.0%	94.0%	5.9%	3.2%
Grand Forks	73,101	$57,213	15.4%	8.1%	3.7%	93.7%	5.6%	2.8%
Morton	32,916	$75,177	7.7%	7.2%	2.5%	94.7%	3.0%	4.3%
Oliver	1,850	$64,148	11.8%	4.8%	3.7%	93.7%	2.3%	6.2%
Sioux	3,993	$39,755	38.5%	15.5%	19.8%	66.8%	11.7%	3.7%
Micropolitan Counties								
McHenry	5,420	$71,612	9.1%	6.8%	4.2%	95.8%	4.1%	9.6%
Renville	2,328	$71,218	5.1%	6.1%	2.2%	94.8%	3.5%	20.9%
Richland	16,546	$62,481	10.7%	9.2%	3.2%	94.2%	6.9%	5.6%
Stark	32,710	$70,364	10.9%	6.7%	2.8%	91.0%	5.0%	4.7%
Stutsman	21,678	$54,652	12.5%	7.0%	4.9%	91.9%	5.2%	3.5%
Ward	69,686	$72,227	9.7%	5.3%	4.3%	93.4%	5.0%	6.3%
Williams	38,460	$80,142	7.1%	7.7%	3.0%	86.7%	4.7%	3.7%
Noncore Counties								
Adams	2,237	$52,896	14.2%	6.9%	1.0%	90.6%	5.6%	5.6%
Barnes	10,869	$64,016	10.6%	5.8%	3.7%	94.1%	4.7%	5.2%
Benson	6,090	$54,375	30.2%	10.7%	3.4%	92.4%	9.1%	1.0%
Billings	839	$71,375	9.6%	1.6%	2.7%	94.4%	3.9%	6.2%
Bottineau	6,442	$68,095	8.7%	4.8%	3.7%	93.5%	3.2%	6.1%
Bowman	3,024	$76,447	9.3%	5.3%	4.2%	92.4%	1.3%	5.5%
Burke	2,177	$97,802	5.5%	4.4%	2.8%	94.9%	0.4%	9.7%
Cavalier	3,725	$60,284	13.8%	4.9%	2.0%	92.6%	4.8%	3.6%
Dickey	5,013	$58,267	5.7%	9.7%	3.1%	95.1%	2.7%	6.5%
Divide	2,196	$83,438	5.6%	12.8%	4.2%	91.8%	5.2%	9.1%
Dunn	4,054	$84,459	7.3%	5.7%	2.5%	80.4%	1.2%	7.6%
Eddy	2,378	$44,958	13.7%	14.4%	1.8%	92.5%	8.5%	5.7%
Emmons	3,316	$56,713	8.1%	10.0%	1.6%	93.4%	2.3%	7.2%
Foster	3,396	$71,250	7.2%	7.1%	0.1%	96.6%	4.1%	2.8%
Golden Valley	1,812	$83,295	5.9%	9.0%	3.9%	97.8%	4.9%	10.6%
Grant	2,351	$57,200	11.8%	8.6%	2.5%	94.9%	1.2%	11.6%
Griggs	2,242	$64,196	4.8%	7.0%	0.7%	95.9%	3.9%	3.3%
Hettinger	2,502	$62,865	10.1%	5.8%	3.0%	90.2%	1.0%	3.8%
Kidder	2,397	$52,419	10.3%	14.3%	0.9%	88.2%	0.7%	6.5%
LaMoure	4,173	$63,594	14.5%	3.9%	1.9%	94.8%	2.8%	5.1%
Logan	1,814	$53,929	7.4%	12.2%	1.1%	97.5%	1.3%	2.3%
McIntosh	2,568	$58,056	10.2%	8.9%	0.3%	93.2%	6.4%	0.7%
McKenzie	13,762	$78,442	13.0%	10.7%	2.2%	82.1%	2.6%	7.7%
McLean	9,788	$72,324	7.7%	5.0%	1.7%	95.3%	3.2%	9.3%
Mercer	8,405	$78,547	9.6%	9.3%	2.3%	87.3%	2.4%	5.7%

County	Pop.	Median HH Inc.	Poverty <100% FPL	Poverty <150% FPL	Unemp-loyed	Insured	No Vehicle	Travel >1hr
Mountrail	9,717	$76,520	12.9%	11.0%	3.1%	83.0%	5.1%	6.8%
Nelson	3,035	$56,724	10.4%	5.4%	1.3%	92.7%	2.7%	5.3%
Pembina	6,912	$61,795	7.3%	8.8%	4.3%	93.2%	2.0%	2.8%
Pierce	4,038	$59,803	11.2%	6.8%	0.9%	93.9%	4.6%	3.0%
Ramsey	11,638	$55,534	14.7%	7.4%	0.9%	91.1%	7.9%	4.2%
Ransom	5,679	$67,480	11.2%	5.5%	3.1%	95.4%	4.6%	6.4%
Rolette	12,508	$49,434	26.9%	12.7%	8.1%	72.2%	8.7%	2.0%
Sargent	3,839	$67,467	5.7%	3.5%	1.3%	97.2%	2.6%	4.0%
Sheridan	1,328	$61,125	4.3%	7.1%	0.8%	90.5%	3.7%	12.7%
Slope	775	$67,614	4.5%	10.2%	5.7%	97.7%	0.9%	5.0%
Steele	1,870	$81,354	12.1%	3.7%	1.7%	94.5%	1.0%	3.9%
Towner	2,190	$51,912	14.8%	10.4%	3.0%	90.4%	5.2%	4.4%
Traill	8,008	$73,113	6.0%	7.2%	1.9%	93.6%	3.8%	6.2%
Walsh	10,631	$59,368	9.7%	11.5%	2.3%	93.3%	5.0%	4.4%
Wells	4,031	$58,932	8.8%	7.0%	1.6%	94.3%	5.3%	3.8%
Metropolitan	392,747	$68,628	10.7%	6.4%	3.1%	93.9%	5.6%	3.5%
Micropolitan	186,828	$70,597	9.7%	6.6%	3.7%	91.6%	5.1%	5.3%
Noncore	193,769	$65,460	11.7%	8.3%	2.6%	90.3%	4.2%	5.4%
Statewide	773,344	$68,310	10.7%	6.9%	3.2%	92.5%	5.1%	4.4%

County rate increased 10% or more between 2016 and 2021.
County rate decreased 10% or more between 2016 and 2021.

a. More complete descriptions of the demographic measures are provided in the appendix.
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

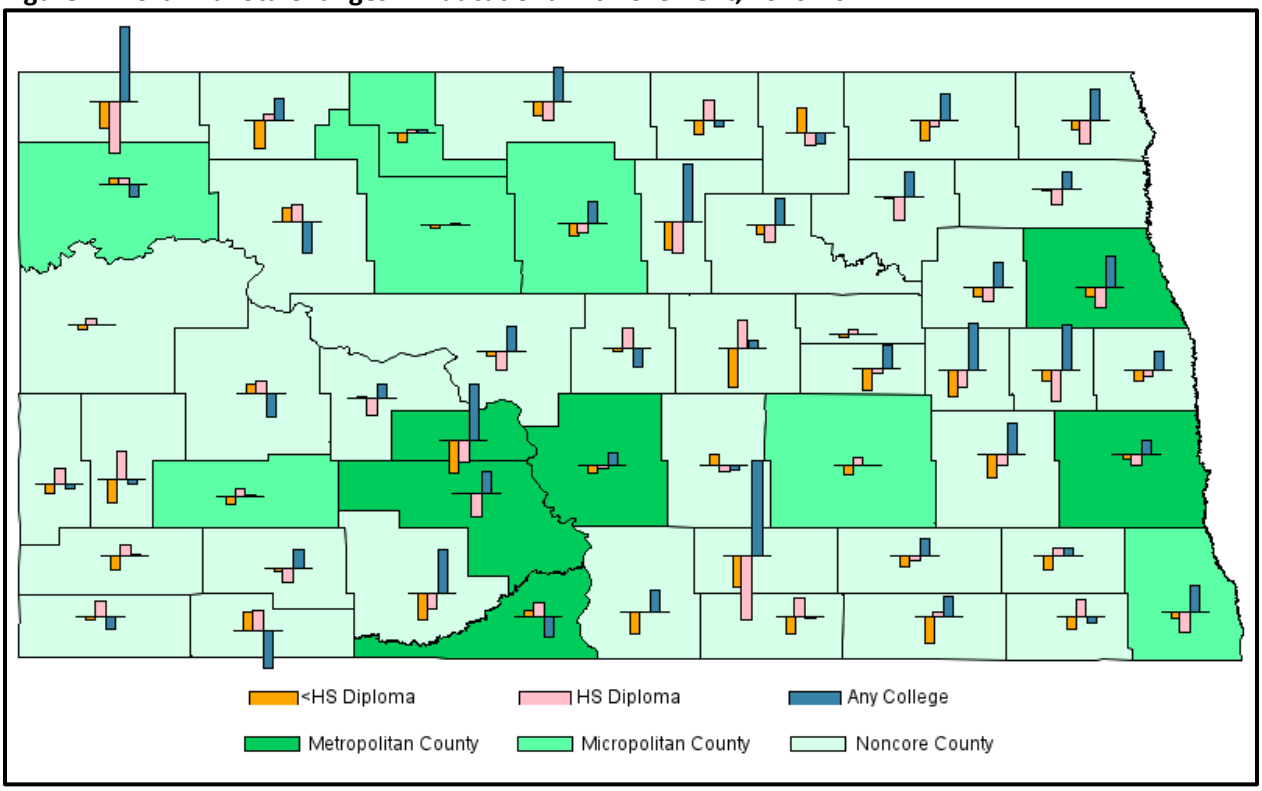
Data Exploration

The internet offers many sites that allow users to point-and-click their way to developing maps on population characteristics. Here are a couple of useful examples:

Rural Health Information Hub, Rural Data Explorer
https://www.ruralhealthinfo.org/data-explorer

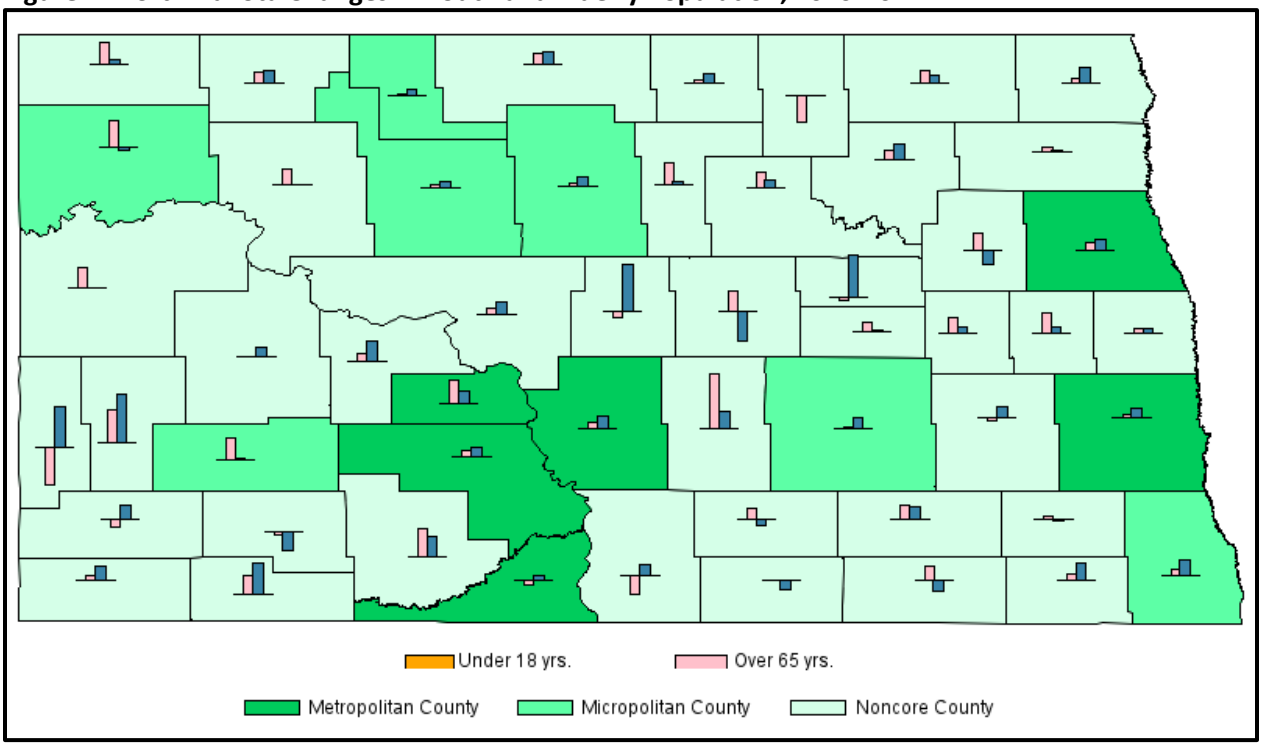
National Association of Counties, County Explorer
https://explorer.naco.org/

Figure 1. North Dakota Changes in Educational Achievement, 2016-2021



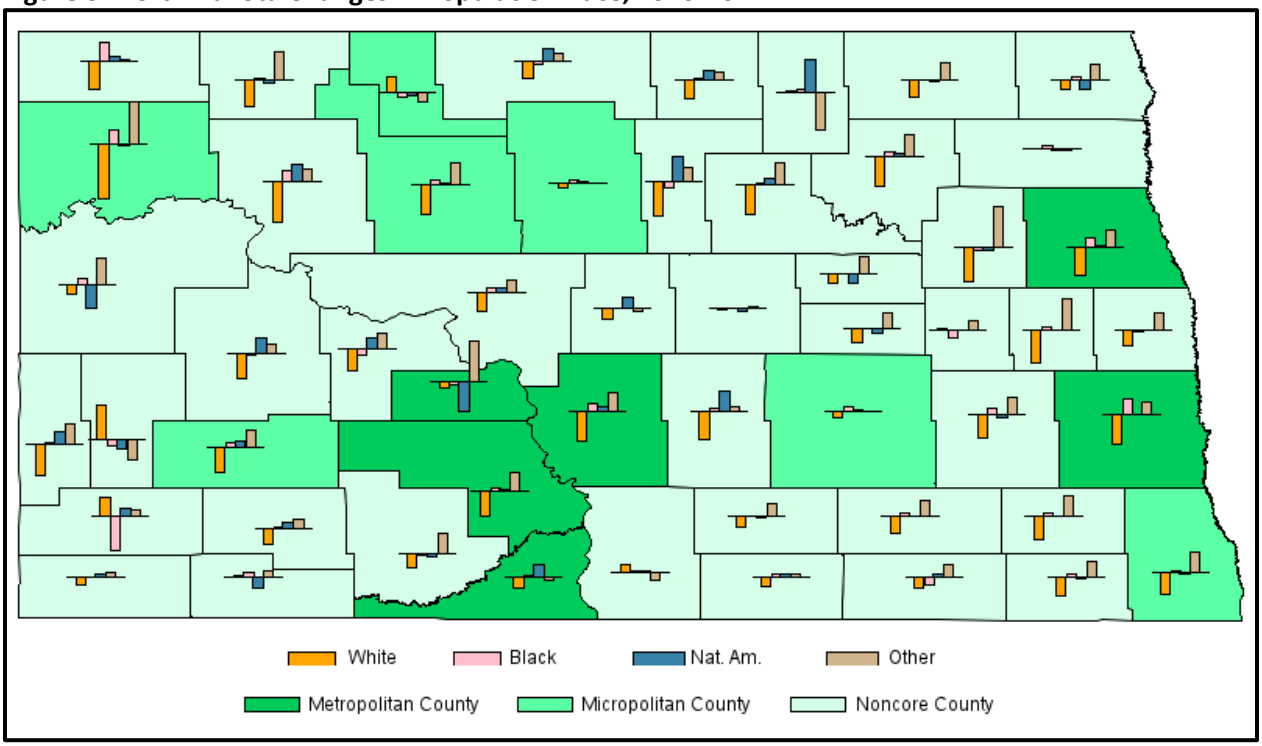
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Figure 2. North Dakota Changes in Youth and Elderly Population, 2016-2021



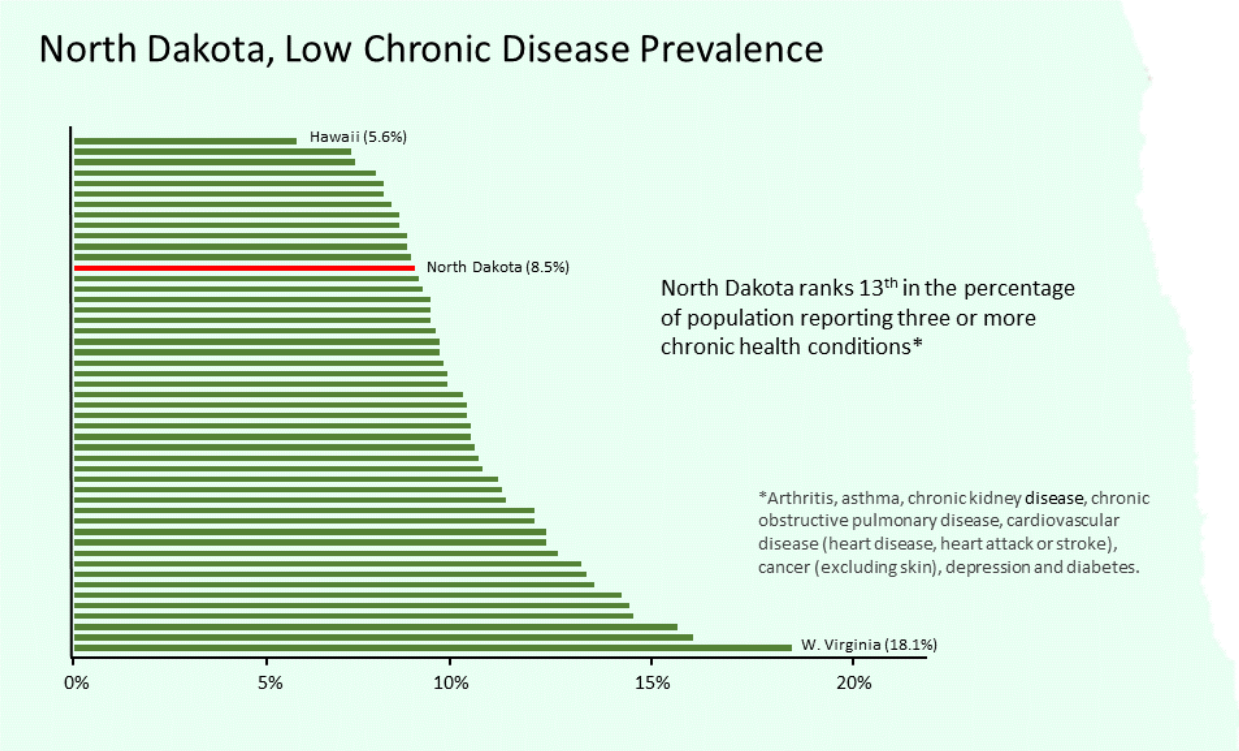
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Figure 3. North Dakota Changes in Population Race, 2016-2021



Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021.

Population Health Conditions



Data Source: United Health Foundation, America's Health Rankings (https://www.americashealthrankings.org/)

Diseases of the heart, malignant neoplasms, and COVID-19 were the three leading causes of death in North Dakota in 2020. Accidents (unintentional injuries) were a distant fourth most common cause of death.[1] More than half of Americans live with at least one chronic disease (defined as conditions that last one year or more and require ongoing medical attention and/or limit activities of daily living), like heart disease, stroke, cancer, or diabetes. "These and other chronic diseases are the leading causes of death and disability in America, and they are also a leading driver of health care costs."[2]

Analysis of CDC chronic disease prevalence data shows that North Dakota ranks very favorably among the United States. The state is in, or near, the top half of rankings for most chronic disease categories – except for cancer (lower numbers are 'better'):

- Asthma 5th
- COPD 9th
- Diabetes 14th
- Cholesterol High 15th

- Coronary Heart Disease 16th
- Stroke 20th
- Depression 21st
- High Blood Pressure 21st
- Heart Attack 23rd
- Kidney 26th
- Arthritis 29th
- Cancer (other than skin) 37th

Compared to surrounding states (Table 3), North Dakota has the lowest crude prevalence rate (i.e., rates that have not been adjusted for age or other demographic characteristics) of coronary heart disease but had the highest (or tied for highest) rate of kidney disease and stroke. Between 2017 and 2021 the state saw a 10.5% decrease in the rate of coronary heart disease; however, it also saw an 11.5% increase in the rate of kidney disease, a 15.2% increase in the rate of cancer (other than skin), and a 15.0% decrease in population reporting their general health status as "fair" or "poor."

Table 3. Population Disease Crude Prevalence[a] 2021, North Dakota and Surrounding States

Disease	North Dakota	Minnesota	South Dakota	Montana
Arthritis	25.4%	22.6%	23.9%	27.5%
Asthma	12.5%	12.8%	12.4%	14.7%
COPD	4.8%	4.7%	6.0%	5.9%
High Cholesterol	33.5%	31.4%	36.7%	30.5%
Coronary Heart Disease	3.4%	3.6%	4.4%	3.8%
Depression	19.5%	20.5%	16.5%	22.8%
Diabetes	9.5%	9.0%	10.8%	8.9%
Heart Attack	3.9%	3.7%	4.3%	4.0%
High Blood Pressure	31.1%	29.5%	33.5%	30.6%
Kidney Disease	2.9%	2.9%	2.5%	2.6%
Cancer (other than skin)	7.6%	7.3%	7.8%	7.2%
Stroke	2.8%	2.6%	2.8%	2.7%
Overall Health Fair/Poor	13.0%	12.2%	13.6%	14.4%
Physical Health[b]	9.5%	8.5%	8.4%	11.8%
Mental Health[b]	12.6%	12.4%	11.4%	14.8%

2021 measure is 10% or more lower than 2017.
2021 measure is 10% or more higher than 2017.

a. More complete descriptions of the demographic measures are provided in the appendix.
b. Question was not asked in 2017.
Source: CDC Chronic Disease Indicators, 2017 and 2021 (https://www.cdc.gov/cdi/index.html).

County estimates of chronic disease prevalence were obtained from the CDC's Behavioral Risk Factor Surveillance System (BRFSS). It should be noted that these numbers are based on relatively small population samples and that these data are self-reported. Tables 4a-b show those county-level estimates, highlighting those counties that have rates in the "highest 10" in the state. Because of the data limitations cited above, changes over time are not reflected here.

BRFSS data indicates that all metropolitan counties except Sioux are among those with the highest reported rates of cancer. On the other hand, Sioux County has the highest rates of every other chronic disease considered. Several other counties – all noncore – are frequently highlighted as having the highest rates among the 15 diseases reported: Benson (13), McIntosh (12), Rolette (14), and Towner (14).

Table 4a. Population Disease Age-Adjusted Prevalence[a], North Dakota Counties, 2020

	Chronic Disease (part 1)							
County	Arthritis	Cancer	Kidney disease	COPD	Heart disease	Asthma	Depression	Diabetes
Metropolitan Counties								
Burleigh	20.7%	6.2%	2.3%	4.8%	5.2%	9.3%	19.1%	7.6%
Cass	21.1%	6.3%	2.5%	4.9%	5.2%	9.2%	19.2%	8.6%
Grand Forks	21.6%	6.2%	2.6%	5.6%	5.9%	9.2%	18.3%	8.9%
Morton	21.0%	6.2%	2.4%	5.2%	5.6%	9.4%	19.2%	8.6%
Oliver	22.0%	6.2%	2.6%	5.7%	6.0%	9.2%	18.5%	8.6%
Sioux	28.4%	5.9%	4.5%	10.9%	9.9%	12.9%	21.7%	18.4%
Micropolitan Counties								
McHenry	22.1%	6.1%	2.5%	5.7%	5.9%	9.1%	19.2%	8.6%
Renville	21.4%	6.1%	2.4%	5.2%	5.5%	9.1%	18.4%	7.9%
Richland	23.0%	6.1%	2.6%	5.9%	6.0%	9.2%	18.5%	8.9%
Stark	21.8%	6.0%	2.5%	5.5%	5.8%	9.0%	18.3%	8.6%
Stutsman	22.7%	6.1%	2.6%	5.9%	5.8%	9.4%	19.6%	8.5%
Ward	21.3%	6.2%	2.5%	5.1%	5.3%	8.8%	18.5%	8.3%
Williams	20.8%	6.0%	2.5%	5.3%	5.6%	9.0%	18.3%	8.6%
Noncore Counties								
Adams	22.5%	6.1%	2.6%	6.1%	5.9%	9.6%	18.9%	8.9%
Barnes	22.2%	6.1%	2.4%	5.3%	5.5%	9.1%	19.4%	8.2%
Benson	26.1%	6.0%	3.8%	9.2%	8.5%	11.8%	20.8%	14.2%
Billings	20.6%	6.0%	2.3%	5.1%	5.6%	8.6%	17.3%	8.1%
Bottineau	21.1%	6.2%	2.5%	5.4%	5.6%	9.1%	17.9%	8.4%
Bowman	21.3%	6.1%	2.5%	5.6%	5.6%	9.2%	18.5%	8.1%
Burke	21.3%	6.1%	2.4%	5.2%	5.5%	9.1%	18.5%	8.1%
Cavalier	21.5%	6.1%	2.5%	5.6%	5.8%	9.2%	18.7%	8.4%
Dickey	21.1%	6.2%	2.4%	5.1%	5.4%	9.0%	19.0%	7.8%
Divide	22.6%	6.1%	2.7%	6.3%	6.3%	9.6%	18.7%	9.2%
Dunn	22.0%	6.0%	2.5%	5.6%	6.0%	9.1%	17.9%	9.0%
Eddy	22.9%	6.2%	2.7%	6.1%	6.0%	9.5%	19.3%	9.1%
Emmons	22.1%	6.1%	2.6%	6.0%	5.9%	9.3%	18.5%	8.7%
Foster	22.4%	6.2%	2.5%	5.6%	5.8%	9.3%	19.3%	8.6%
Golden Valley	22.7%	6.2%	2.5%	5.6%	5.7%	9.3%	19.3%	8.4%
Grant	22.8%	6.2%	2.6%	6.1%	6.2%	9.5%	18.9%	8.9%
Griggs	21.7%	6.2%	2.4%	5.2%	5.4%	9.0%	18.9%	7.8%
Hettinger	23.2%	6.1%	2.6%	6.2%	6.1%	9.9%	19.8%	8.8%

County	Chronic Disease (part 1)							
	Arthritis	Cancer	Kidney disease	COPD	Heart disease	Asthma	Depression	Diabetes
Kidder	23.3%	6.1%	2.8%	6.5%	6.4%	9.3%	19.0%	9.4%
LaMoure	21.9%	6.2%	2.6%	6.0%	6.0%	9.4%	19.6%	8.6%
Logan	22.0%	6.1%	2.5%	5.7%	5.9%	9.3%	19.2%	8.5%
McIntosh	23.2%	6.1%	2.7%	6.5%	6.2%	9.7%	19.6%	9.4%
McKenzie	22.1%	6.0%	2.7%	5.8%	6.1%	9.5%	17.4%	9.2%
McLean	21.8%	6.2%	2.5%	5.5%	5.7%	9.3%	18.7%	8.6%
Mercer	21.7%	6.3%	2.5%	5.7%	5.9%	9.3%	18.6%	8.8%
Mountrail	22.4%	6.0%	2.9%	6.4%	6.7%	9.8%	18.3%	10.5%
Nelson	22.4%	6.1%	2.5%	5.5%	5.7%	9.1%	18.6%	8.7%
Pembina	21.5%	6.1%	2.6%	5.7%	6.0%	9.3%	18.4%	8.7%
Pierce	22.1%	6.2%	2.6%	5.6%	5.8%	9.1%	18.2%	8.7%
Ramsey	22.9%	6.1%	2.7%	6.1%	6.0%	9.6%	19.0%	9.2%
Ransom	22.1%	6.1%	2.6%	5.8%	5.9%	9.1%	19.1%	8.7%
Rolette	27.8%	6.1%	3.9%	8.7%	8.4%	12.2%	21.1%	16.0%
Sargent	20.4%	6.1%	2.3%	5.0%	5.5%	8.7%	17.7%	8.1%
Sheridan	22.2%	6.1%	2.5%	6.0%	5.9%	9.4%	19.7%	8.7%
Slope	21.3%	6.1%	2.5%	5.4%	5.8%	8.9%	18.0%	8.5%
Steele	20.9%	6.2%	2.4%	4.9%	5.5%	9.0%	18.0%	8.1%
Towner	22.9%	6.1%	2.7%	6.3%	6.2%	9.6%	19.6%	9.3%
Traill	21.1%	6.1%	2.4%	5.0%	5.4%	9.0%	18.1%	8.0%
Walsh	22.9%	6.0%	2.7%	6.2%	6.2%	9.3%	18.8%	9.4%
Wells	21.5%	6.1%	2.5%	5.6%	5.6%	9.2%	18.8%	8.4%

Measures with the 10 highest values in the state. In the event of ties, more than 10 cells may be highlighted in a given column.

a. Percentages are age-adjusted prevalence (standardized by the direct method to the year 2000 standard U.S. population). Source: CDC PLACES: Local Data for Better Health, County Data 2022 release (https://www.cdc.gov/places/). Estimates are based on Behavioral Risk Factor Surveillance System (BRFSS) data from 2019 and 2020.

Table 4b. Population Disease Age-Adjusted Prevalence[a] and Health Status, North Dakota Counties, 2020

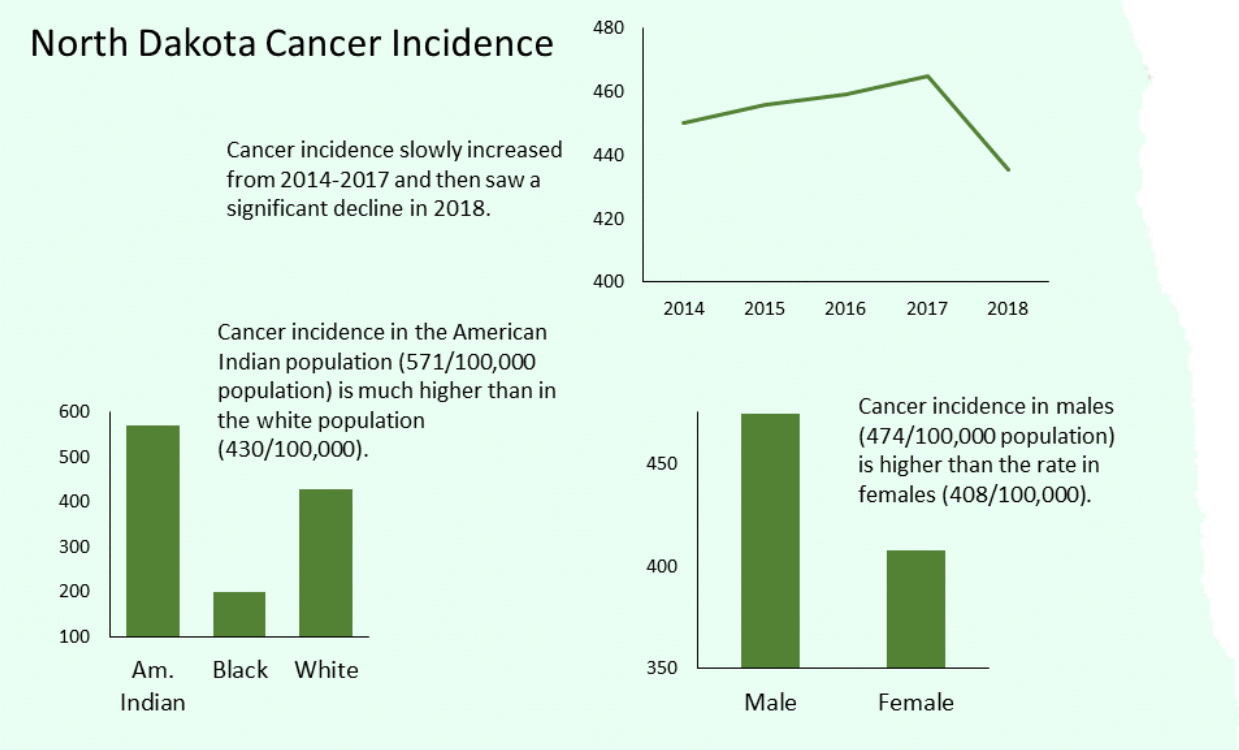
County	Chronic Disease (part 2)				Health Status		
	Obesity	Stroke	High Blood Press.	High Cholesterol	Fair Poor health	Mental health	Physical health
Metropolitan Counties							
Burleigh	31.9%	2.3%	27.6%	27.6%	9.8%	12.2%	7.4%
Cass	33.9%	2.4%	28.5%	26.8%	10.6%	11.8%	7.4%
Grand Forks	34.5%	2.7%	30.0%	26.7%	11.5%	12.8%	8.5%
Morton	35.8%	2.5%	29.6%	29.6%	11.2%	12.4%	8.1%
Oliver	35.4%	2.7%	29.0%	27.4%	11.9%	13.0%	8.7%
Sioux	47.0%	5.9%	39.9%	28.3%	27.2%	18.3%	16.7%
Micropolitan Counties							
McHenry	36.9%	2.6%	29.7%	27.6%	11.9%	12.9%	8.6%
Renville	35.5%	2.4%	30.1%	27.9%	10.7%	12.6%	8.0%
Richland	36.2%	2.7%	27.9%	26.9%	11.8%	13.1%	8.9%
Stark	27.9%	2.6%	30.5%	28.3%	11.9%	12.3%	8.7%
Stutsman	33.6%	2.7%	28.7%	27.7%	12.0%	12.9%	8.9%
Ward	36.5%	2.5%	31.3%	27.0%	11.2%	12.2%	8.1%
Williams	35.4%	2.6%	29.9%	26.8%	11.5%	12.7%	8.3%
Noncore counties							
Adams	34.0%	2.8%	28.9%	26.8%	12.5%	13.2%	9.0%
Barnes	35.8%	2.5%	28.6%	27.3%	10.9%	12.6%	8.1%
Benson	41.6%	4.5%	35.8%	27.0%	21.2%	16.5%	13.7%
Billings	32.4%	2.4%	29.4%	27.6%	10.6%	12.0%	7.8%
Bottineau	36.6%	2.5%	29.5%	27.7%	11.2%	12.6%	8.3%
Bowman	33.8%	2.6%	28.8%	26.9%	11.7%	12.9%	8.5%
Burke	32.8%	2.5%	29.4%	27.6%	10.7%	12.6%	8.0%
Cavalier	33.2%	2.6%	29.8%	28.4%	11.3%	12.8%	8.5%
Dickey	33.9%	2.4%	29.6%	27.5%	10.5%	12.4%	7.8%
Divide	34.9%	2.9%	30.7%	28.3%	13.0%	13.5%	9.3%
Dunn	35.3%	2.7%	29.1%	27.7%	12.0%	12.8%	8.6%
Eddy	37.6%	2.8%	29.5%	28.0%	12.9%	13.2%	9.1%
Emmons	34.4%	2.7%	31.1%	27.3%	12.4%	13.1%	8.9%
Foster	36.2%	2.6%	28.9%	27.2%	11.5%	12.9%	8.5%
Golden Valley	36.1%	2.6%	29.2%	27.0%	11.7%	12.9%	8.5%
Grant	36.0%	2.8%	30.3%	27.2%	12.7%	13.2%	9.1%
Griggs	33.8%	2.4%	28.8%	26.8%	10.5%	12.4%	7.9%
Hettinger	35.9%	2.8%	30.9%	27.2%	12.8%	13.9%	9.1%
Kidder	36.5%	2.9%	31.7%	27.8%	13.6%	13.4%	9.6%
LaMoure	35.6%	2.7%	30.0%	27.6%	12.3%	13.1%	8.9%
Logan	33.2%	2.6%	29.3%	28.1%	11.8%	13.0%	8.6%
McIntosh	36.0%	2.9%	30.6%	28.7%	13.8%	13.7%	9.7%
McKenzie	34.9%	2.8%	28.6%	26.2%	12.7%	12.8%	9.0%
McLean	35.4%	2.6%	31.4%	26.9%	11.2%	12.9%	8.4%

County	Chronic Disease (part 2)				Health Status		
	Obesity	Stroke	High Blood Press.	High Cholesterol	Fair Poor health	Mental health	Physical health
Mercer	35.6%	2.6%	30.2%	27.1%	11.7%	12.9%	8.5%
Mountrail	36.6%	3.2%	32.3%	27.8%	14.6%	13.6%	9.9%
Nelson	34.6%	2.6%	30.2%	28.0%	11.4%	12.7%	8.4%
Pembina	36.5%	2.7%	29.8%	27.4%	11.9%	12.8%	8.7%
Pierce	34.5%	2.7%	31.9%	26.5%	11.6%	12.7%	8.6%
Ramsey	33.8%	2.8%	29.3%	26.9%	12.8%	13.3%	9.2%
Ransom	37.4%	2.7%	30.1%	27.5%	12.0%	13.0%	8.7%
Rolette	49.1%	4.7%	39.8%	29.2%	22.2%	16.9%	14.0%
Sargent	32.6%	2.4%	28.5%	28.2%	10.4%	12.1%	7.7%
Sheridan	34.4%	2.7%	31.0%	27.5%	12.5%	13.5%	8.9%
Slope	32.7%	2.6%	29.2%	27.7%	11.3%	12.4%	8.3%
Steele	33.8%	2.4%	28.4%	26.8%	10.0%	12.3%	7.7%
Towner	37.1%	2.9%	31.9%	28.2%	13.4%	13.7%	9.4%
Traill	32.6%	2.4%	28.4%	27.0%	10.2%	12.4%	7.8%
Walsh	33.2%	2.9%	30.6%	27.0%	13.8%	13.4%	9.6%
Wells	33.9%	2.6%	29.3%	26.7%	11.6%	13.0%	8.4%

Measures with the 10 highest values in the state. In the event of ties, more than 10 cells may be highlighted in a given column.

a. Percentages are age-adjusted prevalence (standardized by the direct method to the year 2000 standard U.S. population). Source: CDC PLACES: Local Data for Better Health, County Data 2022 release (https://www.cdc.gov/places/). Estimates are based on Behavioral Risk Factor Surveillance System (BRFSS) data from 2019 and 2020.

Cancer Incidence



Data Source: CDC WONDER database (https://wonder.cdc.gov/).

Following heart disease, cancer was the second leading cause of death in North Dakota in 2017.[3] Data from the CDC[2] shows that while cancers of the digestive system were the most common cancer diagnosis in 2018, age adjusted rates for cancers of the male genital system (driven largely by prostate cancer) and the female breast are higher.

Rates of cancer of the male genital system (again, largely prostate cancer) and skin cancer (largely melanoma) both saw a substantial increase (i.e., more than 5%) between 2014 and 2018. North Dakota has notably higher rates than surrounding states in male genital cancer, and respiratory system cancer (Table 5). It has substantially lower rates of breast cancer, skin cancer, and female genital cancer.

Table 5. Cancer Incidence 2018, North Dakota and Surrounding States

Cancer site	North Dakota		Region
	Count	Rate[a]	Rate[a]
All Invasive Cancer Sites Combined	3,789	435.5	456.4
Digestive System	639	73.1	74.5
Colon and Rectum	313	36.2	35.9
Colon excluding Rectum	217	25.1	25.1
Pancreas	106	11.9	13.1
Male Genital System	609	132.1	123.0
Prostate	581	125.2	114.7
Respiratory System	551	61.6	53.6
Lung and Bronchus	516	57.6	50.5
Male and Female Breast	543	64.8	70.1
Female Breast	538	127.2	135.3
Male and Female Breast, In Situ	100	13	14.9
Urinary System	327	37	38.5
Kidney and Renal Pelvis	163	18.3	17.3
Urinary Bladder, invasive and in situ	157	17.9	20.3
Skin excluding Basal and Squamous	198	24.1	37.3
Melanoma of the Skin	183	22.6	35.2
Lymphomas	176	20.7	23.3
Non-Hodgkin Lymphoma	152	17.5	20.2
Female Genital System	155	37.3	48.6
Endocrine System	115	15.9	13.4
Thyroid	110	15	12.9
Leukemias	124	14.2	15.8
Miscellaneous	147	16.8	15.5

2018 measure is 5% or more lower than 2014.
2018 measure is 5% or more higher than 2014.
a. Age-adjusted rate per 100,000 population.
Source: CDC WONDER Database (https://wonder.cdc.gov/).

Analysis of North Dakota county-level cancer incidence from 2015-2019 shows that rates have largely been stable or falling (Table 6). Rates have fallen in 6 counties (1 metropolitan, 1 micropolitan, and 4 noncore), rising in one county (Ward, a micropolitan county), and stable in all other counties.

Table 6. Cancer Incidence, North Dakota Counties, 2015-2019

County	Avg. Count[a]	Rate[b]	Recent Trend[c]
Metropolitan Counties			
Burleigh	520	470.7	stable
Cass	788	468.7	falling
Grand Forks	309	459.5	stable
Morton	189	511.8	stable
Oliver	11	397.5	stable
Sioux	14	441	stable
Micropolitan Counties			
McHenry	42	506.8	stable
Renville	17	486.4	stable
Richland	95	453.9	stable
Stark	140	435.9	stable
Stutsman	104	378.4	falling
Ward	331	489.8	rising
Williams	118	387.6	stable
Noncore Counties			
Adams	13	322.2	falling
Barnes	71	460.2	falling
Benson	29	424.1	stable
Billings	*	*	*
Bottineau	49	485.2	stable
Bowman	17	365.2	stable
Burke	12	405.3	stable
Cavalier	27	422.9	stable
Dickey	28	385.9	stable
Divide	12	325.7	stable
Dunn	17	315.7	falling
Eddy	16	424.6	stable
Emmons	26	444.5	stable
Foster	22	467.1	stable
Golden Valley	12	465.7	stable
Grant	19	428.9	stable
Griggs	17	389.6	stable
Hettinger	17	438.6	stable
Kidder	17	432.9	stable
LaMoure	22	313.7	falling
Logan	10	316.6	stable
McIntosh	22	433	stable
McKenzie	36	321.1	stable
McLean	75	519.3	stable
Mercer	63	549.3	stable
Mountrail	51	507.6	stable
Nelson	26	443.3	stable
Pembina	51	455.8	stable
Pierce	27	437.2	stable
Ramsey	73	445.3	stable
Ransom	33	407.5	stable
Rolette	66	466.5	stable
Sargent	30	507.5	stable
Sheridan	11	464.4	stable
Slope	*	*	*
Steele	12	389.2	stable
Towner	14	345.9	stable
Traill	47	424.8	stable
Walsh	72	437	stable
Wells	33	445.1	stable
North Dakota	3,894	454.4	falling
United States[d]	1,728,431	449.4	stable

a. Average annual count, 2015-2019.

b. 5-year age-adjusted incidence rate, cases per 100,000 population.

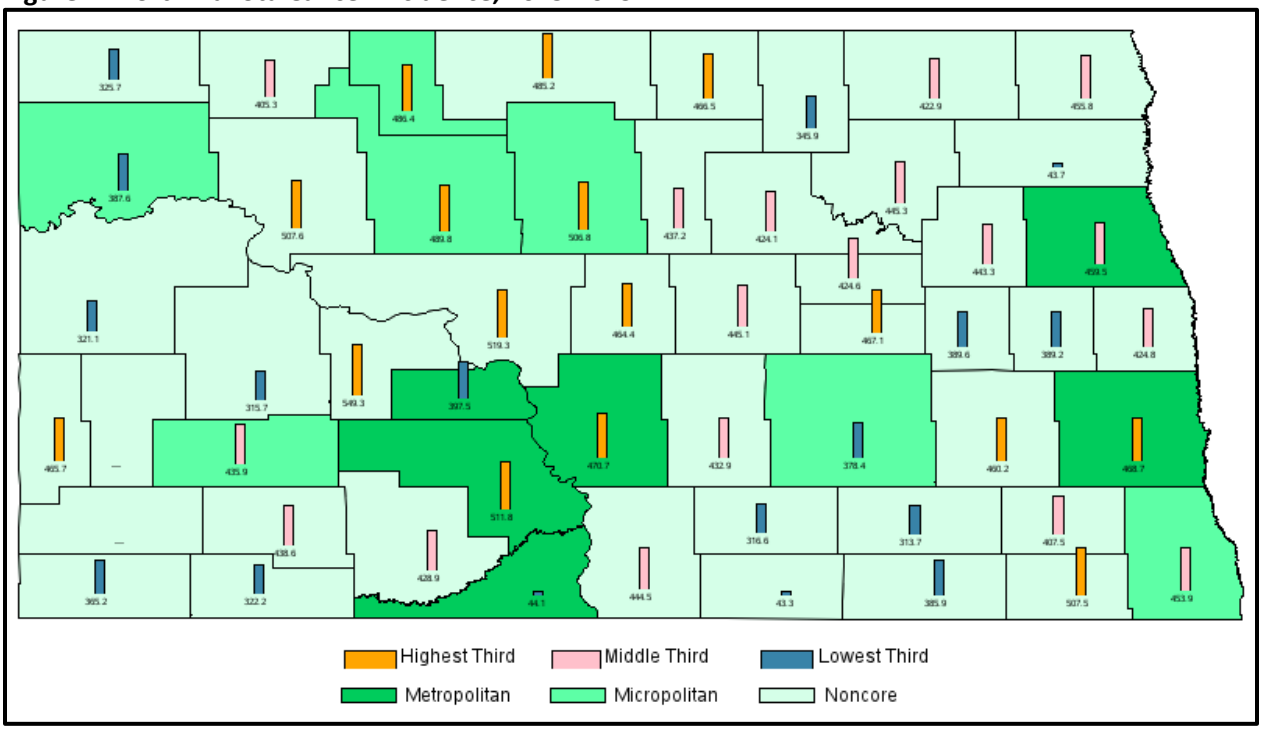
c. Trend based on 5-year age-adjusted incidence rate: 'rising' when 95% confidence interval of average annual percent change is above 0, 'stable' when 95% confidence interval of average annual percent change includes 0, 'falling' when 95% confidence interval of average annual percent change is below 0.

d. Data for the United States does not include Nevada.

* Data suppressed to ensure confidentiality.

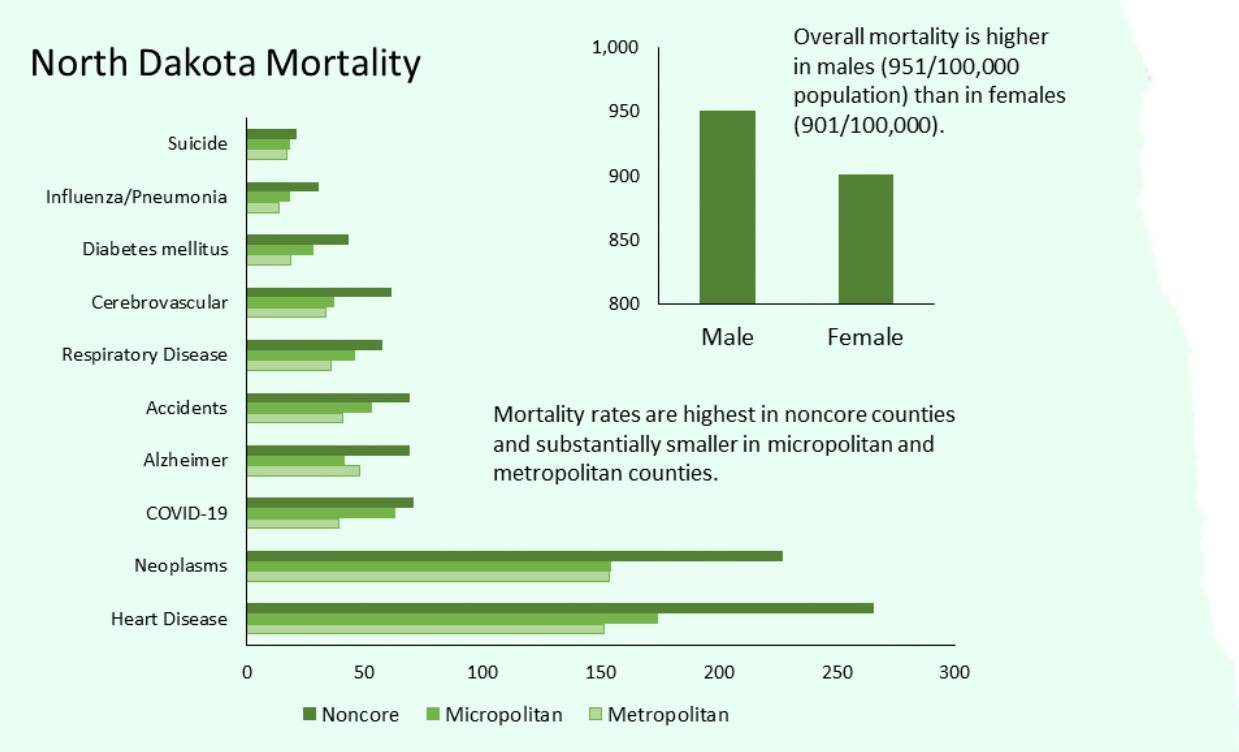
Source: CDC WONDER Database (https://wonder.cdc.gov/).

Figure 4. North Dakota Cancer Incidence, 2015-2019



Note: Data for Billings and Slope counties suppressed to ensure confidentiality.
Source: Source: CDC WONDER Database (https://wonder.cdc.gov/).

Mortality



Data Source: CDC WONDER database (https://wonder.cdc.gov/).

There were 21,199 deaths in North Dakota in 2018-2020 for a crude rate of 926.8 deaths/100,000 population. Nationally, the state had the 24th highest death rate[4]. There are notable differences in the death rates across county classifications with metropolitan counties having the lowest overall death rate (796.6/100,000), then micropolitan counties (872.6/100,000), and noncore counties having the highest overall death rate (1,234.2/100,000).

The leading causes of death in North Dakota and in surrounding states were “diseases of the heart” and “malignant neoplasms”, although the rank of those two causes varies by geography (both within, and between the states). Another highly ranked cause of death for the three-year period was COVID-19 – notable because it only became a cause of death in one of the three years (2020). In general, the geographic pattern of cause-specific death rates was the same as the overall stated above: metropolitan county rates are lowest, followed by micropolitan county rates, and noncore counties having the highest death rates.

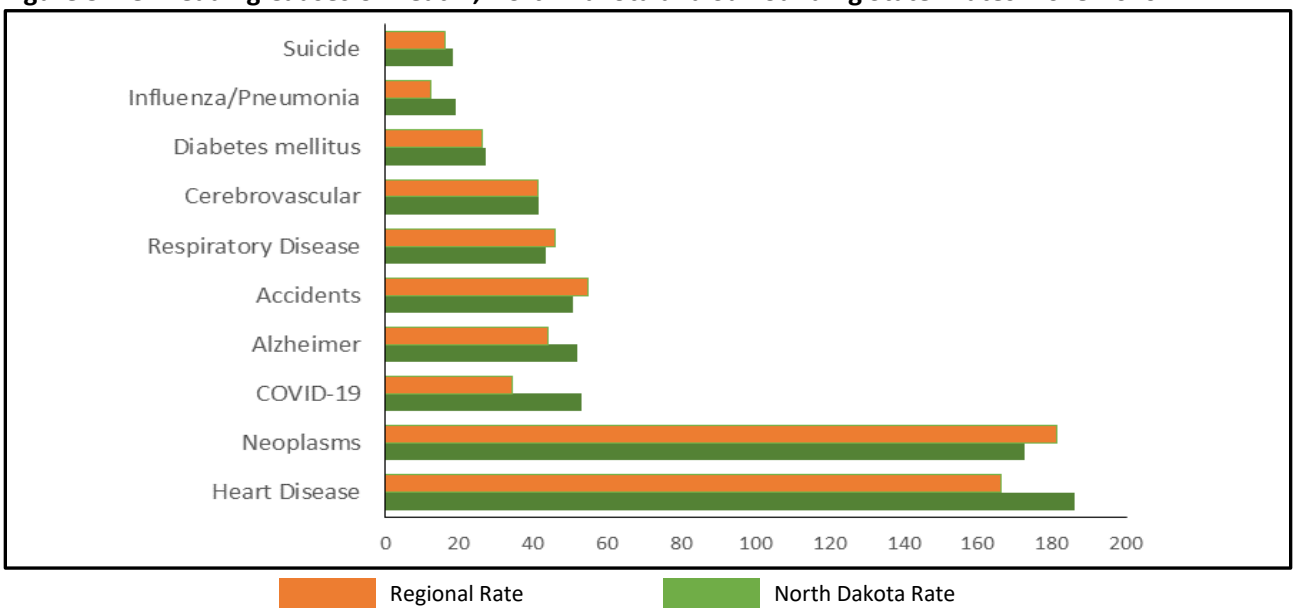
North Dakota's overall mortality rate (926.8 deaths/100,000 population) is 4.9% higher than the rate in surrounding states (Table 7, Figure 5). But that higher rate is not consistent across all leading causes of death. The state's mortality rates are substantially higher than those in adjoining states for diseases of the heart, COVID-19, Alzheimer's disease, influenza and pneumonia, intentional self-harm, kidney diseases (e.g., nephritis), hypertensive diseases, and septicemia. It has a substantially lower death rate from Parkinson's disease. Across nearly all the causes of death in North Dakota reported in Table 7, the noncore mortality rate is substantially higher than the rate in metropolitan and micropolitan counties.

Table 7. Causes of Death[a] 2018-2020, North Dakota and Surrounding State[b] Rates[c]

	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
Cause of Death	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate
All Mortality	926.8	883.1	796.6	789.6	872.6	981.6	1,234.2	1,198.8
Diseases of heart	186.1	166.3	151.4	138.4	174.3	204.3	265.8	251.7
Malignant neoplasms	172.4	181.2	153.3	164.7	154.1	197.0	227.2	238.6
COVID-19	52.9	34.4	39.2	31.0	62.9	33.0	70.5	51.3
Alzheimer's disease	51.8	43.8	48.0	41.6	41.3	49.6	69.1	47.6
Accidents (unintentional injuries)	50.7	54.8	40.4	51.9	52.8	54.4	69.0	68.6
Chronic lower respiratory disease	43.5	45.7	35.4	38.6	45.9	54.9	57.4	67.8
Cerebrovascular diseases	41.4	41.4	33.6	37.3	36.9	45.2	61.0	55.6
Diabetes mellitus	27.2	26.2	18.5	21.9	28.4	28.6	43.2	43.1
Influenza and pneumonia	19.2	12.3	13.9	9.6	18.3	16.6	30.6	19.7
Intentional self-harm	18.3	16.3	16.8	14.4	18.2	18.6	21.3	22.4
Chronic liver disease & cirrhosis	15.6	14.9	14.2	13.5	11.9	13.4	21.9	23.2
Nephritis, neph. synd. & nephrosis	14.9	10.1	11.8	8.3	13.0	11.2	22.5	17.1
Hypertension/hyp. renal disease	13.8	12.3	15.7	12.0	*	10.9	14.3	15.6
Septicemia	12.3	8.9	10.2	8.0	14.7	9.1	14.2	13.1
Parkinson's disease	11.5	12.7	11.6	12.4	9.9	14.0	13.0	12.7

* Data suppressed to ensure confidentiality.

Figure 5. Ten Leading Causes of Death[a], North Dakota and Surrounding State[b] Rates[c] 2018-2020



a. More complete descriptions of the causes of death are provided in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.
c. Rates per 100,000 population.
Source: Source: CDC WONDER Database (https://wonder.cdc.gov/).

County-level analyses of cause of death can be difficult in less populous states because confidentiality policies (for example, suppressing data where incidence counts are lower than 20) leave lots of table cells empty. Table 8 and Figures 6-7 report on the eight most frequent causes of death (in the state) by county. Focusing on the two most common causes of death (heart disease and malignant neoplasm), there is considerable variation in crude death rates (i.e., rates that have not been adjusted for age or other demographic characteristics) between counties.

Heart Disease, mortality rate/100,000 population

Metropolitan:	Lowest: 121.1 (Cass)	Highest: 242.9 (Sioux)
Micropolitan:	Lowest: 140.6 (Williams)	Highest: 386.6 (Renville)
Noncore:	Lowest: 132.1 (McKenzie)	Highest: 731.2 (McIntosh)

Malignant Neoplasm, mortality rate/100,000 population

Metropolitan:	Lowest: 128.6 (Cass)	Highest: 189.4 (Morton)
Micropolitan:	Lowest: 126.3 (Williams)	Highest: 278.2 (McHenry)
Noncore:	Lowest: 91.1 (McKenzie)	Highest: 386.6 (Nelson)

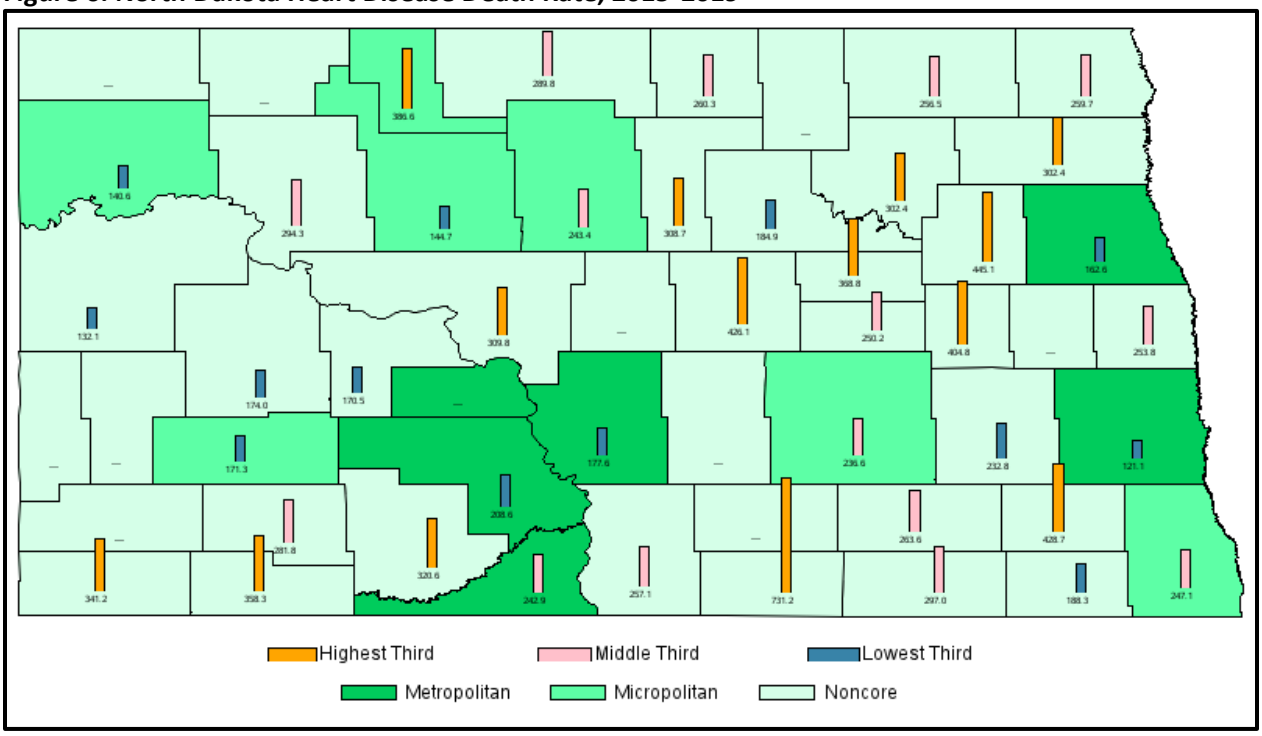
Table 8. Causes of Death[a] Crude Death Rates[b] 2018-2020, North Dakota Counties

County	Heart Disease	Neo-plasm	COVID-19	Alz-heimer	Accident	Respira-tory	Cardiac	Diabetes
Metropolitan Counties								
Burleigh	177.6	169.6	56.1	64.1	40.1	32.7	45.3	27.2
Cass	121.1	128.6	28.0	38.0	35.8	27.4	26.1	13.2
Grand Forks	162.6	179.3	31.5	55.8	43.4	35.3	28.1	17.2
Morton	208.6	189.4	64.9	47.9	47.9	92.6	53.2	27.7
Oliver	*	*	*	*	*	*	*	*
Sioux	242.9	172.4	*	*	*	*	*	*
Micropolitan Counties								
McHenry	243.4	278.2	*	*	*	*	*	*
Renville	386.6	*	*	*	*	*	*	*
Richland	247.1	185.3	41.2	*	45.3	43.2	*	*
Stark	171.3	146.9	47.6	75.1	41.2	44.4	30.7	25.4
Stutsman	236.6	222.2	104.6	53.1	72.4	54.7	59.6	53.1
Ward	144.7	132.0	78.0	31.4	52.0	46.6	37.3	22.1
Williams	140.6	126.3	27.8	24.2	52.8	35.8	26.9	26.9
Noncore Counties								
Adams	358.3	313.5	*	*	*	*	*	*
Barnes	232.8	274.2	82.9	79.7	95.7	89.3	82.9	*
Benson	184.9	150.8	*	*	97.3	*	*	*
Billings	*	*	*	*	*	*	*	*
Bottineau	289.8	226.6	110.6	*	*	*	105.4	*
Bowman	341.2	264.1	*	*	*	*	*	*
Burke	*	*	*	*	*	*	*	*
Cavalier	256.5	318.5	*	*	*	*	*	*
Dickey	297.0	221.0	241.7	*	*	*	*	*
Divide	*	351.7	*	*	*	*	*	*
Dunn	174.0	158.8	*	*	*	*	*	*
Eddy	368.8	*	*	339.3	*	*	*	*
Emmons	257.1	288.0	*	*	*	*	*	*
Foster	250.2	291.9	219.0	*	*	*	*	*
Golden Valley	*	*	*	*	*	*	*	*
Grant	320.6	*	*	*	*	*	*	*
Griggs	404.8	*	*	*	*	*	*	*
Hettinger	281.8	335.5	*	*	*	*	*	*
Kidder	*	*	*	*	*	*	*	*
LaMoure	263.6	173.0	*	*	*	*	*	*
Logan	*	*	*	*	*	*	*	*
McIntosh	731.2	345.7	*	*	*	*	*	*
McKenzie	132.1	91.1	*	*	77.5	*	*	*
McLean	309.8	218.3	77.4	81.0	*	73.9	*	70.4
Mercer	170.5	235.5	*	*	*	*	*	*
Mountrail	294.3	131.1	*	*	111.9	*	*	*
Nelson	445.1	386.6	*	*	*	*	*	*
Pembina	259.7	308.7	*	102.9	102.9	*	*	*

County	Heart Disease	Neo-plasm	COVID-19	Alz-heimer	Accident	Respira-tory	Cardiac	Diabetes
Metropolitan Counties								
Pierce	308.7	242.0	175.2	*	*	*	*	*
Ramsey	302.4	250.1	58.2	*	78.5	66.9	142.5	*
Ransom	428.7	224.0	*	140.8	*	*	*	*
Rolette	260.3	194.6	49.2	*	63.3	51.6	*	68.0
Sargent	188.3	256.8	*	*	*	*	*	*
Sheridan	*	*	*	*	*	*	*	*
Slope	*	*	*	*	*	*	*	*
Steele	*	*	*	*	*	*	*	*
Towner	*	*	*	*	*	*	*	*
Traill	253.8	228.9	*	137.3	*	*	*	*
Walsh	302.4	270.9	69.3	69.3	*	69.3	72.5	*
Wells	426.1	295.7	*	208.7	*	*	*	*

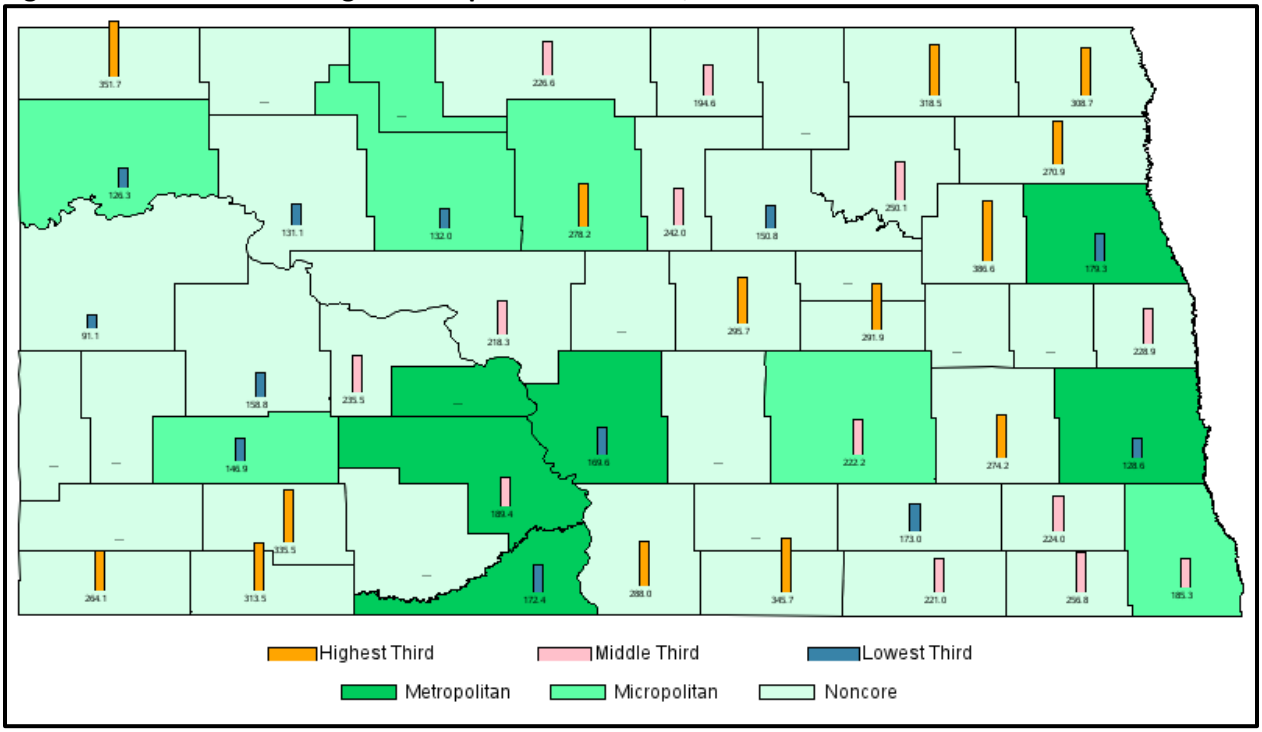
a. More complete descriptions of the causes of death are provided in the appendix.
b. Rates per 100,000 population.
* Data suppressed to ensure confidentiality.
Source: CDC WONDER database (https://wonder.cdc.gov/).

Figure 6. North Dakota Heart Disease Death Rate, 2015-2019



Source: Source: CDC WONDER Database (https://wonder.cdc.gov/).

Figure 7. North Dakota Malignant Neoplasm Death Rate, 2015-2019



Source: Source: CDC WONDER Database (https://wonder.cdc.gov/).

Data Exploration

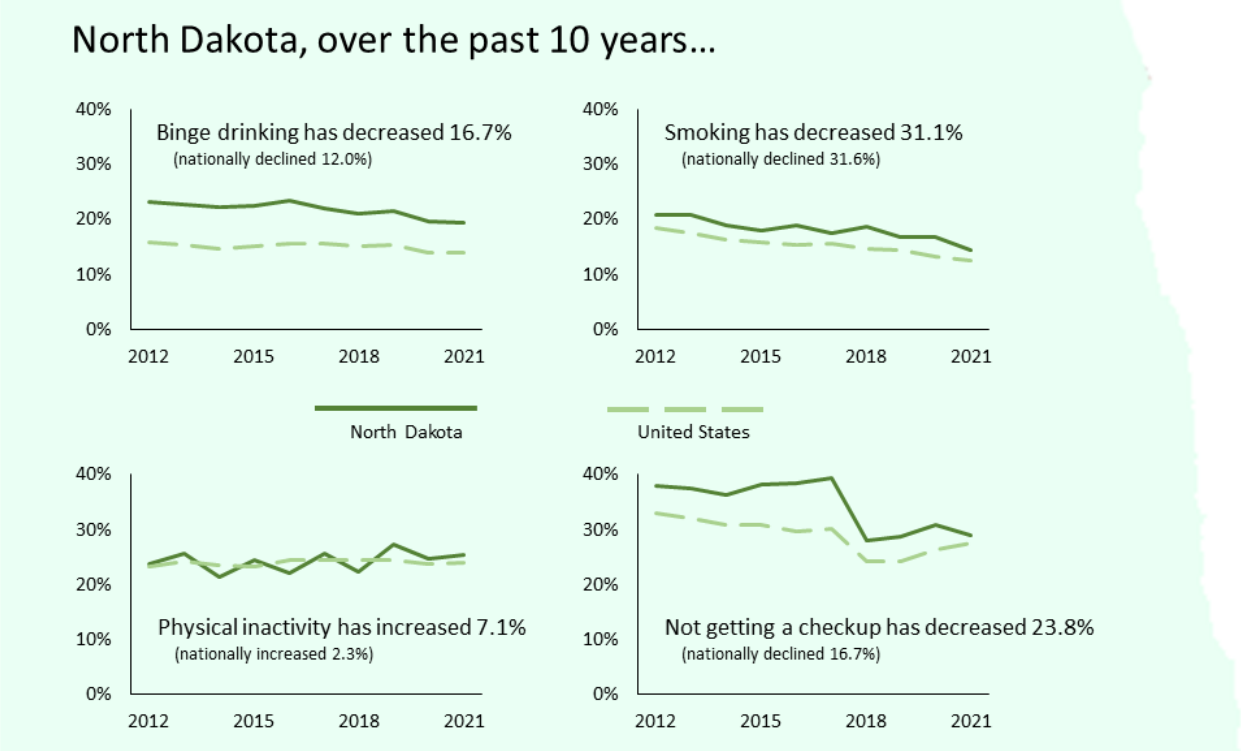
The internet offers many sites that allow users to point-and-click their way to developing maps or other graphics on population disease prevalence. Here are a couple of useful examples:

CDC Interactive PLACES map:
https://experience.arcgis.com/experience/22c7182a162d45788dd52a2362f8ed65

McKinsey & Company US Public Health Dashboard
https://www.mckinsey.com/industries/public-and-social-sector/our-insights/us-public-health-dashboard

NIH State Cancer Profiles
https://statecancerprofiles.cancer.gov/

Behavioral and Social Risk Factors



Data Source: CDC's Behavioral Risk Factors Surveillance Survey (BRFSS), 2012-2021 (https://www.cdc.gov/places/).

Personal behavioral risk factors, such as smoking, excessive alcohol consumption, and physical inactivity play an important role in health. But other "social risk" factors – not always a matter of choice – can also have a large impact on health. For example, personal housing choices are generally limited by circumstance but can significantly affect health.

In the Commonwealth Fund's 2020 Scorecard on State Health System Performance,[1] North Dakota ranked 13th overall amongst all the states on composite health system measures. Ranking states on 49 performance indicators grouped into four dimensions, North Dakota ranked highly in each of the dimensions:

• Access and Affordability (23rd)	Includes rates of insurance coverage for children and adults, out-of-pocket expenses for health insurance and medical care, cost-related barriers to receiving care, and receipt of dental visits.
• Prevention and Treatment (20th)	Includes measures of receipt of preventive care and needed mental health care, as well as measures of quality in ambulatory, hospital, postacute, and long-term care settings.
• Avoidable Use and Cost (11th)	Includes indicators of hospital and emergency department use that might be reduced with timely and effective care and follow-up care, as well as estimates of per-person spending among Medicare beneficiaries and working-age adults with employer-sponsored insurance.
• Healthy Lives (15th)	Includes measures of premature death, health status, health risk behaviors (including smoking and obesity), tooth loss, and state public health funding.
• Overall ranking (13th)	A composite of the four component dimensions

North Dakota's personal health risk behaviors and prevention factors are, with one exception, largely on par with those of the other states in the region (Table 9). Data from the CDC's Behavioral Risk Factors Surveillance Survey (BRFSS) shows that the state's population reports substantially higher rates of physical inactivity than other regional states across all geographies. Both in the state and in the region, noncore counties report more physical inactivity than micropolitan counties which report more physical inactivity than metropolitan counties. That same general pattern is seen in smoking behavior with the highest North Dakota smoking rate (19.7%) seen in noncore counties. North Dakota's rate of annual routine physical checkups is slightly worse than the other states in the region. Again, the state's poorest routine physical checkup rate (69.0%) is seen in noncore counties.

Table 9. Personal Health Risk Behaviors and Prevention Factors[a] 2019, North Dakota and Region[b]

Behaviors	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate
Binge drinking	22.2%	22.3%	21.9%	22.2%	22.6%	22.6%	22.6%	22.6%
Smoking	17.7%	16.5%	16.5%	15.3%	18.1%	17.6%	19.7%	20.8%
Physically inact.	27.3%	21.1%	24.8%	19.8%	29.2%	22.7%	30.5%	25.6%

North Dakota is 10% or more lower (better) than regional rate.
North Dakota is 10% or more higher (worse) than regional rate.

Prevention Factors	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate	State Rate	Region Rate
Cholest. screen	82.2%	83.3%	82.7%	84.2%	81.9%	81.6%	81.3%	80.7%
BP medicine	57.1%	54.7%	57.2%	54.7%	56.9%	54.4%	56.8%	54.9%
Routine checkup	70.2%	71.7%	71.1%	72.3%	69.4%	70.5%	69.0%	70.2%

North Dakota is 10% or more higher (better) than regional rate.
North Dakota is 10% or more lower (worse) than regional rate.

a. More complete descriptions of the risk factor measures are provided in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.
Source: CDC PLACES: Local Data for Better Health, County Data 2021 release (https://www.cdc.gov/places/). Estimates are based on Behavioral Risk Factor Surveillance System (BRFSS) data from 2019.
Note: Percentages are population-weighted, age-adjusted prevalence (standardized by the direct method to the year 2000 standard U.S. population).

BRFSS data for these six risk behaviors and prevention factors – binge drinking, smoking, physical inactivity, cholesterol screening, taking blood pressure medicine as required, and getting a routine annual checkup – show very small degrees of variation across North Dakota counties. The county-level data in Table 10 shows that there are no clear "better" or "worse" counties in these health behavior measures. Several counties – Burleigh, Cass, Grand Forks, Sioux, Ward, Benson, Dickey, Rolette, Steele, and Traill – are among the best performing counties in three or more of the measures. But Sioux, Benson, and Rolette are also in the poorest performing counties in three other measures. Other counties with poor performance in three or more categories include Grant, Mountrail, Sheridan, and Walsh. McIntosh County was in the lowest 10 counties in four categories but was also in the highest in two other categories.

Table 10. Personal Health Risk Behaviors and Prevention Factors[a] 2019, North Dakota Counties

County	Health Risk Behaviors			Prevention		
	Binge drinking	Smoking	Physically inactive	Cholest. Screening	BP medicine	Routine checkup
Metropolitan Counties						
Burleigh	21.5%	16.5%	25.5%	82.3%	57.1%	69.1%
Cass	21.7%	16.1%	22.8%	83.3%	57.3%	72.4%
Grand Forks	22.5%	15.9%	26.7%	82.2%	57.6%	71.4%
Morton	23.4%	17.6%	27.6%	82.5%	56.3%	69.6%
Oliver	23.7%	17.8%	28.3%	81.6%	55.2%	68.7%
Sioux	17.5%	34.0%	43.4%	78.4%	60.2%	70.5%
Micropolitan Counties						
McHenry	24.2%	18.4%	30.0%	81.4%	56.5%	68.9%
Renville	23.9%	17.3%	28.1%	81.6%	56.3%	69.8%
Richland	24.6%	17.5%	28.4%	81.1%	56.0%	67.3%
Stark	22.0%	18.9%	29.5%	81.6%	57.3%	69.4%
Stutsman	23.1%	19.3%	32.4%	81.1%	56.5%	70.0%
Ward	22.3%	17.5%	28.0%	82.6%	57.8%	70.5%
Williams	22.0%	18.2%	29.5%	82.0%	55.7%	68.0%
Noncore Counties						
Adams	22.4%	18.1%	28.5%	81.5%	56.6%	68.4%
Barnes	23.2%	17.9%	28.2%	81.7%	56.7%	69.3%
Benson	19.5%	28.9%	39.0%	79.1%	59.6%	70.2%
Billings	22.9%	17.4%	28.1%	81.6%	56.3%	69.3%
Bottineau	23.7%	18.2%	29.5%	81.8%	56.2%	69.7%
Bowman	23.2%	17.8%	28.4%	81.5%	56.3%	69.0%
Burke	24.0%	17.7%	29.4%	81.6%	56.0%	68.9%
Cavalier	23.3%	18.3%	27.7%	81.7%	56.6%	68.5%
Dickey	22.6%	16.7%	25.4%	81.8%	56.2%	69.6%
Divide	21.8%	19.6%	30.6%	80.9%	57.5%	69.5%
Dunn	23.0%	17.7%	30.6%	81.6%	56.6%	68.5%
Eddy	22.8%	18.3%	31.3%	81.5%	56.8%	69.5%
Emmons	22.8%	19.4%	31.6%	80.8%	56.4%	69.7%
Foster	23.6%	17.5%	27.7%	81.6%	56.7%	68.8%
Golden Valley	22.9%	17.5%	28.8%	81.8%	56.9%	69.5%
Grant	22.4%	20.6%	32.3%	79.8%	57.4%	68.8%
Griggs	22.6%	18.1%	29.3%	81.1%	56.8%	68.8%
Hettinger	21.9%	20.7%	31.5%	80.6%	57.0%	69.4%
Kidder	22.7%	19.7%	35.3%	80.1%	57.2%	68.1%
LaMoure	21.1%	19.4%	31.1%	80.5%	56.6%	68.4%
Logan	23.6%	20.1%	30.6%	81.1%	56.8%	68.8%
McIntosh	20.9%	19.8%	31.6%	80.1%	57.3%	68.3%
McKenzie	20.5%	18.5%	29.4%	81.6%	55.7%	66.9%
McLean	21.8%	18.7%	28.9%	81.8%	56.0%	69.6%
Mercer	24.4%	18.3%	29.8%	81.8%	55.5%	69.2%
Mountrail	23.0%	20.8%	31.5%	81.5%	55.1%	68.1%

County	Health Risk Behaviors			Prevention		
	Binge drinking	Smoking	Physically inactive	Cholest. Screening	BP medicine	Routine checkup
Nelson	24.1%	18.0%	28.1%	81.4%	57.3%	68.7%
Pembina	24.0%	18.8%	28.3%	81.1%	55.8%	68.5%
Pierce	23.4%	19.8%	30.4%	81.0%	57.8%	69.1%
Ramsey	24.0%	17.7%	28.9%	81.7%	56.5%	70.2%
Ransom	22.6%	18.5%	29.8%	81.4%	57.1%	68.7%
Rolette	20.7%	31.1%	38.0%	80.8%	60.7%	71.3%
Sargent	25.1%	17.5%	28.9%	82.0%	56.4%	69.0%
Sheridan	22.9%	21.0%	32.8%	80.0%	56.7%	69.1%
Slope	23.5%	17.5%	28.9%	81.5%	56.7%	68.6%
Steele	24.2%	15.5%	25.4%	82.9%	56.3%	69.1%
Towner	22.4%	19.9%	31.5%	80.9%	57.3%	68.6%
Traill	23.8%	16.5%	27.1%	82.4%	56.2%	68.8%
Walsh	21.8%	18.3%	32.8%	80.2%	57.3%	67.5%
Wells	22.6%	18.2%	28.9%	81.3%	56.4%	67.9%

County in the top 10 of the state.
County in the bottom 10 of the state.

a. More complete descriptions of the risk factor measures are provided in the appendix.
Source: CDC PLACES: Local Data for Better Health, County Data 2021 release (https://www.cdc.gov/places/). Estimates are based on Behavioral Risk Factor Surveillance System (BRFSS) data from 2019.
Note: Percentages are population-weighted, age-adjusted prevalence (standardized by the direct method to the year 2000 standard U.S. population).

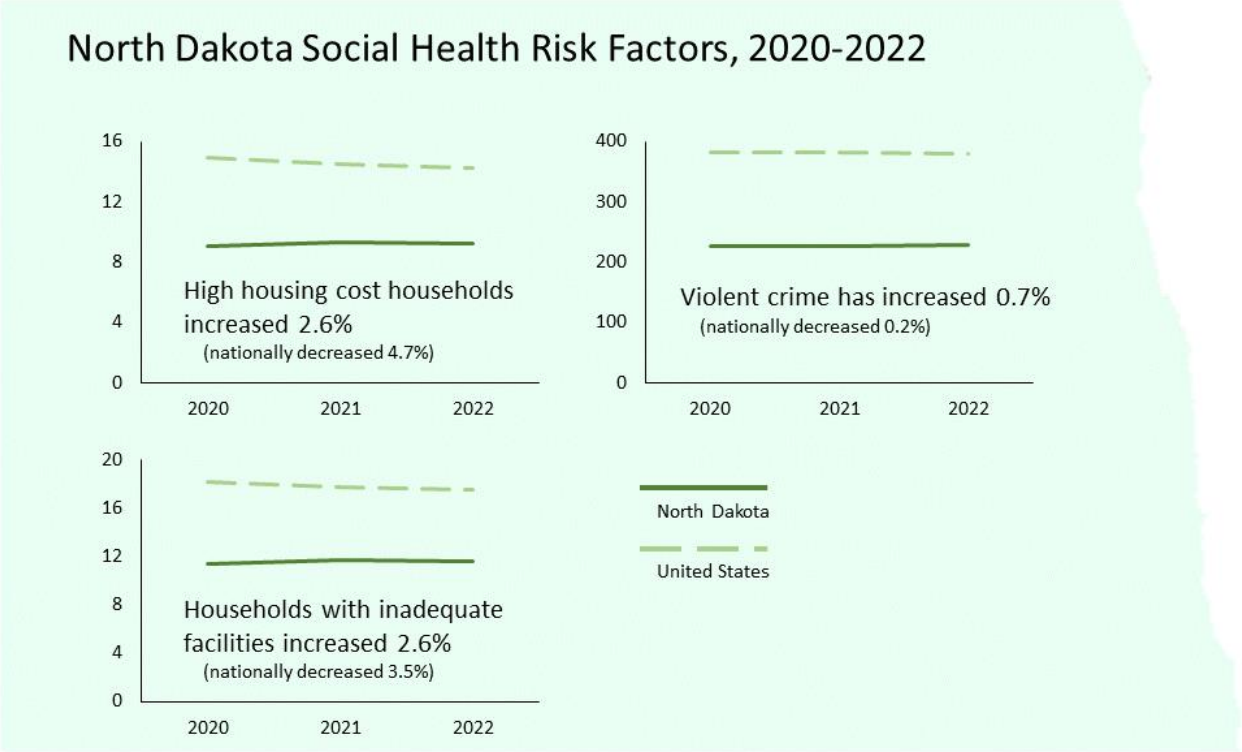
Data Exploration

A number of user-friendly web sites allow you to explore population health behaviors and environmental factors. A couple of examples:

County Health Rankings
https://www.countyhealthrankings.org/reports/state-reports/2022-north-dakota-state-report

Measure of America of the Social Science Research Council
https://measureofamerica.org/maps/

Social Risk Factors



Source: County Health Rankings, 2020-2022 (https://www.countyhealthrankings.org/reports/state-reports/2022-north-dakota-state-report).

While some personal behavior choices, such as smoking and drinking alcohol, have obvious effects on population health, social determinants of health (SDOH) also have a major impact. These are the "conditions in which people are born, grow, live, work and age" and "are shaped by the distribution of money, power and resources."[2] In this regard, North Dakota is quite fortunate. Data from the 2022 County Health Rankings shows that North Dakota's:

- Proportion of high housing cost households (households that spend 30% or more of annual income on housing costs) is 39.6% lower than that of the US (9.0% vs 14.9%).
- Violent crime rate is 40.8% lower than that of the US (226.2 vs 382.1 per 100,000 population).
- Proportion of households with inadequate facilities (lacking kitchen or plumbing facilities) is 37.5% lower than that of the US. (11.4% vs 18.2%).

But in contrast to the robust national comparisons, North Dakota lags other states in the region on several SDOH measures. Table 11a shows that North Dakota has a higher percentage of households

facing high housing costs. And in comparisons of the population in noncore counties, the state fares poorer in violent crime rate, high housing costs, overcrowded households, and households with inadequate facilities.

Table 11a. North Dakota Social and Economic Factors, Physical Environment[a]

Risk Factor	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
	State	Region	State	Region	State	Region	State	Region
Violent Crime Rate	248.9	227.9	274.7	271.2	211.3	245.8	168.4	123.5
Injury Deaths	74.6	72.2	69.0	59.8	76.1	73.1	99.2	98.7
Air Pollution	7.6	6.8	7.9	7.5	7.0	6.0	6.7	6.2
High Housing Cost	10.7	9.3	10.9	10.6	10.9	9.1	9.5	6.7
Overcrowded Household	2.2	2.2	2.3	1.9	1.7	2.4	2.7	2.4
Inadequate Facilities	0.9	0.8	0.7	1.1	1.2	0.6	1.5	0.7

North Dakota is 10% or more lower (better) than regional rate.
North Dakota is 10% or more higher (worse) than regional rate.

Source: County Health Ranking 2022 (https://www.countyhealthrankings.org/reports/state-reports/2022-north-dakota-state-report).
a. More complete descriptions of these factors can be found in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.

North Dakota's elderly population overall has higher rates of poverty, disability, and living alone (Table 11b). Within the state, the rates for all three of those characteristics are highest in the micropolitan counties and are lowest in metropolitan counties.

Table 11b. North Dakota Social and Economic Factors, Elderly Population[a]

Elderly Population	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
	State	Region	State	Region	State	Region	State	Region
In poverty	9.2%	7.8%	6.8%	7.1%	12.8%	7.8%	10.4%	9.9%
Disabled	31.7%	30.3%	29.7%	29.3%	34.2%	30.3%	32.8%	33.5%
Living alone	32.3%	29.2%	31.1%	29.6%	35.9%	28.7%	31.6%	28.3%

North Dakota is 10% or more lower (better) than regional rate.
North Dakota is 10% or more higher (worse) than regional rate.

Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021 (https://www.census.gov/programs-surveys/acs).
a. More complete descriptions of these factors can be found in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.

County-by-county examinations (Table 12a-b) of these SDOH factors show that, with one exception (McKenzie County), the state's higher violent crime rate is not an issue in noncore counties. But injury death rates tend more frequently to be higher in noncore counties. Housing issues (high cost, overcrowding, inadequate facilities) are distributed across all counties with no noticeable geographic component.

Table 12a. North Dakota Social and Economic Factors and Physical Environment[a]

County	Social and Economic Factors[b]		Physical Environment[b]			
	Violent Crime Rate (258.0)	Injury Deaths (72.3)	Air Pollution (6.4)	High Housing Costs (9.3)	Over-crowded Hsholds (2.0)	Inad. Facilities (0.8)
Metropolitan Counties						
Burleigh	250.3	57.7	8.6	8.5	1.9	1.0
Cass	309.4	56.2	7.1	10.6	1.6	1.1
Grand Forks	242.7	60.9	7.5	14.7	2.4	1.4
Morton	223.0	67.5	7.0	8.3	1.1	0.5
Oliver	54.1	---	6.4	9.2	1.1	0.5
Sioux	11.3	194.4	5.9	9.3	12.2	1.8
Micropolitan Counties						
McHenry	49.9	116.8	6.2	6.3	0.5	1.1
Renville	77.2	---	5.3	5.7	1.6	2.0
Richland	129.5	62.7	7.0	6.9	0.9	1.2
Stark	151.3	67.3	5.7	9.2	3.0	0.5
Stutsman	284.7	88.2	6.6	9.3	0.9	0.3
Ward	256.1	68.8	5.8	11.4	2.5	0.4
Williams	372.7	75.3	6.1	6.6	3.6	0.7
Noncore Counties						
Adams	64.1	88.3	5.3	9.8	0.4	0.4
Barnes	180.9	92.4	6.6	9.4	0.2	0.6
Benson	29.5	146.1	6.7	6.8	8.5	0.8
Billings	53.9	---	4.4	9.7	1.0	3.6
Bottineau	81.7	93.5	6.2	7.0	1.0	0.3
Bowman	107.8	---	5.2	6.4	2.4	0.0
Burke	63.3	---	2.8	5.5	2.2	0.5
Cavalier	79.0	95.3	6.7	5.5	1.1	0.0
Dickey	68.6	73.8	6.6	5.1	1.6	0.9
Divide	0.0	---	5.3	10.7	0.0	0.0
Dunn	186.0	100.6	5.1	5.8	2.7	0.5
Eddy	169.3	104.8	6.4	11.7	0.4	0.8
Emmons	59.0	134.4	6.1	8.4	0.3	0.3
Foster	18.7	105.3	6.4	4.1	1.0	0.3
Golden Valley	81.0	---	5.1	10.3	0.5	1.8
Grant	84.8	94.7	5.6	7.4	1.6	0.7
Griggs	44.3	107.1	6.4	5.0	0.0	0.4
Hettinger	37.0	---	5.5	8.2	0.0	1.9
Kidder	62.6	---	6.3	4.2	2.2	0.4
LaMoure	48.7	78.7	6.5	5.8	0.2	2.4
Logan	26.2	105.4	6.1	6.7	1.1	2.3

County	Social and Economic Factors[b]		Physical Environment[b]			
	Violent Crime Rate (258.0)	Injury Deaths (72.3)	Air Pollution (6.4)	High Housing Costs (9.3)	Over-crowded Hsholds (2.0)	Inad. Facilities (0.8)
McIntosh	73.6	140.8	6.0	8.6	0.3	0.3
McKenzie	368.6	95.3	5.3	5.5	7.8	0.1
McLean	103.3	94.1	6.4	6.3	1.7	0.5
Mercer	126.4	79.0	5.5	5.2	2.0	0.1
Mountrail	165.2	137.1	5.6	3.3	4.9	1.9
Nelson	134.0	83.1	6.5	5.7	1.8	0.9
Pembina	85.6	92.9	7.2	3.8	0.6	1.1
Pierce	138.0	88.5	6.4	14.2	0.2	2.0
Ramsey	143.4	85.3	6.7	7.9	1.6	0.3
Ransom	128.6	132.9	6.7	5.7	0.3	0.3
Rolette	41.1	118.3	6.6	9.1	5.8	0.6
Sargent	90.6	66.9	6.7	2.9	1.6	0.8
Sheridan	116.0	---	6.1	11.6	0.6	2.2
Slope	0.0	---	5.1	4.3	0.0	0.0
Steele	51.7	---	6.5	5.0	1.1	0.4
Towner	---	109.0	6.5	3.8	3.4	0.0
Traill	99.3	84.8	7.0	7.6	0.4	1.0
Walsh	165.5	72.9	7.1	6.6	0.9	0.3
Wells	132.7	66.3	6.4	5.9	1.0	0.2

County is 10% or more lower (better) than state rate.
County is 10% or more higher (worse) than state rate.

a. More complete descriptions of these factors can be found in the appendix.
b. Numbers in parentheses represent the overall state rate.
Source: County Health Rankings 2022 (https://www.countyhealthrankings.org/reports/state-reports/2022-north-dakota-state-report).

Table 12b shows living circumstances of the North Dakota elderly population. The table shows that between 2016 and 2021 there were notable changes in the proportion of the elderly population living in poverty, with a disability, or alone. But those changes (both increases and decreases) happened across all geographies. Further the distribution of counties above and below the overall state rate is also distributed across the county geographies.

Table 12b. North Dakota Social and Economic Factors, Elderly Population[a]

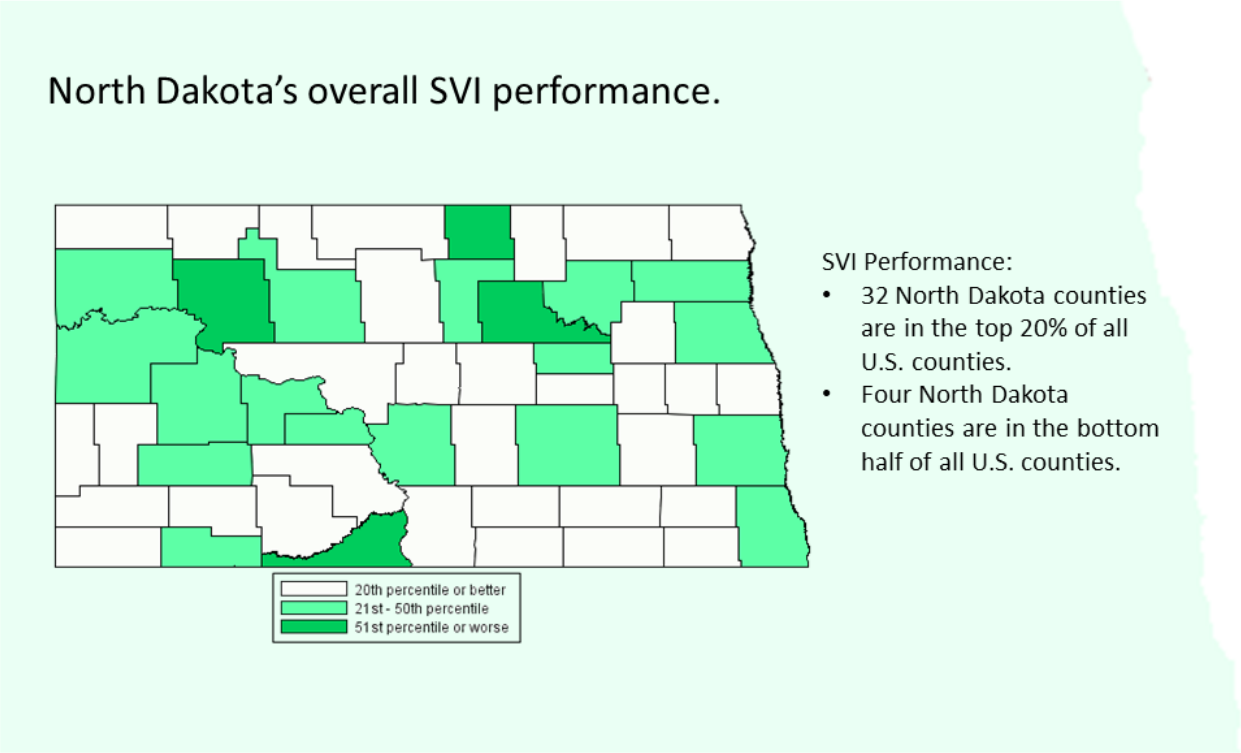
County	Elderly Pop.	In Poverty	Disabled	Living Alone
Metropolitan Counties				
Burleigh	15,267	7.7%	32.2%	29.8%
Cass	21,619	4.9%	30.6%	30.2%
Grand Forks	8,841	8.5%	26.9%	39.5%
Morton	5,074	7.2%	21.4%	26.1%
Oliver	444	15.3%	37.8%	15.1%
Sioux	318	20.8%	42.5%	18.6%
Micropolitan Counties				
McHenry	1,077	14.4%	32.1%	34.7%
Renville	364	2.7%	31.3%	25.5%
Richland	2,876	9.7%	34.0%	32.4%
Stark	4,040	13.7%	32.3%	37.9%
Stutsman	3,869	17.9%	35.0%	36.3%
Ward	8,476	11.1%	32.0%	33.4%
Williams	3,379	13.2%	42.1%	43.6%
Noncore Counties				
Adams	537	9.1%	27.2%	30.7%
Barnes	2,256	8.8%	31.1%	32.8%
Benson	818	10.6%	42.1%	19.9%
Billings	202	9.9%	26.2%	22.3%
Bottineau	1,409	9.2%	29.7%	30.6%
Bowman	613	6.2%	25.8%	29.5%
Burke	424	5.7%	31.8%	32.8%
Cavalier	932	11.5%	25.8%	32.5%
Dickey	928	9.6%	33.4%	29.2%
Divide	492	6.3%	25.2%	26.4%
Dunn	671	4.8%	37.7%	29.7%
Eddy	574	13.2%	42.7%	40.4%
Emmons	912	12.7%	33.0%	35.1%
Foster	684	10.7%	28.1%	26.5%
Golden Valley	418	7.2%	42.8%	28.0%
Grant	660	13.6%	29.2%	31.8%
Griggs	594	9.1%	25.4%	32.2%
Hettinger	565	11.3%	33.1%	38.9%
Kidder	556	14.9%	23.4%	37.6%
LaMoure	1,037	12.1%	26.5%	29.8%
Logan	443	9.0%	28.9%	26.4%
McIntosh	701	16.7%	33.7%	35.7%
McKenzie	1,131	17.9%	39.4%	37.5%
McLean	2,220	8.2%	27.9%	23.3%
Mercer	1,566	7.2%	34.2%	27.6%
Mountrail	1,049	10.4%	40.1%	20.0%
Nelson	728	9.8%	51.8%	38.7%

County	Elderly Pop.	In Poverty	Disabled	Living Alone
Pembina	1,537	12.4%	27.5%	37.0%
Pierce	889	8.3%	25.4%	35.2%
Ramsey	2,222	11.3%	36.9%	38.1%
Ransom	1,057	5.0%	44.3%	41.0%
Rolette	1,385	17.6%	43.8%	21.7%
Sargent	819	7.6%	32.4%	28.6%
Sheridan	425	5.9%	28.2%	34.1%
Slope	198	11.1%	39.9%	17.7%
Steele	445	7.4%	19.8%	28.3%
Towner	509	20.8%	39.9%	35.0%
Traill	1,407	6.5%	29.8%	33.8%
Walsh	2,083	11.8%	33.1%	31.6%
Wells	946	9.4%	24.0%	41.3%
Metropolitan	51,563	6.8%	29.7%	31.1%
Micropolitan	24,081	12.8%	34.2%	35.9%
Noncore	37,042	10.4%	32.8%	31.6%
Statewide	112,686	9.2%	31.7%	32.3%

County rate increased 10% or more between 2016 and 2021.
County rate decreased 10% or more between 2016 and 2021.

a. More complete descriptions of the demographic measures are provided in the appendix.
Source: American Community Survey 5-year estimates, 2012-2016 and 2017-2021 (https://www.census.gov/programs-surveys/acs).

Social Vulnerability Index



Source: CDC Agency for Toxic Substances and Disease Registry (ATSDR), 2020 (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

The CDC Agency for Toxic Substances and Disease Registry (ATSDR)[3] biennially releases data on the Social Vulnerability Index (SVI). Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. The ATSDR uses U.S. Census data to rank each census tract and county on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes:

- Socioeconomic status – poverty, unemployment, housing cost burden, no high school diploma, and uninsurance.
- Household composition – population aged 65 or older, persons aged 17 or younger, persons with a disability, single-parent households with children under 18, persons who speak English "less than well".
- Race/Ethnicity/Language – population of racial minority or Hispanic/Latino.
- Housing/Transportation – population in multi-unit structures, or mobile homes, population in households with more than one person/room, households with no vehicle, persons in institutionalized group quarters.

The SVI ranks individual counties for the entire United States against one another based on their measure percentiles. Those percentile rankings range from 0 to 1, with higher values indicating greater vulnerability. Table 13 displays the average percentile rankings across the four SVI themes for the state and region overall and within metropolitan, micropolitan, and noncore counties. Note that this table does not depict changes over time as the definitions of several of the SVI themes were changed from previous data releases.

Overall, North Dakota performs better than the other states in the region in all four SVI themes. But the state's metropolitan counties perform markedly worse in three of the themes. Percentiles are roughly equivalent between the state's and region's counties. North Dakota's noncore counties have markedly lower (better) percentiles than the region's noncore counties.

Table 13. Social Vulnerability Thematic Percentile Rankings[a] 2020, North Dakota and Region[b]

Measure	Overall		Metropolitan		Micropolitan		Noncore	
	State	Region	State	Region	State	Region	State	Region
Socioeconomic Status	0.16	0.27	0.26	0.15	0.16	0.22	0.15	0.32
Household Characteristics	0.26	0.32	0.29	0.28	0.22	0.28	0.26	0.34
Racial & Ethnic Minority Status	0.31	0.36	0.50	0.37	0.34	0.35	0.27	0.36
Housing Type/Transportation	0.39	0.45	0.59	0.42	0.57	0.53	0.32	0.43

a. Percentile rankings range from 0 to 1, with higher values indicating greater vulnerability.
b. Region includes Minnesota, South Dakota, and Montana.
Source: CDC Agency for Toxic Substances and Disease Registry (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Table 14 reports on the SVI percentile performance of North Dakota counties across all four major themes. It also indicates counties that are 20 percent or more higher/lower than the state average percentile. Metropolitan and micropolitan counties perform proportionally worse than noncore counties on the "Racial & Ethnic Minority Status" and "Housing Type/Transportation" themes. But noncore counties perform proportionally worse than metropolitan and micropolitan counties on the "Socioeconomic Status" and "Household Characteristics" themes.

Table 14. North Dakota County Social Vulnerability Percentiles[a]

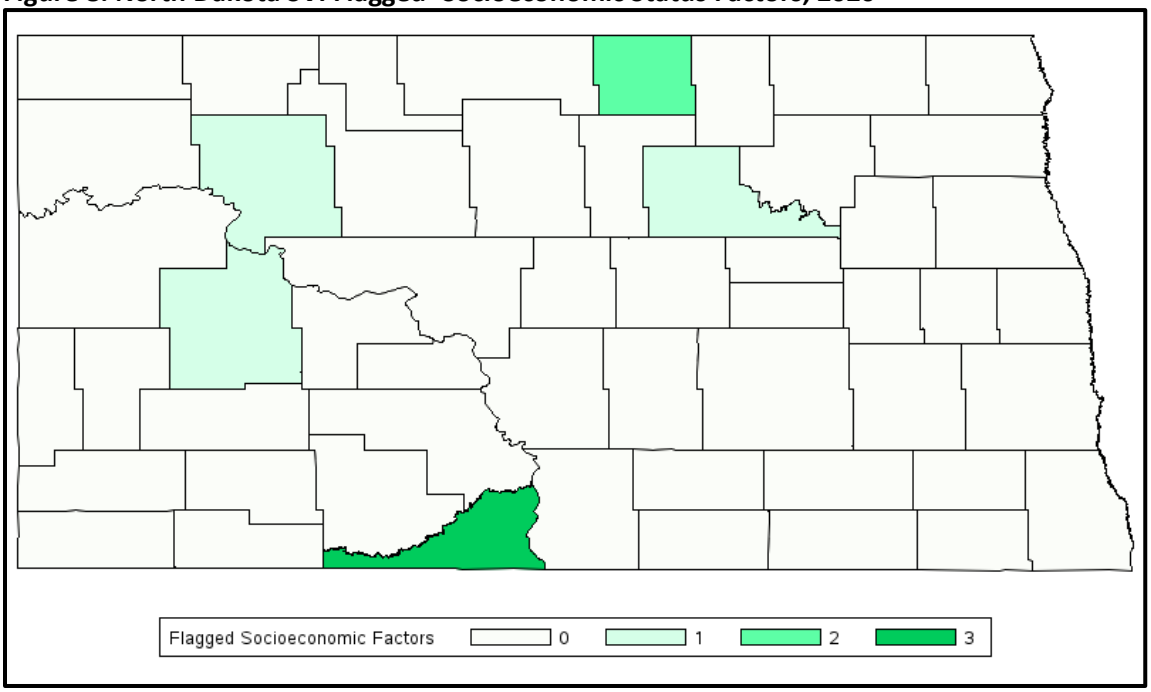
County	Socioeconomic Status	Household Characteristics	Racial & Ethnic Minority Status	Housing Type/ Transportation
Metropolitan Counties				
Burleigh	0.05	0.20	0.40	0.73
Cass	0.14	0.06	0.47	0.70
Grand Forks	0.32	0.03	0.50	0.85
Morton	0.06	0.02	0.34	0.31
Oliver	0.09	0.90	0.28	0.13
Sioux	0.89	0.50	0.99	0.85
Micropolitan Counties				
McHenry	0.10	0.12	0.07	0.13
Renville	0.01	0.54	0.25	0.08
Richland	0.11	0.15	0.31	0.72
Stark	0.19	0.08	0.41	0.66
Stutsman	0.33	0.11	0.26	0.85
Ward	0.17	0.02	0.52	0.87
Williams	0.24	0.52	0.58	0.70
Noncore Counties				
Adams	0.13	0.40	0.18	0.66
Barnes	0.02	0.08	0.33	0.45
Benson	0.51	0.95	0.92	0.80
Billings	0.03	0.04	0.00	0.47
Bottineau	0.03	0.11	0.29	0.16
Bowman	0.11	0.34	0.17	0.26
Burke	0.00	0.05	0.20	0.07
Cavalier	0.12	0.29	0.16	0.44
Dickey	0.04	0.14	0.22	0.19
Divide	0.24	0.18	0.30	0.17
Dunn	0.22	0.54	0.51	0.57
Eddy	0.15	0.89	0.38	0.56
Emmons	0.13	0.07	0.02	0.17
Foster	0.04	0.06	0.09	0.23
Golden Valley	0.04	0.14	0.37	0.48
Grant	0.08	0.28	0.09	0.19
Griggs	0.02	0.21	0.03	0.15
Hettinger	0.32	0.04	0.30	0.04
Kidder	0.26	0.05	0.24	0.11
LaMoure	0.09	0.17	0.06	0.02
Logan	0.06	0.13	0.02	0.05
McIntosh	0.24	0.10	0.11	0.20
McKenzie	0.30	0.28	0.59	0.80
McLean	0.01	0.21	0.36	0.12
Mercer	0.17	0.24	0.28	0.47

County	Socioeconomic Status	Household Characteristics	Racial & Ethnic Minority Status	Housing Type/ Transportation
Mountrail	0.37	0.63	0.80	0.78
Nelson	0.05	0.17	0.25	0.12
Pembina	0.21	0.04	0.29	0.15
Pierce	0.09	0.70	0.21	0.35
Ramsey	0.19	0.41	0.50	0.90
Ransom	0.07	0.03	0.16	0.30
Rolette	0.78	0.63	0.98	0.93
Sargent	0.00	0.18	0.28	0.14
Sheridan	0.19	0.03	0.00	0.06
Slope	0.03	0.31	0.06	0.01
Steele	0.00	0.05	0.05	0.11
Towner	0.18	0.59	0.39	0.04
Traill	0.03	0.08	0.28	0.25
Walsh	0.18	0.55	0.48	0.55
Wells	0.06	0.17	0.01	0.33

County rate is 20% or more lower than state rate.
County rate is 20% or more higher than state rate.

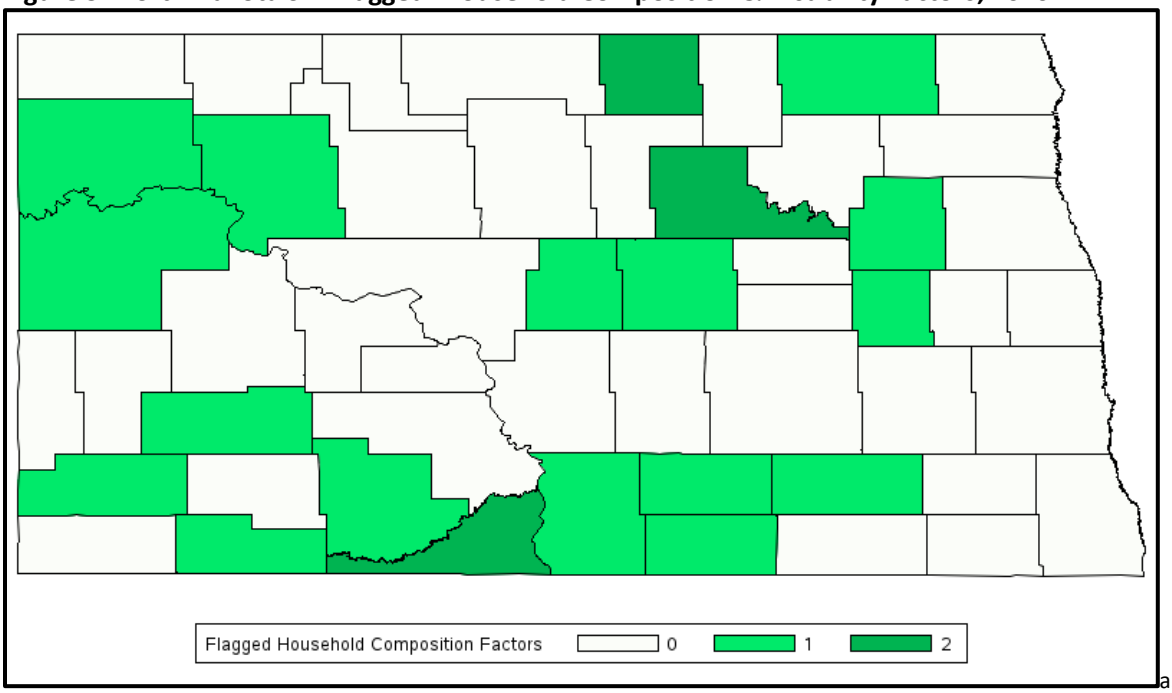
a. Percentile rankings range from 0 to 1, with higher values indicating greater vulnerability.
Source: CDC Agency for Toxic Substances and Disease Registry (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Figure 8. North Dakota SVI Flagged[a] Socioeconomic Status Factors, 2020



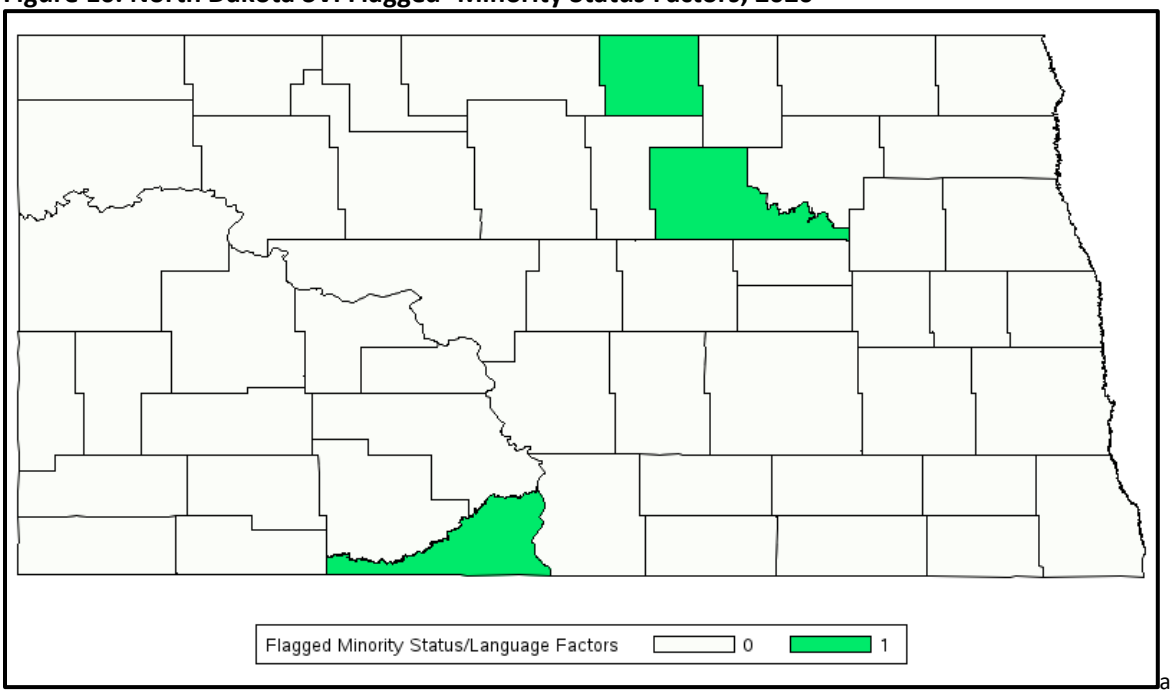
a. Factors are 'flagged" when their level exceeds the 90th percentile of values (nationally). Higher percentiles represent poorer performance.
Source: CDC Agency for Toxic Substances and Disease Registry (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Figure 9. North Dakota SVI Flagged[a] Household Composition & Disability Factors, 2020



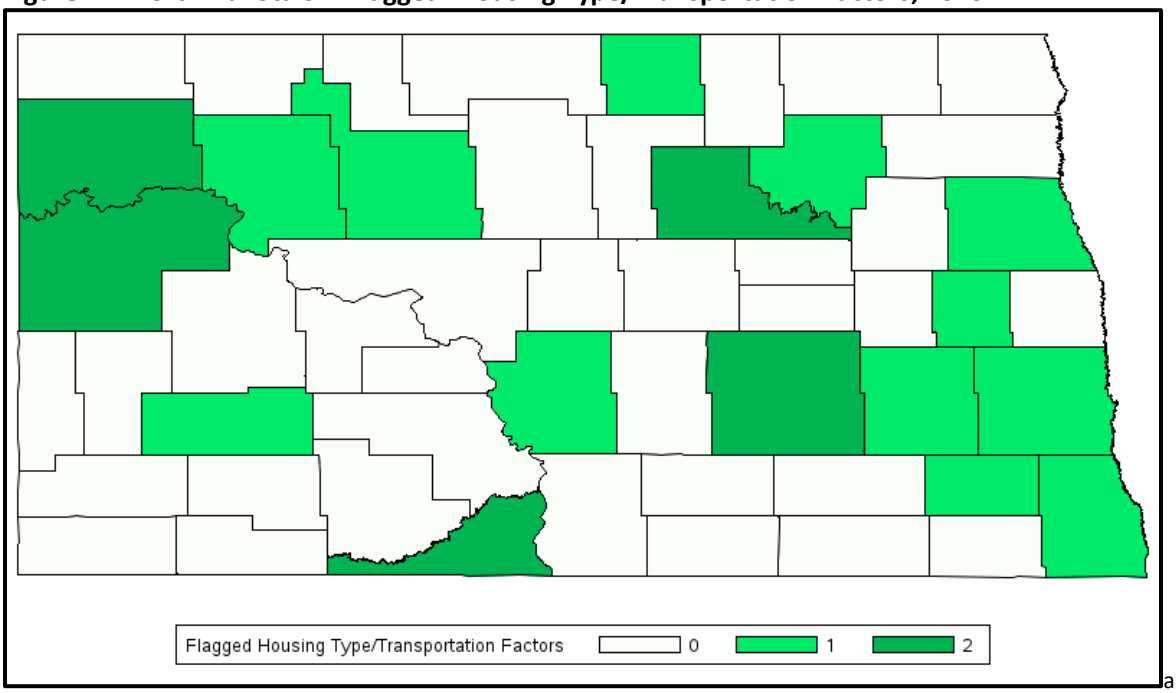
a. Factors are 'flagged" when their level exceeds the 90th percentile of values (nationally). Higher percentiles represent poorer performance.
Source: CDC Agency for Toxic Substances and Disease Registry. (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Figure 10. North Dakota SVI Flagged[a] Minority Status Factors, 2020



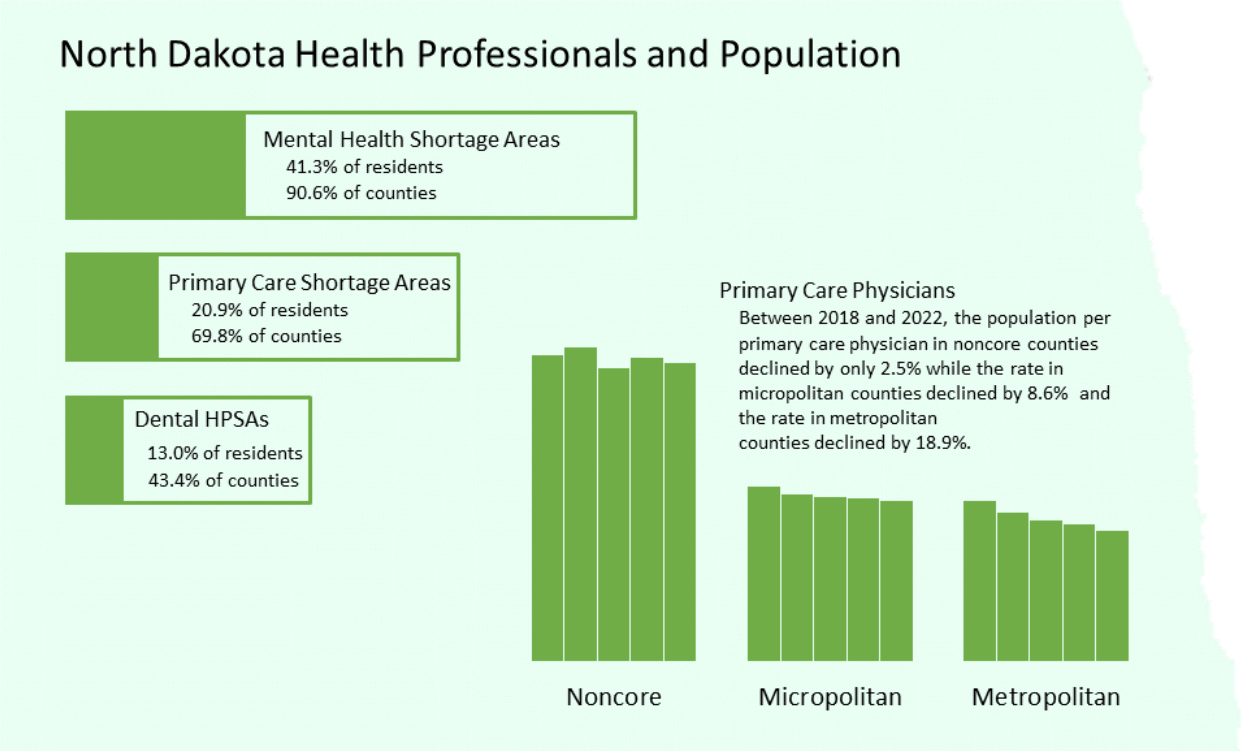
a. Factors are 'flagged" when their level exceeds the 90th percentile of values (nationally). Higher percentiles represent poorer performance.
Source: CDC Agency for Toxic Substances and Disease Registry. (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Figure 11. North Dakota SVI Flagged[a] Housing Type/Transportation Factors, 2020



a. Factors are 'flagged" when their level exceeds the 90th percentile of values (nationally). Higher percentiles represent poorer performance.
Source: CDC Agency for Toxic Substances and Disease Registry. (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

Health Professionals



Data source: HRSA Area Health Resource File 2021, National Provider Identification File, 2018-2022

Healthcare workforce issues are frequently identified as a source of ongoing concern for North Dakota. The UND School of Medicine and Health Sciences Advisory Council report on state health issues points out that there are two healthcare workforce problems facing the state. First is the general shortage of providers. But perhaps even more confounding is the maldistribution of the providers in the state with many more rural areas facing healthcare workforce shortages.[1] State population data reported by HRSA's Area Health Resource File (AHRF)[2] show:

- 20.9% of the population live in 37 counties wholly designated* as primary care health professions shortage areas (HPSAs);
- 13.0% live in 23 counties wholly designated as dental HPSAs, and
- 41.2% live in 48 counties wholly designated as mental health HPSAs.

* HPSAs can be geographic areas (including the entire population within a defined geographic area), populations (a group of people in a defined geographic area, such as a low-income area, or migrant farm worker community), or facilities (such as public or non-profit private medical facilities, correctional facilities, state/county mental hospitals, and others). "Wholly designated" refers to entire counties that have been designated as a HPSA.

National Provider Identifier (NPI)[3] data from October 2022 showed that there are 6,866 physicians, advanced practice providers, dentists, and behavioral health professionals practicing in North Dakota (specific provider types included in each group are detailed in the appendix).

Healthcare provider counts and population rates of (providers per 10,000 population) various classifications of healthcare providers are shown in Table 15. The table reports counts and population rates for North Dakota statewide and in metropolitan counties, micropolitan counties, and noncore counties. It also shows similar counts and rates in the aggregated states surrounding North Dakota. Compared to surrounding states, North Dakota has slightly higher provider rates for primary care physicians and advanced practice providers. It has substantially lower provider rates for physician specialists, and behavioral health physicians and non-physician providers. Within North Dakota, provider/population rates are much lower in noncore counties than in micropolitan counties with some of the greatest disparities in behavioral health physicians and providers.

Table 15. Healthcare Provider Counts[a] and Population Rates[b] 2022, North Dakota and Region[c]

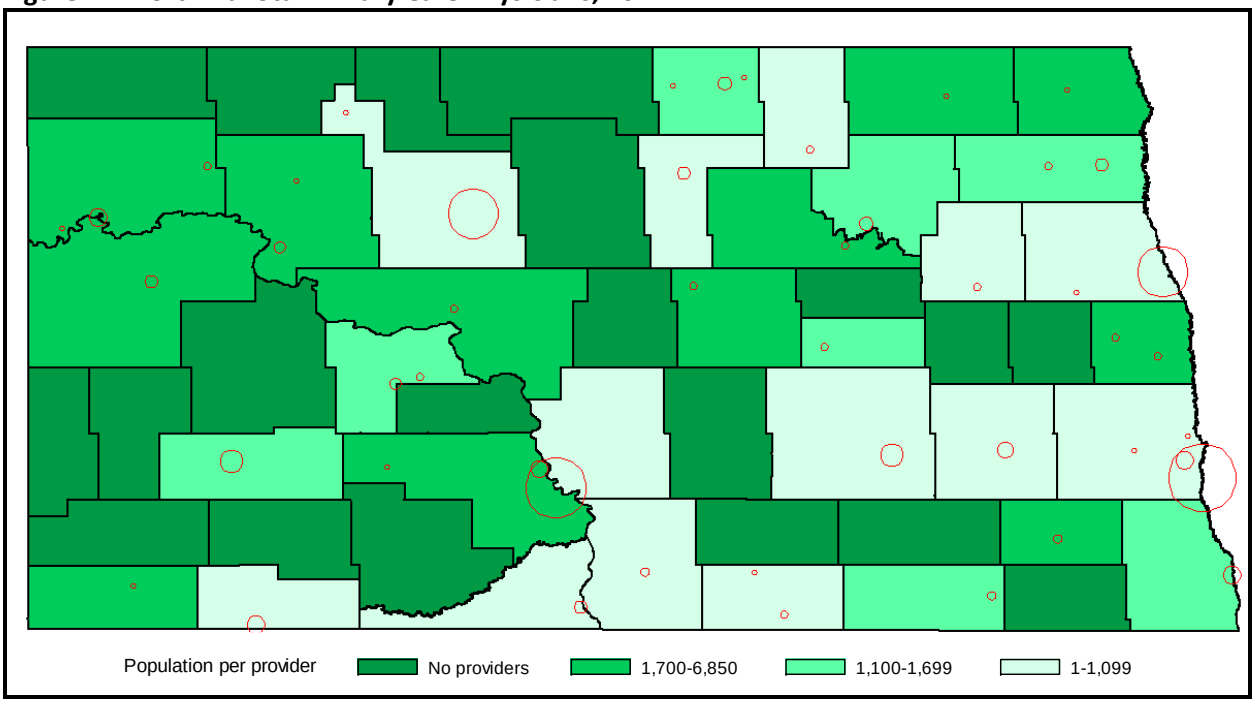
	Overall			Metropolitan Counties			Micropolitan Counties			Noncore Counties		
	State Count	State Rate	Region Rate	State Count	State Rate	Region Rate	State Count	State Rate	Region Rate	State Count	State Rate	Region Rate
Primary Care Physician	742	9.77	9.53	461	12.41	10.26	162	10.10	8.82	119	5.23	7.64
Advanced Practice Provider	1,858	24.47	22.83	1,221	32.88	27.00	319	19.89	18.21	318	13.97	12.58
Physician Specialist	1,605	21.14	25.56	1,320	35.54	33.86	221	13.78	16.98	64	2.81	4.65
Behavioral Health Physician	784	10.32	13.17	623	16.78	17.10	139	8.67	9.71	22	0.97	2.85
Behavioral Health Provider	1,341	17.66	25.15	921	24.80	28.60	295	18.40	28.21	125	5.49	11.51
Dentist	536	7.06	7.73	309	8.32	8.49	113	7.05	7.68	114	5.01	5.28

North Dakota is 10% or more lower (better) than regional rate.
North Dakota is 10% or more higher (worse) than regional rate.

a. Provider counts exclude those in military installations or in the VA system.
b. Providers per 10,000 population.
c. Region includes Minnesota, South Dakota, and Montana.
Source: National Provider Identifier (NPI) Data, 10/2022; American Community Survey 5-year estimates, 2016-2020.

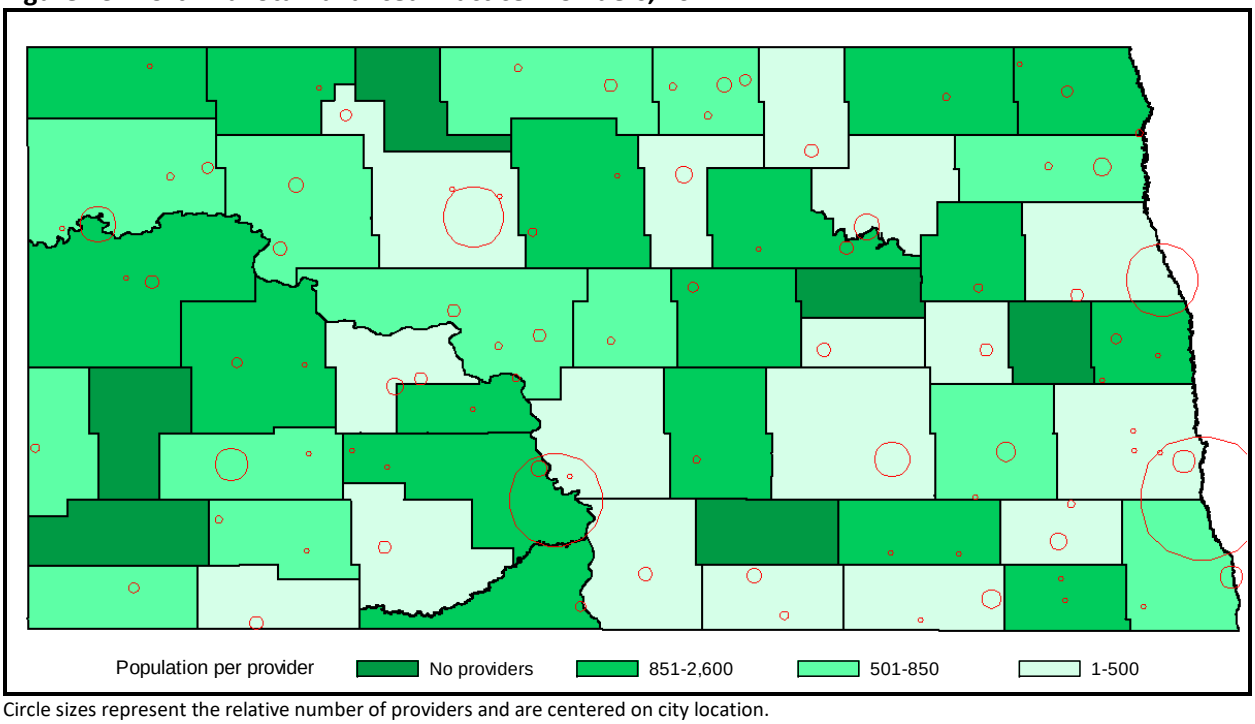
Figures 12-15 show the locations of health professionals in North Dakota. The red circles on the maps are centered on city locations and the circle size represents the relative number of providers.

Figure 12. North Dakota Primary Care Physicians, 2022



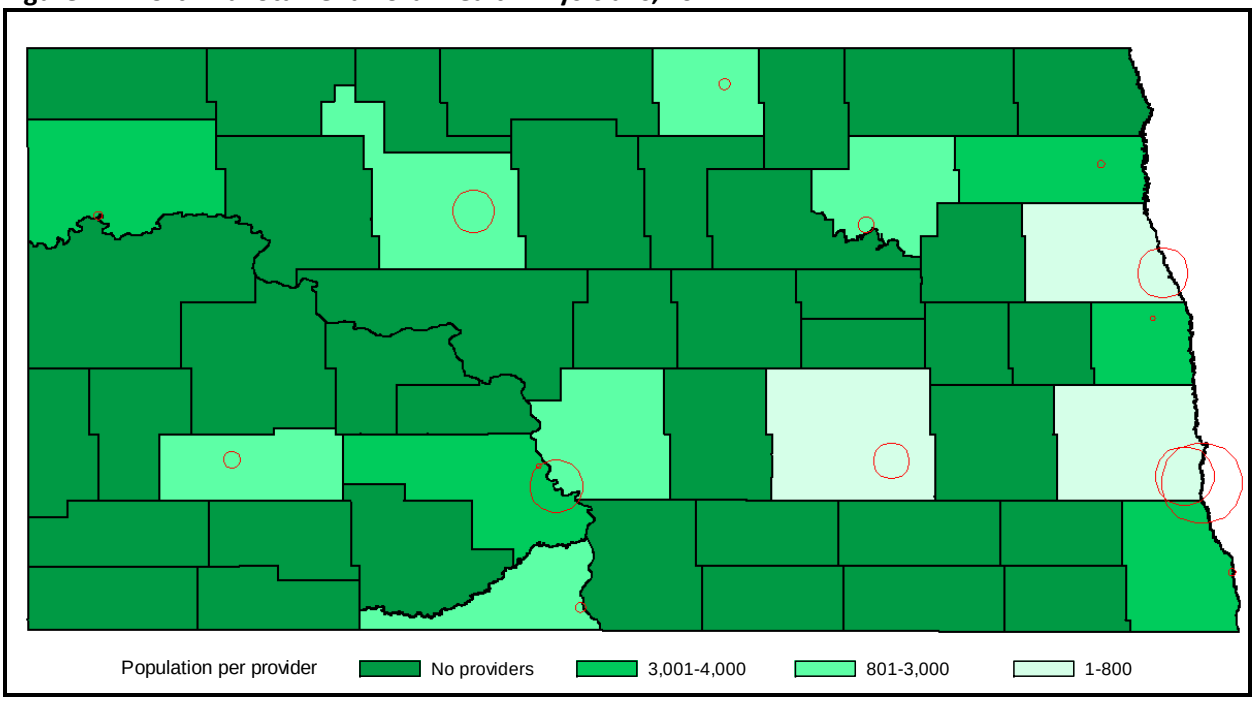
Circle sizes represent the relative number of providers and are centered on city location.
Primary care physicians include General Practice, Family Practice, Hospice and Palliative Care, Sports Medicine, and Pediatric Medicine.
Source: National Provider Identifier (NPI) Data, 10/2022
https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination/

Figure 13. North Dakota Advanced Practice Providers, 2022



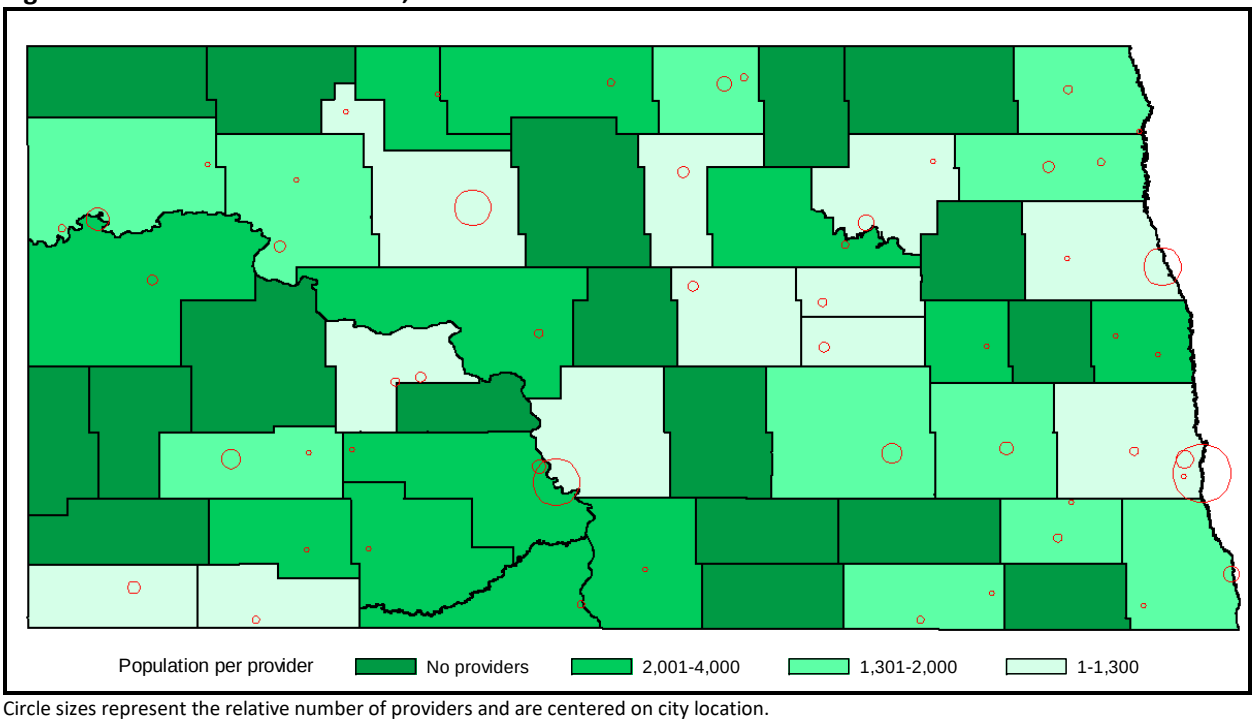
Circle sizes represent the relative number of providers and are centered on city location.
Advance practice providers include Anesthesiology Assistant, Certified Nurse Midwife, Certified Registered Nurse Anesthetist (CRNA), Nurse Practitioner, and Physician Assistant.
Source: National Provider Identifier (NPI) Data, 10/2022
https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination/

Figure 14. North Dakota Behavioral Health Physicians, 2022



Circle sizes represent the relative number of providers and are centered on city location.
Behavioral health physicians include Psychiatry Physician, and Clinical Psychologist.
Source: National Provider Identifier (NPI) Data, 10/2022
https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination/

Figure 15. North Dakota Dentists, 2022



Circle sizes represent the relative number of providers and are centered on city location.
Dentists include Dentist, and Oral Surgery (Dentist).
Source: National Provider Identifier (NPI) Data, 10/2022
https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination/

Data Exploration

The American Medical Association provides an interactive website allowing you to create your own healthcare workforce maps:

https://www.ama-assn.org/about/research/health-workforce-mapper-app

Note that the website uses a different data source than that used in this report and so there will be some count and definition differences.

Counts of North Dakota healthcare providers in counties are shown in Table 16. Note that 20 counties (37.7%) have no primary care providers, 39 counties (73.6%) have no behavioral health physicians, 24 counties (45.3%) have no nonphysician behavioral health providers, and 18 counties (34.0%) have no dentists. Only 6 counties have no advanced practice providers.

Table 16. Healthcare Provider Counts[a] and Rates[b] in North Dakota Counties 2022

County	Primary Care Physician		Physician Specialist		Advanced Practice Provider		Behavioral Health Physician		Behavioral Health Provider		Dentist	
	#	rate	#	rate	#	rate	#	rate	#	rate	#	rate
Metropolitan Counties												
Burleigh	147	(666.0)	353	(277.3)	354	(276.5)	113	(866.3)	249	(393.2)	88	(1,112.4)
Cass	201	(910.4)	712	(257.0)	646	(283.3)	407	(449.6)	491	(372.7)	156	(1,173.0)
Grand Forks	104	(702.9)	253	(288.9)	218	(335.3)	102	(716.7)	172	(425.0)	58	(1,260.4)
Morton	12	(2,743.0)	2	(16,458.0)	12	(2,743.0)	1	(32,916.0)	12	(2,743.0)	9	(3,657.3)
Oliver	0	(0.0)	0	(0.0)	1	(1,850.0)	0	(0.0)	0	(0.0)	0	(0.0)
Sioux	6	(665.5)	1	(3,993.0)	4	(998.3)	4	(998.3)	0	(0.0)	2	(1,996.5)
Micropolitan Counties												
McHenry	0	(0.0)	0	(0.0)	4	(1,355.0)	0	(0.0)	0	(0.0)	0	(0.0)
Renville	0	(0.0)	1	(2,328.0)	0	(0.0)	0	(0.0)	0	(0.0)	1	(2,328.0)
Richland	12	(1,378.8)	7	(2,363.7)	21	(787.9)	2	(8,273.0)	3	(5,515.3)	11	(1,504.2)
Stark	20	(1,635.5)	25	(1,308.4)	43	(760.7)	11	(2,973.6)	41	(797.8)	16	(2,044.4)
Stutsman	20	(1,083.9)	17	(1,275.2)	50	(433.6)	51	(425.1)	62	(349.6)	16	(1,354.9)
Ward	101	(690.0)	130	(536.0)	157	(443.9)	72	(967.9)	142	(490.7)	54	(1,290.5)
Williams	15	(2,564.0)	39	(986.2)	59	(651.9)	3	(12,820.0)	49	(784.9)	24	(1,602.5)
Noncore Counties												
Adams	12	(186.4)	7	(319.6)	7	(319.6)	0	(0.0)	1	(2,237.0)	2	(1,118.5)
Barnes	10	(1,086.9)	3	(3,623.0)	16	(679.3)	0	(0.0)	8	(1,358.6)	7	(1,552.7)
Benson	2	(3,045.0)	1	(6,090.0)	8	(761.3)	0	(0.0)	2	(3,045.0)	2	(3,045.0)
Billings	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Bottineau	0	(0.0)	0	(0.0)	8	(805.3)	0	(0.0)	1	(6,442.0)	2	(3,221.0)
Bowman	1	(3,024.0)	1	(3,024.0)	4	(756.0)	0	(0.0)	0	(0.0)	6	(504.0)
Burke	0	(0.0)	0	(0.0)	1	(2,177.0)	0	(0.0)	0	(0.0)	0	(0.0)
Cavalier	1	(3,725.0)	0	(0.0)	2	(1,862.5)	0	(0.0)	2	(1,862.5)	0	(0.0)
Dickey	3	(1,671.0)	3	(1,671.0)	15	(334.2)	0	(0.0)	1	(5,013.0)	3	(1,671.0)
Divide	0	(0.0)	1	(2,196.0)	1	(2,196.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dunn	0	(0.0)	0	(0.0)	5	(810.8)	0	(0.0)	0	(0.0)	0	(0.0)
Eddy	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	3	(792.7)
Emmons	3	(1,105.3)	1	(3,316.0)	8	(414.5)	0	(0.0)	0	(0.0)	1	(3,316.0)

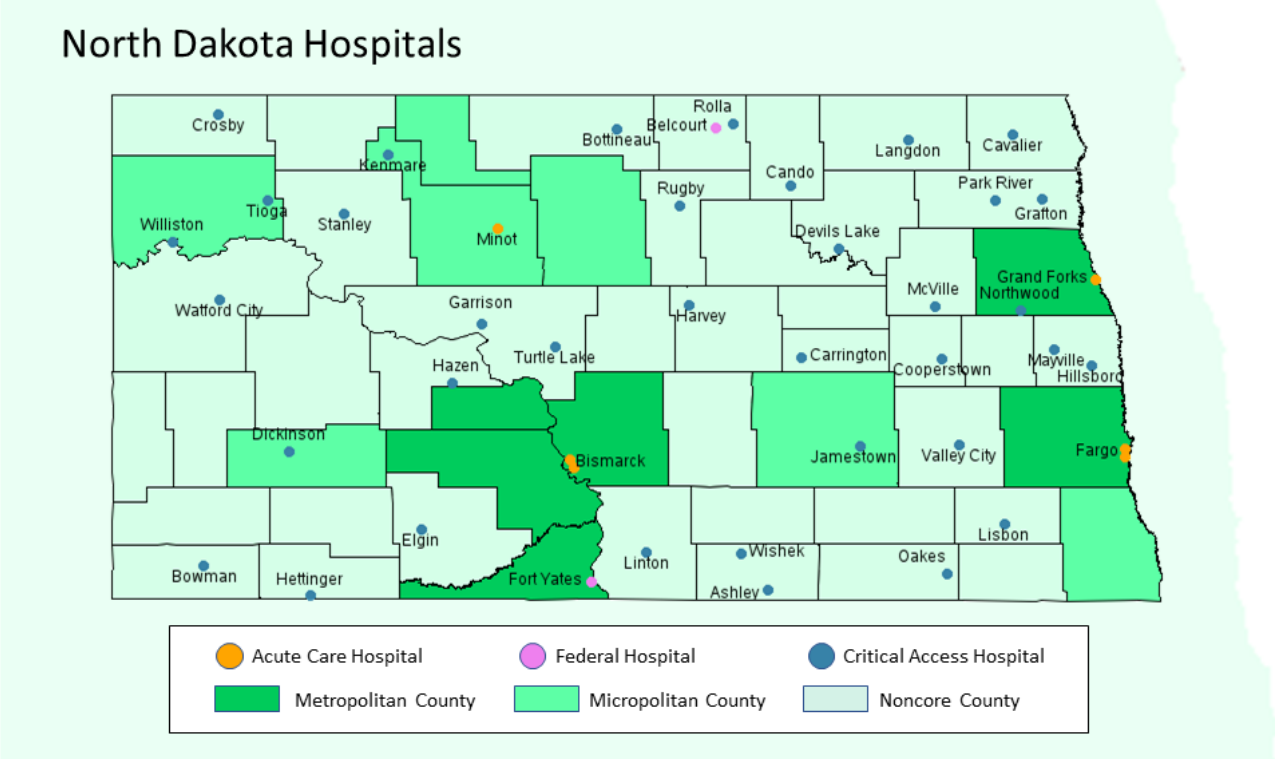
County	Primary Care Physician #	Primary Care Physician rate	Physician Specialist #	Physician Specialist rate	Advanced Practice Provider #	Advanced Practice Provider rate	Behavioral Health Physician #	Behavioral Health Physician rate	Behavioral Health Provider #	Behavioral Health Provider rate	Dentist #	Dentist rate
Foster	2	(1,698.0)	0	(0.0)	8	(424.5)	0	(0.0)	1	(3,396.0)	4	(849.0)
Golden Valley	0	(0.0)	0	(0.0)	3	(604.0)	0	(0.0)	6	(302.0)	0	(0.0)
Grant	0	(0.0)	2	(1,175.5)	6	(391.8)	0	(0.0)	5	(470.2)	1	(2,351.0)
Griggs	0	(0.0)	0	(0.0)	6	(373.7)	0	(0.0)	0	(0.0)	1	(2,242.0)
Hettinger	0	(0.0)	0	(0.0)	3	(834.0)	0	(0.0)	0	(0.0)	1	(2,502.0)
Kidder	0	(0.0)	0	(0.0)	2	(1,198.5)	0	(0.0)	0	(0.0)	0	(0.0)
LaMoure	0	(0.0)	0	(0.0)	2	(2,086.5)	0	(0.0)	0	(0.0)	0	(0.0)
Logan	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
McIntosh	3	(856.0)	3	(856.0)	12	(214.0)	0	(0.0)	0	(0.0)	0	(0.0)
McKenzie	6	(2,293.7)	0	(0.0)	8	(1,720.3)	0	(0.0)	4	(3,440.5)	4	(3,440.5)
McLean	2	(4,894.0)	0	(0.0)	16	(611.8)	0	(0.0)	1	(9,788.0)	3	(3,262.7)
Mercer	7	(1,200.7)	3	(2,801.7)	17	(494.4)	0	(0.0)	7	(1,200.7)	7	(1,200.7)
Mountrail	6	(1,619.5)	4	(2,429.3)	17	(571.6)	0	(0.0)	7	(1,388.1)	6	(1,619.5)
Nelson	3	(1,011.7)	0	(0.0)	3	(1,011.7)	0	(0.0)	0	(0.0)	0	(0.0)
Pembina	1	(6,912.0)	2	(3,456.0)	8	(864.0)	0	(0.0)	2	(3,456.0)	4	(1,728.0)
Pierce	6	(673.0)	3	(1,346.0)	11	(367.1)	0	(0.0)	1	(4,038.0)	5	(807.6)
Ramsey	8	(1,454.8)	8	(1,454.8)	26	(447.6)	10	(1,163.8)	45	(258.6)	11	(1,058.0)
Ransom	3	(1,893.0)	2	(2,839.5)	13	(436.8)	0	(0.0)	2	(2,839.5)	4	(1,419.8)
Rolette	9	(1,389.8)	9	(1,389.8)	18	(694.9)	5	(2,501.6)	13	(962.2)	11	(1,137.1)
Sargent	0	(0.0)	0	(0.0)	2	(1,919.5)	0	(0.0)	0	(0.0)	0	(0.0)
Sheridan	0	(0.0)	0	(0.0)	2	(664.0)	0	(0.0)	0	(0.0)	0	(0.0)
Slope	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Steele	0	(0.0)	1	(1,870.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Towner	2	(1,095.0)	1	(2,190.0)	7	(312.9)	0	(0.0)	6	(365.0)	0	(0.0)
Traill	4	(2,002.0)	1	(8,008.0)	6	(1,334.7)	1	(8,008.0)	0	(0.0)	2	(4,004.0)
Walsh	8	(1,328.9)	1	(10,631.0)	14	(759.4)	2	(5,315.5)	5	(2,126.2)	7	(1,518.7)
Wells	2	(2,015.5)	3	(1,343.7)	4	(1,007.8)	0	(0.0)	0	(0.0)	4	(1,007.8)

a. Provider counts exclude those in military installations or in the VA system.

b. Numbers in parentheses are population counts per provider.

Source: National Provider Identifier (NPI) Data, 10/2022; American Community Survey 5-year estimates, 2016-2020.

Hospitals



Source: CMS Hospital Cost Report Information System data, 2021. https://www.cms.gov/research-statistics-data-and-systems/downloadable-public-use-files/cost-reports

North Dakota has 42 non-federal, general medical and surgical hospitals* with 36 of those located in micropolitan or noncore counties. Although North Dakota has 20 counties with no hospital, the existing facilities are broadly distributed across the state (Figure above). In addition, there are two hospitals operated by the Indian Health Service, two long term care hospitals, three psychiatric hospitals, and one rehabilitation hospital. There have been no recent hospital closures in North Dakota – the last hospital to close was Richardton Health Center in 2009.[2]

* While there are 50 institutions in the state that are identified as "hospitals", a number of those are institutions with special foci either in terms of the care that they deliver or the patients that they will admit. For example, two of those hospitals are long term care institutions, three are psychiatric hospitals, and one is a rehabilitation hospital… none of them provide general medical and surgical care. Further, two of the hospitals in the state are part of the Indian Health Service and "can provide healthcare to only eligible Alaska Native and American Indians at its federal hospitals and clinics."[1]

Although metropolitan and rural comparisons have driven much of the content of this report, geography is only one factor impacting hospital characteristics. Designation as a critical access hospital (CAH) or prospective payment system (PPS) hospital is at least as influential. CAHs and PPS hospitals are reimbursed by CMS using very different payment formulations that are designed to meet the financial requirements of both hospital types more appropriately. CAHs are legally limited in the number of inpatient beds they can provide, proximity to other hospitals, and average length of stay for admitted patients. Over 85% of the hospitals in North Dakota (36 of 42) are CAHs.

Hospital Cost Report data from CMS (Table 17) shows that there are several differences between the hospitals in North Dakota and those in surrounding states:

- The state has a higher proportion of critical access hospitals (85.7%) than the surrounding states (68.4%).
- All North Dakota nonfederal hospitals are run as non-government, nonprofit organizations. The surrounding states have hospitals controlled by government entities (e.g., state, or county), and hospitals operated as for-profit organizations.
- North Dakota overall has a lower population/bed ratio than surrounding states, with substantially lower rates in metropolitan and noncore counties. However, the state's highest population/bed ratio is in micropolitan counties – in large part because those counties have only six hospitals and five of those are CAHs.
- Overall, North Dakota has a higher rate of inpatient discharges/1,000 population than the surrounding states. Note that findings for specific geographies are not displayed because they will be highly influenced by referrals from less populous counties to larger care centers in metropolitan and micropolitan counties.
- The number of inpatient days/1,000 population is also higher in North Dakota than in surrounding states. Note that findings for specific geographies are not displayed because they will be highly influenced by referrals from less populous counties to larger care centers in metropolitan and micropolitan counties.

In 2020, over two-thirds (68.9%) of the hospitals in the US were members of a system – "an entity with two or more hospitals owned, leased, sponsored, or contract managed by a central organization"[3] (Table 18). But this phenomenon is less common among CAHs where only 46.6% were members of a system in 2020. The picture is much the same both in North Dakota and in the surrounding states where system membership is much less likely among CAHs. Since 2016, there has been modest growth in the proportion of hospitals that are members of systems – between two and five percentage points. Note that the rather dramatic increase that occurred in North Dakota PPS system participation is the result of only one additional hospital joining a system.

Table 17. General Medical and Surgical Hospital Characteristics[a] 2021, North Dakota and Region[b]

	Overall		Metropolitan Counties		Micropolitan Counties		Noncore Counties	
	State	Region	State	Region	State	Region	State	Region
Total hospitals (PPS & CAH)	42	237	6	69	6	42	30	126
Counties w/ hospital	33/53	169/209	3/6	33/40	4/7	29/35	26/40	107/134
Acute care hospitals	6	75	5	46	1	25	0	4
Critical access hospitals	36	162	1	23	5	17	30	122
Control: Government	0	33	0	6	0	7	0	20
Nonprofit	42	197	6	57	6	34	30	106
Proprietary	0	5	0	5	0	0	0	0
Not indicated	0	2	0	1	0	1	0	0
Total hospital beds	1,912	13,310	1,048	8,852	232	1,898	632	2,560
Population/bed	404.5	573.3	374.8	590.7	805.3	655.3	306.6	452.2
Total hosp. employees	18,836	129,186	13,891	91,477	2,661	22,035	2,284	15,673
Total discharges	78,750	643,946	62,862	527,248	11,320	78,223	4,568	38,475
Disch./1,000 pop.	101.8	84.4						
Total inpatient days	432,927	3,249,370	315,196	2,609,229	52,608	319,841	65,123	320,300
Inpt. days/1,000 pop.	559.8	425.9						

a. Includes all non-Federal short term acute care hospitals and critical access hospitals. More extensive explanations of the hospital characteristics can be found in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.
Source: CMS Hospital Cost Report Information System data, 2020-2021.

Table 18. Hospital System Membership[a], 2020, North Dakota, the Region[b] and the U.S.

	State		Region		United States	
Critical Access Hosp	44.4%	(+2.7%)	51.2%	(+3.7%)	46.6%	(+1.7%)
PPS Hospital	83.3%	(+16.6%)	79.7%	(+3.3%)	75.9%	(+3.1%)
Overall	50.0%	(+4.8%)	60.0%	(+3.5%)	66.8%	(+2.3%)

a. Numbers in parentheses are percentage point change since 2016.
b. Region includes Minnesota, South Dakota, and Montana.
Source: American Hospital Association Annual Survey, 2020.

Table 19. North Dakota Hospital System Membership, 2020

System Name	Hospitals
CommonSpirit Health	10
Sanford Health	5
Sisters of Mary of the Presentation Health System	3
Trinity Health	2
Essentia Health	1

Source: American Hospital Association Annual Survey, 2020.

Because of the restrictions imposed on CAHs, it is unusual (although not impossible) to find a CAH in a metropolitan county (Table 17 shows that there are 24 metropolitan CAHs in the four-state region, but only one in North Dakota). It is also somewhat unusual to find a PPS hospital in a noncore county (Table

17 shows that there are four noncore PPS hospitals in the four-state region – three in Minnesota and one in Montana[*]). Table 20 displays characteristics of metropolitan PPS hospitals, micropolitan CAHs, and noncore CAHs. Note that because of their rarity in North Dakota (and in an effort to minimize biased geographic reports), metropolitan CAHs and noncore PPS hospitals have been excluded from further analysis.

- North Dakota metropolitan PPS hospitals average more employees, but fewer beds, discharges, patient days, and have a lower average daily census than similar hospitals in the surrounding states.
- North Dakota micropolitan CAH hospitals average fewer employees, but more beds, discharges, patient days, and have a higher average daily census than similar hospitals in the surrounding states.
- Noncore CAHs in North Dakota average more beds, but fewer employees, discharges, and patient days, and have a lower average daily census than similar hospitals in the surrounding states.

Table 20. Critical Access and PPS Hospital Characteristics[a] 2021, North Dakota and Region[b]

	Metropolitan PPS Hospitals		Micropolitan CAHs		Noncore CAHs	
	State (n=5)	Region (n=46)	State (n=5)	Region (n=17)	State (n=30)	Region (n=122)
Avg. employee count	2,338.1	1,913.7	188.5	205.6	76.1	117.4
Avg. bed count	174.7	183.6	23	18	21.1	19.7
Avg. discharges	10,486	11,290	835	523	152	267
Avg. patient days	52,378	55,733	3,859	2,462	2,171	2,433
Avg. length of stay	4.8	4.3	2.9	3.0	3.3	3.2
Avg. daily census	143.5	152.7	7.8	4.3	1.4	2.4

a. Includes all non-Federal short term acute care hospitals and critical access hospitals. More extensive explanations of the hospital characteristics can be found in the appendix.
b. Region includes Minnesota, South Dakota, and Montana.
Source: CMS Hospital Cost Report Information System data, 2020-2021.

In addition to being very complex organizations in terms of the medical care that they provide, hospitals are exceedingly complex in terms of their finances. They have a wide range of sources of income (e.g., inpatient and outpatient revenue, but also government appropriations, interest, income from investments, and others) and a wide range of fixed (e.g., buildings and equipment) and variable (e.g., supplies and personnel) costs. This diversity of revenues and expenses also means that there are a wide range of financial metrics that can be used to assess the condition of hospital finance. Tables 21a-c report on seven "core" financial indicators extracted from CMS Hospital Cost Reports, with additional detailed tables available in the appendix.

- *Operating margin* – a profitability measure (expressed as a percentage) that includes only operating revenue and expenses.[4]

[*] Minnesota noncore PPS hospitals: St. Mary's Regional Health Center, Detroit Lakes; Grand Itasca Clinic and Hospital, Grand Rapids; May Clinic Health System, Fairmont
Montana noncore PPS hospital: Northern Montana Hospital, Havre
North Dakota metropolitan CAH: Northwood Deaconess Health Center, Northwood

  - A large majority of hospitals considered in this report had a negative operating margin in 2020. In North Dakota, the metropolitan PPS hospitals had the highest proportion of negative operating margins (80%) followed by noncore CAHs (77%) and micropolitan CAHs (60%). There are some differences, but the figures for hospitals in the surrounding states are similar (metropolitan PPS: 58.7%, micropolitan CAH: 64.7%, noncore CAH (67.2%).
- *Excess margin* – a profitability measure (expressed as a percentage) that includes all sources of revenue. [4]
  - The additional sources of revenue included in this measure were of substantial benefit (it is likely that Federal COVID-19 relief funds were a major source of that revenue). Only five (12.5%) of the state hospitals and 21 (11.4%) of hospitals in the surrounding states in this report had a negative excess margin.
- *Personnel expense as percent of total operating revenue* – the proportion of the hospital's operating revenue that goes to personnel expenses. [4]
  - Personnel expenses require approximately 50% of operating revenue, but median measures are slightly higher in North Dakota than in surrounding states.
- *Return on equity* – a measure (percentage) of the hospital profitability in relation to its equity. [4]
  - The median return on equity ranges from 12.2% to 20.4% across the classes of hospitals and geographies. Whereas there is no difference between North Dakota and surrounding state CAHs, the state metropolitan PPS hospitals performed substantially better than their peers in the surrounding states.
- *Medicare inpatient revenue per day* – total Medicare revenue (dollars) per Medicare inpatient stay. [4]
  - Medicare inpatient revenue per day is substantially higher in the PPS hospitals than the CAHs. This is unsurprising given limits on CAH lengths of stay and higher acuity of patients seen at metropolitan referral centers.
- *Outpatient to total revenue* – proportion of total hospital revenue obtained from outpatient revenue. [4]
  - Outpatient revenue accounts for over 70% of total revenue in all of the hospitals considered in this report except for metropolitan PPS hospitals in the surrounding states (57.2%).
- *Days cash on hand* – the hospital's cash reserve, measured as the number of days the hospital can pay its operating expenses with the current available cash. [4]
  - Days cash on hand varied widely across the hospitals considered in this report with no discernible pattern across geography of hospital type.

Data Exploration

The internet offers many sites that allow users to point-and-click their way to developing reports on hospital financial measures. Here are a couple of useful examples:

The National Academy for State Health Policy offers a web site for visualizing a number of hospital finance metrics:

https://tool.nashp.org/

The American Hospital Directory (a subscription data service) offers free demonstration reports on a limited set of hospital finance metrics:

https://www.ahd.com/

Table 21a. Metropolitan PPS Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

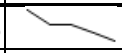
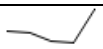
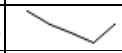
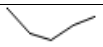
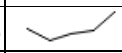
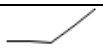
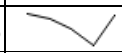
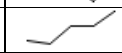
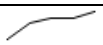
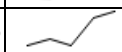
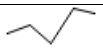
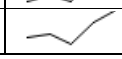
	State (n=5)		Region (n=46)	
Financial Indicators (medians)	2020	2016-2020	2020	2016-2020
Operating Margin	-6.9%		-0.7%	
Excess Margin	7.7%		8.2%	
Personnel Expense as % of Total Oper. Rev	57.8%		48.5%	
Return on Equity	19.3%		12.2%	
Medicare inpatient revenue/day	$9,125		$11,903	
Outpatient revenue as percent of total	70.1%		57.2%	
Days Cash on Hand - all sources	15.9		109.1	

Table 21b. Micropolitan Critical Access Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

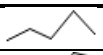
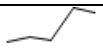
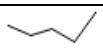
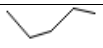
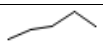
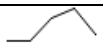
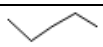
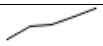
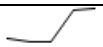
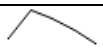
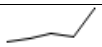
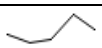
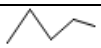
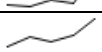
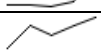
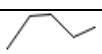
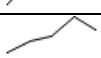
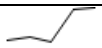
	State (n=5)		Region (n=17)	
Financial Indicators (medians)[d]	2020	2016-2020	2020	2016-2020
Operating Margin	-0.9%		-5.7%	
Excess Margin	12.6%		10.0%	
Personnel Expense as % of Total Oper. Rev	49.4%		48.6%	
Return on Equity	16.6%		16.6%	
Medicare inpatient revenue/day	$4,840		$2,433	
Outpatient revenue as percent of total	71.8%		78.6%	
Days Cash on Hand - all sources	196.5		91.3	

Table 21c. Noncore Critical Access Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

	State (n=30)		Region (n=122)	
Financial Indicators (medians)[d]	**2020**	**2016-2020**	**2020**	**2016-2020**
Operating Margin	-7.1%		-4.5%	
Excess Margin	14.3%		14.4%	
Personnel Expense as % of Total Oper. Rev	57.0%		54.4%	
Return on Equity	20.4%		20.4%	
Medicare inpatient revenue/day	$1,059		$1,694	
Outpatient revenue as percent of total	72.3%		75.6%	
Days Cash on Hand - all sources	208.7		237.6	

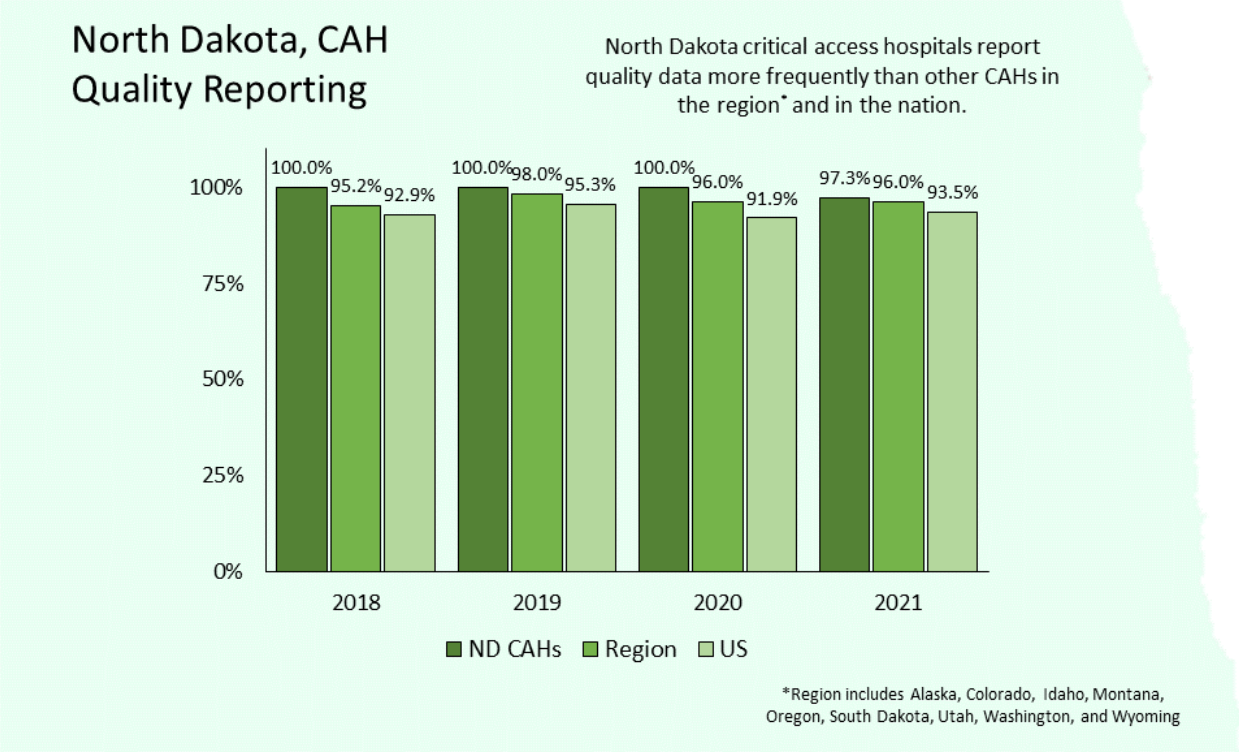
a. More extensive explanations of the hospital financial characteristics can be found in the appendix.

b. The 2016-2020 sparklines are only intended to represent generalized data trends. They use varying scales and should not be used to draw direct comparisons between characteristics or geographies.

c. Region includes Minnesota, South Dakota, and Montana.

Source: CMS Hospital Cost Report Information System data, 2020-2021.

Hospital Quality



Data Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021

Quality Reporting

Publicly available rural North Dakota healthcare organization (HCO) quality data is limited to measures included in the Medicare Beneficiary Quality Improvement Program (MBQIP). MBQIP divides CAH quality performance measures in four domains, described below. As part of the Medicare Rural Hospital Flexibility Program (Flex), MBQIP is designed to "improve the quality of care provided in critical access hospitals (CAHs) by increasing quality data reporting by CAHs and then driving quality improvement activities based on the data."[2] MBQIP quality reporting requirements are minimal. Yearly quality reporting identifies CAHs that report data in any domain, in any quarter, and for any measure (within the selected domain). The domains include Patient Safety/Inpatient, Outpatient, Patient Engagement, and Care Transitions. North Dakota CAHs (N=37, includes one Indian Health Service CAH) have better MBQIP reporting performance than all U.S. CAHs in all MBQIP quality domains (Table 22).[3] Essentially, there are only one or two ND CAHs no reporting data in any given domain.

Table 22. North Dakota and U.S. CAH MBQIP Quality Report Rates, 2021

Quality Doman	State	United States
Patient Safety/Inpatient	97.3%	93.5%
Outpatient	94.6%	88.2%
Patient Engagement	94.6%	91.5%
Care Transitions	97.3%	92.6%

Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Patient Safety/Inpatient

North Dakota CAHs perform similarly to all CAHs in the "healthcare workers given influenza vaccination" and "fulfills antibiotic stewardship core elements" quality measures (Table 23).

Table 23. North Dakota and U.S. CAH Patient MBQIP Safety/Inpatient Quality Measures, 2021

Measure	Description	State (n=37)		United States (n=1,359)	
		CAHs reporting	Perform-ance[a]	CAHs reporting	Perform-ance[a]
HCP/IMM-3	Healthcare workers given influenza vaccination	32	78.5%	984	79.4%
Antibiotic Stewardship	Fulfill antibiotic stewardship core elements	36	83.3%	1,157	88.9%

a. HCP/IMM-3 is expressed as the percentage of health care workers immunized. Antibiotic Stewardship is the percentage of CAHs fulfilling all antibiotic stewardship core elements.

Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Not all North Dakota CAHs report data on all types of healthcare-associated infections. Sufficient data for measure calculation is only available at the state-level for two measures. Both measures show good performance (i.e., rates less than 1.0) and the North Dakota result for HAI-2 is substantially better than the national rate (Table 24).

Table 24. North Dakota and U.S. CAH Healthcare-Associated Infection Measures, 2021

Measure	Description	State (n=37)		United States (n=1,359)	
		CAHs reporting	SIR[a]	CAHs reporting	SIR[a]
HAI-1	Central-line-associated bloodstream infections (CLABSI)	31	*	1,102	0.8
HAI-2	Catheter-associated urinary tract infections (CAUTI)	33	0.4	1,156	0.7
HAI-3	Surgical site infections from colon surgery (SSI:C)	11	*	469	0.9
HAI-4	Surgical site infections from abdominal hysterectomy (SSI:H)	11	*	434	1.4
HAI-5	Methicillin-resistant Staphylococcus Aureus (MRSA) infections	18	*	872	0.8
HAI-6	Clostridium difficile (C.diff) intestinal infections	18	0.8	912	0.7

a. SIRs are a ratio of the total number of infections observed in 2021 divided by the predicted number of annual infections (lower numbers are better).
* Indicates insufficient data to calculate SIR.
Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Outpatient

In hospital outpatient care, North Dakota CAHs perform similarly to all CAHs in the "Fibrinolytic therapy received within 30 minutes" measure and perform significantly better than all CAHs on the "Patients left without being seen" measure (Table 25).

Table 25. North Dakota and U.S. CAH Outpatient Quality Measures, 2021

Measure	Description	State (n=37)		United States (n=1,359)		Bench-mark[b] (%)
		CAHs reporting	% of patients[a]	CAHs reporting	% of patients[a]	
OP-2	Fibrinolytic therapy received within 30 minutes	35	50.0	1,121	48.3	100.0
OP-22	Patients left without being seen (lower is 'better')	25	1.1	834	1.3	0.1

North Dakota is significantly better than all CAHs nationally.

a. Rates without highlights were not significantly different from comparable rates in all CAHs nationally.
b. Benchmarks are set at the national 90th percentiles of CAHs with MOUs during 2021.
Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

North Dakota CAHs perform similarly to all CAHs on the "Median time to transfer to another facility – acute coronary intervention" measure and perform significantly better than all CAHs in the "Median time from ED arrival to ED departure for discharged patients (Table 26). But the state's CAHs (and all CAHs nationally) performance is less than the established benchmarks for both median quality measures.

Table 26. North Dakota and U.S. CAH Median Quality Measures, 2021

Measure	Description	State (n=37)		United States (n=1,359)		Bench-mark[b] (minutes)
		CAHs reporting	Minutes[a]	CAHs reporting	Minutes[a]	
OP-3b	Median time to transfer to another facility - acute coronary intervention	35	79.5	1,121	70.0	36.0
OP-18b	Median time from ED arrival to ED departure for discharged patients	35	98.0	1,134	116.0	84.0

North Dakota is significantly better than all CAHs nationally.

a. Median minutes to receiving care. Lower is better for all measures. Rates without highlights were not significantly different from comparable rates in all CAHs nationally.

b. Benchmarks are set at the national 90th percentiles of CAHs with MOUs during 2021.

Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Patient Engagement

North Dakota CAHs perform similarly to all CAHs in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey in most measures, but significantly better in the "Area around the patient's room was always quiet at night" measure and significantly worse in the "Patient's room and bathroom were always clean" measure (Table 27). The state's CAHs (and all CAHs nationally) performance is less than the established benchmarks for all of the HCAHPS measures.

Table 27. North Dakota and U.S. CAH HCAHPS Results, 2021

HCAHPS Measure	Percentage of patients that gave the highest level of response (e.g., "always")		
	ND CAHs (n=37)	All CAHs (n=1,359)	Bench-mark[a] (%)
CAHs Reporting	35	1,359	
Nurses always communicated well	83.3	83.6	87.7
Doctors always communicated well	84.5	83.8	88.0
Patients always received help as soon as wanted	75.1	74.0	81.2
Staff always explained medications before giving them to patients	66.6	66.4	74.1
Staff always provided information about what to do during recovery at home	86.1	88.4	92.2
Patients strongly understood their care when they left the hospital	55.7	55.2	63.6
Patient's room and bathroom were always clean	72.2	78.7	79.6
Area around patient's room was always quiet at night	72.1	66.9	79.6
Patient gave a rating 9 or 10 [high] on a 1-10 scale	75.9	77.0	85.7
Patient would definitely recommend the hospital to friends and family	73.8	74.8	NA

North Dakota is significantly better than all CAHs nationally.

North Dakota is significantly worse than all CAHs nationally.

a. Benchmarks come from the benchmarks selected for CMS' Hospital Value-Based Purchasing Program in 2021.

Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Care Transitions

North Dakota CAHs perform better than all CAHs in all the Emergency Department Care Transitions (EDTC) elements except "Allergies and/or reactions" in which North Dakota CAHs perform similarly to all CAHs (Table 28).

Table 28. North Dakota and U.S. CAH EDTC Results, 2021

Emergency Department Transfer Communication Composite and Elements	Average Percentage		
	ND CAHs (n=37)	All CAHs (n=1,359)	Bench-mark[a] (%)
CAHs Reporting	36	1,259	
EDTC-All: Composite	92.9	90.2	100.0
Home Medications	95.8	94.4	100.0
Allergies and/or Reactions	96.4	96.1	100.0
Medications Administered in ED	97.5	96.4	100.0
ED Provider Note	95.8	94.7	100.0
Mental Status/Orientation Assessment	97.3	95.5	100.0
Reason for Transfer and/or Plan of Care	98.1	96.8	100.0
Tests and/or Procedures Performed	97.8	96.5	100.0
Tests and/or Procedures Results	97.7	96.0	100.0

North Dakota is significantly better than all CAHs nationally.

a. Benchmarks are set at 100% for all EDTC measures.

Source: Flex Monitoring Team, MBQIP Quality Measures Annual Report North Dakota – 2021.

Health Care Value

The concept of *healthcare value* is embodied in the Triple Aim of better patient care, improved community health, and smarter spending.[1] Better patient care implies improved clinical care and patient safety, and an improved patient experience. Improved community health implies attention to the entire community, not an individual patient. Smarter spending implies the wise use of financial resources and avoiding duplication and waste.

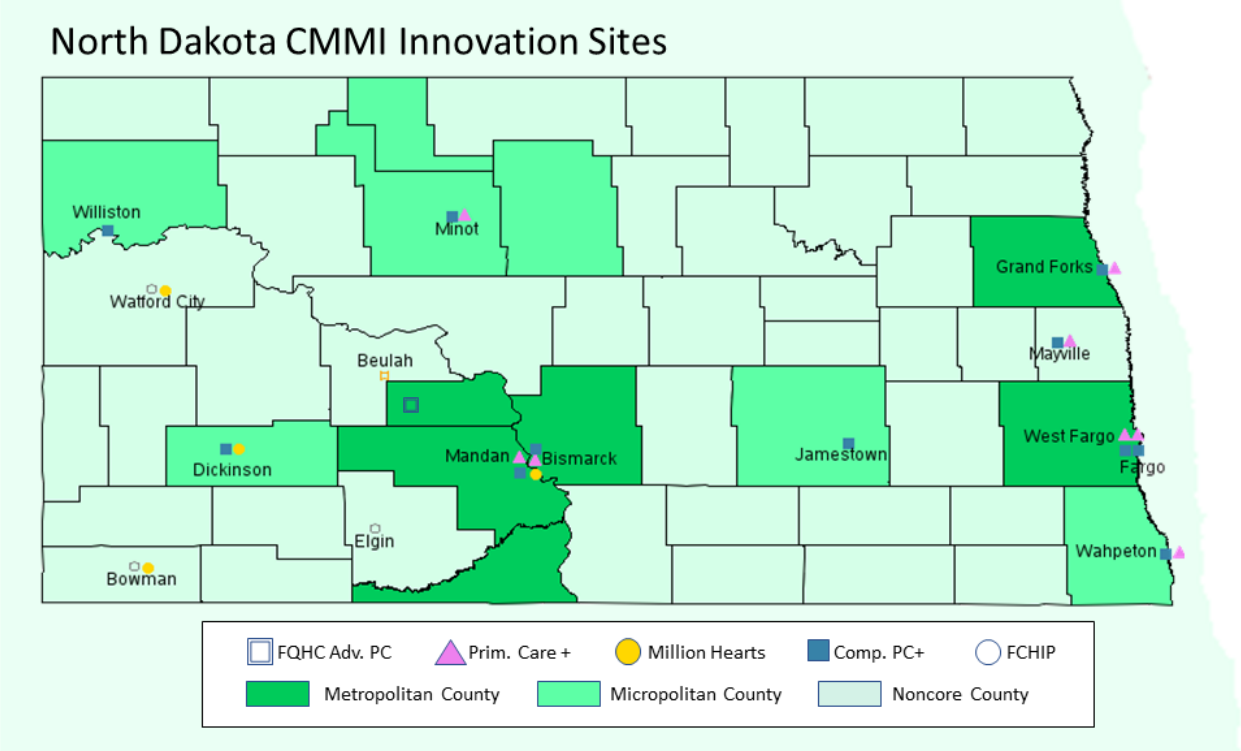
In the nearly 15 years since the Triple Aim's introduction, a focus on better experience, healthier communities, and lower costs has become the currency that defines healthcare *value*. Quality measurement has expanded and matured exponentially to align with this focus. Most publicly reported quality measures were originally measures of care processes (e.g., how often diabetic patients had their blood sugar tested). Today, outcome measures, patient experience measures, cost and efficiency measures, and patient-reported outcomes go beyond clinical quality to measure value more comprehensively. The Centers for Medicare & Medicaid Services (CMS) publicly reports a wide variety of value-focused quality measures at the facility level for hospitals, nursing homes, home health agencies, and more through the Medicare Care Compare web sites. In addition, states, regional health improvement collaboratives, health plans, and other health-related organizations are requiring and publicly reporting a variety of quality measures.

Many North Dakota HCOs, such as CAHs and rural health clinics (RHCs), have generally not been included in publicly reported quality measures for multiple reasons:

- CAHs and RHCs are excluded from CMS quality reporting mandates and incentives.
- Low patient and service volumes make statistically significant performance calculations challenging; and rural HCOs frequently do not meet the minimum case threshold for public reporting.
- Available quality measures may be irrelevant to rural HCO scope of services.

Many entities (e.g., CMS through the Medicare Shared Savings Program, North Dakota Medicaid and Medicaid expansion [administered by Blue Cross/Blue Shield of North Dakota], Medicare Advantage plans, and commercial insurers) likely collect North Dakota rural HCO quality data, but those data are not publicly available. The relative paucity of North Dakota quality data is a missed opportunity for the state's rural North Dakota healthcare organizations (HCOs) to advance the Triple Aim, develop value-based care capacity, reduce reliance on decreasing fee-for-service payment, and receive value-based payment (VBP). Without statewide quality data, HCOs do not have the ability to benchmark their performance in order to learn, share, and improve; and researchers, technical assistance providers, and policymakers do not have a comprehensive picture of the quality of care in North Dakota and are unable to identify broadscale needs and opportunities and target resources where most needed. The continued development of VBP programs in both the public and private sectors requires valid and reliable data to measure quality and calculate payment. Rural-relevant measures of quality, and strong participation of rural providers in quality reporting programs, are essential to enable rural HCOs to participate in the rapidly evolving healthcare delivery and payment system.

Value-Based Payment

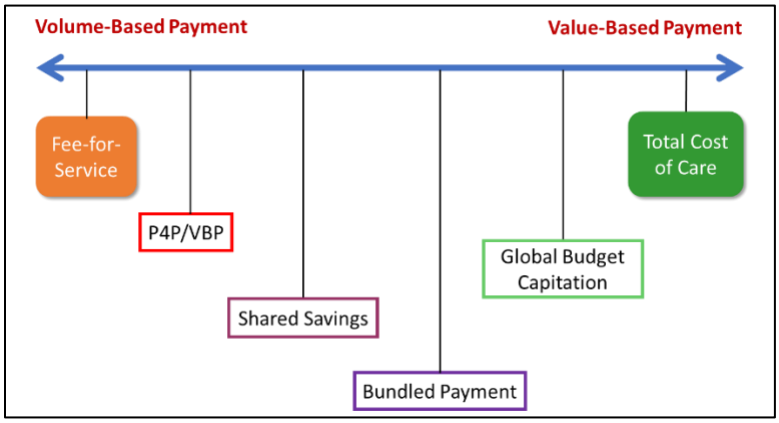


Data source: CMS "Where Innovation is Happening. https://innovation.cms.gov/innovation-models/map. February 2023.

Value-based payment is payment for health care that delivers one or more parts of the Triple Aim (i.e., better patient care, improved community health, and smarter spending). Value-based payment is often described by what it is not; it is not exclusively fee-for-service. Healthcare payment may be considered along a continuum from volume-based payment (e.g., fee-for-service) to value-based payment (e.g., total cost of care). Despite the distinction between volume-based payment and value-based payment, most new payment models fall along the payment continuum and are a blend of the two. For example, shared savings programs are based on fee-for-service, but payers reward clinical-quality and cost-savings performance by sharing savings (if any) with participating healthcare providers (Figure 16).

Shared savings is the most predominant value-based payment in U.S. health care. In 2022 the Medicare Shared Savings Program (SSP) engaged 483 accountable care organizations (ACOs) and included over 11 million Medicare beneficiaries.[1] The SSP is established by federal law and administered by the Centers for Medicare & Medicaid Services (CMS). Thus, the SSP is not a time-limited demonstration. However, the Center for Medicare & Medicaid Innovation (CMMI) administers multiple value-based payment models (i.e., time-limited demonstrations) that are described later in this section.

Figure 16: The Healthcare Payment Continuum



In 2022, 45.1 percent of all Medicare beneficiaries and 37.2 percent of rural Medicare beneficiaries were enrolled in Medicare Advantage plans.[2] Although Medicare pays Medicare Advantage insurers a capitated rate and thus considers the program value-based, Medicare Advantage insurers do not necessarily use capitation to pay healthcare providers.

Parallel to federal programs and models, several state Medicaid programs are active in value-based payment. Well-established examples include Oregon's Coordinated Care Organization (CCO) program[3] and North Carolina Medicaid's Accountable Care Organization program.[4] Commercial insurers are also involved in value-based payment. For example, in 2021 over 500 commercial ACOs were in operation[5] and the largest ACO in the U.S. was TMA PracticeEdge (Texas Medical Association - Blue Cross and Blue Shield of Texas ACO) with 5 million enrollees.[6]

Comparisons

Shared-savings plans are the most common value-based payment system in the U.S. Data regarding shared-savings plan locations, enrollment, and other ACO information are available for the Medicare SSP. The North Dakota Medicare SSP ACO enrollee percentage of the state's population is lower than the U.S percentage, and lower than the percentage in the adjacent states of Minnesota, South Dakota, and Montana (Table 29).[7,8]

Table 29: Medicare Shared Saving Programs, Enrollees, and Percent of Population Enrolled, 2021

	SSP ACOs[a]	Attributed Beneficiaries[b]	Eligible Beneficiaries[c]	% Attributed
United States	475	9,891,595	61,932,601	16.0%
Minnesota	20	121,446	1,055,433	11.5%
Montana	9	41,663	240,442	17.3%
North Dakota	8	8,756	135,416	6.5%
South Dakota	33	36,073	180,389	20.0%

a. Count of SSP ACOs with 10 or more assigned Medicare beneficiaries in one or more counties.
b. Count of Medicare beneficiaries that have been assigned to an SSP ACO.
c. Total Medicare eligible population.
Source: RHV analysis of CMS data on Number of Accountable Care Organization Assigned Beneficiaries by County and CMS Medicare landscape data[8].

Nationally, Medicare Advantage enrollment among Medicare beneficiaries is more prevalent in urban areas than in rural areas. North Dakota Medicare Advantage enrollment rates are much lower than the U.S. Similarly, North Dakota Medicare Advantage enrollment rates and number of plans available are lower than the surrounding states (Table 30).[9,10]

Table 30: Medicare Advantage Enrollment Rates, Plans, and Payers,[a] 2022

	Total Enrollment	Rural Enrollment[b]	Total Plans	Avg. # of plans available to beneficiaries[c]	Avg. # of payers offering plans[c]
United States	45.7%	38.8%	3,815	38.5	10.2
Minnesota	55.0%	50.6%	93	36.4	7.4
Montana	24.8%	22.4%	25	13.4	4.5
North Dakota	26.0%	20.9%	32	21.1	6.0
South Dakota	28.7%	25.3%	34	22.3	5.7

a. Total CMS Medicare Advantage enrollment includes other prepaid plans: Local Coordinated Care Plan (CCP), Regional CCP, Medical Savings Accounts (MSA), Private Fee-For-Service (PFFS), Demonstrations, National Programs of All-Inclusive Care for the Elderly (PACE), Health Care Prepayment Plans (HCPP), and Employer Direct PFFS.
b. Proportion of Medicare eligible population in rural counties enrolled in a Medicare Advantage plan.
c. Average plan and payer counts are weighted by number of eligible beneficiaries in each county.
Source: RHV analysis of CMS data on Medicare Advantage plan enrollment and payers[8].

Comparing North Dakota Medicaid and commercial insurer value-based plans to other states is beyond the scope of this environmental scan, requiring contact with each individual state Medicaid program and insurance commissioner office. However, based on federal value-based payment program prevalence, it appears that Medicaid and commercial insurer value-based payment participation in North Dakota is less common than in the U.S. and less common than in adjacent states.

North Dakota Value-Based Payment Activity

Although not as prevalent as elsewhere in the nation, Medicare Advantage, Medicare SSP (Tables 30 and 31), and CMMI value-based payment models operate in North Dakota. The Medicare SSP is the Medicare ACO program in which Medicare shares savings with an ACO if the ACO achieves cost savings and certain quality performance benchmarks. The Medicare SSP is established in federal law. Thus, it is not a time-limited model. Nine North Dakota CAHs and their clinics, and one urban site, participate in the SSP through the ACO aggregator Signify Health. Four urban facilities and one rural clinic are participating in the Essentia (Minnesota-based) ACO. Although shared savings data are not publicly available at an individual healthcare organization level, several of the North Dakota participants report receiving shared savings. The Frontier Community Health Integration Project is limited to rural hospitals, including three in North Dakota. The remaining CMMI models located in North Dakota predominantly operate in urban areas (Table 31).[11,12]

Table 31: CMS and CMMI Activity (other than SSP) in North Dakota, 2023

CMMI Models	Urban Sites	Rural Sites
Comprehensive Primary Care Plus (CPC+, inactive)	18	9
Primary Care First (PCF)	18	2
FQHC Advanced Primary Care Practice (inactive)	0	1
Frontier Community Health Integration Project (FCHIP)	0	3
Million Hearts (inactive)	1	2
Bundled Payments for Care Improvement (BPCI)	0	0

Source: CMS "Where Innovation is Happening"[11]

- *Comprehensive Primary Care Plus (CPC+)* –CPC+ was a national advanced primary care medical home model that aimed to strengthen primary care through regionally based multi-payer payment reform and delivery transformation. The CPC+ model is no longer active, but the CMMI website lists 27 North Dakota practices that participated in the model. Nine of those 27 practices were in rural areas.
- *Primary Care First (PCF)* – Built on CPC+ primary care concepts, PCF implements a set of voluntary five-year payment structures to support delivery of advanced primary care. Fourteen North Dakota practices are participating in the PCF model. Two of those practices are in rural areas.
- *Federally Qualified Health Center (FQHC) Advanced Primary Care Practice* – This model is no longer active. Participating FQHCs were expected to achieve Level 3 patient-centered medical home recognition, help patients manage chronic conditions, and actively coordinate care for patients. The CMMI website lists one rural North Dakota FQHC participant.

- *Frontier Community Health Integration Project (FCHIP)* – FCHIP expands and integrates some CAH payments to help keep patients within the community who might otherwise be transferred to distant providers. Three North Dakota CAHs participate in FCHIP.
- *Million Hearts* – This model is no longer active. The Million Hearts® Cardiovascular Disease (CVD) Risk Reduction Model was a randomized controlled trial that sought to bridge a gap in cardiovascular care by providing targeted incentives for health care practitioners to engage in beneficiary CVD risk calculation and population-level risk management. Three out of the four North Dakota participants were in rural areas.
- *Bundled Payments for Care Improvement (BPCI) Advanced* – BPCI Advanced is a voluntary episode-based payment model that combines physician, hospital, and other service reimbursements into a single bundled payment to reduce expenditures and improve quality of care. BPCI Advanced builds on past bundled payment initiatives to include payments for 34 Clinical Episodes. One urban North Dakota system participates in this model.

Medicaid and Commercial

North Dakota Health and Human Services is currently developing a Medicaid value-based payment strategy for prospective payment system (PPS) hospitals in the state. That program is to be fully operational in 2025. However, there are currently no publicized plans for rural CAH participation in Medicaid value-based payment.

Blue Cross Blue Shield of North Dakota (BCBSND) offers value-based payment plans for its commercial and Medicaid Expansion patient populations. BlueAlliance is the program for the commercial BCBSND enrollees and BlueAlliance Care+ is the program for the Medicaid Expansion enrollees. The BCBSND website notes different quality and performance measures for small, mid-size, and large providers. The quality measures assessed for small providers in 2023 include:

- Primary Care Visits
- Post-Discharge Follow Up
- Potentially Preventable ER Visits
- Potential Preventable Admissions
- Breast Cancer Screening
- Colorectal Cancer Screening

The BCBSND value-based programs include a patient-centered medical home foundation. For mid-size and large providers, a total cost of care performance measure is added. The BCBSND value-based plans are being redesigned in 2023 for 2024 implementation. Specific plan details, provider requirements, and rural/urban participation rates are not publicly available.[13]

Commercial value-based payment plans other than BCBSND are much less prevalent in North Dakota but include Medica (based in Minnesota) and Sanford Health (based in South Dakota).[14] Altru and You is an ACO collaboration between Altru Health System and Medica, providing health care and insurance coverage in North Dakota and Minnesota. The degree to which these commercial plans include value-based payments to hospitals and clinics is unknown.

Public Policy Environment and Payment Policies of Commercial Insurers

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Four streams of policy activity impact the abilities of healthcare organizations (HCOs) – including rural hospitals and their affiliated clinics – to take full advantage of innovative approaches to meeting community health objectives. They are: 1) federal payment policies in the Medicare program; 2) federal regulatory policies in Medicare; 3) state payment policies in the Medicaid program; and 4) state regulatory policies. These themes emerge from the narrative in this chapter:

- Payment policies, both federal and state, are evolving from being based solely on fee-for-service (FFS) to payment systems incorporating process and outcome measures linked to value, with the eventual intent of transitioning out of FFS.
- Regulatory policies are evolving to facilitate new models of delivering services, including changes in sites of care (facilitated by telehealth), healthcare personnel functions (clinicians practicing to top of license, nonclinical personnel), use of different personnel within health teams in delivering value, and specific measures used in facility licensing and accreditation.
- Policy changes are implemented incrementally, creating multiple opportunities for rural HCOs and others to participate directly in developing those changes.

FEDERAL POLICIES

Given the data reported elsewhere in this scan -- the percentage of North Dakota's population 65 and over, the percent of hospital inpatient and outpatient revenue associated with Medicare beneficiaries, and the importance of addressing chronic conditions that are leading causes of death – this chapter leads with a discussion of federal policies. The primary focus is Medicare payment and related regulations, with a quick overview of other relevant policies that should draw attention of North Dakota HCOs and related organizations.

Medicare Payment Policies

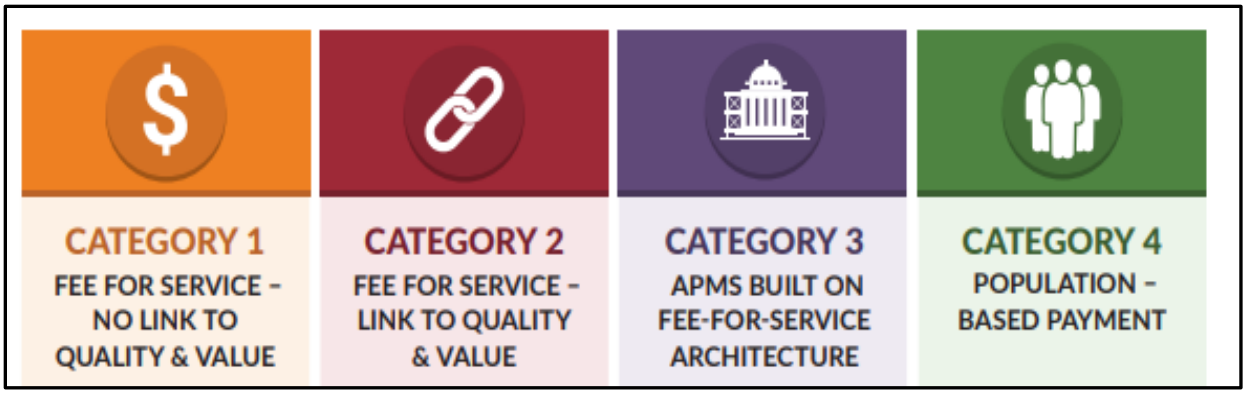
Two trends in Medicare payment policies warrant attention from North Dakota rural HCOs and rural health stakeholders: the growing role of Medicare Advantage (MA) plans in determining provider payment and the increasing momentum to shift Traditional Medicare payment policies to value-based payment (VBP) models. MA is treated as an alternative payment methodology by the Centers for Medicare & Medicaid Services (CMS) because the methodology for federal payment is capitated payment based on prior total Medicare expenditures (with adjustments) by county. Current VBP methodologies with the largest percentage of Medicare beneficiaries (e.g., shared savings, bundled payment, hospital payment adjustments as penalties and rewards), urban and rural, retain FFS but introduce quality metrics as additional drivers of payment. More detail is provided in the following subsections, including points of leverage for change in policy development and implementation.

Traditional Medicare and the March to Value-Based Payment

Policy attention is shifting from a singular focus on fighting the COVID-19 pandemic to once again focusing on transformation from volume-based payment to VBP and meeting the triple aim of improving patient experience of care, improving population health, and lowering healthcare costs. Medicare payment policies since implementation of the Patient Protection and Affordable Care Act 2010 have been intended to advance VBP, moving across the four categories of payment in the Health Care Payment Learning and Action Network (HCPLAN) framework shown in Figure 17.

Current payment systems are in categories 2 and 3 of the framework, mostly still using a FFS design, but with elements of value added on, such as incentives and penalties based on quality metrics; and shared savings programs. New goals published by CMS in 2022 include having 100% of Medicare beneficiaries served by providers in advanced payment models (APMs) by 2030 (counting MA as an advanced payment model because Medicare's payment to the plans is based on capitation).

Figure 17. HCPLAN APM Framework APM Framework[1]



Specific actions from CMS to reach the 2030 goal will significantly impact payment to rural HCOs; the direction of impact (positive or negative) will be a function of legislation, final rules implementing systems, and adaptive actions taken by rural HCOs.

Rural HCOs (likely through national and state rural health and hospital associations) and associated stakeholders should monitor national proposals to modify Medicare payment policies. ***Opportunities will arise to inform members of Congress about rural impacts of modifications to hospital and physician payment. These include changes to eligibility for designations such as Critical Access Hospital (CAH) and Rural Health Clinic (RHC) as well as proposals to change elements of payment such as 340B and sequestration. Rural stakeholders should comment on proposals during the regulatory process, including annual updates to hospital payment policies (inpatient prospective payment, CAH cost-based payment, outpatient payment).***

Rural HCOs could adapt to new payment design in ways that take advantage of policy shifts that may offer opportunities to generate new revenue streams consistent with changes in health care delivery modalities. As of 2023 the major Traditional Medicare payment shift is to encourage more providers to participate in the shared savings program (SSP), which could be opportunities for CAHs and RHCs to benefit from savings (reduced total spending versus benchmarks) to the Medicare program. Changes are intended to increase participation by inexperienced ACOs (less than 40 percent of ACO applicant's providers have previously participated in the SSP) and low revenue ACOs (total participant provider Medicare revenue is less than 35 percent of total Medicare expenditures for assigned beneficiaries) – an intent to expand ACO presence in rural areas. A full description of the changes is available from the Rural Health Value web site. The changes include:

- Longer time in Basic Track A (upside risk only), for inexperienced ACOs, up to 7 years
- Advanced Interest Payment: one-time $250,000 and quarterly per-beneficiary payments for the first 2 years
- Changes to the minimum savings rate (MSR) to allow shared savings at half the regular rate until the MSR is met
- Introduce Accountable Care Prospective Trend to adjust benchmarks calculated based on national and regional rates
- Reduce Negative Regional Adjustment Cap from 5% to 1.5%

- Adjustment for Prior Savings: adding back into benchmark a portion of savings generated by ACOs
- Risk Score Growth Cap Adjustment: allow flexibility within a 3 percent cap on growth in the risk score
- Sliding Scale for Shared Savings and Losses: sharing a percentage of savings when ACO quality performance is below 30th percentile but at least in 10th percentile in one of four outcome measures.

Rural HCOs, including CAHs, who are not current or previous participants in ACOs (and therefore qualify as inexperienced) should assess participating in an ACO that can take advantage of the new provisions. HCOs who are currently participating in ACOs, or who are considering doing so in the near future, should be implementing strategic plans that accomplish three objectives: 1) retaining and expanding services in the local setting when done in the most cost-effective manner possible (avoiding higher cost settings); 2) investing in care management initiatives that lower patient utilization of expensive services, thereby increasing savings; and 3) engaging community-based organizations in programs to help Medicare beneficiaries maintain optimum health and therefore avoid using expensive clinical services.

Other changes to Medicare payment affect rural HCOs and their transition to value-based care. Payment that at a minimum sustains current patient revenue levels is a critical consideration. Therefore, extending designations such as low-volume and Medicare-Dependent hospitals through September 30, 2024 (in the Omnibus appropriation bill passed in December 2022) is an important policy success for rural providers, but also an indication that the issue will be back in less than two years. Another important consideration is physician payment, which was cut by 2 percent for 2023, and faces a 3 percent cut in January 2024.

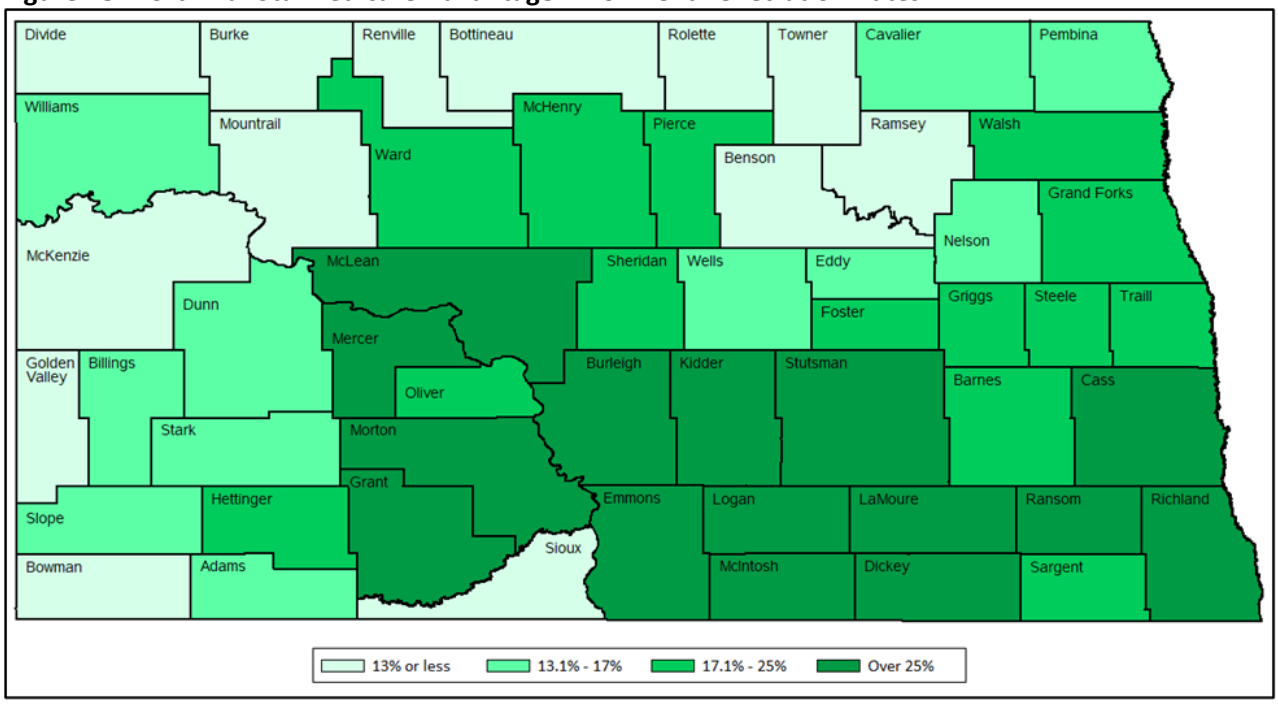
Medicare payment also influences a critical element of rural healthcare – supply of healthcare professionals. The Omnibus appropriations bill increased Medicare Graduate Medical Education (GME) residency slots by 200 positions for fiscal year 2026 and requires that at least 10 percent of new positions be in rural hospitals. This increase followed an increase of 1,000 GME slots in the Consolidated Appropriations Act of 2021. One of the four categories specified for the new positions is hospitals in rural areas; another is hospitals that serve areas designated as health professional shortage areas. Another change in Medicare payment policy could help support serving rural patients – coverage for services provided by marriage and family therapists and licensed professional counselors starting in January 2024. ***Rural HCOs and state associations should work to take full advantage of Medicare GME slots, and direct payment for providers needed in rural places, to build and sustain essential services. They should also participate in discussions of any further initiatives that provide Medicare payment (increases or new authority) that bolster rural resources.***

<u>Medicare Advantage</u>

The effect of MA plan growth is something of a “sleeper issue” in rural health policy discussions, principally because there are obvious payment policy levers to pull in Traditional Medicare, whereas MA plan payment to providers (facilities and clinicians) is not directly determined by federal legislation and regulation. That said, the impact of MA plan payment on rural HCOs is steadily becoming more obvious by virtue of beneficiary enrollment. The percentage of rural beneficiaries in MA plans nationally has increased from 36.8 percent in 2021 to 37.8 percent in 2022; for all of North Dakota the comparable

numbers are 21.7 and 26.0 percent. There is considerable variability across counties, shown in Figure 18 and appended Table 32; in rural and micropolitan North Dakota counties the percentage reaches above 30 percent in a few counties and is above 20 percent in several counties.[2] In those places, payment set in contracts with MA plans could influence the fiscal health of HCOs.

Figure 18. North Dakota Medicare Advantage Enrollment Penetration Rates*



* Proportion of eligible Medicare beneficiaries enrolled in Medicare Advantage plan as of March 2022.

MA contracts are between plans and providers, with terms generally determined by the plans (for example, setting hospital payment as a percent of charges, a function of Medicare payments as determined by the prospective payment system, or on a cost basis for critical access hospitals). Although government policies do not have a direct role in those contracts, there are policy levers that can influence contract negotiations and other activities of MA plans:

- Rules for network adequacy: These include time and distance requirements measuring access from beneficiary residence, requiring that 85 percent of enrollees live within the standards. For example, the time and distance requirements for access to inpatient hospital services in rural counties are 85 minutes and 70 miles; for micropolitan counties 80 minutes and 60 miles.[3] Changes can be made during the annual rule-making process, as was done in 2022 when the percent of beneficiaries was reduced to 85, and the standard could be met with telehealth providers.[4] ***Network adequacy standards may strengthen the negotiating position of rural HCOs, especially in frontier areas.***
- Resources to address population health: Federal policies define eligibility of expenses as part of the medical loss ratio and therefore contributing to the required minimum loss ratio (85%). In recent years, additional services have been explicitly allowed as supplemental benefits, including telehealth and supplemental benefits for the chronically ill in 2020. ***Collaborations***

between HCOs and MA Plans may present means of using capitated payments to strengthen local community-based services.

Table 32. North Dakota Medicare Advantage Enrollment Penetration Rates*

County	Medicare Eligibles	Percent Enrolled in MA
Burleigh	18,359	34.1
Cass	27,198	31.6
Grand Forks	11,228	24.9
Morton	6,351	40.9
Oliver	476	19.7
Sioux	453	11.0
Adams	662	16.5
Barnes	2,715	24.6
Benson	1,111	11.4
Billings	192	15.1
Bottineau	1,702	4.1
Bowman	777	12.9
Burke	488	3.5
Cavalier	1,057	14.5
Dickey	1,161	25.9
Divide	529	0.0
Dunn	826	14.3
Eddy	630	15.7
Emmons	986	28.8
Foster	786	23.7
Golden Valley	421	0.0
Grant	670	28.7
Griggs	695	23.2
Hettinger	639	18.5
Kidder	656	36.7
LaMoure	1,104	33.4
Logan	503	34.0
McHenry	1,342	23.0
McIntosh	853	30.7
McKenzie	1,258	0.0
McLean	2,567	25.8
Mercer	1,967	29.0
Mountrail	1,471	3.1
Nelson	972	15.8
Pembina	1,840	15.4
Pierce	1,062	23.6
Ramsey	2,699	13.0
Ransom	1,310	28.2
Renville	564	4.8
Richland	3,505	33.1
Rolette	2,222	4.6
Sargent	939	22.2
Sheridan	431	20.0
Slope	180	15.0
Stark	4,952	16.3
Steele	489	22.7
Stutsman	4,941	44.1
Towner	651	12.9
Traill	1,740	17.9
Walsh	2,604	17.1
Ward	10,443	24.9
Wells	1,189	14.0
Williams	4,087	13.2

* Proportion of eligible Medicare beneficiaries enrolled in Medicare Advantage plan as of March 2022.

There may be more opportunities to influence federal requirements of MA plans in the next few years. Recent attention to MA plan practices in upcoding (recording a condition at a higher level of acuity than it should have been) as a means of increasing severity scores and therefore payment, and concerns about improper payment has made scrutiny of MA plans a priority for members of Congress – one US Senator (Grassley, R-IA) used the phrase "paint a giant bulls-eye" -- and alerted CMS to the need to act.[5] There could be opportunities to address other concerns about the impact of MA plan enrollment on rural health care delivery.

Medicare and Medicaid Innovations

The CMS Center for Medicare & Medicaid Innovation (CMMI) was established by the Patient Protection and Affordability Act to promote innovation in the Medicare program (and in some instances the

Medicaid program) that could lead to changes in Medicare payment and regulatory policy. There is considerable debate about its success after ten years, especially if measured as savings or costs resulting from the more than 50 demonstration programs initiated in that time. Analysis by Avelere published in August 2022 estimated a net loss of $9.4 billion 2017-2026. In contrast (but not necessarily contradictory) CMMI's 2022 report to Congress identified specific examples of net saving from specific programs. Regardless of the debate about net savings, CMMI continues to develop models. While many of the programs call for large populations of beneficiaries and therefore are implemented predominantly in urban areas, there have been, and are, programs with rural participants. The Rural Health Value team maintains a catalog of value-based initiatives, including reporting rural participation.

One CMMI model, the Community Health Access and Rural Transformation Model (CHART), was originally intended to include both Transformation and ACO tracks. There were four participants in the Transformation track (two have withdrawn) and the ACO track was removed from the model in February 2022 "given broader efforts underway," which were described in the earlier section of this chapter (ACO rule changes). The Transformation track aims included changes to hospital payment in a multi-payer model that requires participation by the State Medicaid agency. That element of the model has yet to be implemented; hospitals in the four states declined to participate in the model. Given the realities of the CHART Model, CMS/CMMI is currently working to develop a different model to test. As of the end of February 2023 no announcement has been made; agency staff have been gathering input regarding potential elements of a model as well as what has been learned from previous rural innovation demonstrations. The Rural Health Value team published findings from a discussion among rural providers and organizations with lessons learned about elements of successful value-based care models. ***Rural HCOs and rural health associations/organizations should seek venues to provide input in CMMI development of rural models; and should examine existing and new demonstrations for opportunities to advance value-based care and payment in rural places.***

While much of the attention in national policies is aimed at Medicare providers, national actions influence State Medicaid programs. The CHART Transformation Track is an example since participation by state Medicaid agencies is mandatory in demonstrations of capitated payment models. Similarly, the Pennsylvania Rural Health Model includes Medicaid as a payer in all-payer global budgeting for participating hospitals. Beyond those specific examples of CMMI programs involving State Medicaid, CMS has published letters to State Medicaid directors (SMDs) encouraging them to adopt value-based strategies. On September 15, 2020, SMD letter #20-004, in 33 pages, provided background and specific payment strategies that states could use, and replicate, to advance value-based care. State examples are provided for each strategy. A series of CMS letters to SMDs have highlighted opportunities to address social determinants of health (SDOH). On January 7, 2021 CMS issued a 51-page letter to State Health Officials with detailed opportunities to use funds under Medicaid and the Children's Health Insurance Program (CHIP) to pay for services addressing SDOH (SHO# 21-001). Medicaid funds could be used for nutritious food, affordable housing, transportation, safe neighborhoods, and opportunities for employment. More recently, on January 4, 2023 CMS released a letter to State Medicaid Directors (SMD#: 23-001) with requirements that states must meet to use Medicaid funds to reduce health disparities and address unmet health-related social needs. Waivers under this authority have been approved in New Mexico, Arizona, Arkansas, Massachusetts, and Oregon. The Arkansas waiver includes meeting the needs of four at-risk populations, one of which is rural residents with serious mental illness and/or substance use disorders. ***Rural HCOs and rural health associations/organizations should***

collaborate with State Medicaid agencies to take advantage of federal waivers to help fund community-based services addressing SDOH, as a component of value-based care.

Other Federal Policies (HHS and USDA)

In addition to payment policies, federal agencies are responsible for implementing other congressional initiatives intended to bolster healthcare services in rural areas. Within the U.S. Department of Health and Human Services those include programs designed to improve recruitment of healthcare professionals to rural places. Health professions training programs within the Health Resources and Services Administration (HRSA) include:

- Bureau of Health Workforce programs include the National Health Service Corps, loan repayment programs, student loans, and the Conrad 30 visa program. Of particular note to rural communities is the Nurse Corps Workforce program, with more than 2,300 clinicians providing care to underserved patients, 20 percent of whom serve in rural communities. These programs have grown in recent years; their impact is a function of the level of annual appropriations.
- The Federal Office of Rural Health Policy (FORHP) also supports rural public health workforce development through a public health workforce training network grant program, which has training tracks in community health support, health information technology, community para-medicine, and case management staff and/or respiratory therapists.
- The Rural Residency Planning and Development Program provides annual grants to develop new residence programs or rural track programs through one of two pathways: primary care and high need specialty, or maternal health and obstetrics.

The Centers for Disease Control and Prevention received increased funding in the Consolidated Appropriations Act 2023 for public health infrastructure and capacity, which included reauthorizing the community health worker program, focused on medically underserved areas. This includes funding to recruit, hire, train, and retain community health workers. The program for accredited continuing medical education for primary care providers in rural health clinics and community health centers was reauthorized.

Rural HCOs and associated organizations should continue supporting healthcare workforce training programs and take advantage of opportunities for federal support to recruit and retain health workers in rural communities, with special focus on those that contribute to redesigning the system to improve value.

The U.S. Department of Agriculture (USDA) has supported rural hospitals through its Rural Development program, especially the Community Facilities Programs that provide direct loans and grants, and loan guarantees. Those funds have financed new construction, and expansion of broadband to health facilities. With funding through the American Recovery Act, USDA has implemented a grant program that supports efforts focused on long-term sustainability of rural health. The funds must be used in relation to the COVID-19 pandemic, which is defined broadly to include addressing economic conditions arising from the COVID-19 emergency. Initial awards were announced on April 13, 2022; they included grants to upgrade telehealth and telemedicine capabilities, reimburse hospitals for lost revenue, and purchases of medical equipment. Additional grants may be awarded in future cycles. If successful, this program may be considered as a USDA contribution to rural development in the next Farm Bill, which

will be written during the current session of Congress. ***Rural HCOs should monitor USDA programs as sources of investment capital supporting transitioning to value-based care, including what may be discussed for inclusion in the Farm Bill as it is developed in the 118th Congress.***

STATE POLICIES

State Medicaid programs provide leverage for states to influence both total patient revenue flowing to rural HCOs and payment methodologies, making State Medicaid Agencies (SMAs) critical decision makers in the shift to value-based payment. Additionally, state regulatory policies present direct leverage in redesigning health care delivery, particularly regarding optimum use of healthcare providers (clinical and community health workers) and new technologies (particularly telehealth). Actions of commercial insurance plans are also considered here since their policies for negotiations with providers will influence prospects for rural HCO success in new payment design.

Medicaid Policies

Policy levers in the Medicaid program influence payment to providers, either directly through state-administered payment systems, or indirectly through contracts with Medicaid managed care organizations (MCOs). Additionally, Medicaid policies regarding what is eligible for payment may accelerate momentum in transition to value-based payment (VBP), for example paying for nutritious food to improve health status.

National Activities

Eligibility for Medicaid coverage is a state-level determination and will have renewed importance as the continuous enrollment provision of the public health emergency expires in March 2023 and the enhanced federal match is phased out by the end of 2023. *The number of rural residents qualified for Medicaid will change after March 31, 2023 as a function of state policies, affecting payment to rural HCOs*. Further, the eleven states who have not expanded Medicaid per the eligibility standards available with federal match through the ACA may act to do so. Conversely, states that expanded Medicaid eligibility, but for a defined number of years, may opt to revert to pre-expansion status (North Dakota is among those states). State decisions regarding Medicaid expansion affect payment for patient services provided by rural HCOs.

Payment policies in states administering the program's interactions with providers may incorporate elements of VBP. CMS provides technical assistance to states interested in designing alternative delivery systems and moving to VBP through the Medicaid Innovation Accelerator Program; a number of states have benefited from the program since it began in 2016. Additionally, Section 1115 Medicaid waivers can be used to support spending on benefits not included in traditional Medicaid, including addressing population health. State Medicaid programs using MCOs to administer provider payment may use contracts to require MCOs to implement VBP models. As of July 2022, 29 states require MCO to implement VBP models and 26 define the types of models that must be implemented. State Medicaid program activities in VBP are tracked by the Center for Health Care Strategies; the most recent report was published in November 2022. ***State Medicaid programs are increasingly sources of demonstrating new approaches in VBP which will affect both rural Medicaid clients and rural HCOs; actively engaging State Medicaid Agencies and MCOs is an important element in strategies to shift to VBP.***

Medicaid in North Dakota

Medicaid beneficiaries in North Dakota who are currently enrolled as a result of the extension during the public health emergency are being notified of actions they must take to update contact information. They will be informed about their coverage, as well as provided with the opportunity to renew their enrollment, if eligible. A web site is dedicated to providing information, and the state has contracted with a communications firm to provide outreach and information.

North Dakota initially accepted federal funding for expansion in 2013 and has extended participation in subsequent years, currently through 2024 (per budget action). Currently, Blue-Cross Blue Shield (BCBS) administers the program for the eligible population through expansion (with the exception of 19- and 20-year-olds). BCBS is responsible for determining the methodology for direct payment to providers treating expansion-eligible patients, and the North Dakota Medicaid program is responsible for payment on behalf of other Medicaid recipients, using fee schedules established and updated by the North Dakota Health and Human Services Department. BCBS is currently developing a VBP approach to its engagement with Medicaid providers.

Rural HCOs in North Dakota should be engaged in processes to inform local residents of steps needed to continue Medicaid enrollment (if eligible). Rural HCOs should also continue working with the State and with BCBS regarding payment methodologies and fee schedules.

Regulatory Policies

Considerable detail is necessary to assess the total landscape of state regulations affecting deployment of healthcare professionals, use of advanced treatment modalities, location and reconstruction of healthcare facilities, and insurance policies. The Rural Health Value team recommends using the Health Workforce Technical Assistance Center to learn of state activities regarding any healthcare profession. Their web site includes an extensive library of resources, including model scope-of-practice legislation and literature reviews based on issues in workforce planning. We also recommend using the database maintained by the National Conference on State Legislatures, although it is a bit dated. The important issue, always subject to debate, is allowing healthcare professionals to practice to the top of their license, taking full advantage of skill sets to provide the maximum possible access to care.

In 2023 a high priority in many states will be developing licensure rules for Rural Emergency Hospitals (REHs) - as of January 2023 four states had passed applicable laws (Kansas, Nebraska, South Dakota, and Michigan) and one state (Texas) used its emergency regulatory process to promulgate new rules for immediate use (one hospital has worked through the entire state and federal process). Other hospital regulatory policies may require change as delivery systems evolve. As a specific illustration of the importance of regulation, use of telehealth as a tool in achieving the quadruple aim and extending care to rural residents is influenced by state regulations. Among the specific *elements of telehealth regulations are*:

- services that can be delivered via telehealth (current considerations include prescriptive authority for controlled substances, remote patient monitoring);
- eligibility for payment and parity with other service modalities; and supervision of health professionals.

North Dakota HCOs entering VBP arrangements that rely on improved access to primary care and preventive health services will need to consider appropriate use of health professionals and modalities (including telehealth) consistent with existing policies; and enter into discussions to change those policies as necessary and appropriate.

Commercial Insurance Payment

While not always included in a review of public policies, the activities of commercial insurance plans must be included in any environmental scan of factors impacting rural HCO transformation to VBP. Commercial insurance payment is vital to the financial success of healthcare providers. In North Dakota 59% of the population is insured through employer-based insurance plans, compared to 15.4% covered by Medicare and 11.2% covered by Medicaid (data as of 2021). Commercial insurers generally pay at higher rates than either Medicare or Medicaid; a study using 2017 data found that if commercial insurers matched Medicare fees, hospitals would have lost more than 30% of their patient revenue. Further, commercial insurance now includes approximately 50 percent of Medicare beneficiaries who are enrolled in Medicare Advantage plans operated by commercial carriers.

Beyond consideration of total patient revenue, determinations of services eligible for payment and participation in investment costs of transitioning to VBP, are potential activities of commercial plans that could accelerate movement to value-based care. For example, there are more active commercial carrier ACO contracts than there are in the Medicare and Medicaid programs (995, 625, and 139 respectively).[6] Considerable variation exists across commercial plan approaches to VBP. Most of the activity is in Category 3 of the HCPLAN framework - APMs that are still based on a FFS design, but incorporating measures related to value. Like the evolution of VBP in public programs, commercial carriers may start with incentive payments for preventive care services, then reporting on quality metrics, followed by adjusting payment based on quality measures. They may also build into their payment programs disincentives based on expenditures deemed avoidable (e.g., preventable hospitalizations).

Successful negotiations with commercial insurance plans are foundational to supporting value-based care that serves the interests of rural residents and providers. Two current trends in health care influence the success of such negotiations. First, consolidation and affiliation activities among both HCOs and insurance carriers, combined with public policies regarding network adequacy, affect the power dynamics of such negotiations. Second, evidence about the impact of new payment models drives desires by all parties to move deeper into VBP (e.g., through Category 3 into Category 4). Both trends are in the direction of suggesting more agreement on value-based models. ***Rural North Dakota HCOs should stay abreast of, if not ahead of, the trend of greater insistence on value-based care in negotiations with commercial insurance***.

CONCLUSION

This discussion of policy trends supporting the transition from volume-based to value-based payment identified specific opportunities for rural HCOs to help shape new payment models that would benefit them and the residents they serve. Multiple recommendations were offered throughout the preceding text which would position rural North Dakota HCOs for success in sustaining local services that benefit their communities.

Appendices

Background Chapter

References

1. State of North Dakota. (2023). North Dakota, be Legendary. Accessed 2/15/2023 at https://www.nd.gov/.
2. U.S. Census Bureau. (2022). North Dakota: 2020 Census. Accessed 2/15/2023 at https://www.census.gov/library/stories/state-by-state/north-dakota-population-change-between-census-decade.html.
3. University of North Dakota. (2022). CDC Equity Project Consultant RFP.
4. U.S. Bureau of Labor Statistics. (2022). American Community Survey. Accessed 2/15/2023 at https://www.bls.gov/cex/cecomparison/acs_profile.htm.
5. U.S. National Archives, Federal Register. (2022). 2020 Standards for Delineating Core Based Statistical Areas. Accessed 2/15/2023 at https://www.federalregister.gov/documents/2021/07/16/2021-15159/2020-standards-for-delineating-core-based-statistical-areas.

Population Demographics Chapter

References

1. North Dakota Compass. (2022). Population Trends, North Dakota. Accessed 2/14/2023 at https://ndcompass.org/trends/Population%20Trends%20October%202022.pdf
2. U.S. Census Bureau. (2022). The Ranking Project, Estimated Rankings of all States. Accessed 2/14/2023 at https://www.census.gov/csrm/rankings/

Chapter Notes

County-level data on population characteristics were obtained from the U.S. Census Bureau's American Community Survey (ACS, https://www.census.gov/programs-surveys/acs). Multiple versions of the data were used as need required. These included the one-year estimate datasets for 2016-2021, and the five-year estimates for 2016 and 2021.

The demographic measures in this report include:

- Age – Ages of respondents are reported in years. Note that the column for <18 is all people under 18 years, including people under 5 years.
- Race – Race of respondent. Reported categories include:

  - White alone
  - Black or African American alone
  - American Indian and Alaska Native alone
  - Asian alone
  - Native Hawaiian and Other Pacific Islander alone
  - Some other race alone
  - Two or more races
- Ethnicity – Is the person of Hispanic, Latino, or Spanish origin?
- Education – The highest degree or level of school the person has completed. Percentages are based on the total population 25 years and older. "Some college" includes persons completing an associate degree (e.g. AA, AS). "Graduate or professional degree" includes persons completing a master's degree (e.g. MA, MS, MSW, MBA), and/or professional degree (e.g. MD, DVM, JD), and/or doctorate degree (e.g. PhD, EdD).
- Income, Median Household – Median household income in the previous 12 months.
- Income, Under 100% FPL – Percentage of the population for whom poverty status is determined below 100 percent of the poverty level.
- Income, Under 150% FPL – Percentage of the population for whom poverty status is determined below 150 percent of the poverty level.
- Unemployed – Percentage of the civilian noninstitutionalized population 18 to 64 in the labor force but unemployed. The ACS uses a series of seven questions to classify an individual's employment status; these questions ask about work status, layoff, job search, and availability for work.
- Insured – Percentage of the civilian noninstitutionalized population without health insurance coverage.
- No Vehicle – Percentage of households with no vehicle available.
- Drive more than 1 hour to work – Percentage of workers 16 years and over who did not work from home and travel 1 hour or more to work.

Population Health Conditions Chapter

References

1. Centers for Disease Control and Prevention. (2023). CDC WONDER. Accessed 2/15/2023 at https://wonder.cdc.gov.
2. National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). (2023). Chronic Disease Data. Accessed 2/15/2023 at https://www.cdc.gov/chronicdisease/index.htm.
3. Centers for Disease Control and Prevention. (2023). National Center for Health Statistics, Stats of the State of North Dakota. Accessed 2/15/2023 at https://www.cdc.gov/nchs/pressroom/states/northdakota/northdakota.htm.
4. Kaiser Family Foundation. (2022). State Health Facts, Number of Deaths per 100,000 Population. Accessed 2/15/2023 at https://www.kff.org/other/state-indicator/death-rate-per-100000/

Chapter Notes

State-level data on chronic disease prevalence was obtained from the CDC's Chronic Disease Indicators database, 2017 and 2021 (https://chronicdata.cdc.gov/Behavioral-Risk-Factors/Behavioral-Risk-Factor-Surveillance-System-BRFSS-P/dttw-5yxu/data).

County-level health data on health-related factors was obtained from the "CDC PLACES: Local Data for Better Health" project (https://www.cdc.gov/places/).

All cause of death data was obtained using CDC's WONDER database (https://wonder.cdc.gov/).

- Chronic Disease and Health Status Measures
  - BRFSS respondents aged≥18 years who report having been told by a doctor, nurse, or other health professional that they had arthritis.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they have any other types (besides skin) of cancer.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they have kidney disease.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they had chronic obstructive pulmonary disease (COPD), emphysema, or chronic bronchitis.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they had angina or coronary heart disease.
  - Weighted number of BRFSS respondents who answer "yes" to both of the following questions: "Have you ever been told by a doctor, nurse, or other health professional that you have asthma?" and "Do you still have asthma?"
  - BRFSS respondents aged≥18 years who report having been told by a doctor, nurse, or other health professional that they had depressive disorder.
  - BRFSS respondents aged≥18 years who report ever been told by a doctor, nurse, or other health professional that they have diabetes other than diabetes during pregnancy.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they have high blood pressure.
  - BRFSS respondents aged≥18 years who report having been told by a doctor, nurse, or other health professional that they had high cholesterol.
  - BRFSS respondents aged≥18 years who have a body mass index (BMI) =30.0 kg/m² calculated from self-reported weight and height.
  - BRFSS respondents aged≥18 years who report ever having been told by a doctor, nurse, or other health professional that they have had a stroke.
  - BRFSS respondents aged≥18 years who report their general health status as "fair" or "poor."
  - BRFSS respondents aged≥18 years who report 14 or more days during the past 30 days during which their mental health was not good.
  - BRFSS respondents aged≥18 years who report 14 or more days during the past 30 days during which their physical health was not good.

- Cause of death ICD-10 Codes
  - Diseases of heart (I00-I09,I11,I13,I20-I51)

- Malignant neoplasms (C00-C97)
- COVID-19 (U07.1)
- Alzheimer disease (G30)
- Accidents (unintentional injuries) (V01-X59,Y85-Y86)
- Chronic lower respiratory diseases (J40-J47)
- Cerebrovascular diseases (I60-I69)
- Diabetes mellitus (E10-E14)
- Influenza and pneumonia (J09-J18)
- Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)
- Chronic liver disease and cirrhosis (K70,K73-K74)
- Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)
- Essential hypertension and hypertensive renal disease (I10,I12,I15)
- Septicemia (A40-A41)
- Parkinson disease (G20-G21)

Behavioral and Social Risk Factors Chapter

References

1. The Commonwealth Fund. (2020). 2020 Scorecard on State Health System Performance. Accessed 2/15/2023 at https://www.commonwealthfund.org/sites/default/files/2020-09/Radley_State_Scorecard_2020.pdf.
2. Alderwick H, Gottlieb LM. Meanings and misunderstandings: a social determinants of health lexicon for health care systems. Milbank Q. 2019;97(2):407-419.
3. (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html)

Chapter Notes

County-level health data on health-related factors was obtained from the "CDC PLACES: Local Data for Better Health" project (https://www.cdc.gov/places/). This report summarizes the County Data 2021 release, which provided estimates based on Behavioral Risk Factor Surveillance System (BRFSS) data from 2019. Four sets of tables, based on CDC categories are produced:

County-level data on population characteristics was obtained from the U.S. Census Bureau's American Community Survey (ACS, https://www.census.gov/programs-surveys/acs). Multiple versions of the data were used as the need required. These included the one-year estimate datasets for 2016-2021, and the five-year estimates for 2016 and 2021.

Data on social vulnerability was downloaded from the CDC Agency for Toxic Substances and Disease Registry (ATSDR) web site (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html). Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. The ATSDR uses U.S. Census data to rank each census tract and county on 15 social factors, including poverty, lack of vehicle access, and crowded housing.

Personal Health Risk Behaviors and Prevention Factors include:

- Binge drinking – Adults aged ≥18 years who report having five or more drinks (men) or four or more drinks (women) on an occasion in the past 30 days.
- Smoking – Respondents aged ≥18 years who report having smoked ≥100 cigarettes in their lifetime and currently smoke every day or some days.
- Physically inactive – Respondents aged ≥18 years who answered "no" to the following question: "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"
- Cholesterol Screening - Respondents aged ≥18 years who report having their cholesterol checked within the past 5 years.
- Blood pressure medicine – Among respondents aged ≥18 years who report having been told by a doctor, nurse, or other health professional of having high blood pressure other than during pregnancy, the proportion reporting taking medicine for high blood pressure.
- Routine checkup – Respondents aged ≥18 years who report having been to a doctor for a routine checkup (e.g., a general physical exam, not an exam for a specific injury, illness, condition) in the previous year.

Social and Economic Factors and Physical Environment include:

- Violent Crime Rate – Number of reported violent crime offenses per 100,000 population.
- Injury Deaths – Number of deaths due to injury per 100,000 population
- Air Pollution – Average daily density of fine particulate matter in micrograms per cubic meter (PM2.5)
- High Housing Cost – Percentage of households that spend 30% or more of annual income on housing costs.
- Overcrowded Household – Percentage of households with overcrowding.
- Inadequate Facilities – Percentage of households with lack of kitchen or plumbing facilities

Elderly population risk factors include:

- Elderly, in poverty – Percentage of the population 65 and over for whom poverty status is determined below 150 percent of the poverty level.
- Elderly, disabled – Percentage of the civilian noninstitutionalized population age 65 and over with a disability including hearing, vision, cognitive, ambulatory, self-care, or independent living difficulty.
- Elderly, living alone – Percentage of the population 65 and over living alone.

SVI Themes

- Socioeconomic status
  - Percentile percentage of persons below 150% poverty estimate.
  - Percentile percentage of civilian (age 16+) unemployed estimate.
  - Percentile percentage of housing cost-burdened occupied housing units estimate.
  - Percentile percentage of persons with no high school diploma (age 25+) estimate.
  - Percentile percentage of uninsured estimate.
- Household composition
  - Percentile percentage of persons aged 65 and older estimate.
  - Percentile percentage of persons aged 17 and younger estimate.

  - Percentile percentage of civilian noninstitutionalized population with a disability estimate.
  - Percentile percentage of single-parent households with children under 18 estimate.
  - Percentile percentage of persons (age 5+) who speak English "less than well" estimate.
- Race/Ethnicity/Language
  - Percentile percentage minority (Hispanic or Latino (of any race); Black and African American, Not Hispanic or Latino; American Indian and Alaska Native, Not Hispanic or Latino; Asian, Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander, Not Hispanic or Latino; Two or More Races, Not Hispanic or Latino; Other Races, Not Hispanic or Latino) estimate.
- Housing/Transportation
  - Percentile percentage housing in structures with 10 or more units estimate.
  - Percentile percentage mobile homes estimate.
  - Percentile percentage households with more people than rooms estimate.
  - Percentile percentage households with no vehicle available estimate.
  - Percentile percentage of persons in group quarters estimate.

Health Professionals Chapter

References

1. University of North Dakota, School of Medicine and Health Sciences. (2022). Biennial Report. Accessed 12/19/2022 at https://med.und.edu/publications/biennial-report/index.html.
2. Health Resources and Services Administration. (2022). Area Health Resources File. Accessed 12/19/2022 at https://data.hrsa.gov/topics/health-workforce/ahrf.
3. Centers for Medicare and Medicaid Services. (2022). Data dissemination. Accessed 1/12/2023 at https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination.

Chapter Notes

NPI Data

Data from the National Plan and Provider Enumeration System's National Provider Identifier (NPI) registry for October 2022 was downloaded from their public web site (https://www.cms.gov/Regulations-and-Guidance/Administrative-Simplification/NationalProvIdentStand/DataDissemination).

Note that while the NPI numbers presented in this report are very precise, they still represent estimates. Not all healthcare professionals have an NPI. In particular, providers that do not bill Medicare or Medicaid or that only bill through a group practice or other provider (this is particularly true for advanced practice providers) are not required to have an NPI.

Provider taxonomy data from the Centers for Medicare & Medicaid Services was downloaded (https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/Find-Your-Taxonomy-Code) in order to classify providers. Providers were classified based on NPI taxonomies:

NPI Provider Taxonomy

Advanced Practice Providers
- Anesthesiology Assistant
- Certified Nurse Midwife
- Certified Registered Nurse Anesthetist (CRNA)
- Nurse Practitioner
- Physician Assistant

Behavioral Health Physician
- Physician/Psychiatry
- Psychologist Clinical

Behavioral Health Provider
- Licensed Clinical Social Worker

Dentist
- Dentist
- Oral Surgery (Dentist)

Primary Care Physician
- Physician/Family Practice
- Physician/General Practice
- Physician/Hospice and Palliative Care
- Physician/Pediatric Medicine
- Physician/Sports Medicine

Physician Specialist
- Clinical Cardiac Electrophysiology
- Intensive Cardiac Rehabilitation
- Physician/Addiction Medicine
- Physician/Allergy/ Immunology
- Physician/Anesthesiology
- Physician/Cardiovascular Disease (Cardiology)
- Physician/Dermatology
- Physician/Diagnostic Radiology
- Physician/Emergency Medicine
- Physician/Gastroenterology
- Physician/General Surgery
- Physician/Hospitalist
- Physician/Internal Medicine
- Physician/Interventional Cardiology
- Physician/Interventional Pain Management
- Physician/Interventional Radiology
- Physician/Neurology
- Physician/Neuropsychiatry
- Physician/Nuclear Medicine
- Physician/Obstetrics & Gynecology
- Physician/Ophthalmology
- Physician/Osteopathic Manipulative Medicine
- Physician/Otolaryngology
- Physician/Pathology
- Physician/Physical Medicine & Rehabilitation
- Physician/Preventive Medicine
- Physician/Radiation Oncology
- Physician/Sleep Medicine
- Physician/Urology
- Physician/Podiatry

Hospitals Chapter

References

1. Indian Health Service. (2023). for Patients. Accessed 2/14/2023 at https://www.ihs.gov/forpatients/.
2. UNC Cecil G. Sheps Center for Health Services Research. (2023). Rural Hospital Closures. Accessed 3/17/2023 at https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/
3. American Hospital Association. (2022). AHA Annual Survey Database™. Accessed 12/16/2022 at https://www.ahadata.com/aha-annual-survey-database.
4. University of North Carolina, Finance and Operations. (2023). Glossary. Accesses 12/16/2022 at https://finance.unc.edu/policies-procedures-and-forms/glossary/

Chapter Notes

Cost Report Data

Annual hospital cost report data were obtained from CMS. CMS frequently updates the data (as institutions submit revised reports) and the data in this report are from 2017-2021 data downloaded in January 2023. Note that cost reports are based on hospital fiscal years which will vary from hospital-to-hospital (e.g., in the 2021 cost reports, 62.9% of critical access and acute care hospitals aligned their fiscal year with the calendar year). Further, cost report submissions are reviewed by CMS which frequently requests report modifications. As a result, the data may contain multiple records for any given hospital and not all records are "final". The data used in this report are from the most recent data submission from each hospital, regardless of its final status.

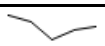
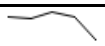
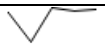
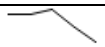
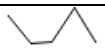
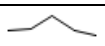
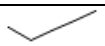
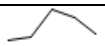
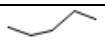
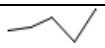
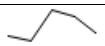
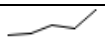
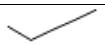
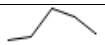
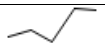
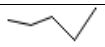
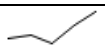
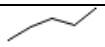
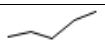
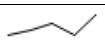
Hospital Financial Metrics[3]

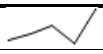
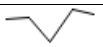
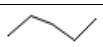
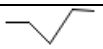
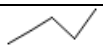
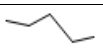
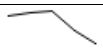
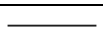
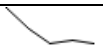
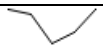
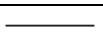
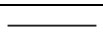
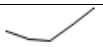
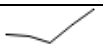
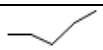
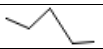
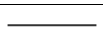
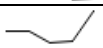
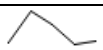
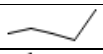
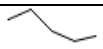
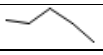
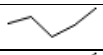
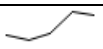
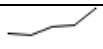
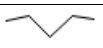
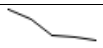
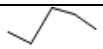
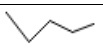
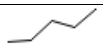
- Current Assets: Cash and other assets that may reasonably be expected to be converted to cash within a year or during the normal operating cycle.
- Fixed Assets: Hospital equipment and structures, including owner-occupied housing.
- Other Assets: Includes intangible assets such as goodwill, unamortized loan costs and other organization costs.
- Total Assets: Sum of all assets including current, fixed, and other.
- Current Liabilities: Financial obligations that are paid within one year.
- Long-Term Liabilities: Debts or other obligations that will not be paid within one year.
- Total Liabilities: Sum of all financial obligations.
- Total Fund Balance: Total assets minus the total liabilities.
- Total Liabilities & Fund Balance: Total fund balance plus the total liabilities.
- Inpatient Revenue: Total revenue generated from inpatient stays.
- Outpatient Revenue: Total revenue generated from outpatients.
- Total Patient Revenue: Sum of inpatient and outpatient revenue.
- Contractual Allowance (Discounts): The differences between revenue at established rates and the amounts realizable from third-party payors under contractual agreements. These adjustments are made to customer, patient, business, or taxpayer accounts as the result of a contractual agreement to provide certain services or products at a previously negotiated price.
- Net Patient Revenue: Revenue collected after all contractual adjustments and bad debts are removed.
- Total Operating Expense: Costs and expenses directly attributable to operations of business activities.
- Operating Income: Net revenue less operating expenses but before all non-operating.
- Income and expenses as well as taxes that result in a profit.
- Other Income (Contributions, Bequests, etc.): Total income from contributions, gifts, etc.
- Income from Investments: Total income from temporary investments (e.g., marketable securities).
- Governmental Appropriations: Grants, appropriations, or transfers of funds from government entities for the purposes of operating the hospital.
- Miscellaneous Non-Patient Revenue: Sum of any other non-patient sources of revenue excluding contributions, income from investment, and government appropriations.

- Total Non-Patient Revenue: Sum of all income from non-patient sources.
- Total Other Expenses: Sum of expenses not directly related to patient care.
- Net Income or (Loss): Net of revenues, expenses, gains, and losses.
- EBITDAR: Earnings before interest, taxes, depreciation, and amortization.
- Return on Assets (ROA): Net income divided by total assets; a useful gauge of profitability by measuring the size of the surplus generated in relation to the amount of assets needed to achieve the surplus.
- Current Ratio: A liquidity indicator of the ability to pay liabilities. Shows the number of times short-term obligations can be met from short-term creditors. A high ratio number is one way short-term creditors evaluate their margin of safety.
- Days in Net Total Receivable: A measure of the time it takes to collect account receivables. The ratio of the sum of all receivables (minus uncollectibles) to net patient revenue per day.
- Average Payment Period (days): The average length of credit given to the hospital by its suppliers.
- Inventory Turnover: The ratio of annual revenue to inventory. Low Inventory Turnover is a sign of inefficiency because inventory usually has a return rate of zero.
- Total Debt to Net Assets: A measure of the proportion of assets that are financed through long-term debt relative to those that are not.
- Average Age of Plant: The average age of a healthcare organization's plant and equipment.

Additional Data Tables

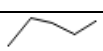
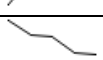
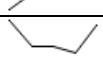
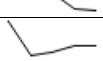
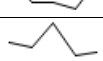
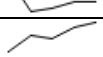
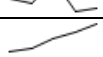
Appendix Table 1a. Metropolitan PPS Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

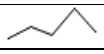
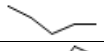
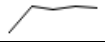
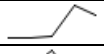
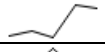
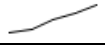
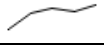
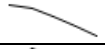
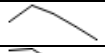
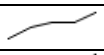
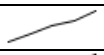
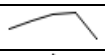
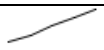
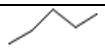
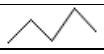
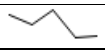
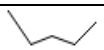
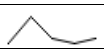
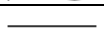
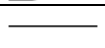
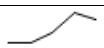
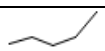
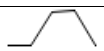
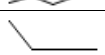
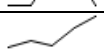
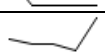
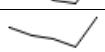
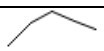
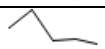
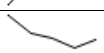
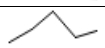
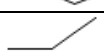
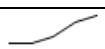
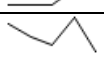
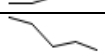
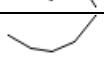
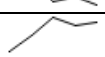
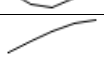
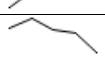
Metric (medians)[d]	State (n=5)		Region (n=46)	
	2020	2016-2020	2020	2016-2020
Assets				
Current Assets	$105,503		$87,831	
Fixed Assets	$195,966		$79,582	
Other Assets	$30,429		$39,169	
Total Assets	$331,899		$276,388	
Liabilities and fund balances				
Current Liabilities	$67,626		$36,898	
Long-Term Liabilities	$201,648		$59,493	
Total Liabilities	$242,553		$96,795	
Total Fund Balance	$89,346		$167,651	
Total Liabilities & Fund Balance	$331,899		$276,388	
Balance Sheet				
Inpatient Revenue	$387,358		$344,780	
Outpatient Revenue	$1,031,633		$428,703	
Total Patient Revenue	$1,418,992		$919,425	

Metric (medians)[d]	State (n=5) 2020	State (n=5) 2016-2020	Region (n=46) 2020	Region (n=46) 2016-2020
Contractual Allowance (Discounts)	$898,447		$526,056	
Net Patient Revenues	$520,545		$287,415	
Total Operating Expense	$570,467		$326,431	
Operating Income	$-49,922		$-1,988	
Other Income (Contrib, Bequests, etc.)	$0		$0	
Income from Investments	$0		$9	
Governmental Appropriations	$0		$0	
Miscellaneous Non-Patient Revenue	$77,013		$19,941	
Total Non-Patient Revenue	$97,080		$22,168	
Total Other Expenses	$40		$0	
Net Income or (Loss)	$45,791		$19,452	
Financial Indicators				
EBITDAR[e]	$75,151		$30,487	
Return on Assets (ROA)	6.4%		8.7%	
Current Ratio	2.58		1.93	
Days in Net Total Receivable	46.3		52.9	
Average Payment Period (days)	69.8		68.8	
Inventory Turnover	47.6		53.0	
Total Debt to Net Assets	0.06		0.72	
Average Age of Plant	9.7		14.4	

a. More extensive explanations of the hospital financial characteristics can be found in the appendix.
b. The 2016-2020 sparklines are only intended to represent generalized data trends. They use varying scales and should not be used to draw direct comparisons between characteristics or geographies.
c. Region includes Minnesota, South Dakota, and Montana.
d. Dollar figures are reported in $1,000's
e. EBITDAR: Earnings Before Interest, Taxes, Depreciation, Amortization, and Rent.
Source: CMS Hospital Cost Report Information System data, 2020-2021.

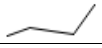
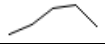
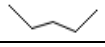
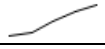
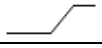
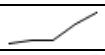
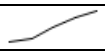
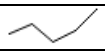
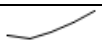
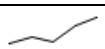
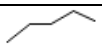
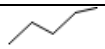
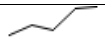
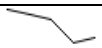
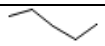
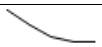
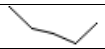
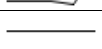
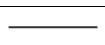
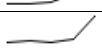
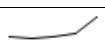
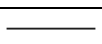
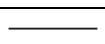
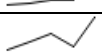
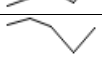
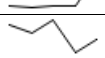
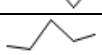
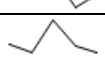
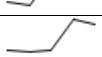
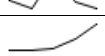
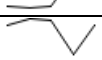
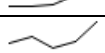
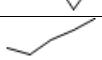
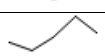
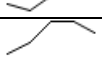
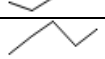
Appendix Table 1b. Micropolitan Critical Access Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

Metric (medians)[d]	State (n=5) 2020	State (n=5) 2016-2020	Region (n=17) 2020	Region (n=17) 2016-2020
Assets				
Current Assets	$13,859		$14,277	
Fixed Assets	$35,051		$19,952	
Other Assets	$2,223		$2,858	
Total Assets	$88,595		$95,820	

Metric (medians)[d]	State (n=5) 2020	State (n=5) 2016-2020	Region (n=17) 2020	Region (n=17) 2016-2020
Liabilities and fund balances				
Current Liabilities	$8,927		$9,013	
Long-Term Liabilities	$12,955		$4,185	
Total Liabilities	$34,102		$15,078	
Total Fund Balance	$13,194		$34,741	
Total Liabilities & Fund Balance	$88,595		$95,820	
Balance Sheet				
Inpatient Revenue	$21,607		$14,300	
Outpatient Revenue	$83,138		$36,003	
Total Patient Revenue	$104,745		$46,484	
Contractual Allowance (Discounts)	$46,695		$18,264	
Net Patient Revenues	$58,050		$31,691	
Total Operating Expense	$58,590		$33,300	
Operating Income	$-540		$-750	
Other Income (Contrib, Bequests, etc.)	$242		$5	
Income from Investments	$44		$10	
Governmental Appropriations	$0		$0	
Miscellaneous Non-Patient Revenue	$2,838		$4,357	
Total Non-Patient Revenue	$3,147		$6,609	
Total Other Expenses	$0		$0	
Net Income or (Loss)	$3,875		$5,648	
Financial Indicators				
EBITDAR[e]	$10,379		$8,022	
Return on Assets (ROA)	8.7%		6.2%	
Current Ratio	1.58		2.15	
Days in Net Total Receivable	57.3		57.4	
Average Payment Period (days)	123.7		93.5	
Inventory Turnover	80.1		58.7	
Total Debt to Net Assets	0.9		0.5	
Average Age of Plant	11.7		10.5	

a. More extensive explanations of the hospital financial characteristics can be found in the appendix.
b. The 2016-2020 sparklines are only intended to represent generalized data trends. They use varying scales and should not be used to draw direct comparisons between characteristics or geographies.
c. Region includes Minnesota, South Dakota, and Montana.
d. Dollar figures are reported in $1,000's
e. EBITDAR: Earnings Before Interest, Taxes, Depreciation, Amortization, and Rent.
Source: CMS Hospital Cost Report Information System data, 2020-2021.

Appendix Table 1c. Noncore Critical Access Hospital Finance[a] 2020 and Trends[b], North Dakota and Region[c]

	State (n=30)		Region (n=122)	
Metric (medians)[d]	**2020**	**2016-2020**	**2020**	**2016-2020**
Assets				
Current Assets	$9,801		$9,969	
Fixed Assets	$4,629		$6,977	
Other Assets	$961		$2,378	
Total Assets	$19,070		$21,293	
Liabilities and fund balances				
Current Liabilities	$3,678		$4,425	
Long-Term Liabilities	$1,346		$4,887	
Total Liabilities	$6,507		$10,012	
Total Fund Balance	$9,108		$12,306	
Total Liabilities & Fund Balance	$19,070		$21,293	
Balance Sheet				
Inpatient Revenue	$4,567		$5,592	
Outpatient Revenue	$11,687		$14,535	
Total Patient Revenue	$15,510		$21,220	
Contractual Allowance (Discounts)	$2,377		$6,653	
Net Patient Revenues	$11,581		$14,298	
Total Operating Expense	$12,588		$15,963	
Operating Income	$-1,091		$-575	
Other Income (Contrib, Bequests, etc.)	$2		$20	
Income from Investments	$6		$71	
Governmental Appropriations	$0		$0	
Miscellaneous Non-Patient Revenue	$2,482		$2,669	
Total Non-Patient Revenue	$3,944		$3,277	
Total Other Expenses	$0		$0	
Net Income or (Loss)	$1,939		$2,301	
Financial Indicators				
EBITDAR[e]	$2,644		$3,395	
Return on Assets (ROA)	9.5%		12.1%	
Current Ratio	2.44		2.90	
Days in Net Total Receivable	57.5		57.1	
Average Payment Period (days)	114.4		90.3	
Inventory Turnover	64.8		55.6	
Total Debt to Net Assets	0.8		0.7	
Average Age of Plant	14.4		13.0	

a. More extensive explanations of the hospital financial characteristics can be found in the appendix.
b. The 2016-2020 sparklines are only intended to represent generalized data trends. They use varying scales and should not be used to draw direct comparisons between characteristics or geographies.
c. Region includes Minnesota, South Dakota, and Montana.
d. Dollar figures are reported in $1,000's
e. EBITDAR: Earnings Before Interest, Taxes, Depreciation, Amortization, and Rent.
Source: CMS Hospital Cost Report Information System data, 2020-2021.

Hospital Quality Chapter

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Value-Based Payment Chapter

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Private and Public Policy Environment Chapter

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