

# North Dakota State Health Assessment



**2016**



# North Dakota State Health Assessment

Jack Dalrymple  
*Governor of North Dakota*

Terry Dwelle, MD, MPHTM  
*State Health Officer*

Kelly Nagel, MS, RD, LRD  
*Director, Office of Public Health Systems and Performance,  
North Dakota Department of Health*

Tracy Miller, PhD, MPH  
*State Epidemiologist*

# Table of Contents

Introduction .....	4
North Dakota Partnership .....	4
Purpose and Key Objectives .....	5
Methodology .....	6
State Population Health Profile .....	6
Data Retreat .....	11
North Dakota Landscape .....	12
Geography.....	12
Demographics .....	12
Workforce .....	15
Risk and Protective Factors.....	18
Fruit and Vegetabel Consumption.....	19
Physical Activity .....	20
Breastfeeding.....	20
Overweight and Obesity.....	21
High Blood Pressure (Hypertension).....	22
High Cholesterol.....	23
Tobacco Use.....	24
Cessation.....	25
Secondhand Smoke Exposure .....	25
Injury .....	26
Mental Health Risks .....	28
Injury and Disease Burden.....	29
Chronic Diseases.....	30
Alzheimer’s Disease .....	30
Cancer.....	31
Cardiovascular Disease .....	32
Diabetes .....	33
Oral Disease.....	35
Communicable Diseases .....	37
HIV.....	37
Shiga toxin-producing Escherichia coli (TEC) .....	38
Injury.....	40
Suicide.....	40
Domestic Violence/Sexual Assault.....	41
Motor Vehicle Crashes.....	42
Falls .....	43
Unintentional Poisoning.....	45

# Table of Contents (continued)

Behavioral Health .....	46
Adult Mental Health .....	47
Adult Substance Use.....	48
Children’s Behavioral Health.....	49
Environmental Health .....	51
Preserve and Improve Air Quality .....	51
Ensure Safe Public Drinking Water .....	52
Preserve and Improve Surface and Ground Water Quality .....	54
Manage Solid Waste .....	55
Health Concerns .....	56
Health Disparities Among Specific Populations in North Dakota .....	56
Social Determinants of Health.....	47
Maternal, Child, and Adolescent Populations.....	59
State Priorities .....	59
State Outcome Measure .....	63
Immunization Rates .....	64
Drug Abuse and Overdose.....	67
Summary of Stakeholder Survey.....	68
Survey Results.....	68
Health Care Access .....	70
State Assets.....	77
Acknowledgements .....	82

# Introduction

The North Dakota Gaining Ground Leadership Team is working to improve population health in the state through partnerships and collaborations with tribal governments, community members, and stakeholders. The leadership team conducted a statewide health assessment planning process to accomplish this. This assessment provides an overview of a state's population characteristics, social and economic factors, and health outcomes. The purpose of a statewide health assessment is to collect and analyze data in a way that educates and mobilizes communities to develop health priorities, leverage resources, and plan actions to improve population health. This effort is accomplished through the systematic collection and analysis of data from a wide range of sources to provide a thorough basis for decision-making, and with the active involvement of partners throughout each step in the proposed activities.

## North Dakota's Partnership

North Dakota's Gaining Ground Leadership Team has evolved from its original membership and scope which consisted of three main partner organizations

1. North Dakota Department of Health (NDDoH)
2. North Dakota State University Master of Public Health Program
3. University of North Dakota Center for Rural Health

These groups came together to assess the population's chronic disease risks and prevalence. The team has expanded representation across the health care system to include:

- University of North Dakota Master of Public Health Program
- American Indian Public Health Resource Center
- North Dakota Association of City and County Health Officials
- Regional Public Health Networks
- Healthy North Dakota
- North Dakota Indian Affairs Commission
- North Dakota Quality Health Associates

The leadership team has conducted strategic planning and has identified priority strategies to be “define the population's health and oversee the state health assessment.” The multiple state level representation and knowledge and awareness of the health data have shifted the direction of the health assessment to be more comprehensive with a focus on population concerns.

## Purpose and Key Objectives

The purpose of the assessment is to provide the foundation for community health improvement efforts that may lead to a more equitable state of health for North Dakotans. The findings will be used to identify key strategic issues and priorities for state and community level action. The key objectives of this report are:

1. Create awareness of health data and engage communities in addressing unmet health needs.
2. Describe the socio-demographic characteristics, health behaviors, health status, and health care utilization of North Dakotans, and available statewide assets.
3. Determine a set of high-priority community health needs. These needs will inform the State Vision and Strategy Committee in their direction setting for state improvements.



# Methodology

A combination of primary and secondary data was used to provide a comprehensive assessment of the health status and concerns of North Dakota. Primary data sources include stakeholder survey results, observation studies, vital records, and surveillance reports. Secondary data sources include census, Kids Count, and crime data.

## State Population Health Profile

The leadership team used various resources for gathering the data and information found in this report. The state health profile has served as the framework for the state health assessment process beginning in 2012. The profile was created by the NDDoH Career Field Epidemiology Officer and updated by the North Dakota State Epidemiologist. The profile template, formed in 2010, was based on questions and data requests that came into the health department from community leaders, city officials, local public health unit directors, and the general public.

Secondary data was collected from the U.S. Census website, American Community Survey reports, Bureau of Criminal Investigation website, and the Kids Count data center site. The primary data presented in the state profile was provided by the NDDoH's Behavioral Risk Factor Surveillance System and the Division of Vital Records.

DATA SOURCE	YEARS
United State Census Population Data	2010 - 2015
American Community Survey reports	2010-2014
Bureau of Criminal Investigation website	2010-2015
Kids County datacenter website	2010-2015
BRFSS	2010-2015
Vital Records	2010-2015

The Census Bureau’s Population Estimates and American Community Survey data was used to develop a description of North Dakota’s population. These population estimates, while commonly used for a variety of other reasons, allow for estimates of recent demographic changes. For risk factor data, the BRFSS was used to gain a sense of general health risks and behaviors among North Dakota residents (tables below).

<b>ALCOHOL</b>		<b>North Dakota 2011-2014</b>
Binge Drinking	Respondents who reported binge drinking (5 drinks for men, 4 drinks for women) one or more times in the past 30 days.	24.1 (23.3-25.0)
Heavy Drinking	Respondents who reported heavy drinking (more than 2 drinks per day for men, more than 1 drink per day for women) during the past 30 days	6.8 (6.3-7.3)
Drunk Driving	Respondents who reported driving when they had too much to drink one or more times during the past 30 days	2.5 (2.1-2.9)
<b>ARTHRITIS</b>		
Doctor-Diagnosed Arthritis	Respondents who reported ever have been told by a doctor or other health professional that they had some form of arthritis.	25.1 (24.4-25.7)
Activity Limitation Due to Arthritis	Respondents who reported being limited in any usual activities because of arthritis or joint symptoms.	6.4 (6.0-6.8)
<b>ASTHMA</b>		
Ever Asthma	Respondents who reported ever having been told by a doctor, nurse or other health professional that they had asthma.	11.6 (11.0-12.3)
Current Asthma	Respondents who reported ever having been told by a doctor, nurse or other health professional that they had asthma and who still have asthma.	8.2 (7.7-8.7)
<b>BODY WEIGHT</b>		
Overweight But Not Obese	Respondents with a body mass index greater than or equal to 25 but less than 30 (overweight)	36.7 (35.8-37.6)
Obese	Respondents with a body mass index greater than or equal to 30 (obese)	30.1 (29.3-31.0)
Overweight or Obese	Respondents with a body mass index greater than or equal to 25 (overweight or obese)	66.8 (65.9-67.7)

<b>CANCER</b>		<b>North Dakota 2011-2014</b>
Ever Cancer	Respondents who reported ever having been told by a doctor, nurse or other health professional that they had cancer (excluding skin cancer).	6.4 (6.0-6.7)
<b>CARDIOVASCULAR</b>		
Heart Attack	Respondents who reported ever having been told by a doctor, nurse or other health care professional that they had a heart attack.	4.4 (4.1-4.7)
Angina	Respondents who reported ever having been told by a doctor, nurse or other health care professional that they had angina.	4.1
Stroke	Respondents who reported ever having been told by a doctor, nurse or other health care professional that they had a stroke.	2.3 (2.1-2.5)
Cardiovascular Disease	Respondents who reported ever having been told by a doctor, nurse or other health care professional that they had any of the following: heart attack, angina or stroke.	7.6 7.3-8.0)
<b>CHOLESTEROL</b>		
Never Cholesterol Test	Respondents who reported never having a cholesterol test	22.3 (21.1-23.4)
No Cholesterol Test in Past 5 Years	Respondents who reported never having a cholesterol test in the past five years	26.7 (25.5-27.9)
High Cholesterol	Respondents who reported that they had ever been told by a doctor, nurse or other health professional that they had high cholesterol.	36.6 (35.4-37.8)
<b>CHRONIC LUNG DISEASE</b>		
COPD	Respondents who have ever been told by a doctor, nurse or other health professional ever told you that they have COPD (chronic obstructive pulmonary disease), emphysema, or chronic bronchitis	4.6 (4.3-5.0)
<b>COLORECTAL CANCER</b>		
Fecal Occult Blood	Respondents age 50 and older who reported not having a fecal occult blood test in the past two years.	87.3 (86.4-88.2)
Never Sigmoidoscopy	Respondents age 50 and older who reported never having had a sigmoidoscopy or colonoscopy	36.4 (34.9-37.8)
Up-to-date for Colorectal Screening	Respondents age 50 and older who are up-to-date according to recommended screening guidelines for colorectal screening	60.9 (59.5-62.4)

<b>DIABETES</b>		<b>North Dakota 2011-2014</b>
Diabetes Diagnosis	Respondents who reported ever having been told by a doctor that they had diabetes.	8.5 (8.1-8.9)
<b>FRUITS AND VEGETABLES</b>		
Five Fruits and Vegetables	Respondents who reported that they do not usually eat 5 fruits and vegetables per day	85.9 (85.0-86.7)
<b>GENERAL HEALTH</b>		
Fair or Poor Health	Respondents who reported that their general health was fair or poor	14.0 (13.4-14.6)
Poor Physical Health	Respondents who reported they had 8 or more days in the last 30 when their physical health was not good	11.4 (10.8-11.9)
Poor Mental Health	Respondents who reported they had 8 or more days in the last 30 when their mental health was not good	11.0 (10.4-11.6)
Activity Limitation Due to Poor Health	Respondents who reported they had 8 or more days in the last 30 when poor physical or mental health kept them from doing their usual activities.	6.9 (6.5-7.4)
Any Activity Limitation	Respondents who reported being limited in any way due to physical, mental or emotional problem.	17.5 (16.8-18.1)
<b>HEALTH CARE ACCESS</b>		
Health Insurance	Respondents who reported not having any form or health care coverage	11.4 (10.7-12.1)
Access Limited by Cost	Respondents who reported needing to see a doctor during the past 12 months but could not due to cost.	7.8 (7.2-8.3)
No Personal Provider	Respondents who reported that they did not have one person they consider to be their personal doctor or health care provider.	26.8 (25.9-27.6)
<b>HYPERTENSION</b>		
High Blood Pressure	Respondents who reported ever having been told by a doctor, nurse or other health professional that they had high blood pressure.	29.6 (28.6-30.6)
<b>IMMUNIZATION</b>		
Influenza Vaccine	Respondents age 65 and older who reported that they did not have a flu shot in the past year	39.9 (38.4-41.3)
Pneumococcal Vaccine	Respondents age 65 or older who reported never having had a pneumonia shot.	29.0 (27.6-30.3)

<b>INJURY</b>		<b>North Dakota 2011-2014</b>
Fall	Respondents 45 years and older who reported that they had fallen in the past 12 months	27.4 (26.1-28.6)
Seat Belt	Respondents who reported not always wearing their seatbelt	32.0 (31.1-32.8)
<b>ORAL HEALTH</b>		
Dental Visit	Respondents who reported that they had not had a dental visit in the past year	33.7 (32.4-35.0)
Tooth Loss	Respondents who reported they ever had a permanent tooth extracted.	42.6 (41.3-43.8)
<b>PHYSICAL ACTIVITY</b>		
Recommend Physical Activity	Respondents who reported that they did not get the recommended amount of physical activity	53.8 (52.6-55.1)
Inactive	Respondents reporting little or no physical activity	30.4 (29.3-31.6)
<b>TOBACCO</b>		
Current Smoking	Respondents who reported that they smoked every day or some days	21.2 (20.4-22.0)
<b>WOMEN'S HEALTH</b>		
Pap Smear	Women 18 and older who reported that they had not had a pap smear in the past three years	25.0 (23.0-27.0)
Mammogram Age 40+	Women 40 and older who reported that they had not had a mammogram in the past two years	27.0 (25.4-28.6)

The remaining information for the state health profile concludes with data from vital records highlighting births and deaths for the state, along with crime statistics and childhood risk indicators. North Dakota's leading causes of death identified from death statistics served as the framework for the Injury and Disease Burden Section.

The leadership team also worked with statewide coalitions and advisory committees to collect and interpret the data. The Coordinated Chronic Disease Partnership assisted with the collection of chronic disease risk and prevalence data; the UND School of Medicine and Health Sciences Advisory Council collected health care utilization data; and the North Dakota Chamber of Commerce provided demographic and population data.

## Data Retreat

In October 2016, a data retreat was held to identify, prioritize, and organize measures to describe the health of North Dakotans. Participants included those who work with or have knowledge of data collected and needed by their agencies. Participants included the North Dakota Department of Health, North Dakota Department of Human Services, North Dakota Chamber of Commerce, North Dakota Department of Transportation, North Dakota State University, University of North Dakota Center for Rural Health, Sanford Health, North Dakota Compass, Local Public Health, Workforce Safety Insurance, and American Indian Public Health Resource Center.

These agencies identified priority health outcomes, socioeconomic determinants, and health factors for the state health assessment data collection and reporting process.



# North Dakota Landscape

## Geography

The state of North Dakota covers 70,698 square miles. It is located in the upper central part of the United States along the Canadian border between Montana to the west, Minnesota to the east, and its sister state South Dakota to the south. North Dakota is the 19th largest state geographically but ranks 47th in population. Located in the region known as the Great Plains, the state ranges from flat, blacktop fertile farmland along its eastern border to rolling hills in its central region and rugged Badlands in the western part of the state.

Four tribal nations have tribal headquarters in North Dakota: Mandan, Hidatsa, Arikara (MHA) Nation, Spirit Lake Nation, Standing Rock Sioux Tribe and Turtle Mountain Band of Chippewa Indians. The counties which overlap American Indian Reservation lands in North Dakota include Dunn, McKenzie, McLean, Mercer, Mountrail, Ward, (MHA Nation); Benson, Eddy, Nelson, Ramsey (Spirit Lake Sioux Tribe Reservation); Sioux County (Standing Rock Reservation); and Rolette County (Turtle Mountain Band of Chippewa Indians).

## Demographics

North Dakota experienced an extended period of out-migration that lasted several decades, but in 2008, as a result of oil and gas development in the western region of the state, there was a significant increase in population. According to the 2010 Census estimates, the state's population was estimated to be 672,591; by 2015 that number had climbed to 756,927.

According to the 2015 Census Estimates, the population breakdown is as follows:

- 388,853 (51%) males and 368,074 (49%) female residents
- 173,926 (23%) under age 18
- 107,281 (14%) age 65 or older

The table below references the racial and ethnic breakdown in North Dakota as reported by the North Dakota Department of Commerce:

Race/Ethnicity	Percent
White	91
American Indian and Alaska Native	6
Black or African American	1
Asian	1
Other Race	1
Native Hawaiian and Other Pacific Islander	<.5
Hispanic	2
Two or more races	2

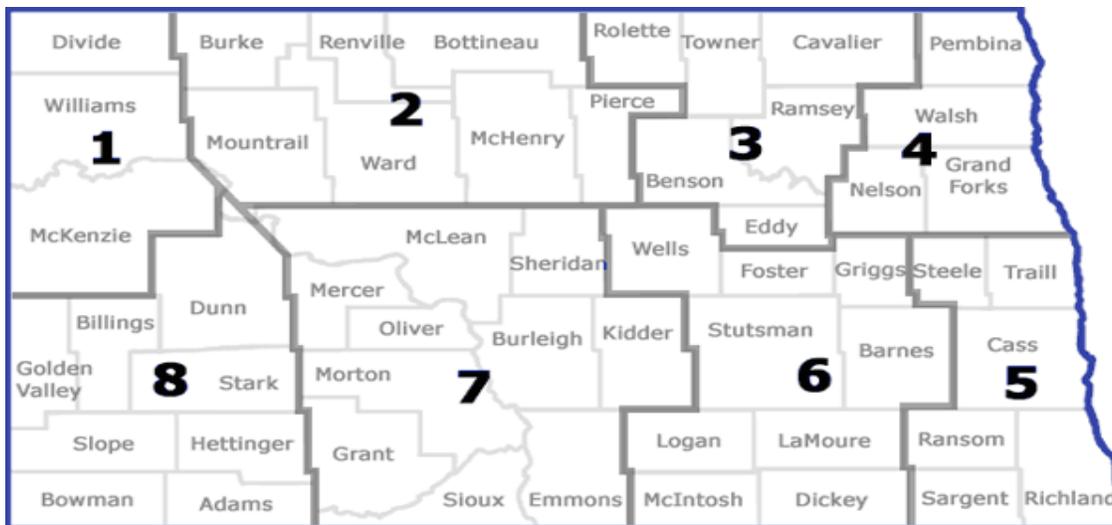
Ninety-seven percent of the people living in North Dakota are native residents of the United States. Sixty-seven percent were born in North Dakota. One percent of the people living in North Dakota are foreign born. Of the foreign-born population, 27 percent entered the country in 2010 or later.

### ***Changes in Population***

Between the April 1, 2010, Census and the population estimate date of July 1, 2015, the state is estimated to have grown by 84,336 (or 12.5%) additional residents. Of that, 61,105 were the results of net-migration and 22,285 of natural rate (births less deaths). In-migration saw a growth in the age group 20-34 years or age and children younger than 5 years.

Since 2010, five of the eight economic planning regions (Williston, Minot, Fargo, Bismarck, and Dickinson) have experienced relatively significant growth, (greater than 10%), Grand Forks has experienced more moderate change (4%) and Devils Lake and Jamestown have experienced little change in population.

Region 5, (Fargo) experienced the greatest growth with 21,727 additional residents or 12 percent. However, the Williston Region, initially the smallest region, grew from 30,829 to 50,570, a 64 percent increase during this timeframe.



### ***Metropolitan, Urban and Rural, and Frontier Populations***

North Dakota has three designated metropolitan statistical areas (MSAs): Bismarck, Fargo, and Grand Forks. The Bismarck MSA consist of Burleigh, Morton, Oliver, and Sioux Counties. The Fargo MSA consists of Cass County, N.D., as well as Clay County, Minn., and the Grand Forks MSA consists of Grand Forks County, N.D., and Polk County, Minn. (It should also be noted that the city of Minot and Ward County in northcentral North Dakota now falls only a few thousand residents short of meeting MSA minimum population requirements.) The combined population estimates of the MSA designated counties in 2015 were 371,945 of the state’s estimated population of 756,927 or 49 percent of the state’s population.

The Census Bureau only provided urban and rural population figures at the time of the decennial census. During the 2010 Census, the Census Bureau counted 402,872 residents in Urban (areas and clusters) and 269,719 in rural areas, at a 61.1 percent urban, 39.9 percent rural mix. While the Census Bureau does not provide estimates between censuses in this area the North Dakota Department of Commerce estimates the 2015 balance was 492,812 residents (65.1 %) urban, and 264,115 (34.9 %) rural. Thirty-six of the state’s 53 counties are estimated to have less than six persons per square mile.

### ***Language***

Among people at least 5 years old living in North Dakota, 6 percent spoke a language other than English at home. Of those speaking a language other than English at home, 27 percent spoke Spanish, and 73 percent spoke some other language; 28 percent reported that they did not speak English “very well.”

### ***Geographic Mobility***

Eighty-two percent of the people at least 1 year old residing in North Dakota were living in the same residence one year earlier.

## Workforce

According to Job Service of North Dakota, the top 10 employers in North Dakota include four medical centers, three schools (high-school and college), one general merchandiser, one insurance carrier, and one state government agency. There is a more detailed breakdown of employment in the table below.

### *Employment by Industry in North Dakota*

Industry	Total			Male		Percent Male		Female		Percent Female	
	Estimate (Est.)	% of Total Employment	Margin of Error	Est.	Margin of Error	Est.	Margin of Error	Est.	Margin of Error	Est.	Margin of Error
Civilian employed population 16 years and over	404,589	100%	+/-4,603	220,613	+/-3,623	54.5%	+/-0.5	183,976	+/-2,589	45.5%	+/-0.5
Agriculture, forestry, fishing and hunting, and mining:	38,380	9%	+/-2,581	32,575	+/-2,252	84.9%	+/-2.1	5,805	+/-928	15.1%	+/-2.1
Agriculture, forestry, fishing and hunting	23,607	6%	+/-1,809	20,022	+/-1,540	84.8%	+/-2.3	3,585	+/-663	15.2%	+/-2.3
Mining, quarrying, and oil and gas extraction	14,773	4%	+/-1,929	12,553	+/-1,758	85.0%	+/-4.6	2,220	+/-738	15.0%	+/-4.6
Construction	32,190	8%	+/-2,856	29,562	+/-2,741	91.8%	+/-2.1	2,628	+/-706	8.2%	+/-2.1
Manufacturing	27,497	7%	+/-2,686	20,706	+/-2,323	75.3%	+/-3.4	6,791	+/-1,086	24.7%	+/-3.4
Wholesale trade	16,179	4%	+/-1,818	12,723	+/-1,598	78.6%	+/-4.3	3,456	+/-791	21.4%	+/-4.3
Retail trade	47,045	12%	+/-3,647	25,257	+/-2,662	53.7%	+/-3.0	21,788	+/-1,957	46.3%	+/-3.0
Transportation and warehousing, and utilities:	23,354	6%	+/-2,114	19,214	+/-1,831	82.3%	+/-2.9	4,140	+/-805	17.7%	+/-2.9
Transportation and warehousing	17,186	4%	+/-1,952	14,431	+/-1,708	84.0%	+/-3.6	2,755	+/-709	16.0%	+/-3.6
Utilities	6,168	2%	+/-1,072	4,783	+/-849	77.5%	+/-7.3	1,385	+/-555	22.5%	+/-7.3
Information	4,835	1%	+/-1,005	2,569	+/-690	53.1%	+/-8.9	2,266	+/-642	46.9%	+/-8.9
Finance and insurance, and real estate and rental and leasing	20,660	5%	+/-2,548	7,574	+/-1,360	36.7%	+/-4.8	13,086	+/-1,908	63.3%	+/-4.8
Finance and insurance	15,882	4%	+/-2,290	4,953	+/-976	31.2%	+/-4.9	10,929	+/-1,871	68.8%	+/-4.9
Real estate and rental and leasing	4,778	1%	+/-1,127	2,621	+/-990	54.9%	+/-11.3	2,157	+/-552	45.1%	+/-11.3
Professional, scientific, and management, and administrative and waste management services:	27,754	7%	+/-2,726	14,932	+/-1,860	53.8%	+/-4.1	12,822	+/-1,673	46.2%	+/-4.1
Professional, scientific, and technical services	16,612	4%	+/-2,058	8,767	+/-1,377	52.8%	+/-5.1	7,845	+/-1,286	47.2%	+/-5.1

## Employment by Industry in North Dakota (continued)

Industry	Total			Male		Percent Male		Female		Percent Female	
	Estimate (Est.)	% of Total Employment	Margin of Error	Est.	Margin of Error	Est.	Margin of Error	Est.	Margin of Error	Est.	Margin of Error
Management of companies and enterprises	161	0%	+/-268	161	+/-268	100.0%	+/-40.0	0	+/-151	0.0%	+/-40.0
Administrative and support and waste management services	10,981	3%	+/-1,664	6,004	+/-1,194	54.7%	+/-7.2	4,977	+/-1,099	45.3%	+/-7.2
Educational services, and health care and social assistance:	96,621	24%	+/-4,210	21,901	+/-2,007	22.7%	+/-1.6	74,720	+/-3,265	77.3%	+/-1.6
Educational services	35,123	9%	+/-2,659	10,986	+/-1,399	31.3%	+/-3.3	24,137	+/-2,168	68.7%	+/-3.3
Health care and social assistance	61,498	15%	+/-3,343	10,915	+/-1,550	17.7%	+/-2.2	50,583	+/-2,928	82.3%	+/-2.2
Arts, entertainment, and recreation, and accommodation and food services:	33,377	8%	+/-3,147	13,933	+/-2,108	41.7%	+/-4.2	19,444	+/-2,093	58.3%	+/-4.2
Arts, entertainment, and recreation	7,593	2%	+/-1,416	3,932	+/-1,048	51.8%	+/-8.5	3,661	+/-875	48.2%	+/-8.5
Accommodation and food services	25,784	6%	+/-2,818	10,001	+/-1,821	38.8%	+/-4.6	15,783	+/-1,804	61.2%	+/-4.6
Other services, except public administration	19,069	5%	+/-1,824	9,417	+/-1,285	49.4%	+/-5.0	9,652	+/-1,358	50.6%	+/-5.0
Public administration	17,628	4%	+/-1,906	10,250	+/-1,515	58.1%	+/-5.0	7,378	+/-1,090	41.9%	+/-5.0

Source: Data from Census Bureau ACS 2015 1-Year Estimate



## ***Income***

The median income of households in North Dakota was \$60,557. Eleven percent of households had income below \$15,000 a year, and 11 percent had income of \$150,000 or more.

Eighty-two percent of the households received earnings and 13 percent received retirement income other than Social Security. Twenty-seven percent of the households received Social Security. The average income from Social Security was \$17,298. These income sources are not mutually exclusive; that is, some households received income from more than one source.

The median earning for all (including part-time) workers was \$34,336. The median earning for full-time, year-round male workers was \$52,031 and for year-round female workers was \$37,016.

## ***Poverty***

Twelve percent of people were in poverty. Fifteen percent of related children younger than 18 were below the poverty level, compared with 10 percent of people older than 65. Seven percent of all families and 33 percent of families with a female householder and no husband present had incomes below the poverty level.

## ***Education***

In 2012, 28 percent of people 25 years and over had a high school diploma or equivalency and 29 percent had a bachelor's degree or higher. Eight percent were dropouts; they were not enrolled in school and had not graduated from high school.

The total school enrollment in North Dakota was 181,102. The nursery school and kindergarten enrollment was 19,300 and elementary and high school enrollment was 98,000 children. College or graduate school enrollment was 57,000.

## ***Health Insurance***

Among the civilian noninstitutionalized population in North Dakota, 92 percent had health insurance coverage, and 8 percent did not have health insurance coverage. For those younger than 18 years of age, 8 percent had no health insurance coverage. The civilian noninstitutionalized population had both private and public health insurance, with 81 percent having private coverage and 24 percent having public coverage.

## ***Disability***

In North Dakota, among the civilian noninstitutionalized population, 11 percent reported a disability. The likelihood of having a disability varied by age – from 3 percent of people under 18 years old to eight percent of individuals 18 to 64 years old, and to 36 percent of those 65 and older.

# Risk and Protective Factors

The *Burden of Chronic Disease in North Dakota, A Status Report for 2016*, by the North Dakota Department of Health, Division of Chronic Disease provided content for the Risk Factor section.

Health behaviors and conditions known as risk factors are associated with increased chances of developing disease and may lead to injury. “Non-modifiable” risk factors are those that people are not able to change, such as age, gender, race and heredity or family history. American Indian children, women, and families are disproportionately affected by both chronic disease risk factors and disease burden.

“Modifiable” risk factors are those factors that people can modify or control through lifestyle changes. These modifiable risk factors include dietary habits; breastfeeding; weight status; physical activity; smoking/tobacco use and exposure to secondhand smoke; management of blood pressure, cholesterol and diabetes; avoiding injuries; and maintaining oral health.



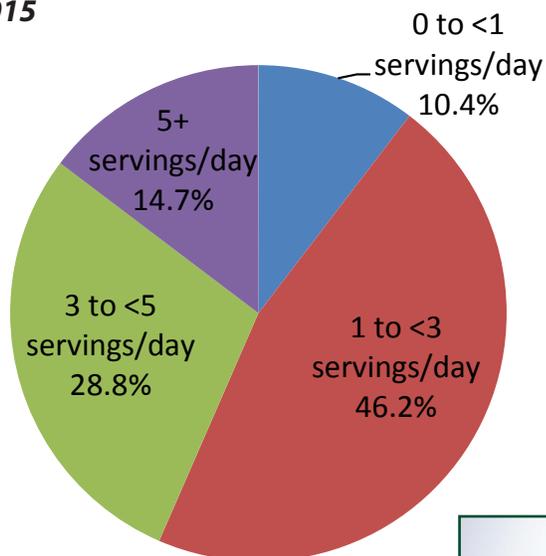
## Fruit and Vegetable Consumption

Compared to people who only eat small amounts of fruits and vegetables, those who eat more generous amounts tend to have reduced risk of chronic diseases, including cardiovascular disease, stroke, type 2 diabetes, and some types of cancer.

According to the *2015-2020 Dietary Guidelines for Americans*, a diet at the 2,000-calorie level recommends 2½ cup-equivalents of vegetables per day and 2 cup-equivalents of fruits per day.

**Despite these recommendations, fewer than one in six adults consume five or more servings of fruits and vegetables per day (Figure 2) and fewer than one in 10 high school students (grades 9-12) consume both fruit two times or more per day and vegetables three times or more per day (Source: ND Youth Risk Behavior Survey (YRBS) 2015).**

### ***Adults' consumption of fruits and vegetables by servings per day, North Dakota, 2015***



**Source: ND BRFSS 2015**

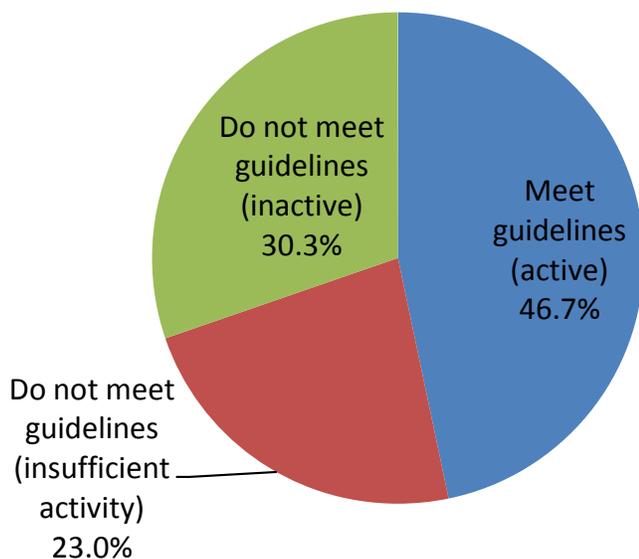


## Physical Activity

Regular physical activity can help to control body weight and reduce the risk of cardiovascular disease, type 2 diabetes, and some cancers. According to the *2008 Physical Activity Guidelines for Americans* (these guidelines will be updated in 2018), adults ages 18-64 years should engage in muscle-strengthening activities on two or more days plus 150 minutes per week of moderate physical activity or 75 minutes per week of vigorous physical activity or an equivalent combination of moderate and vigorous physical activity.

**Unfortunately, slightly more than half of North Dakota adults do not meet the recommended guidelines for physical activity.**

***Adults meeting/not meeting 2008 Physical Activity Guidelines, North Dakota, 2015***



**Source: ND BRFSS 2015**

## Breastfeeding

Breastfeeding is recognized as the ideal source of food for newborns. Infants who were breastfed have lower rates of asthma, obesity, ear infection, and lower respiratory infections, etc. Additionally, women who breastfeed experience lower rates of type 2 diabetes, and ovarian and breast cancers.

**In 2014, approximately four in five (80%) of infants born in the state were breastfed at birth.**

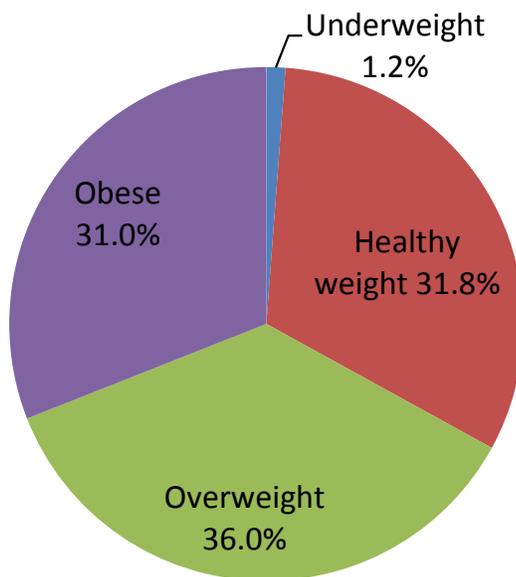
However, according to 2014 projections of the 2012 National Survey of Children's Health, only about 48 percent of new mothers reported breastfeeding at six months.

## Overweight and Obesity

Overweight and obesity are measured by an individual's body mass index (BMI) which is calculated as weight in kilograms  $\div$  (height in meters)<sup>2</sup>. Overweight (BMI 25.0-29.9) and obese (BMI  $\geq$ 30) individuals are at increased risk for many health conditions, including hypertension, type 2 diabetes, coronary heart disease, stroke, and some cancers. Modest weight loss, such as 5 to 10 percent of total body weight, is proven to produce health benefits.

**In North Dakota, two in three adults are overweight or obese, while slightly more than one in four high school students (grades 9-12) are overweight or obese (Source: ND YRBS 2015).**

**Figure 4: Adults' weight status, North Dakota, 2015**



**Source: ND BRFSS 2015**

## High Blood Pressure (Hypertension)

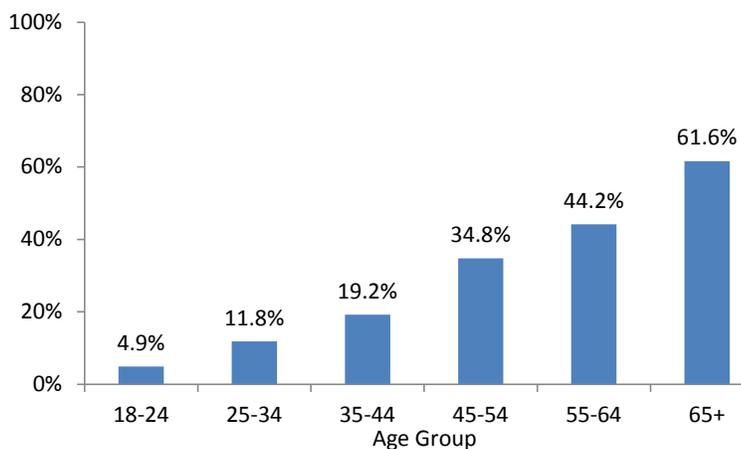
Blood pressure is the force of blood against the walls of the arteries, or in other words, the pumping action of the heart to sustain circulation. High blood pressure (also referred to as hypertension) occurs when an individual has a systolic blood pressure at or above 140 mm/Hg (millimeters of mercury) and/or a diastolic blood pressure at or above 90 mm/Hg. High blood pressure is a serious health concern that raises the risk for heart disease, stroke, and kidney failure. Unfortunately, high blood pressure often goes undetected or is not properly controlled.

According to the CDC, approximately 70 million American adults (one in three) have high blood pressure while about half (52%) have it under control. Also, nearly one in three American adults have pre-hypertension – blood pressure numbers that are higher than normal but not yet in the high blood pressure range. High blood pressure costs the nation \$46 billion each year. This total includes the cost of health care services, medications to treat high blood pressure, and missed days of work.

**Nearly one in three (30.4%) North Dakota adults have been diagnosed with high blood pressure and four in five (80.6%) of them take antihypertensive medication.**

The older a person gets, the more likely they are to have hypertension.

### ***Percentage of North Dakota adults who reported ever being diagnosed with high blood pressure, by age group***



**Source: ND BRFSS 2015**

## High Cholesterol

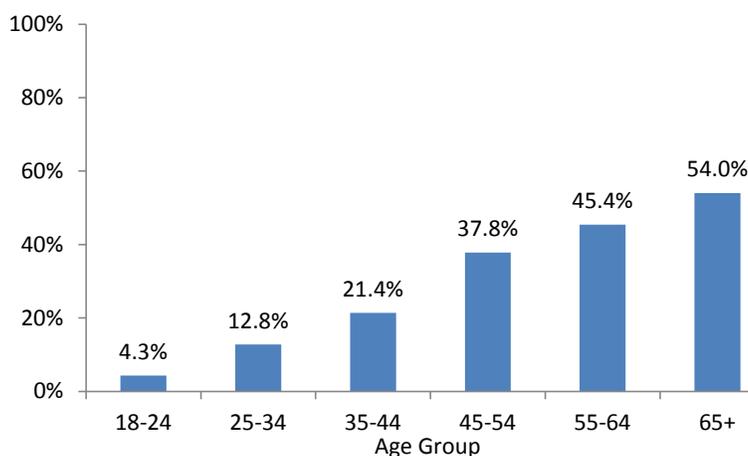
Cholesterol is a waxy, fat-like substance found in the walls of cells in all parts of the body. Excess cholesterol in the blood can become trapped in artery walls and form plaque, which can lead to atherosclerosis (or hardening of the arteries). Atherosclerosis, in turn, can result in poor blood circulation, which negatively affects all organs, including the heart.

High blood cholesterol is a major risk factor for heart disease, especially peripheral vascular disease (restriction of blood supply to the legs) and myocardial infarction (heart attack), and should be kept below 200 mg/dL. Fortunately, healthy cholesterol levels can usually be maintained through regular physical activity, healthy eating, weight control, and a variety of lipid-lowering drugs. The National Institutes for Health (NIH) recommends that adults in America should have their cholesterol checked at least every five years.

**Nearly one in four (23.7%) North Dakota adults report never having a blood cholesterol screening. Of those that reported ever having a blood cholesterol screening, more than one in three (35.0%) reported being diagnosed with high blood cholesterol (Source: ND BRFSS 2015).**

Along with high blood pressure, as adults age they are more likely to have high blood cholesterol.

### ***Percentage of North Dakota adults who reported ever being diagnosed with high blood cholesterol, by age group***



**Source: ND BRFSS 2015**

## Tobacco Use

Tobacco use is the leading preventable cause of disease and death in the United States (Source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014). Each year, on average, approximately 1,100 North Dakotans die from tobacco-related diseases.

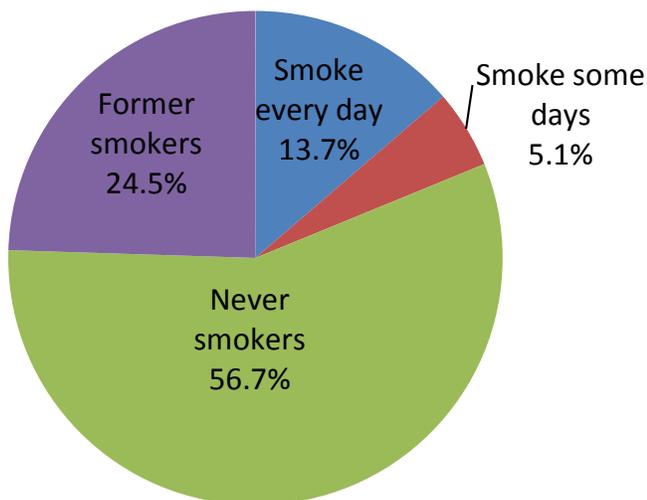
Tobacco use causes a variety of health conditions, including cancers of the lung, kidney, pancreas, cervix, stomach, esophagus, and uterus; cardiovascular disease, including heart diseases, atherosclerosis, and aortic aneurysm; and respiratory diseases including bronchitis, emphysema, and chronic airway obstruction.

Tobacco-related diseases contribute significantly to high health care expenditures, lost productivity, and years of life lost. It is estimated that smoking-related medical costs in North Dakota total \$326 million annually, while smoking-attributable lost productivity costs are estimated at \$232.6 million annually (Source: Campaign for Tobacco-Free Kids). Also, in 2016, the Campaign for Tobacco Free Kids projects that 14,000 of North Dakota's children now younger than 18 will ultimately die prematurely from smoking.

**Despite the negative health consequences associated with smoking, about one in five (18.7%) North Dakota adults reported currently smoking cigarettes in 2015.**

Current smoking was reported in 2015 more by males, American Indians, those with less than a high school education, and those with an income less than \$15,000/year.

### **Percentage of North Dakota adults who were current, former, or never smokers in 2015**



**Source: ND BRFSS 2015**

Among North Dakota high school students (grades 9-12), the prevalence of current smoking has declined from 21.1 percent in 2007 to 11.7 percent in 2015 (Source: ND YRBS). Additionally, in 2015 the reported current use of chewing tobacco or snuff/dip among high school students was 10.6 percent, with a much higher prevalence reported among males (17.6%) than females (3.1%).

## Cessation

Over half of current adult smokers (55.8%) stopped smoking for one or more days in the past year in an attempt to quit (Source: ND BRFSS 2015). NDDoH's tobacco cessation program, NDQuits, is available to tobacco users who want to quit. The 30-day sustained quit rate in 2015 for those who completed telephone counseling and/or were sent medication from NDQuits was 28.4 percent at seven months post-enrollment.



## Secondhand Smoke Exposure

According to the 2010 U.S. Surgeon General's Report, *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease*, "Cigarette smoke contains more than 7,000 chemicals and compounds. Hundreds are toxic and at least 69 cause cancer. Tobacco smoke itself is a known human carcinogen."

Increasingly, North Dakotans have adopted smoke-free policies in their homes to prevent exposure to secondhand smoke. In 2015, 87.6 percent of North Dakotans had adopted smoke-free rules for their homes, while 83.7 percent reported no exposure to someone else's smoke during the past seven days (Source: 2015 North Dakota Adult Tobacco Survey).

North Dakota's smoke-free air law, which protects North Dakotans from secondhand smoke in public, went into effect in December 2012.

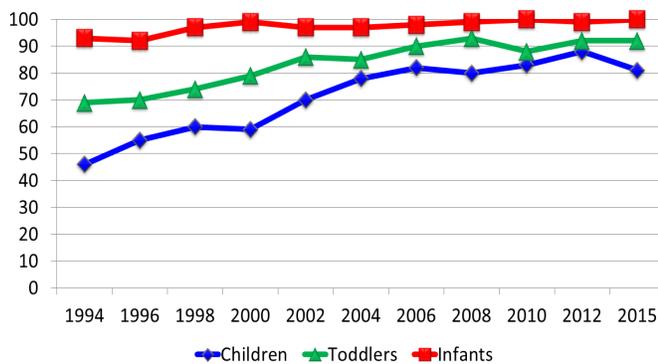
## Injury

A significant proportion of disabilities are caused by injuries including those which result from traffic crashes, falls, and burns.

Buckling children in age- and size-appropriate car seats, booster seats, and seat belts reduces the risk of serious and fatal injuries.

**Although proper use of car seats, booster seats, and seat belts for children is improving in North Dakota over time, it still decreases as children age.**

### **North Dakota child safety restraint use, 1994-2015**



**Source: ND Dept. of Health, Observational Studies**

**Nearly one in five (18%) U.S. vehicle crashes in which someone was injured involved distracted driving in 2013 (Source: National Highway Traffic Safety Administration, 2015). Also, more than half (58%) of North Dakota students in grades 9-12 reported texting or emailing while driving a car or other vehicle on at least one of the last 30 days before the survey (Source: 2015 ND YRBS).**

According to the Centers for Disease Control and Prevention, one in five falls causes a serious injury such as a broken bone or a head injury. These injuries can make it hard for a person to get around, do everyday activities, or live on their own.

## **Violence**

Acts of violence, such as intimate partner and/or sexual violence also increase a person's risk for chronic illnesses. A growing body of science is consistently linking violence (both the experience with and/or the fear of) with risk for and incidence of a range of serious physical health problems. A brief list of disorders associated with experiencing violence such as child abuse, family violence, sexual violence, and community violence includes, but is not limited to:

- Heart disease and hypertension
- Gastrointestinal disorders
- Diabetes
- Neurological and musculoskeletal diseases
- Lung disease including asthma and chronic obstructive pulmonary disease
- Chronic pain
- Migraines and other frequent headaches
- Cervical cancer

According to the CDC's 2008 Morbidity and Mortality Weekly Report (MMWR), *Adverse Health Conditions and Health Risk Behaviors Associated with Intimate Partner Violence*, "Women who have experienced domestic violence are 80 percent more likely to have a stroke, 70 percent more likely to have heart disease, 60 percent more likely to have asthma and 70 percent more likely to drink heavily than women who have not experienced intimate partner violence."

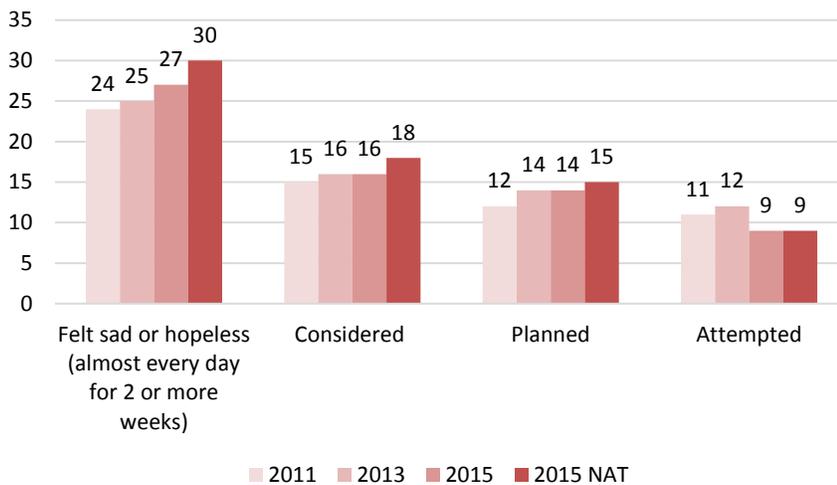
In 2015, 20 domestic violence/rape crisis agencies served 1,041 primary victims of sexual assault; 5,356 new victims of domestic violence and 2,215 children were impacted by domestic violence (Source: Council on Abused Women Services North Dakota).

Integrating efforts to prevent violence into healthy eating and active living strategies, thereby further reducing the risk for chronic illnesses, include creating safe spaces, promoting community development and employment, and fostering social cohesion.

## Mental Health Risks

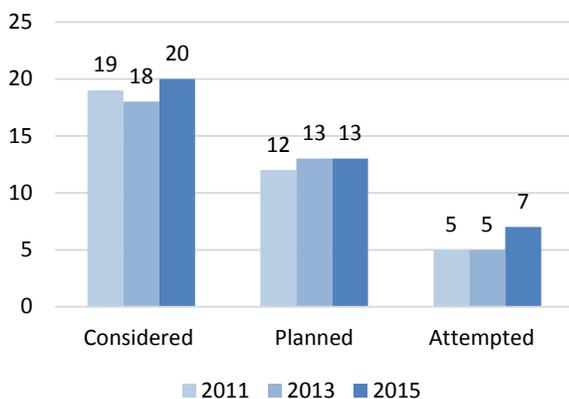
Age, gender, access to lethal means, population density and proximity to service providers are a few of many factors which impact suicide risk in North Dakota. While suicide affects all communities, American Indians, middle-age and older white males, and veteran residents experience the highest suicide rates. Many individual risk factors have been associated with suicide risk, such as family history of suicide, aging, mental and physical health challenges, and isolation.

### Suicide related behaviors (Grades 9-12), 2011-2015



Source: ND YRBS 2015

### Suicide related behaviors (Grades 7-8), 2011-2015

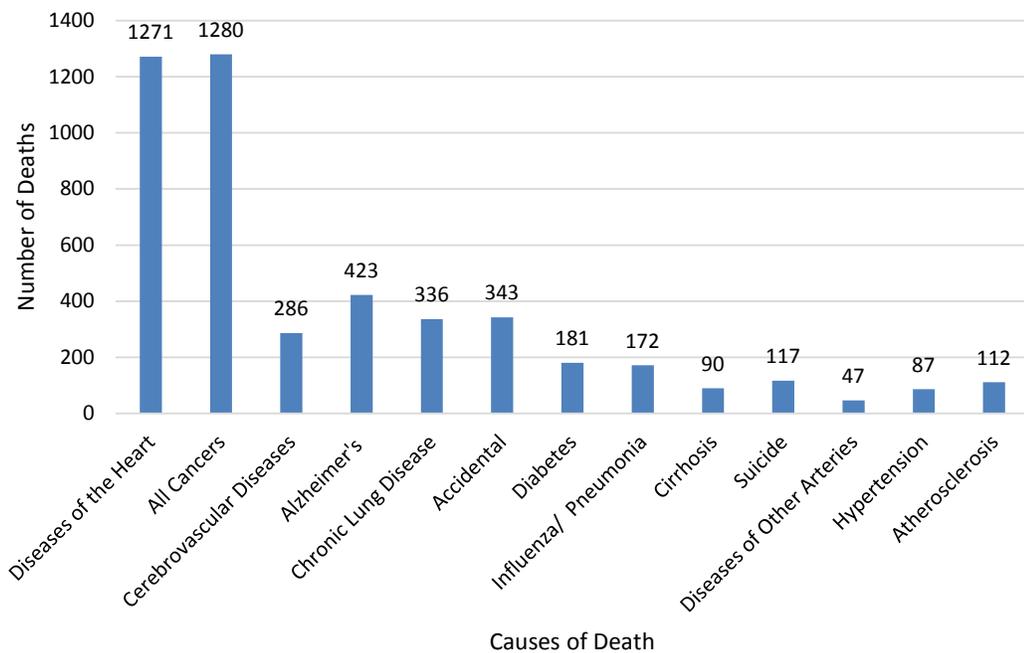


Source: ND YRBS 2015

# Injury and Disease Burden

For North Dakota residents, the leading causes of death are diseases of the heart, all cancers, cerebrovascular disease, Alzheimer’s disease, chronic lung disease, all accidents, diabetes, influenza and pneumonia, hypertension, atherosclerosis, suicide and diseases of other arteries. The Leading Causes of Death is a summary of the causes of death most common to North Dakota residents. The National Center for Health Statistics, a division of the CDC, defines these causes. The NDDoH Division of Vital Records uses the definitions to group specific causes of death to the appropriate category. The certifying medical provider determines the cause of death by the information recorded on the death record. Most categories are a group of related causes of death, while others are a single disease.

## North Dakota resident leading causes of death, 2015



Source: NDDoH Vital Records

# Chronic Diseases

## Alzheimer's Disease

Alzheimer's is a type of dementia that causes problems with memory, thinking, and behavior. Symptoms of Alzheimer's usually develop slowly and worsen over time. Eventually, they become severe enough to interfere with daily tasks.

Alzheimer's is the most common form of dementia, a general term for memory loss and other intellectual abilities serious enough to interfere with daily life. Alzheimer's disease accounts for 60 to 80 percent of dementia cases (Source: Alzheimer's Association).

### **Prevalence**

In 2016, there are approximately 14,000 North Dakotans living with Alzheimer's disease. That number is projected to increase to 16,000 by 2025. The greatest risk factor for Alzheimer's disease is age, so as the population of North Dakota and the United States gets older, the incidence and prevalence of Alzheimer's is projected to increase (Source: Alzheimer's Association).

### **Mortality**

In 2015, there were 423 deaths from Alzheimer's disease, for an age-adjusted mortality rate of 40.74 deaths per 100,000 people (Source: ND Vital Statistics).

### **Consequences (complications and/or costs)**

In the final stages of Alzheimer's disease, individuals lose the ability to respond to their environment, to carry on a conversation and, eventually, to control movement. They may still say words or phrases, but communicating pain becomes difficult. As memory and cognitive skills continue to worsen, personality changes may take place and individuals need extensive help with daily activities. At this stage, individuals may:

- Require full-time, around-the-clock assistance with daily personal care
- Lose awareness of recent experiences, as well as of their surroundings
- Require high levels of assistance with daily activities and personal care
- Experience changes in physical abilities, including the ability to walk, sit and, eventually, swallow
- Have increasing difficulty communicating
- Become vulnerable to infections, especially pneumonia

The estimated cost of caring for people with Alzheimer's disease in North Dakota in 2016 is \$179 million. The total value of unpaid care provided by caregivers in 2015 totaled \$425 million (Source: Alzheimer's Association).

## Cancer

Cancer is not a single disease, but a collection of related diseases defined by the uncontrolled growth and spread of cells into surrounding tissue. Cancer cells can spread to other parts of the body through the blood and lymph systems, which may lead to death if not controlled. Most cancers are named for the organ or type of cell in which they start. For example, cancer that begins in the colon is called colon cancer; cancer that begins in basal cells of the skin is called basal cell carcinoma.

Though people of all ages are diagnosed with cancer, it is primarily an older person's disease. Over three-quarters of all cancers are diagnosed in men and women ages 55 and older.

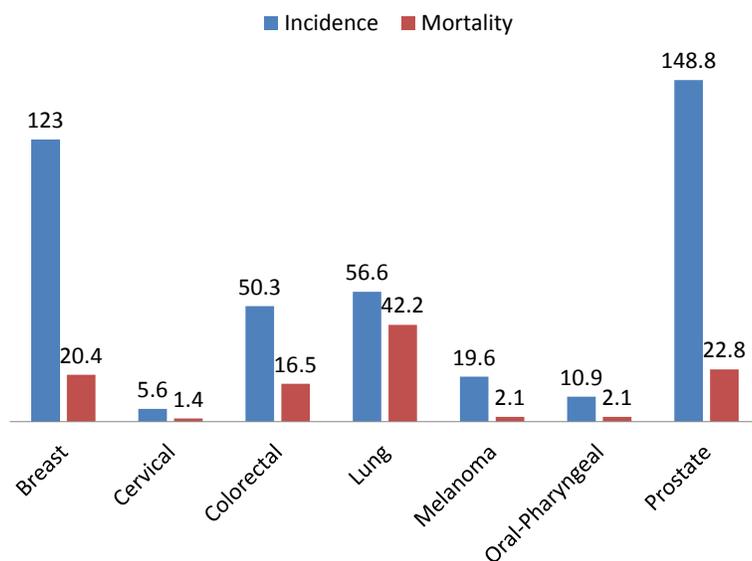
### **Prevalence**

From 2004 to 2013, the most commonly diagnosed cancers among North Dakotans included cancer of the prostate (males only), female breast, lung and bronchus, and colon and rectum.

### **Mortality**

From 2004 to 2013, there were 107.5 annual cancer deaths per 100,000 people in North Dakota. Cancer of the lung was the leading cause of cancer deaths among North Dakota men and women during this time period, accounting for 42.2 deaths per 100,000 persons each year.

### **Cancer incidence and mortality rates per 100,000, North Dakota, 2004-2013**



**Source: ND Cancer Registry, 2004-2013; ND death certificates, 2004-2013**

### **Consequences**

In 2015, medical costs in North Dakota involving all cancers combined were an estimated \$361 million (Source: Chronic Disease Cost Calculator – Version 2, CDC).

## Cardiovascular Disease

Cardiovascular disease (CVD) includes all diseases of the heart and blood vessels, including coronary heart disease, stroke, congestive heart failure, hypertensive disease, and atherosclerosis. CVD is also commonly referred to as “diseases of the circulatory system.” Cardiovascular disease is a chronic disease, with an onset that often extends decades after exposure to one or more risk factors.

Coronary heart disease (or coronary artery disease) is a narrowing of the small blood vessels that supply blood and oxygen to the heart (coronary arteries). Coronary disease usually results from the build-up of fatty material and plaque (atherosclerosis). As the coronary arteries narrow, the flow of blood to the heart can slow or stop. The disease can cause chest pain (stable angina), shortness of breath, heart attack, or other symptoms.

Stroke is another type of cardiovascular disease. It affects the arteries leading to and within the brain. A stroke occurs when a blood vessel that carries oxygen and nutrients to the brain is either blocked by a clot or bursts. When that happens, part of the brain cannot get the blood (and oxygen) it needs, so brain tissue starts to die.

### **Prevalence**

In 2015, an estimated 22,731 (3.9%) North Dakota adults reported having ever been told they have had a heart attack or myocardial infarction. (Source: 2015 ND BRFSS). During the same year, an estimated 14,471 (2.5%) North Dakota adults reported having ever been told they have had a stroke.

### **Mortality**

In 2015, there were 1,271 deaths from coronary heart disease, for an age-adjusted mortality rate of 136.6 deaths per 100,000 people (Source: ND Vital Statistics). During this same time period, there were 286 deaths from stroke, for an age-adjusted mortality rate of 29.3 deaths per 100,000 people.

### **Consequences**

In 2015, medical costs in North Dakota involving coronary heart disease were an estimated \$332 million, while medical costs in North Dakota involving stroke were estimated to be \$193 million (Source: Chronic Disease Cost Calculator – Version 2, CDC).

## Diabetes

Individuals diagnosed with diabetes are unable to produce enough insulin or use their own insulin efficiently, causing blood glucose levels that are higher than normal. There are several types of diabetes:

**Type 1 Diabetes** develops mostly in young individuals but can also develop in adults. Type 1 is an autoimmune disorder characterized by high blood glucose levels as a result of the loss of insulin production, requiring insulin administration for blood glucose control and sustainment of life. About 5 to 10 percent of all people with diabetes have type 1.

**Type 2 Diabetes** is a condition characterized by high blood glucose levels that result from a deficiency of or a resistance to insulin that develops gradually. A sedentary lifestyle, obesity, and genetic factors contribute to the risk for type 2 diabetes. About 90 percent of all people with diabetes have type 2.

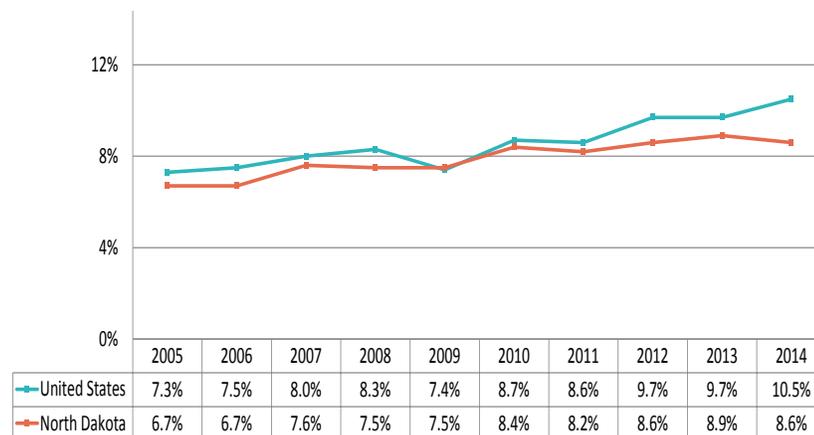
**Gestational Diabetes** can develop in a woman at approximately the 24th week of gestation. Decreased insulin sensitivity results in elevated blood glucose. Once pregnancy is complete, glucose most often returns to normal. Women with gestational diabetes are at a higher risk for prediabetes and type 2.

Adequate and regular health care and self-monitoring are critical to prevent and control diabetes-related complications. Routine physician visits, physical activity, diet modification, and diabetes self-management education positively affect health outcomes. Appropriate screening, early intervention, education, and altering personal behaviors are vital in preventing complications.

### Prevalence

From 2005 to 2014, the prevalence of diagnosed diabetes among adults (18 and older) in North Dakota has increased from 6.7 percent to 8.6 percent.

#### Percent of adults with diabetes, US and North Dakota, 2005-2014

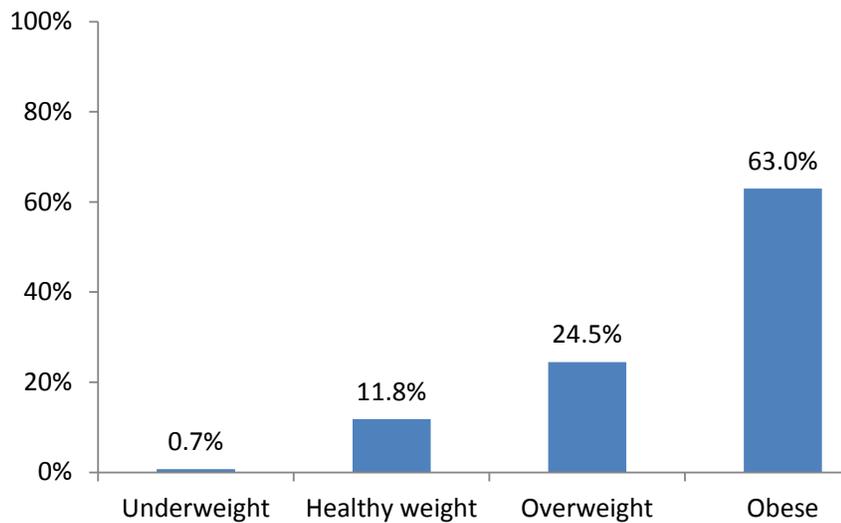


Source: CDC, National Diabetes Statistics Report, 2014

In 2014, approximately 49,000 North Dakota adults were diagnosed with diabetes and an additional 18,961 adults had undiagnosed diabetes (Source: Centers for Disease Control, National Diabetes Statistics Report, 2014).

**In 2015, one in 11 North Dakota adults reported ever being diagnosed with diabetes** (Source: ND BRFSS 2015). Adults who report ever being told they have diabetes are much more likely to be obese.

**Percentage of North Dakota adults who have ever been diagnosed with diabetes, by weight status, 2015**



**Source: ND BRFSS 2015**

**Mortality**

In 2015, there were a total of 181 deaths in North Dakota, or 20.3 deaths per 100,000 people, attributed to diabetes (Source: ND Vital Statistics).

**Consequences (complications and/or costs)**

Health complications of diabetes include eye problems, nerve damage, foot problems, dental problems, kidney disease, and cardiovascular disease.

Estimates of the cost of diabetes have been studied by the American Diabetes Association in 2002, 2007 and 2012, using consistent methodology (Source: Yang W, Dal T, Halder P, Gallo P, Kowal S, Hogan P. Economic Costs of Diabetes in the US in 2012, Diabetes Care 36: 1033-1046, 2013).

The total estimated cost of diagnosed diabetes in 2012 in the U.S. was \$245 billion, including \$176 billion in direct medical costs and \$69 billion in reduced productivity.

The largest components of medical expenditures are:

- Hospital inpatient care (43% of medical cost)
- Prescription medications to treat the complications of diabetes (18%)
- Antidiabetic agents and diabetes supplies (12%)
- Physician office visits (9%)
- Nursing/residential facility stays (8%)

People with diagnosed diabetes:

- Incur average medical expenditures of approximately \$13,700 per year
- Have medical expenditures approximately 2.3 times higher than those without diabetes

Diabetes imposes a significant cost to society. Intangibles from pain and suffering, resources from care provided by nonpaid caregivers, and the burden associated with undiagnosed diabetes are not included in the estimate above.

## Oral Disease

According to the *Oral Health In America: A Report of the Surgeon General*, published in 2000, "...oral health means much more than healthy teeth. It means free of chronic oral-facial pain conditions, oral and pharyngeal (throat) cancers, oral soft tissue lesions, birth defects such as cleft lip and palate, and scores of other diseases and disorders that affect the oral, dental, and craniofacial tissues, collectively known as the craniofacial complex."

Poor oral health can have a negative impact on an individual's social, economic, psychological, and physical well-being.

### **Prevalence**

More than 23 percent of children in the U.S., ages 2 to 11 years have untreated decay, which if left untreated can cause pain and infection and may lead to problems in eating, speaking, and learning. Children from low-income households are more than twice as likely to have untreated tooth decay as children from high-income households. By age 15, nearly 60 percent of all adolescents will have experienced dental decay. It has been estimated that approximately 51.7 million school hours annually are missed by school-aged children due to a dental problem or visit (Source: Scully, C. "Oral health in America: a report of the Surgeon General." (2000): 1-308).

Between 2008 and 2012, the average incidence of cleft lip with cleft palate in North Dakota was 7.9 per 10,000 live births. American Indian children were five times more likely to be born with cleft lip with cleft palate at a rate of 29.2 per 10,000 as compared to 5.5 per 10,000 live births in white children (Source: ND Department of Health, Vital Records).

In 2015, approximately 73 percent of all North Dakota third-grade students experienced decay, and 28 percent had untreated decay. The rate of untreated decay was significantly higher for American Indians (51%), and other minority children (41%), compared to their white peers (24%). Likewise, children attending lower income schools (>50% of children eligible for National School Lunch Program) have significantly higher rates of untreated decay, the prevalence of rampant decay, and the need for early or urgent dental care than students attending higher income schools (Source: ND Department of Health, Oral Health Program, Third-Grade Basic Screening Survey).

The burden of oral disease is not limited to children and adolescents. The presence of extensive tooth loss, untreated caries, and untreated periodontal disease among older adults indicates that a sizable number may not have access to interventions useful for preventing and controlling oral disease. Among North Dakota's adults ages 60 years and older, 32 percent have lost all their teeth and approximately 68 percent have substantial tooth loss. Additionally, 33.7 percent of dentate older adults need urgent oral health care, and about 23 percent have severe gingival inflammation. Older adults, especially those in long-term care facilities, may have more difficulty accessing effective interventions to prevent and control oral disease than younger adults (Source: ND Department of Health, Oral Health Program, Older Adult Basic Screening Survey).

### ***Mortality***

In 2014, the mortality rate of oral-pharyngeal cancers in North Dakota was 1.4 per 100,000 residents. This rate increased slightly in 2015 to 1.7 per 100,000 (Source: ND Department of Health, Vital Records).

### ***Consequences (complications and/or costs)***

Nationally, more than \$100 billion is spent on oral health services each year. Individuals and families bear much of the burden of costs of oral health care, spending \$30 billion out-of-pocket on dental services, ranking second only to prescription drug expenditures (Source: Wall, T., K. Nasseh, and M. Vujicic. "US dental spending remains flat through 2012." Health Policy Institute Research Brief. American Dental Association. January (2014)).

Most oral diseases and conditions are preventable. The Community Preventive Services Task Force (Community Guide) has identified underutilized evidence-based preventive interventions. An example is community water fluoridation, which prevents tooth decay among people of all ages, and is the most cost-effective way to deliver the benefits of fluoride to all residents of a community. One CDC study found that in communities with more than 20,000 residents, every \$1 invested in community water fluoridation yields about \$38 in savings each year from fewer cavities treated. Another intervention highlighted in the Community Guide is the use of dental sealants – plastic coatings applied to the chewing surfaces of the back teeth where most decay occurs. These interventions remain underutilized because barriers exist to their implementation, such as lack of basic state capacity to support oral health, lack of dental insurance and access to clinical and community preventive services, little awareness of effectiveness and safety of these interventions, and costs associated with sustaining preventive programs, such as maintaining community water systems that deliver fluoridated water (Source: CDC).

# Communicable Diseases

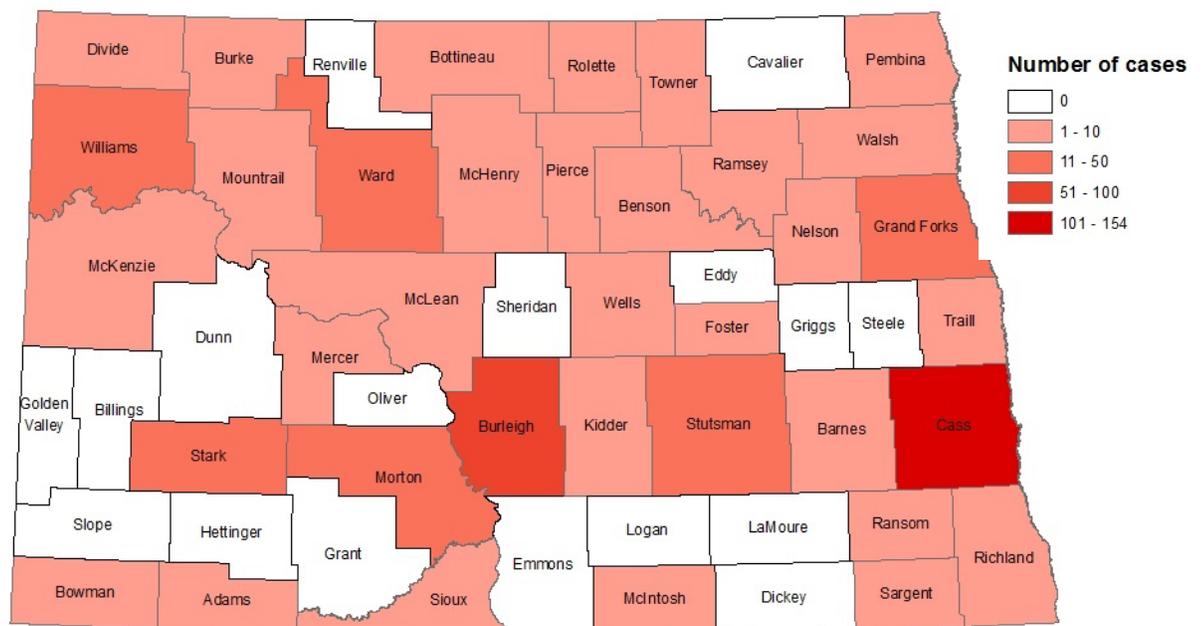
## HIV

HIV is a virus spread through certain body fluids that attack the body’s immune system, specifically the CD4 cells, often called T cells. Over time, HIV can destroy so many of these cells that the body can’t fight off infections and disease. These special cells help the immune system fight off infections. Untreated, HIV reduces the number of CD4 cells (T cells) in the body. This damage to the immune system makes it harder and harder for the body to fight off infections and some other diseases. Opportunistic infections or cancers take advantage of a fragile immune system and signal that the person has AIDS.

### Prevalence

As of December 31, 2015, an estimated 424 individuals were living in North Dakota with HIV/AIDS. North Dakota traditionally ranks 50th out of the 50 states with a prevalence of 57 cases/100,000 people. The main risk factors of people infected with HIV living in North Dakota include male-to-male sexual contact for men, and heterosexual contact for women. Below is a map that depicts the total number of HIV/AIDS cases currently living in North Dakota by county. The map shows there are prevalent cases in all parts of the state. However the majority of cases are concentrated in areas with higher population.

### HIV incidence in North Dakota, 2015



Source: NDDoH Electronic Surveillance System, MAVEN

### ***Consequences (complications and/or costs)***

Some of the long-term consequences of untreated HIV infection can include a decrease in the ability of the immune system to fight off even the most benign infections. Many people progress to the levels of immunosuppression that they are diagnosed with Acquired Immunodeficiency Syndrome (AIDS). At this point, the immune system is so weakened that cancers or other infectious agents can cause illness and the body is not able to fight off the infection. Increased hospitalizations and health care costs make prompt treatment and linkage to care for people living with HIV a crucial step to reducing the health complications that can come along with HIV infection. Utilizing the most recent antiretroviral therapies, many people infected with HIV can live healthy and productive lives. These treatments are very effective at keeping the virus suppressed.

Without appropriate treatment, people are more likely to suffer health difficulties. HIV makes the body more susceptible to other conditions that may be life-threatening.

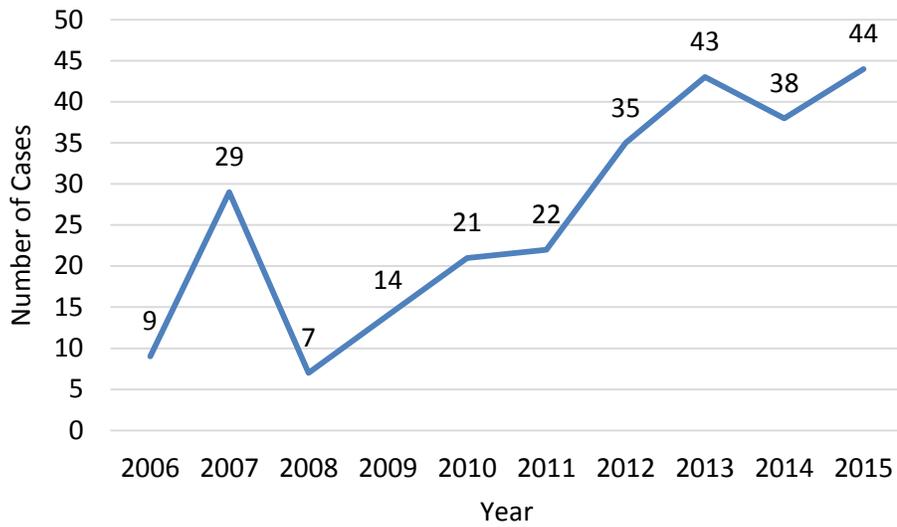
## **Shiga toxin-producing Escherichia coli (STEC)**

Escherichia coli (E. coli) bacteria are normally found in the intestines of people and animals. Most types of E. coli are harmless and are an important part of the normal flora found in the human intestinal tract. However, certain types of E. coli are pathogenic and cause either diarrhea or illness outside of the intestinal tract. Shiga-toxin-producing E. coli, or STEC, is a particularly harmful type of E. coli that causes disease by making a toxin. STEC can be transmitted through contaminated food or water, or through contact with infected people or animals, including their environments (Source: CDC).

### ***Prevalence***

In 2015, the NDDoH received 44 reports of STEC cases, a 16 percent increase from the 38 cases reported in 2014. Of the 44 cases in 2015, 13 were E. coli O157: H7. In 2014, 12 of the 38 cases were E. coli O157: H7. Statewide STEC incidence was 5.4 cases per 100,000 people in 2015. Eighteen counties reported cases, with Logan (51.7 cases per 100,000 people), LaMoure (48.5 cases per 100,000 people), and Grant (41.9 cases per 100,000 people) having the highest incidence of STEC. The median age of cases of STEC was 16 years (range: 1-56 years). Persons aged 15-19 years had the highest age-specific incidence rate (22.1 cases per 100,000 people). Twenty-two (50%) cases were female, and nine (20%) cases were hospitalized.

### **North Dakota STEC Case Counts by Year, 2006-2015**



**Source: NDDoH Electronic Surveillance System, MAVEN**

### **Mortality**

In 2015, the NDDoH received no death reports due to STEC infections.

### **Consequences (complications and/or costs)**

The CDC estimates that approximately 5 to 10 percent of people diagnosed with STEC infections develop hemolytic uremic syndrome (HUS), a serious complication that can be fatal. In 2015, one case of STEC reported to the NDDoH resulted in HUS.

# Injury

## Suicide

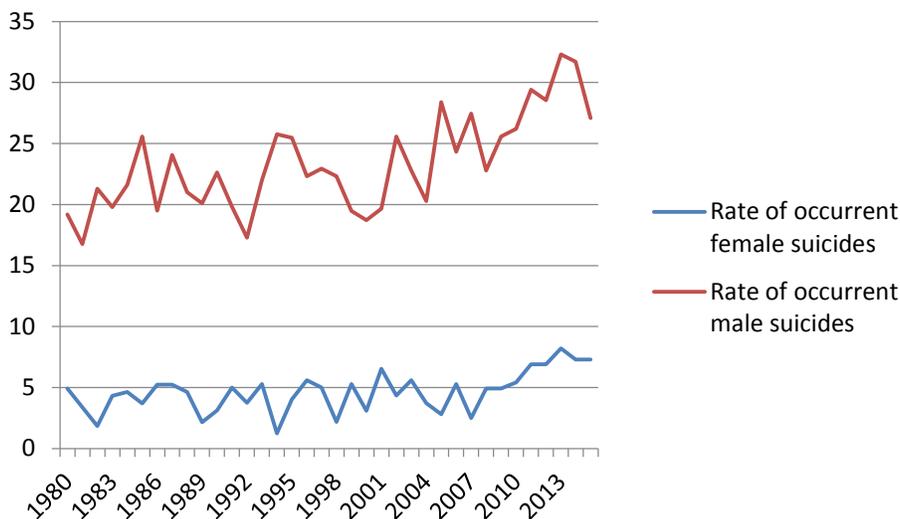
Suicide is a serious public health problem that can have lasting harmful effects on individuals, families, and communities. While its causes are complex and determined by multiple factors, the goal of suicide prevention is simple: Reduce factors that increase risk (risk factors) and increase factors that promote resilience (protective factors). Ideally, prevention addresses all levels of influence: individual, relationship, community, and societal. Effective prevention strategies are needed to promote awareness of suicide and encourage a commitment to social change.

### Prevalence

While we know many more North Dakotans attempt suicide than die by suicide, there is no universal data collection system to know how many North Dakotans receive medical treatment annually for a suicide attempt. It has been estimated that for every completed suicide there are as many as 25 more people who attempt suicide but do not die (American Association of Suicidology, 2008). In 2015, 1,870 North Dakota residents called the National Suicide Prevention Lifeline, requesting support for suicidal thoughts or actions (reported by North Dakota's crisis-line service provider, Firstlink Fargo).

### Mortality

In 2015, 137 North Dakota residents died by suicide. Suicide was the ninth leading cause of death in North Dakota overall, and the second leading cause of death for those between the ages of 15 and 24. Males typically complete suicide four times more frequently than females. The graph below depicts the suicide rate of males and females in North Dakota from 1980 to 2015 per 100,000 in population.



Source: NDDoH Vital Records

### ***Consequences (complications and/or costs)***

Suicide has devastating consequences for not only family and relationships, but also for society in general. In fact, the CDC estimates (updated 2005) that the average suicide costs \$1,061,170 per person. Based on this figure, within the state of North Dakota, our 120 suicides in 2012 cost \$127,340,400 due to combined medical and work loss costs.

## **Domestic Violence/Sexual Assault**

Intimate partner violence (IPV) is a serious public health problem in North Dakota. The term “intimate partner violence” describes physical violence, sexual violence, stalking, and psychological aggression by a current or former intimate partner.

### ***Prevalence***

In 2015, 20 domestic violence/rape crisis agencies served 1,041 primary victims of sexual assault and 5,356 new victims of domestic violence, and 2,215 children were impacted by domestic violence (Source: Council on Abused Women Services North Dakota). The 2014 Crime Report published by the North Dakota Office of the Attorney General included 251 forcible rapes reported by 52 sheriff departments, 53 police departments, and the North Dakota Highway Patrol (Source: <https://www.ag.nd.gov/Reports/BCIReports/CrimeHomicide/MURDER15.pdf>).

### ***Mortality***

The Criminal Justice Statistics Special Report, Homicide in North Dakota, published in 2015 by the North Dakota Office of the Attorney General stated that for the period of 1996-2015, 48 percent of deaths due to homicide involved domestic violence. People killed in domestic violence incidents were more likely to be killed with a firearm than those killed in non-domestic incidents. Eighty percent of female homicide victims were killed in domestic violence incidents, compared to 32 percent of males (Source: <https://www.ag.nd.gov/Reports/BCIReports/CrimeHomicide/MURDER15.pdf>).

### ***Consequences (complications and/or costs)***

Acts of violence, such as intimate partner and sexual violence also increase a person’s risk for chronic illnesses. A growing body of science is consistently linking violence (both the experience with and the fear of) with risk for and incidence of a range of serious physical health problems. According to the Center for Disease Control and Prevention’s 2008 Morbidity and Mortality Weekly Report (MMWR) – Adverse Health Conditions and Health Risk Behaviors Associated with Intimate Partner Violence, “Women who have experienced domestic violence are 80 percent more likely to have a stroke, 70 percent more likely to have heart disease, 60 percent more likely to have asthma and 70 percent more likely to drink heavily than women who have not experienced intimate partner violence.”

According to the CDC, the costs to society of IPV (updated to 2003 dollars) exceeded \$8.3 billion. The increased annual health care costs for victims of IPV can persist as much as 15 years after the cessation of abuse. Consequences include physical (e.g., deaths, injuries, adverse health outcomes), psychological (e.g., anxiety, depression, suicidal behavior, symptoms of post-traumatic stress disorder, antisocial behavior), social (e.g., restricted access to services, isolation from social networks, and homelessness), health behaviors that present further health risks (e.g., substance abuse, alcoholism, suicide attempts), and negative health behaviors (e.g., engaging in high-risk sexual behavior, using harmful substances, unhealthy diet-related behaviors) (Source: <http://www.cdc.gov/violenceprevention/intimatepartnerviolence/consequences.html>).

## **Motor Vehicle Crashes (MVC)**

Reducing motor vehicle crash deaths was one of the great public health achievements of the 20th century for the U.S. However, more than 32,000 people die and 2 million are injured each year from motor vehicle crashes. In 2013, the U.S. crash death rate was more than twice the average of other high-income countries. In the U.S., front seat belt use was lower than in most other comparison countries. One in three crash deaths in the U.S. involved drunk driving, and almost one in three involved speeding. Lower death rates in other high-income countries, and a high percentage of risk factors in the U.S. suggest that we can make more progress in reducing crash deaths (Source: <http://www.cdc.gov/vitalsigns/motor-vehicle-safety/index.html>).

### ***Prevalence and Mortality***

Of the 33,828 cases collected through the State Trauma Registry from January 2009 through December 2014, motor vehicle and motorcycle crashes were the leading cause of all trauma cases reported, with more than 39 percent of the trauma cases attributed to motor vehicle and motorcycle crashes. Motor vehicle and motorcycle crashes also accounted for 38 percent of the 903 deaths recorded.

### ***Consequences (complications and/or costs)***

According to the CDC, in 2013 the total costs of crash-related deaths including medical and work loss costs is \$162 million in North Dakota (Source: <http://www.cdc.gov/motorvehiclesafety/pdf/statecosts/nd-2015costofcrashdeaths-a.pdf>).

In North Dakota, alcohol is a contributing factor to motor vehicle crashes. According to the North Dakota Department of Transportation, in 2015, 43.2 percent of motor vehicle fatal crashes involved alcohol, and 60.9 percent of individuals killed in motor vehicle crashes were not wearing seat belts.

## Falls

Falls are a common cause of injury for adults and children in our state. Falls are the leading cause of both fatal and nonfatal injuries among older adults. The chances of falling and of being seriously injured in a fall increase with age. Twenty to 30 percent of people who fall suffer moderate to severe injuries that can make it difficult to get around or to live independently, increasing the risk of early death. Fall injuries affecting children happen as a result of playground falls, as well as falls from furniture and windows.

### **Prevalence**

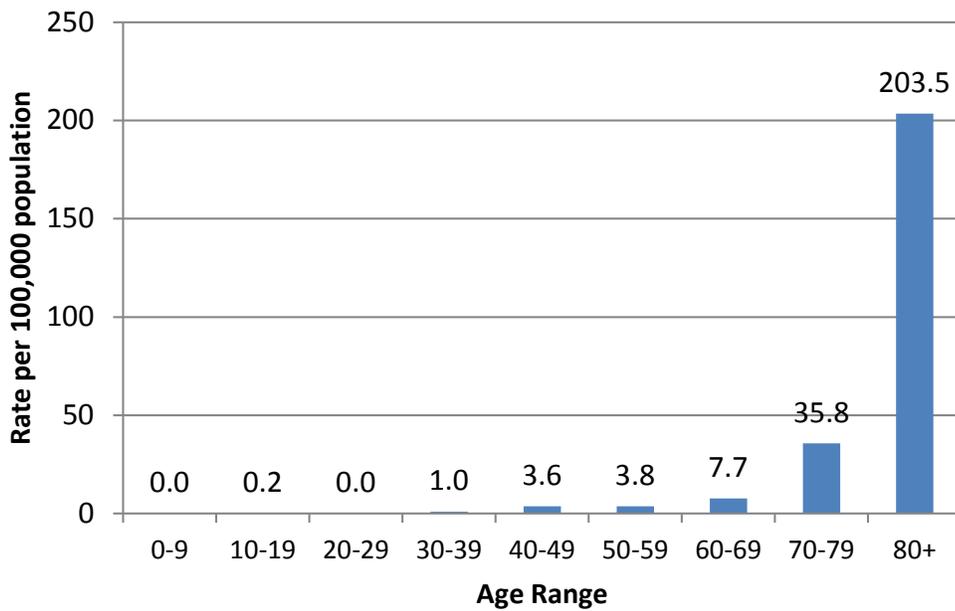
Each year in the U.S., one in three adults age 65 and older falls and sustains moderate to severe injuries, such as hip fractures and head traumas. Falls are the most common cause of traumatic brain injuries. Unintentional falls are the leading cause of non-fatal injuries for children in the U.S. In 2013, unintentional falls resulted in nearly 2,578,235 injuries that required treatment in an emergency room. Injuries occur from activities such as climbing on furniture, playing near unsecured windows, falling down stairs, and playing on playgrounds. Most serious falls occur in the home and to children under the age of 3. On average, more than 275,000 children suffer from traumatic brain injuries each year from falls (Source: CDC).

### **Mortality**

According to the National Center for Health Statistics, the death rates from falls among older men and women have risen sharply over the past decade. The death rate from falls in the U.S. has increased significantly in the past decade as indicated in the figure below. In the U.S. in 2013, about 25,500 older adults died from fall injuries. Falls were the third leading cause of injury-related deaths in North Dakota in 2013, and the first leading cause of injury-related deaths in individuals over the age of 65. Each year in the U.S., more than 2,200 children, or six children a day, die from an injury that occurred in the home (Source: [http://www.safekids.org/safetytips/field\\_type/tip/field\\_risks/falls](http://www.safekids.org/safetytips/field_type/tip/field_risks/falls). Safe Kids Worldwide. 2015). A total of 559 North Dakota residents died due to falls from 2009 through 2014, an average of 93 deaths per year.

The majority of fall-related deaths occur among older adults. Seventy-one percent of fall-related deaths that took place in North Dakota from 2009 through 2014 were in individuals ages 80 and older.

### Rates of fall-related deaths by age, North Dakota, 2009-2014



Source: CDC

### Consequences (complications and/or costs)

Fall-related medical expenses cost Americans more than \$20 billion each year, according to estimates from the CDC. Projections show these costs will climb to more than \$32 billion over the next 20 years. According to the CDC, one of five falls causes a serious injury such as a broken bone or a head injury. These injuries can make it hard for a person to get around, do everyday activities, or live on their own.

## Unintentional Poisoning

Poison is any substance, including medications, which is harmful to your body if too much is eaten, inhaled, injected, or absorbed through the skin. An unintentional poisoning occurs when a person taking or giving too much of substance did not mean to cause harm. Unintentional poisonings are the leading cause of unintentional injuries in the U.S. (Source: CDC).

### ***Prevalence***

Young children comprise a disproportionate percentage of poisoning cases. The Hennepin Regional Poison Center (HRPC) in Minneapolis is the regional poison control center for North Dakota residents. From 2009 to 2014, 56 percent of calls to the poison control center among North Dakota residents were among children 5 years of age and younger. In North Dakota from 2009-2014, 89 percent of poison exposures reported to the HRPC were nontoxic, minimally toxic, or had a minor effect. Moderate effect, major effect, or death occurred in 5 percent of poison exposures reported to poison centers. From 2009-2014, 31,517 calls from North Dakota residents were made to HRPC, or about 5,253 calls a year.

### ***Mortality***

Poisoning deaths surpass motor vehicle crash deaths in people ages 25 to 64 years and are the leading cause of unintentional injury deaths in this age group. There were 38,851 unintentional poisoning deaths in the U.S. in 2013. The rate of unintentional poisoning deaths was 12.3 per 100,000 people (Source: CDC). In North Dakota from 2009 to 2014, there were 240 deaths due to poisoning. The rate of unintentional poisoning deaths among North Dakota residents was 5.73 per 100,000 people. In 2013, unintentional poisoning ranked sixth among the leading causes of injury deaths in North Dakota.

Narcotics and alcohol were the most common substances resulting in death due to poisoning in North Dakota from 2009 to 2014 among residents ages 30 to 50. Among residents over the age of 65, carbon monoxide poisoning was the leading substance resulting in death in North Dakota from 2009 to 2014.

### ***Consequences (complications and/or costs)***

Poisonings also increase the burden on emergency rooms and hospitals as it is the tenth leading reason for nonfatal injuries seen in emergency rooms. They are also the fourth leading reason for hospital admissions from emergency room visits in U.S. The estimated economic burden of poisonings in 2005 was \$3.2 billion in total lifetime medical costs (Source: Injury Surveillance Workgroup 7. (2012). Consensus recommendations for national and state poisoning surveillance. The Safe States Alliance. Atlanta, GA, April 2012).

# Behavioral Health

The North Dakota Behavioral Health Assessment, Gaps and Recommendations, 2016, from the North Dakota Department of Human Services Behavioral Health Division provided content for the behavioral health section.

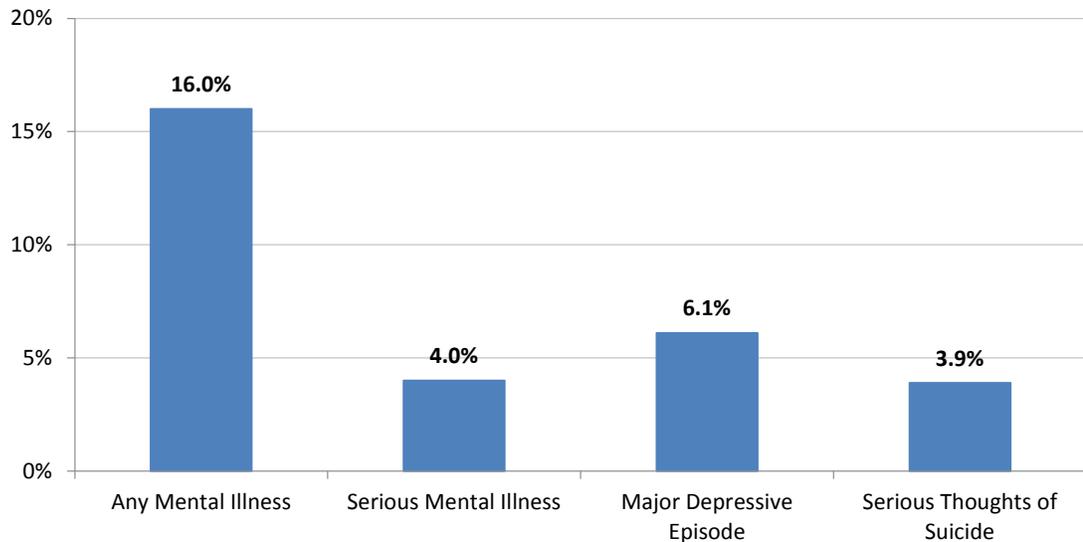
Behavioral health conditions can have a powerful effect on the health of individuals, their families, and communities. These are among the top conditions that cause disability and carry a high burden of disease in the U.S., resulting in significant costs to families, employers, and publicly funded health systems. By 2020, mental and substance use disorders will surpass all physical diseases as a major cause of disability worldwide.

According to SAMHSA's 2013-2014 National Survey on Drug Use and Health (NSDUH), an estimated 91,912 (16.1%) North Dakotans ages 18 and older experienced some form of mental illness. In the past year, 51,950 adults (9.1%) had a substance use disorder. Of these, 18,839 people had both a mental disorder and substance use disorder, also known as co-occurring mental and substance use disorders. Individuals with mental illness and/or substance use disorders die, on average, about five years earlier than persons without these conditions. And, individuals with serious mental illness (SMI) are now dying 25 years earlier than the general population. Also, behavioral health conditions can lead to other chronic diseases such as diabetes and heart disease. Individuals with mental illness may develop cancer at a 2.6 times higher rate on account of late stage diagnosis and inadequate treatment and screenings. Addressing the impact of substance use alone is estimated to cost Americans more than \$600 billion each year.

## Adult Mental Health

Approximately 17 percent of North Dakota adults reported they have been told at some time in their life that they have a depressive disorder (including depression, major or minor depression, and dysthymia). And, an estimated 6 percent of North Dakota adults (ages 18 and older) have experienced a major depressive episode in the past year.

### ***Reported mental illness within the past year among ND adults ages 18 and older***



***Source: National Survey on Drug Use and Health, 2013 and 2014***

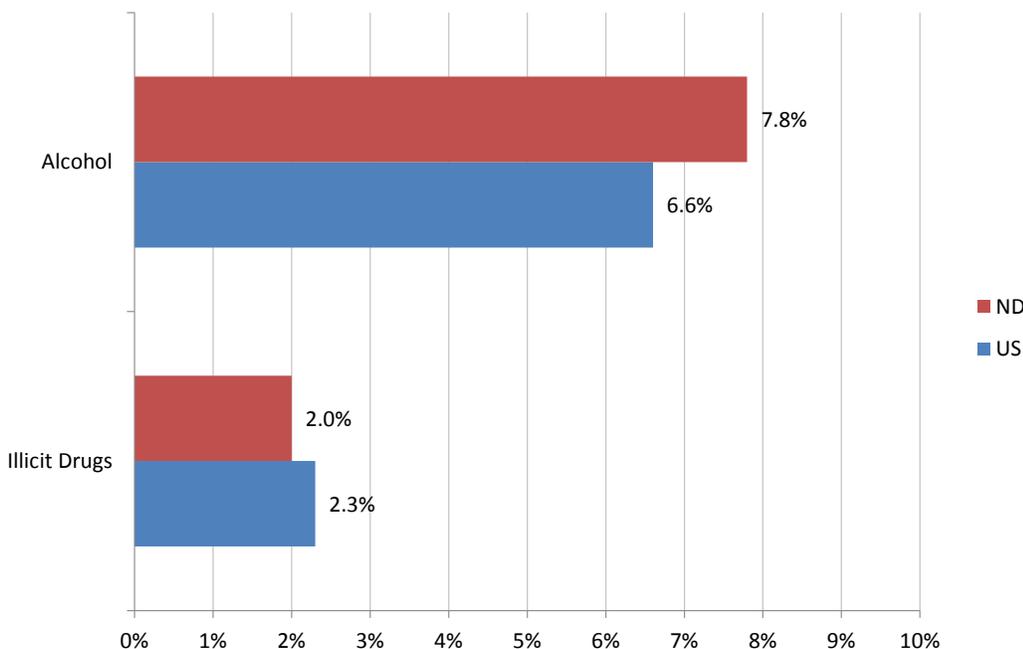
The percentage of North Dakotans with any mental illness in the previous year is 16 percent. While an estimated 4 percent have had a serious mental illness in the past year. Almost 4 percent of North Dakota adults have had serious thoughts of suicide in the past year.

## Adult Substance Use

Alcohol is the most commonly abused substance among adults in North Dakota. Among North Dakotans ages 18 or older, 63.2 percent reported having at least one drink of alcohol in the past 30 days and 30 percent reported having five or more drinks on the same occasion on at least one day in the past 30 days. North Dakota ranks third in the nation for binge drinking rates among those ages 18 or older (30% in North Dakota compared to 24.7% in U.S.). Approximately 4 percent of North Dakota adults ages 18 or older reported nonmedical use of pain relievers in the past year. Just under 3 percent reported current illicit drug use, other than marijuana (within the past 30 days) and 5 percent reported current marijuana use. Just about one in six (15.6%) North Dakotans aged 18 or older reported using tobacco products every day. Cigarettes remained the most commonly used tobacco product.

Approximately eight percent of North Dakotans ages 18 or older report alcohol abuse or dependence. Two percent reported illicit drug abuse or dependence. About two in three (65%) North Dakota adults know who to go to if they need help for themselves or a family member who is abusing alcohol or other drugs. Almost 8 percent of North Dakota adults ages 18 or older who need treatment for alcohol did not receive the treatment. At North Dakota Human Service Centers (statewide), an average of 2,082 adults are receiving addiction services in a quarter (3-month period; average of four quarters; April 2015-March 2016).

### Adults (ages 18+) needing but not receiving treatment for alcohol or illicit drugs

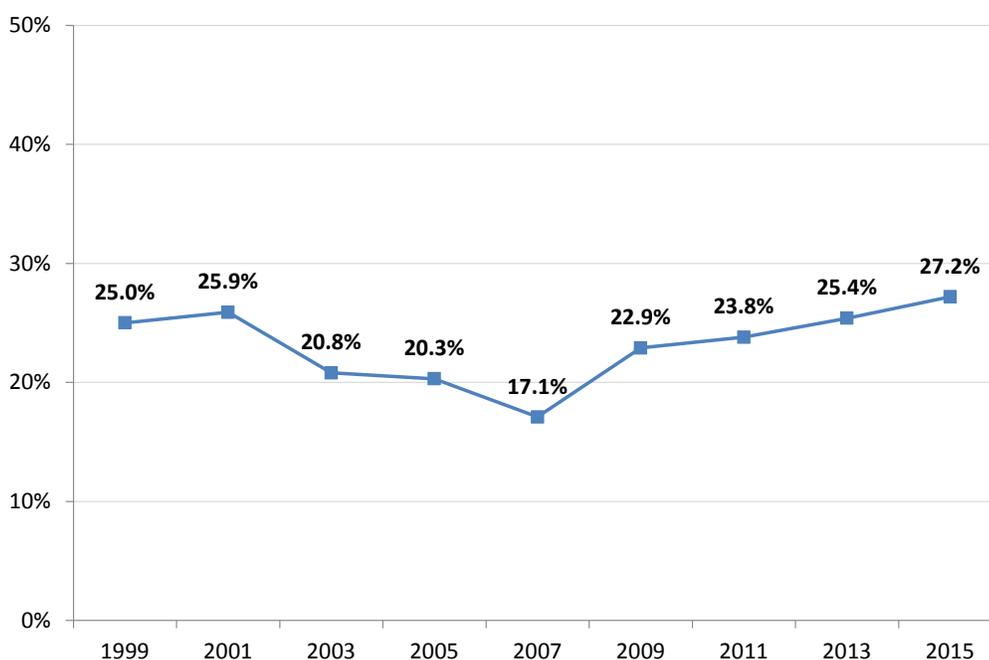


Source: National Survey on Drug Use and Health, 2013 and 2014

## Children's Behavioral Health

More than one in four (27.2%) North Dakota high school students reported feeling sad or hopeless almost every day for two or more weeks in a row, so much so that they stopped doing some usual activities during the past year. This percentage was highest among high school females (35.2% compared to 19.6% males). At North Dakota Human Service Centers (statewide), an average of 1,556 youth are receiving mental health services in a quarter (3-month period; average of four quarters; April 2015 - March 2016).

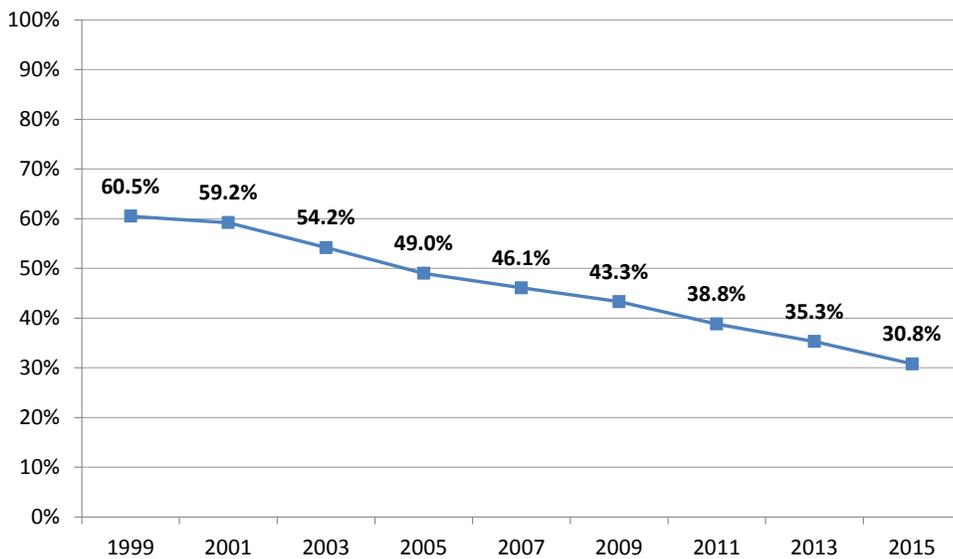
***ND high school students reported feeling sad or hopeless (almost every day for two or more weeks in a row so that they stopped doing some usual activities during the last 12 months)***



***Source: ND YRBS, 2015***

Even with great declines in the past decade, alcohol and tobacco are still the most currently used substances among youth in the state. The percentage of North Dakota high school students who reported having one or more drinks of alcohol during the past 30 days, decreased from 60.5 percent in 1999 to 30.8 percent in 2015. Just over 17 percent reported binge drinking on at least one day during the past 30 days.

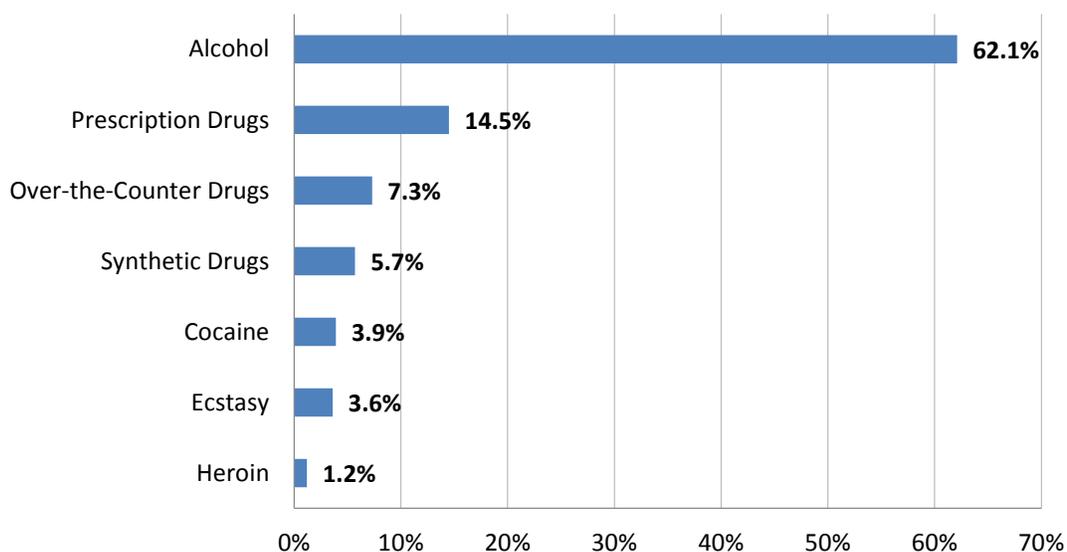
### Current alcohol use (past 30 days) among ND high school students



Source: ND YRBS, 2015

Approximately one-third (31.1%) of North Dakota high school students reported current use (within the past 30 days) of a tobacco product. Cigarettes remain the most commonly used tobacco product by North Dakota youth. Fifteen percent report current use of marijuana (a decrease from 18.8% in 1999) and 14.5 percent report taking a prescription drug without a doctor’s prescription at least one time in their life. Among North Dakota high school students, almost 4 percent reported ever using cocaine, 1 percent reported ever using ecstasy, and nearly 6 percent reported ever using synthetic drugs.

### ND high school students reported lifetime substance use



Source: ND YRBS, 2015

# Environmental Health

Safeguarding the state’s natural resources reduces the risk of health impacts to all North Dakotans. Protective programs and standards ensure state residents can enjoy the benefits of living in a clean and healthy environment.

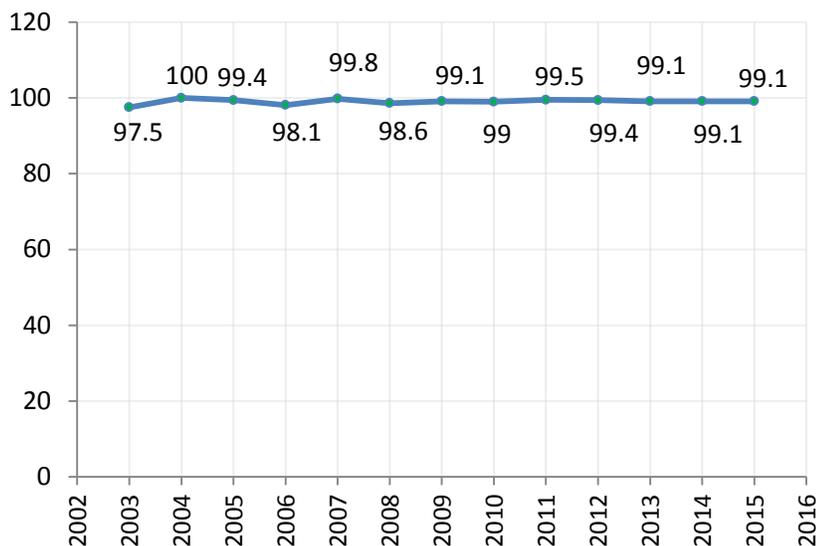
## Preserve and Improve Air Quality

Long-term exposure to excessive levels of air pollution can cause disease and damage to the immune, neurological, respiratory, and reproductive systems. In extreme cases, it can even cause death.

Facilities considered significant sources of air pollution in North Dakota receive control permits to establish the safe levels of pollutant emissions based on state and federal rules. The Division of Air Quality monitors compliance with these permits to ensure maintenance of safe air quality.

More than 99 percent of air pollution sources in the state meet the conditions of permit and air quality standards.

### ***Permitted facilities in full compliance with their air pollution control permits***



**Source: NDDoH Environmental Health Database**

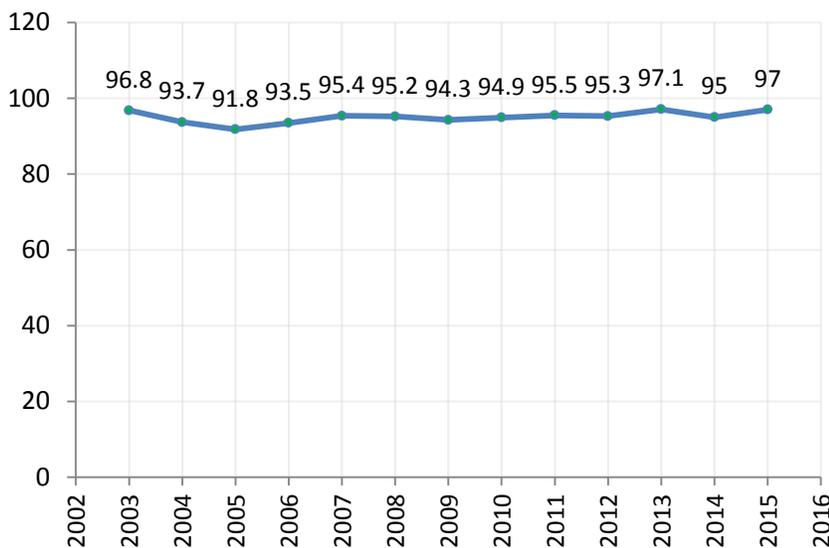
## Ensure Safe Public Drinking Water

Long-term exposure to high levels of certain drinking water contaminants can cause numerous serious adverse health effects. If certain drinking water contaminants are excessively high, even short-term exposure can cause immediate health effects or death.

Under the federal Safe Drinking Water Act (SDWA), public water systems are required to test their drinking water for specific contaminants at prescribed frequencies. The Division of Municipal Facilities monitors public water systems to ensure that required testing is conducted and compliance is maintained with health-based standards.

Ninety-seven percent of community water systems meet all applicable health-based drinking water standards under the SWDA.

### ***Community water systems meeting all applicable health-based SDWA drinking water standards***



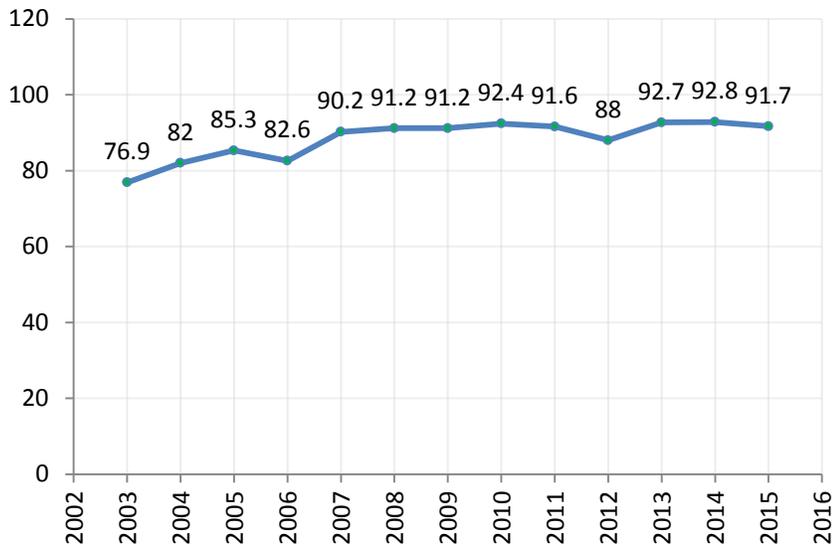
**Source: NDDoH Environmental Health Database**

Public water system treatment and distribution facilities that are improperly operated and maintained can adversely impact public health.

Skilled and knowledgeable operation and maintenance of these systems are critical to avert treatment lapses and contamination occurrences and to keep compliance with the SDWA. The Division of Municipal Facilities provides training and certification for operators of public water systems involved with drinking water treatment and distribution.

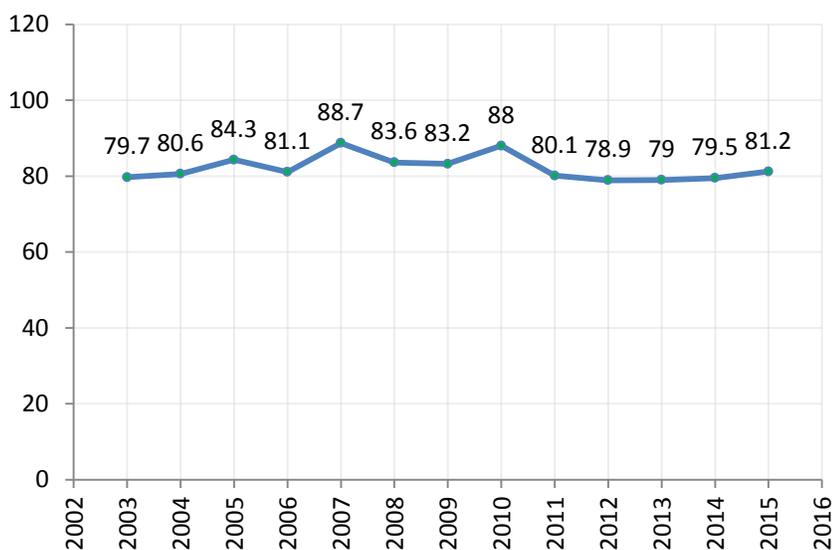
In North Dakota, small communities are challenged to hire and retain qualified workers due to financial constraints and operator turnover. Even so, more than 91 percent of all public water systems meet operator certification requirements for water treatment, and 81 percent of public water systems meet operator certification requirements for water distribution.

**Percentage of public water systems that meet operator certification requirements for water treatment**



**Source: NDDoH Environmental Health Database**

**Percentage of public water systems that meet operator certification requirements for water distribution**



**Source: NDDoH Environmental Health Database**

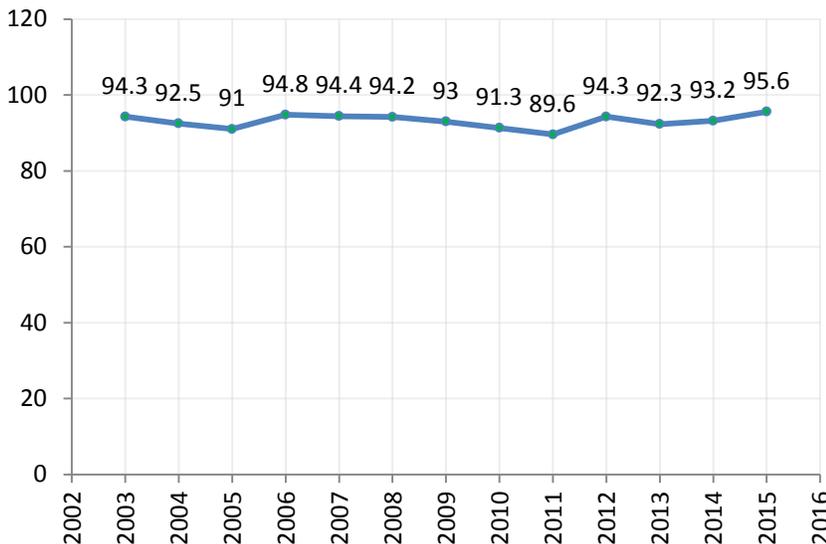
## Preserve and Improve Surface and Ground Water Quality

Inadequately treated or improperly controlled wastewater can pollute the state's water bodies. Contaminated water can lead to adverse health effects, such as gastrointestinal illness, reproductive problems, and neurological disorders.

The Division of Water Quality administers the North Dakota Pollutant Discharge Elimination System (NDPDES) Program, which issues permits to regulate sources that discharge pollutants. Sources include municipal wastewater treatment plants or lagoons, power plants, construction sites, oil refineries, animal feeding operations, and septic pumpers.

The NDPDES Program has consistently met the Environmental Protection Agency's (EPA) Technical Review Criteria for permitted facilities, except in 2011 when there was a dip in compliance due to heavy spring rains. In 2015, more than 95 percent of facilities met the EPA criteria, ensuring that wastewater discharges are being properly monitored and treated before discharge.

### **Percentage of facilities with no discharge in excess of EPA's Technical Review Criteria**

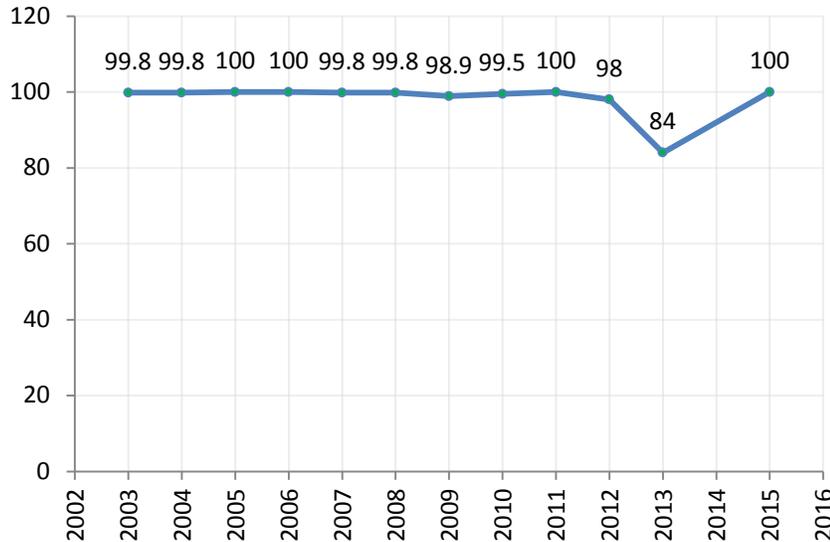


**Source: NDDoH Environmental Health Database**

Reissuing permits promptly ensures that wastewater discharge systems are kept up to date and in compliance with current water quality standards. The percentage of permitted facilities has stayed very high except for 2013, when a large permit extension covering multiple sites lapsed.

Having facilities that discharge wastewater covered under an NDPDES permit ensures that the discharges are controlled, which in turn helps minimize detrimental impacts to the waters of North Dakota.

### **Percentage of state-permitted facilities with an NDPDES permit**



**Source: NDDoH Environmental Health Database**

## **Manage Solid Waste**

Improperly managed waste can affect air, land, surface water and ground water, and it can increase vector-borne diseases. Proper waste management prevents releases and protects public health and the environment.

The amount and complexity of waste flow in some municipal solid waste (MSW) landfills has increased sharply. To address these impacts, the Division of Waste Management has increased training, permitting, and enforcement. MSW landfills and special waste disposal facilities have maintained compliance with applicable state and federal regulations most years.

Underground storage tank (UST) systems also are regulated to prevent the release of contaminants into the environment. Facilities with UST systems are inspected to ensure compliance with the regulations. Owners/operators of these systems are trained in monthly operation and compliance. Inspections and training decrease the potential of a release and minimize the effects of one should it occur. Since 2003, the trend shows an increase in UST facilities compliance with release prevention requirements. In 2015, 92 percent of UST facilities were in compliance.

# Health Concerns

## Health Disparities Among Specific Populations in North Dakota

Health disparities in North Dakota exist and are of concern. Social determinants of health, specific conditions, and access to care significantly affect a variety of disadvantaged groups statewide. More research and formal policies are needed so that the groups addressed in this report and other groups not mentioned receive the right health services, at the right time, delivered in a culturally and linguistically accurate manner at an affordable cost.

### ***American Indians***

American Indians are the largest minority population in North Dakota, comprising approximately 6 percent of the population. American Indians suffer from among the worst health disparities in the nation, including high rates of death and disability due to diabetes, cancer, heart disease, addiction, and unintentional injuries. American Indian life expectancy is significantly lower than average life expectancy among whites. The average age at death for American Indians living in North Dakota is 56.6 years while the average age at death for whites is 77.4 years; this is a difference of more than 20 years. Also, the rate of infant death for American Indians is 15.8 per 1,000, and it is 6.3 per 1,000 for the state overall. Child and adolescent deaths for American Indians are 93 per 1000 and 35 per 1000 for the state overall. Years of potential life lost for all causes of death is 162.5 per 1000 for American Indians and it is 61.9 per 1000 for North Dakota overall (Source: NDDoH, North Dakota Health and Racial Disparity Profile, 2012). These numbers are alarming.

Behavior choices can impact health and shorten lifespans. In reviewing health risk behavior data for American Indians, it shows 49 percent are current smokers compared to 19.8 percent of whites. Alcohol intake data shows an interesting dichotomy. While the binge drinking rate for American Indians is slightly higher than the rest of the population (26% compared to 21.1%), the rate of American Indians who didn't drink the past 30 days (60.4%), is much greater than the rate of whites who didn't drink the last 30 days (38.2%) (Source: NDDoH, North Dakota Health and Racial Disparity Profile, 2012).

In North Dakota, American Indians have higher rates of various chronic and acute conditions than the white population. Rates of asthma and arthritis are higher for American Indians. Rates of cancer are higher than white residents, especially the rate of colon cancer. Rates of depression are unclear, and the suicide rate is higher for American Indians compared to whites, with an adjusted death rate of 143 per 100,000 for AIs and 14 per 100,000 for the rest of the population. Overall, the health status of American Indians in North Dakota is worse than that of the white population (Source: NDDoH, North Dakota Health and Racial Disparity Profile, 2012).

### ***People with Disabilities***

The health of people with disabilities in North Dakota is poorer than the health of individuals without disabilities. Social determinants such as low economic status, low educational attainment, and higher levels of unemployment contribute to unhealthy behaviors. People with disabilities have higher rates of smoking and binge drinking than individuals who do not have disabilities. They are also less likely to be physically active and are more liable to be obese. People with disabilities in North Dakota rate their physical health as much poorer than people without disabilities. Mental health among youth with disabilities is much poorer than the mental health of individuals who do not have disabilities (Source: Seifert D. Health Disparities and Impact of Disability on Health Status in North Dakota, 2015).

## **Social Determinants of Health**

There are gaps in information on specific measures of health in rural counties. Currently, data is divided into 10 regions, and health indicators are analyzed per region. This method has its limitations as one city or county can influence the numbers for the whole region and the data set does not account for this.

### ***Poverty***

In North Dakota, a racial disparity exists for poverty. Whites earn 1.2 times more than non-white individuals. (Source: U.S. Census Bureau) This racial pay gap is particularly notable for the second largest ethnic population after whites: American Indians. Median household income for American Indians in North Dakota is \$25,255, and it is \$48,670 for the white population. Additionally, 48.6 percent of American Indian children and 36.1 percent of American Indian elders live in poverty.

The culture of poverty is perpetuated by a lower rate of educational attainment. Between 2006 and 2010, 17.8 percent of American Indian students did not complete high school compared to 10.6 percent of whites (Source: NDDoH, North Dakota Health and Racial Disparity Profile, 2012). Poverty rates in North Dakota are highest in Sioux, Rolette, and Benson counties. These rural counties overlap with American Indian reservations, highlighting the intersection between rurality and poverty for American Indians.

## ***Homelessness***

Wilder Research performed the most thorough study of homelessness in 2013. They executed and analyzed a survey of homelessness in the Fargo-Moorhead region. There were twice as many homeless people in Fargo in 2012 as there were in 2000. Among the homeless people surveyed, 18 percent were American Indian, and 30 percent of homeless women were American Indian. While the total percentage of people of color in North Dakota is around 10.4 percent, approximately 33 percent of homeless people surveyed were people of color. The homeless demographics outside of the Fargo-Moorhead area are largely unknown. More research will have to be done before the homeless disparities in North Dakota are fully understood (Source: Wilder Research, Homeless adults and their children in Fargo, ND and Moorhead, MN).

## ***Food Insecurity***

Food insecurity is a concern among rural residents and American Indians. The three counties most associated with food insecurity, Rolette (17.2%), Sioux (15.8%), and Benson (14.5%), are included in American Indian reservation lands. Seventeen counties in North Dakota are classified as food deserts, all of which are rural. The only substantial study of food deserts and minority status in the state of North Dakota was conducted in the Fargo-Moorhead area. Fargo-Moorhead itself is not classified as a food desert, but Cass County has a 9.6 percent food insecurity rate (Source: Overall Food Insecurity in North Dakota by County, 2014, Feeding America).

Additionally, there are areas within the city proper that have been classified as emerging food deserts. These emerging food deserts correlate with minority and low-income populations.

## ***Violent Crime***

Safety from violent crime is a major issue in micropolitan western North Dakota. Williams County has a violent crime rate of 332.4 violent crimes per 100,000 people. Cass County and Burleigh County follow with 284.3 per 100,000 and 259.4 per 100,000 respectively (Source: University of Wisconsin Population Health Institute, County Health Rankings and Roadmaps). The rate of violent crime in Williams County increased as the population grew due to oil development.

# Maternal, Child, and Adolescent Population

Early in 2014, North Dakota began planning the five-year needs assessment to select priorities for 2016-2020 to address the maternal and child population health concerns. A consensus-based approach was used to streamline the identified priorities and to align them with the Maternal and Child Health Bureau's population groups and a set of national priority areas.

As a result of the needs assessment process, North Dakota selected 11 state priorities and one outcome measure.

## State Priorities

### **Reduce tobacco use in pregnant women (Women's/Maternal Health)**

**Rationale:** In North Dakota, about 18 percent of women (1 in 5) reported smoking at any point during their pregnancy, compared to about 11 percent nationally (1 in 10). Smoking during pregnancy can cause a baby to be born too early, have low birth weight, and increases the risk of Sudden Infant Death Syndrome (SIDS). Smoking is also a risk factor for cardiovascular and respiratory diseases, cancer, and other illnesses. Also, secondhand smoke causes numerous health problems in infants and children, including more frequent and severe asthma attacks, respiratory infections, and ear infections. Smoking is a modifiable risk factor that if reduced and/or eliminated would have numerous positive short-term and long-term health benefits. North Dakota has seen small, but steady declines in smoking rates during pregnancy over the past few years. There are strong partnerships and adequate funding for tobacco prevention efforts in the state; hence, the momentum for continued change exists.

### **Increase the rate of breastfeeding at six months (Perinatal/Infant Health)**

**Rationale:** In 2013, about 45 percent of North Dakota women reported having breastfed their infants at six months, compared to about 50 percent nationally. Breastfeeding has benefits for both baby and mother. Research suggests that breastfed babies have lower risks of asthma, ear infections, childhood obesity, and SIDS. For moms, breastfeeding leads to lower risks for breast and ovarian cancer and type 2 diabetes. North Dakota has seen some small improvements with breastfeeding initiation; however, there are a couple of areas that continue to present challenges, including the low numbers of American Indian mothers who choose breastfeeding and the low breastfeeding duration rates at six months for lower income women.

### **Reduce disparities in infant mortality (Perinatal/Infant Health)**

**Rationale:** In North Dakota, the American Indian infant death rate (15 per 1,000) is about four times greater than that of the white infant mortality rate (4 per 1,000). Significant differences exist in infant deaths between races. Infants born to American Indian mothers are at much higher risk for poor birth outcomes, including being born too early, being born at low birth weight, and dying in the first year of life. North Dakota's involvement in the Infant Mortality Collaborative for Improvement and Innovation (CoIIN) initiative has raised awareness of this important issue.

### **Reduce overweight and obesity in children (Child Health)**

**Rationale:** In North Dakota, about 36 percent of children and teenagers between the ages of 10 through 17 are considered overweight to obese, compared to 31 percent nationally. There are many reasons for childhood obesity including poor food choices and reduced physical activity. Children that are overweight have an increased risk of heart disease, diabetes, asthma, and low-self-esteem. If children can learn and adapt healthy eating and physical activity habits early in life, these tendencies may have long lasting effects during their life-course. While there were many successful activities relating to this priority during the past years, data indicates that North Dakota's childhood overweight and obesity rates are not improving; hence, there is still much more work to be done to address this critical issue.

### **Reduce fatal motor vehicle crash deaths to adolescents (Adolescents)**

**Rationale:** In North Dakota in the past three years, unintentional injuries among youth ages 15 through 24 due to motor vehicle crashes ranged from about 19 to 27 per 100,000. Motor vehicle crashes are preventable and proven strategies can improve the safety of young drivers on the road. Motor vehicle crashes are the number one killer of teenagers, and young drivers are twice as likely as adult drivers to be in a fatal crash; hence, this new priority was modified to focus on adolescents.

### **Decrease depressive symptoms in adolescents (Adolescents)**

**Rationale:** The 2015 North Dakota Youth Behavior Risk Survey (YRBS) indicated that 19.6 percent of high school students grades 9 through 12 reported feeling so sad or hopeless that they stopped doing some usual activities during the 12 months before the survey. Mental/behavioral health conditions have been increasing among children. Bullying is a major public health problem that may contribute to depression, antisocial behavior, suicidal thoughts, poor school performance, etc. Adolescence is a unique developmental period that encompasses the biological changes of puberty, along with other psychological, cognitive, and behavioral changes. Adolescents require access not only to medical care for illness and injury but also to family planning services, substance abuse treatment, mental health services, anticipatory guidance, and various informational and educational activities oriented toward the development of positive health behaviors. Some of their health problems arise from risky health behaviors, which increase rates of sexually transmitted diseases, unintended pregnancy, substance abuse, injuries, and violence. Intervening during adolescence provides an opportunity to prevent the onset of health-damaging behavior as well as to introduce and establish healthy new behavior patterns that may span a lifetime.

### **Increase the utilization of medical home (Children with Special Health Care Needs)**

**Rationale:** In North Dakota, approximately one in seven children (13.9%) has special health care needs. In the 2009/2010 National Survey of Children with Special Health Care Needs (NS-CSHCN), it was reported that 47.8 percent of children, ages 0 to 18, received coordinated, ongoing, and comprehensive care within a medical home. While North Dakota is doing better than the nation (43%), this percentage represents a decrease from 2005/06 (55%). A medical home means a child has a personal doctor or nurse as a usual source of care, gets needed referrals, receives effective care coordination and assures families are actively involved in their child's care. Children with a medical home are more likely to receive preventive care, are less likely to be hospitalized, and are more likely to be diagnosed early for chronic or disabling conditions.

### **Increase the number of children with special health care needs receiving transition support (Children with Special Health Care Needs)**

**Rationale:** Transition into adulthood is cited as a challenge by families in the National Survey for CSHCN, with only about 47 percent of families in 2009/2010 reporting having adequate resources for successful transition, down from about 51 percent in 2005/2006. Transition to adulthood is a critical developmental period. Children who do not receive transition services are more likely to have unmet health needs as adults. Transition includes discussions about adult doctors, changing health needs, health insurance, and appropriate self-care and management.

### **Increase preventive dental services to children (Cross-cutting/Life Course)**

**Rationale:** The burden of oral disease is not uniformly distributed throughout North Dakota. Access to oral health services is an ongoing concern and challenge. Vulnerable and underserved populations face a variety of barriers to oral health care including transportation issues; lack of insurance or ability to pay for care; inability to take time off work to go to the dentist or transport their children; limited availability of providers accepting Medicaid; and lack of understanding of the importance of good oral health and its impact on overall health. In North Dakota, only about 42 percent of Early Periodic Screening Diagnostic and Treatment-eligible children ages 6 through 9 (less than half) reported having received any dental services. The case for good oral hygiene keeps getting stronger. Understanding the importance of oral health and its connection to overall health is a critical need.

### ***Increase adequate insurance coverage to the MCH population (Cross-cutting/Life Course)***

**Rationale:** Women and children are disproportionately represented among the uninsured and those with inadequate insurance. Expanding health insurance coverage to this group will increase access to necessary health services. In 2014, 9 percent of residents under age 65 in North Dakota lacked health insurance coverage (91 percent had some form of health coverage). This rate is lower than the national average of 14 percent and has decreased since 2013. White residents under age 65 were the highest of the insured at 91.2 percent, while American Indians reported the lowest rates of insurance at only 66.2 percent. Adults least likely to be covered tend to be in younger age groups. North Dakota residents in the age range of 25 through 34 tended to have the lowest coverage at 87.3 percent. In 2014, an estimated 93 percent of children in the state had health insurance, very similar to the national rates. North Dakota children who are white have insurance at a rate higher than the state's average (94%), while American Indian children are insured at rates substantially lower than the state's average, at 86 percent – although this rate had increased from 80 percent in 2012. According to the 2011/2012 National Survey of Children's Health, about 23 percent of all North Dakota children did not have adequate health insurance to meet their needs, compared to 28 percent of Children with Special Healthcare Needs (CSHCN). A benefit of health insurance is better access to care. However, individuals with continuous insurance coverage may still not be adequately insured. Inadequate insurance can lead to delayed or foregone care. Problems include cost-sharing requirements, benefit limitations, and inadequate coverage of needed services.

### ***Implement North Dakota state mandates delegated to North Dakota Department of Health Title V/Maternal and Child Health Program (Cross-cutting/ Life Course)***

**Rationale:** State mandates often influence priorities, which in turn, are reflective of expressed need within the state over time. The inclusion of these mandates epitomizes the successful federal/state partnership by honoring a state's unique priorities. North Dakota has several mandates addressing the health of the MCH population that direct Title V work efforts and require the use of significant resources for successful implementation.

## State Outcome Measure

### **Decrease the disparity of mortality among American Indian infants**

**Rationale:** In North Dakota, the American Indian infant death rate is about three times greater than that of the white infant death rate. For the calendar year 2014, the three-year average mortality rate of American Indian infants was 13 per 1,000, compared to white infants at 4.1 per 1,000. Infants born to American Indian mothers are at much higher risk for poor birth outcomes, including being born too early, being born at low birth weight, and dying in the first year of life. Several risk factors can increase the chances of infant mortality including birth defects, preterm births, low birth weight, maternal complications during pregnancy, and injuries. Risk factors associated with poor birth outcomes include inadequate prenatal care; being a young mother; smoking; alcohol and drug use during pregnancy; and gestational diabetes. Health disparities are caused by an assortment of factors including individual behavior, but the social determinants of health framework recognize that social and physical environments also profoundly impact the ability to experience good health. The Healthy People 2020 initiative for improving population health examines social determinants of health in five key areas: economic stability, education, social and community context, health and health care, and neighborhood and built environment. Traumatic events during infancy and childhood termed adverse childhood experiences, also contribute to health problems as an adult. Additionally, inter-generational impacts of historical trauma and disruption of cultural practices significantly influence the health outcomes for American Indians. While disparities can occur at every stage of the life course, health disparities for many American Indians begin prenatally and among the vast majority of infants who live past their first year, can have long-lasting implications.

Additional areas of need that were examined, but ultimately not included as state priorities included home visiting programs, suicide, youth and adult smoking rates, the incidence of sexually transmitted infections, obesity in adulthood, racial disparities, and American Indian mortality for ages 0-44.

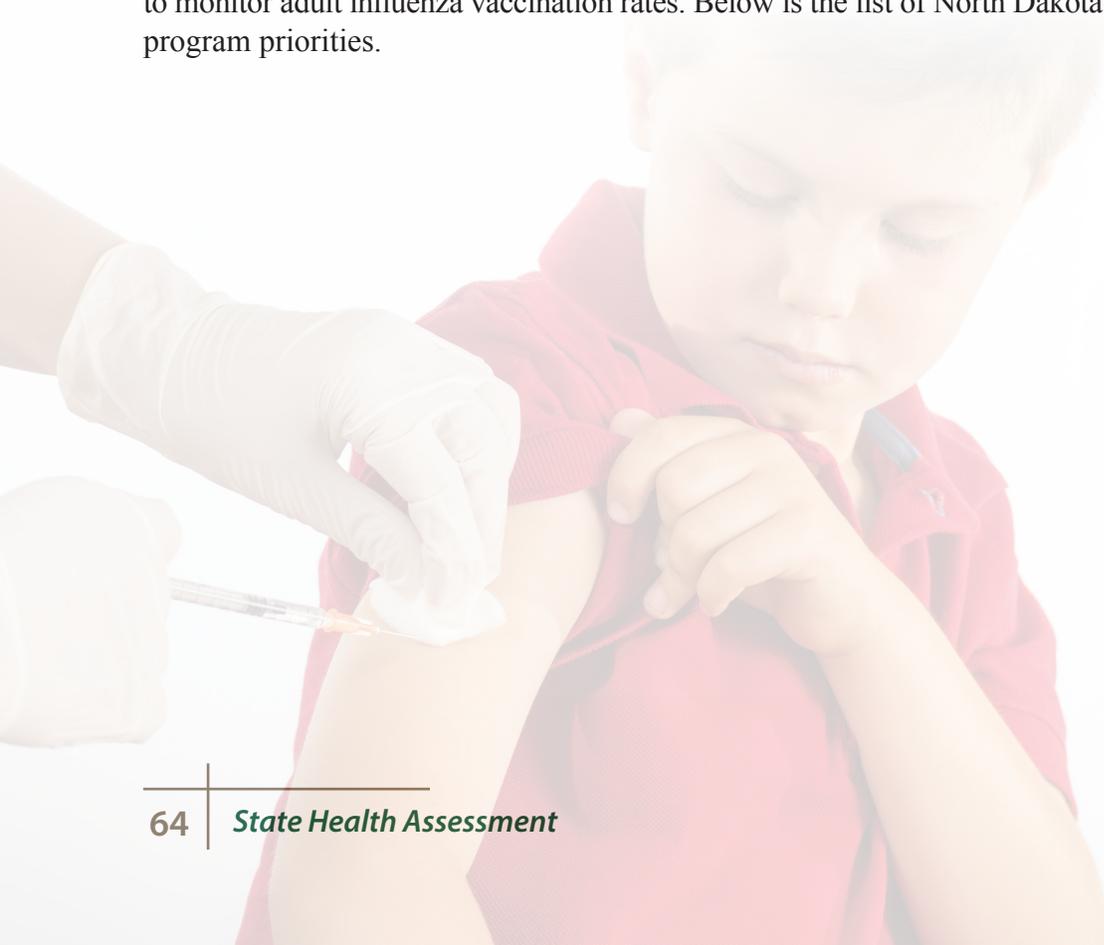
# Immunization Rates

Immunizations have significantly reduced morbidity and mortality from many diseases that previously afflicted adults and children. For example, there were about 500,000 reported cases and 500 deaths from measles each year before licensure of the measles vaccine in 1963; by 2002, only 44 cases were reported in the U.S.

The NDDoH Immunization Program strives to serve the state of North Dakota by conducting education and support of health care providers providing immunizations, education of the general public, maintenance of the state immunization registry, tracking vaccine-preventable diseases, and managing the federal Vaccine for Children (VFC) Program.

The North Dakota Immunization Program strives to reach or exceed Healthy People 2020 goals for immunization rates. Healthy People provides science-based, 10-year national objectives for improving the health of all Americans. Healthy People 2020 goals for immunization and infectious diseases are rooted in evidence-based clinical and community activities and services for the prevention and treatment of infectious diseases.

Quantitative data from the National Immunization Survey (NIS) is used to monitor progress towards meeting goals. School immunization rates are calculated using the annual school immunization survey. Behavioral Risk Factor Surveillance System (BRFSS) data is used to monitor adult influenza vaccination rates. Below is the list of North Dakota immunization program priorities.



North Dakota Priority	Rationale for Selection
<b>Infant Immunization Rates</b>	In North Dakota, 80.2 percent of infants ages 19 to 35 months are up-to-date for the 4:3:1:3:3:1:4 (4 DTaP, 3 Polio, 1 MMR, 3 HepB, 3 Hib, 1 varicella, 4 PCV) series (2015 NIS). The Healthy People 2020 goal for infant immunization rates is 80 percent, so North Dakota just recently met this goal. Additional efforts are needed to maintain and continue to increase this rate.
<b>School Entry Immunization Rates</b>	In North Dakota, kindergarten entry immunization rates are below the Healthy People 2020 goal of 95 percent. According to the 2015-2016 school immunization survey, only 91.0 percent of children are up-to-date for polio, 90.84 percent DTaP, 90.67 percent MMR, 93.52 percent hepatitis B, and 89.63 percent for varicella. Additionally, 3.3 percent of kindergartners in North Dakota are exempted for personal belief exemptions. Clustering of children that occurs in a school setting provides opportunities for transmission of infectious diseases.
<b>Adolescent Immunization Rates</b>	In North Dakota, adolescent (13 to 17 years) immunization rates are above Healthy People 2020 goals, except HPV vaccination. Healthy People 2020 goals for most adolescent vaccines are 80 percent. According to the 2015 NIS, rates for Tdap are 88.9 percent, MCV4 are 91.6 percent, and varicella is 89.8 percent. Rates for completing the HPV vaccine series are 47.1 percent amongst females and 38.4 percent amongst males. One person, every 20 minutes in the U.S., is diagnosed with HPV-related cancer. The HPV vaccine protects against nine strains of the disease that cause most cancers.
<b>Influenza Immunization Rates</b>	In North Dakota, 64 percent of adults ages 65 and older were vaccinated against influenza during the 2015-2016 season according to BRFSS. The Healthy People 2020 goal is 90 percent. Adults 65 and older are at highest risk for severe complications and death due to influenza.

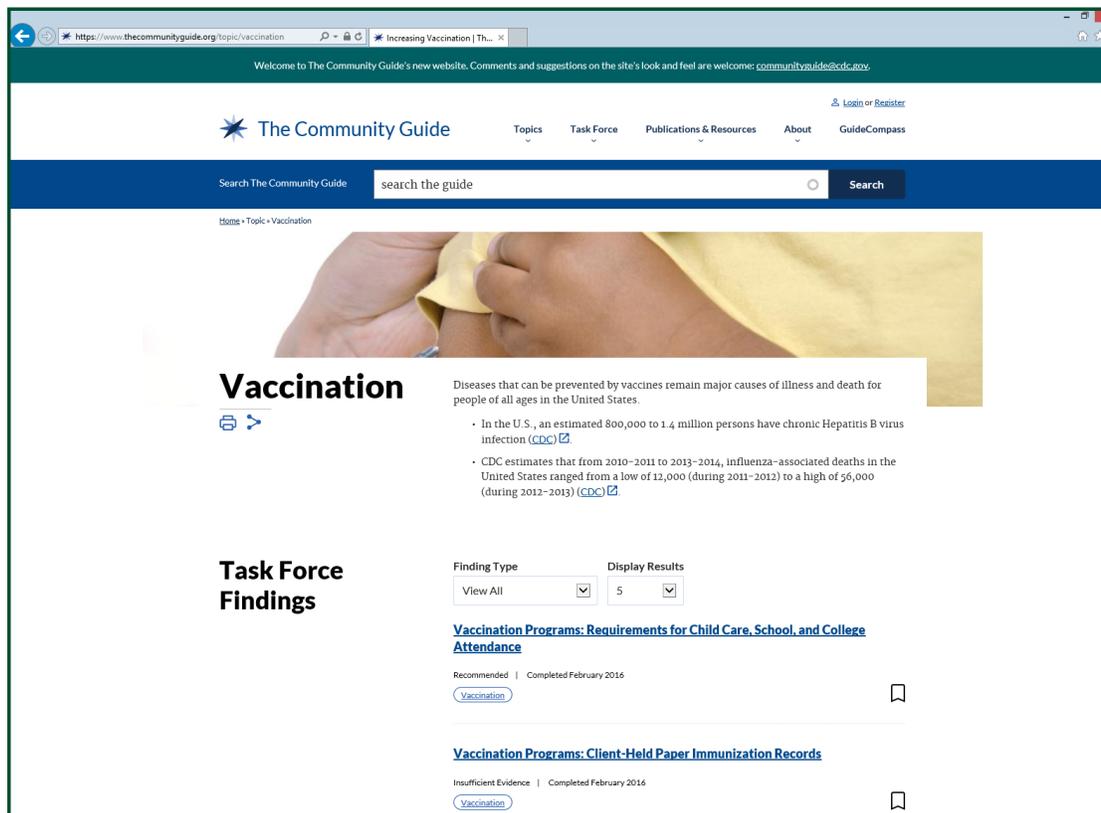
## What is being done?

The following strategies are based on the Guide to Community Preventive Services: Vaccination, which may be found at [www.thecommunityguide.org/vaccines/index.html](http://www.thecommunityguide.org/vaccines/index.html). This website is the official collection of all Community Preventive Services Task Force findings and the systematic reviews on which they are based.

- Reminder/recall
- Provider assessments and feedback
- Immunization mandates
- North Dakota Immunization Information System
- School located immunization clinics

The following strategies are not necessarily formally recommended by the Community Preventive Services Task Force, but the NDDoH feels strongly that they will have a positive impact on immunization rates in North Dakota.

- Ensuring access to immunizations
- Collaboration with stakeholders
- Provider and public education



The screenshot shows the website <https://www.thecommunityguide.org/topic/vaccination>. The page features a search bar at the top with the text "search the guide" and a "Search" button. Below the search bar, there is a navigation menu with "Home" and "Topic > Vaccination". The main content area is titled "Vaccination" and includes a sub-header "Task Force Findings". The text describes diseases preventable by vaccines and lists two findings:

- In the U.S., an estimated 800,000 to 1.4 million persons have chronic Hepatitis B virus infection (CDC) [\[link\]](#)
- CDC estimates that from 2010-2011 to 2013-2014, influenza-associated deaths in the United States ranged from a low of 12,000 (during 2011-2012) to a high of 56,000 (during 2012-2013) (CDC) [\[link\]](#)

Below the findings, there are two search filters: "Finding Type" set to "View All" and "Display Results" set to "5". The first finding is titled "Vaccination Programs: Requirements for Child Care, School, and College Attendance" and is labeled "Recommended | Completed February 2016". The second finding is titled "Vaccination Programs: Client-Held Paper Immunization Records" and is labeled "Insufficient Evidence | Completed February 2016".

# Drug Abuse and Overdose

North Dakota has seen a rise in opioid abuse and addiction. The category of opioid drugs includes morphine and heroin and a long list of prescription pain medication. The most common prescription opiates are Oxycodone, hydrocodone, and codeine.

The Centers for Disease Control and Prevention claims the U.S. is experiencing an epidemic of drug overdose (poisoning) deaths. Since 2000, the rate of deaths from drug overdoses has increased 137 percent, including a 200 percent increase in the rate of overdose deaths involving opioids. In 2014, there were approximately one and a half times more drug overdose deaths in the U.S. than deaths from motor vehicle crashes. In 2014, opioids were involved in 28,647 deaths or 61 percent of all drug overdose deaths; the rate of opioid overdoses has tripled since 2000. The 2014 data demonstrate that the U.S. opioid overdose epidemic includes two distinct but interrelated trends: a 15-year increase in overdose deaths involving prescription opioid pain relievers and a recent surge in illicit opioid overdose deaths, driven largely by heroin (Source: Morbidity and Mortality Weekly Report, January 1, 2016, 64(50);1378-82).

North Dakota is one of the states identified with statistically significant increases in the rate of drug overdose deaths from 2013 to 2014. Forty-three North Dakotans died from a drug overdose in 2014, compared to 20 in 2013.

In response to the increase in overdose deaths in the state, the North Dakota Board of Pharmacy took action in April 2016. Using authority given by North Dakota lawmakers, the board began allowing all North Dakota pharmacists to prescribe naloxone to patients at risk of an overdose, their friends and family members, or other individuals in a position to assist in the event of an overdose. The enacted rules allow a trained pharmacist to prescribe and dispense naloxone rescue kits by a written protocol approved by the Board of Pharmacy. The Board also operationalized a Prescription Drug Monitoring Program in 2008 and had recently implemented Drug Take-Back Programs to properly dispose of unused, unneeded, or expired medications.

Also, the North Dakota Department of Human Services' Behavioral Health Division, in collaboration with the Reducing Pharmaceutical Narcotics Task Force, launched "Stop Overdose," a statewide campaign supporting community efforts to address prescription drug and opioid abuse.

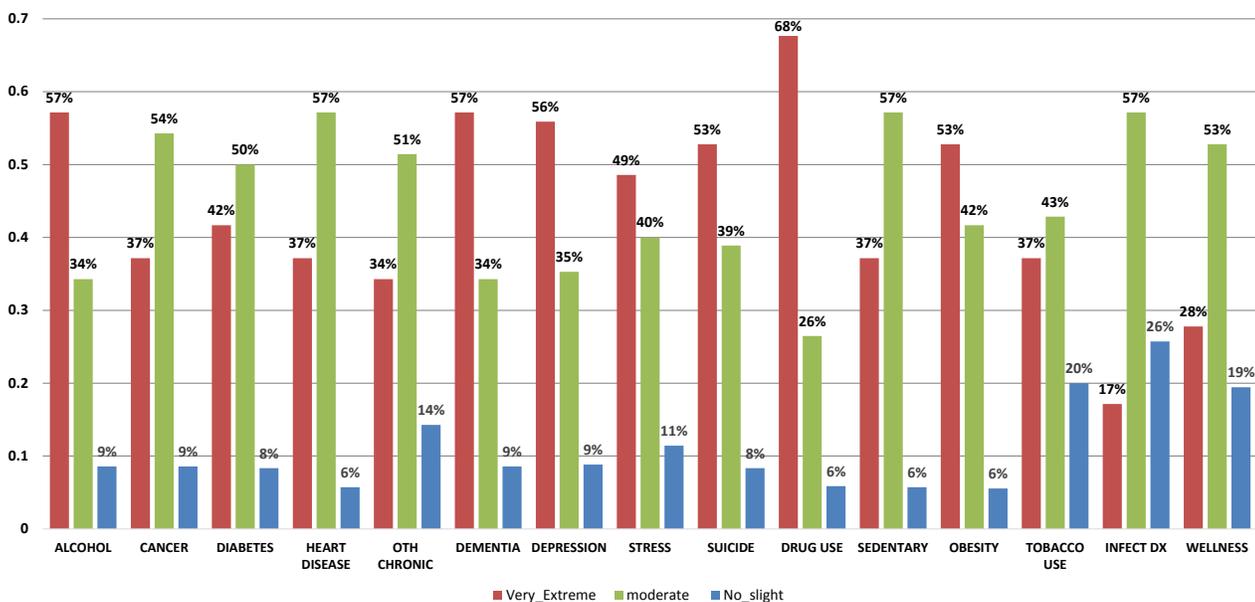
# Summary of Stakeholder Perspective Survey

Community stakeholder perspectives on health was a major component of this assessment. Healthy North Dakota Coordinating Committee members obtained data through an online survey. Members were asked to complete the survey from the perspective of their agency or organization and the population(s) they serve. They also distributed the survey to other lead contacts for other stakeholder groups or coalitions that directly serve individuals in hopes that survey responses would be representative of both the community and individual.

Survey response analysis consisted of basic frequencies and percentages.

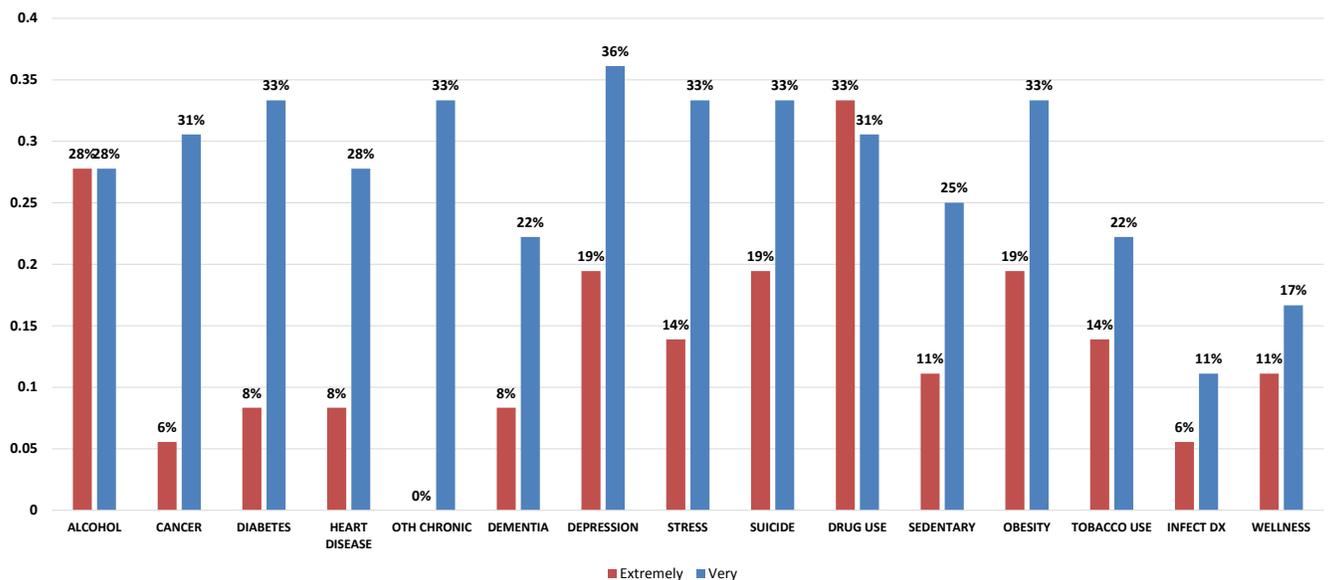
## Survey Results

Sixty-five surveys were distributed and 62 people responded. Of those 62 respondents, 36 (58%) completed more than half of the survey. All 36 respondents completed the question “Regarding the conditions or concerns of your members or the population you serve, please rank your concerns about the following Physical, mental health, and substance abuse issues for both adults and youth.” As seen in the graph below, the largest concern centered around drug and alcohol use. Additionally, more than 50 percent of respondents also indicated that dementia/Alzheimer’s, depression, suicide, and obesity ranked as very or extremely concerning among the populations that they serve.



The preceding graph provided an initial overview, but a more specific look at each level of concern was conducted to help identify priorities indicating a greater need among the communities in North Dakota. In the table and graph below, drug and alcohol use continued to rank as the highest concern (extreme) among the respondents scoring 33 percent and 28 percent respectively. While suicide, depression, and obesity continued to rank high among the extreme concerns, dementia/Alzheimer’s dropped down to moderate concern among most respondents. By providing this information back to stakeholders (such as Healthy North Dakota, Local Public Health, and the Statewide Vision and Strategy group), a coordinated effort can be developed in which to address the problem areas.

	Extremely		Very		Moderately		Slightly		Not at all	
ALCOHOL	10	28%	10	28%	12	33%	2	6%	2	6%
CANCER	2	6%	11	31%	19	53%	2	6%	2	6%
DIABETES	3	8%	12	33%	18	50%	1	3%	2	6%
HEART DISEASE	3	8%	10	28%	20	56%	1	3%	2	6%
OTH CHRONIC	0	0%	12	33%	18	50%	4	11%	2	6%
DEMENTIA	3	8%	8	22%	18	50%	4	11%	3	8%
DEPRESSION	7	19%	13	36%	12	33%	2	6%	2	6%
STRESS	5	14%	12	33%	14	39%	2	6%	3	8%
SUICIDE	7	19%	12	33%	13	36%	2	6%	2	6%
DRUG USE	12	33%	11	31%	9	25%	1	3%	3	8%
SEDENTARY	4	11%	9	25%	20	56%	1	3%	2	6%
OBESITY	7	19%	12	33%	15	42%	1	3%	1	3%
TOBACCO USE	5	14%	8	22%	15	42%	7	19%	1	3%
INFECT DX	2	6%	4	11%	20	56%	9	25%	1	3%
WELLNESS	4	11%	6	17%	19	53%	7	19%	0	0%



# Health Care Access

This report concludes with a description of North Dakota’s access to health care, along with other valuable assets and resources. Access to health care is a fundamental issue for many North Dakota residents, whether it is due to financial barriers or geographic barriers. North Dakota’s secure health care network of services, settings and providers have worked to reduce the barriers to access. This section relies on previous work of the Fourth Biennial Report: Health Issues for the State of North Dakota, 2017, from the Advisory Council of the University of North Dakota School of Medicine and Health Sciences.

## **Hospitals**

North Dakota has 52 hospitals (36 Critical Access hospitals or CAHs) all in rural areas. There are six general acute care Prospective Payment System hospitals that are the tertiary hospitals or the “big six” located in Bismarck, Fargo, Grand Forks, and Minot; three psychiatric; two Indian Health Service or IHS; two long-term acute care; two transplant; and one rehabilitative. All 36 CAHs and the six tertiary hospitals are non-profit. There are 19 counties (out of 53) that do not have a primary or acute care hospital and there are eight counties that have two primary or acute care hospitals (three are urban counties – Burleigh, Cass, and Grand Forks – and five are rural counties).

Over the years North Dakota, like much of the country, has experienced the movement from independent or stand-alone hospitals to more of a system arrangement. This network facilitates organizational stability in a competitive market for both urban and rural providers; allows for greater efficiencies; promotes patient care and quality of care; expedites health workforce placements, and enhances technology sharing and exchange. All CAHs have formal transfer and communication agreements with tertiary hospitals, along with other collaborative arrangements. Except for the two IHS hospitals, all the rural hospitals are paid on an allowable cost basis, and the tertiary hospitals follow the prospective payment methodology.

## **Ambulatory Care**

There are approximately 300 primary care and specialty clinics in North Dakota, with rural and urban hospitals or health systems accounting for more than 55 percent of the clinics. Over 80 percent of physicians work for a system as opposed to the solo practice. A common form of the rural clinic is the federally certified Rural Health Clinic. North Dakota has 52 RHCs, with 42 being owned by a CAH. The state also has five federally qualified health centers (FQHC) with the most common type being the community health center (CHC). Thus, there are four CHC and one migrant health center. The five FQHC have central clinics and satellite clinics serving 14 communities, with 11 being rural and three urban. Fargo and Grand Forks have central clinics, while Minot is a satellite of a rural central site.

Over the years, the number of RHCs in North Dakota has declined from a peak in the early 1990s of over 90 to only 52 today while the number of FQHCs and the communities they served has steadily increased to the five clinic systems serving 14 communities today. While FQHCs and RHCs may have slightly different organizational structures and missions, they each are critical safety net providers. Almost all RHCs in North Dakota are non-profit, and as was previously stated, by statute, all the FQHCs are non-profit. Both RHCs and FQHCs receive some form of cost-based reimbursement under Medicare.

### ***Mental Health***

The mental health system in North Dakota relies heavily upon the state Department of Human Services Division of Mental Health and Substance Abuse (DMHSA), which has public responsibility for mental health services. The DMHSA functions as the state mental health authority, overseeing services delivered through eight regional human service centers and the North Dakota State Hospital in Jamestown. The human service centers provide crisis stabilization and resolution, inpatient services, psychiatric and medical management, social services, residential services and support, vocational and educational services, and supportive employment. The state hospital provides physical, medical, psychological, and other services and is accredited and Medicare-certified.

Throughout the state, there are 25 facilities or programs providing mental health services. This includes eight regional human service centers consisting of both public and private organizations such as Prairie St. John's in Fargo and the Stadter Center in Grand Forks. Most provide multiple forms of care services. Seven provide outpatient and partial hospitalization; seven provide residential care; six provide inpatient, outpatient, and partial hospitalization; three offer outpatient, partial hospitalization, and residential care; and one provides inpatient, outpatient, and residential care. All of these resources, except one, are located in urban (Bismarck, Fargo, Grand Forks) or large rural (Devils Lake, Dickinson, Jamestown, and Minot). The one rural exception is a residential care facility in Sentinel Butte. While centers are in all regions and corners of the state, rural access is still limited. A CAH CEO survey, administered by the Center for Rural Health, found in 2014 that behavioral and mental health access was a significant concern in rural North Dakota.

“Access to mental/behavioral health – inpatient and outpatient” was the highest rated concern, out of 34 items, with “access to mental/behavioral health services – substance abuse” being the second-highest problem facing rural hospitals. The behavioral and mental health issues surpassed more commonly recognized rural hospitals matters such as workforce supply and reimbursement. The preliminary analysis of community health needs assessments (CHNA), performed by the Center for Rural Health, found in 2016 that behavioral health was a primary concern (identified in the top four or five issues) in 29 of 34 CHNAs at that time. Mental health was the third highest need identified in 18 of the 34 CHNAs. The CHNAs include data from both urban and rural communities. The input came from community members. Both the CAH CEO survey and the CHNA process support the contention that behavioral and mental health are serious issues facing North Dakota.

## **Dental**

In North Dakota, 30 percent of the 53 counties have been designated by the federal government as dental health professional shortage areas. Those counties have also been identified as rural communities by the U.S. Census Bureau. As of March 2016, 17 of 53 counties had no practicing dentist, eight had one dentist, and 15 had between two and four dentists. Nearly 62 percent of all practicing dentists were located in the four largest, more urban counties – Burleigh, Cass, Grand Forks, and Ward. While about 54 percent of the state’s population is classified as urban, 68 percent of dental assistants, 60 percent of dental hygienists, and 61 percent of dentists practice in urban settings. Roughly 22 percent of North Dakota’s residents live in what is called isolated rural (2,500 or fewer people), and these areas account for only 8 percent of the overall dentists practicing in the state.

According to the American Dental Association, there are about 61 dentists per 100,000 in the U.S. This contrasts with North Dakota which has about 55 dentists per every 100,000 people. The number of dental providers in the state has been on a consistent incline, alongside state population rates; however, there is still greater demand than supply with a potential crisis. Nearly 19 percent of dentists in the state report anticipated retirement in the next one to five years. Collectively, 35 percent of dentists indicated retiring in the next one to 15 years.

Typical hours of operation may also translate to inadequate access to a dental professional. Dentists in the state generally work four-day weeks, Monday through Thursday. While only 13 percent of dentists in the state reported working 40 hours or more, it did not seem to have an impact on wait-time. Roughly 48 percent of dentists reported that a new patient could make an appointment for an exam within a week by calling their office. Collectively, 71 percent reported they would see a patient within two weeks of calling, and only 13 percent said a patient would wait more than four weeks.

A majority of North Dakota dental practices that had billed Medicaid in the last calendar year (58%) saw 50 or fewer Medicaid patients. These dental practices (58% of that billing Medicaid) accounted for only 11 percent of Medicaid patients that visited a dentist in 2013. More than 50 percent of Medicaid patients that saw a dentist in 2013 received care from one of only 21 North Dakota dental practices; this means that eight percent of the dental practices billing Medicaid in 2013 provided care to 52 percent of the Medicaid enrollees accessing dental services.

## ***Emergency Medical Services***

Emergency Medical Services (EMS) can be viewed as a pre-hospital service. However, as EMS continues to develop, it is also seen as a vital element in an overall integrated health-delivery system. Even the role and function of emergency care personnel is expanding to include more and different skill sets (e.g., community paramedic with an expanded scope to address health or medical services beyond traditional paramedic levels). More and more other critical elements that are meant to address medical and health issues come into play within a framework of EMS. These features include stroke and cardiac systems of care, the development and potential of community paramedics, the reshaping of the rural EMS system, federal and state policy, and trauma.

At the state level, the division with primary responsibility is the Emergency Preparedness and Response Section of the North Dakota Department of Health. The section has three divisions: Emergency Medical Systems, Hospital Preparedness, and Public Health Preparedness. The Division of Emergency Medical Systems has a broad jurisdiction of responsibility and service including:

- Licensing ground and air ambulances and quick response units
- Updating and maintaining training, testing, certification, and licensure programs
- Providing technical assistance to EMS services; approving continuing education curriculum
- Administering state EMS grant programs
- Maintaining data systems
- Coordinating the state CISM team
- Organizing the state stroke system of care
- Coordinating the state cardiac system of care
- Maintaining a relationship with the North Dakota EMS Association; and other functions

The Division of Emergency Medical Systems collaborates with the Center for Rural Health on related matters, including a multi-state evaluation of an emergency cardiac device, stroke efforts, and the Medicare Rural Hospital Flexibility program.

The Division also coordinates and manages the statewide critical incident stress management team. They administer the STEMI program (STEMI refers to heart attacks), an initiative aimed at improving the system of care for heart attack patients and the community paramedic program.

Emergency Medical Systems also provides oversight to the SIM-North Dakota program, which provides training and education in trauma events through the use of simulation, including four semi-truck vehicles that travel throughout the state to rural hospitals, clinics, and ambulance systems. SIM-ND is a collaboration between the state and the UND School of Medicine and Health Sciences. Each semi-truck has one section designed to replicate a hospital emergency department and one section replicates an ambulance. Providers receive training through the use of simulators and mock drills.

In North Dakota, there are 4,073 licensed EMS providers (a decline of approximately 9 percent from 2014, or 409 personnel).

- AEMT: 60 (1.5%)
- EMT-I/99: 1 (0.02%)
- EMT-I/85: 86 (2.1%)
- EMT/EMTB: 1,780 (43.7%)
- EMR/First Responder: 2,151 (52.8%)
- EMT-Paramedic: 597 (14.65%)

EMS continues to change and evolve both regarding new skill sets, requirements/expectations, and even classification of personnel. The paramedic field continues to expand. In 2005 there were 346 paramedics, and in 2015 this had grown by 72 percent to 597. EMR (Emergency Medical Responder) is a newer category of provider created in the past four years. Most of the EMS personnel formerly referred to as first responders have been reclassified as EMR who typically render care to the sick or injured while an ambulance is in route. They are usually part of a quick response unit, fire department, or law enforcement. The EMT-I/85 (Emergency Medical Technician-Intermediary/85) is a level of intermediary training formulated by the National Registry of Emergency Medical Technicians in 1985. They provide more invasive procedures than found at the EMT-basic level including IV therapy, the use of advanced airway devices and providing for advanced assessment skills. The EMT-I/99 is the closest level to the EMT-paramedic. Also in the intermediary category, they can provide needle decompression of a tension pneumothorax, endotracheal intubation, nasogastric tube placement, use of cardiac event monitors/ECGs and medication administration to control certain cardiac arrhythmias. The AEMT (Advanced Emergency Medical Technician) is considered a mid-level provider of pre-hospital emergency medical services and is a transition from the EMT-I which has somewhat less training. AEMT was approved as a newer EMS provider in 2013. It is a category that in some states is being used to replace the EMT-I/85 and I/99. They provide rapid on-scene treatment. Like the paramedic, the AEMT is considered Advanced Life Support.

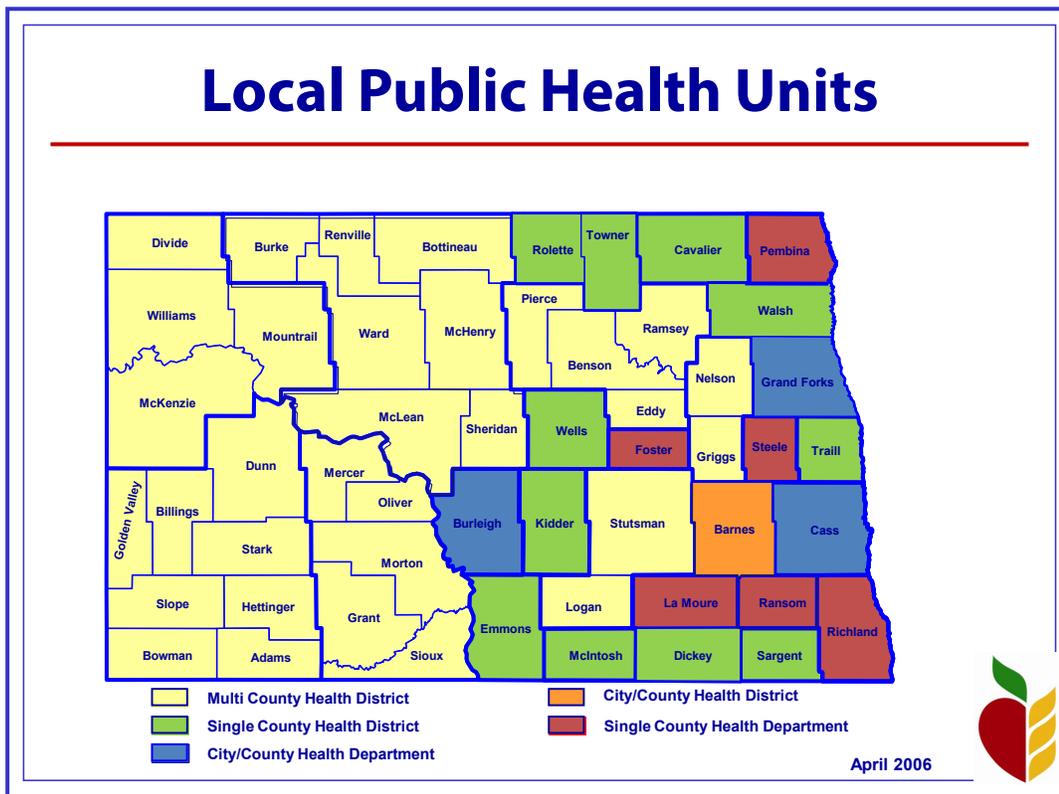
More than 90 percent of the EMTs in North Dakota are volunteers. The EMS system in rural areas is heavily dependent on a strained volunteer model with an aging volunteer base, changes in family dynamics and culture, local economies, and even how people value personal time versus civic commitment. While the number of paramedics is relatively small (597), they constitute a growing provider base along with the EMT-I/85, I/99, and AEMT. These are the highest trained EMS personnel. While the overall number of EMS personnel declined by 9 percent in North Dakota, there is a slight increase in the number of higher trained staff showing that the expectation for improved skill sets is present.

Most paramedics are in urban areas, but the number of rural paramedics has increased (paramedics must staff advanced life support [ALS] systems). Sixteen of the state's 22 ALS units are rural based. While there are more ALS units in rural than urban, the vast majority of paramedics are working in an urban setting. A rural unit may employ only one or two whereas an urban ALS will rely on many more. There are 128 ground ambulance units in North Dakota (down from 133 in 2014) with 106 (previously 114) being basic life support and 22 (formerly 19) being ALS. There are three air ALS systems, two air critical-care services, and one air BLS system. There are 82 (previously 86) quick-response units. Of the ground ambulances (128), 56 (44%) are classified as private/independent, 41 are (32%) are government, 16 (13%) are associated with a local fire department, and 15 (12%) are hospital-based. A significant majority (63%) are organized as non-profits with 29 percent being government controlled, and only eight percent are for-profit. Similar to CAHs, communities are more willing to tax themselves to take on some of the financial burdens of maintaining an ambulance system. In 2015, 63 percent of ambulance units received local mill levy support.

### ***Public Health***

Local public health provides a unique value as both providers of safety-net services and coordinators of population health efforts to improve the quality and sustainability of the health care system. North Dakota's public health system is decentralized with 28 independent local public health units working in partnership with the North Dakota Department of Health. The 28 local public health units are organized into single or multicounty health districts, city-county health departments, or city-county health districts. Seventy-five percent of the local health units serve single county, city or combined city-county jurisdictions, while the other 25 percent serve multicounty jurisdictions. The majority of the multicounty jurisdictions are located in the western part of the state. All 53 counties are covered by this arrangement.

## Location of public health units in North Dakota



**Source: North Dakota Department of Health, 2006**

In this decentralized approach, the units are required to meet state standards and follow state laws and regulations, but they can exercise their powers and have administrative authority to make decisions to meet their local needs. While each public health unit can organizationally determine its mission and primary focus, there are some common services provided. The top activities and services provided by North Dakota local public health units include child and adult immunizations, tobacco use prevention services, prevention screenings such as blood pressure and blood sugar, and child wellness home visits and injury prevention services. Disease prevention and health promotion are highly associated with public health. Environmental health services are provided through a regional approach.

Local public health has been engaged with non-profit hospitals in the Community Health Needs Assessment (CHNA) process. Under the ACA, hospitals are required to work with public health. This arrangement has strengthened organizational relationships in some communities between the public health unit and the hospital. The Center for Rural Health has assisted both local public health and hospitals to conduct CHNA processes. Identified community health priorities can be found at the following link: <https://ruralhealth.und.edu/projects/community-health-needs-assessment/community-needs>.

# State Assets

There are several state assets and resources at work within North Dakota that aim to improve the health of the state’s population and reduce the burden of injury and disease. The following tables outline current programs, resources and collaborations that support healthy living and encourage prevention. The list is not all inclusive of North Dakota’s large collection of valuable assets.

Health Issue	Asset or Resource	Description
Alzheimer’s	North Dakota Dementia Care Services Program	A state-funded program administered by the North Dakota Department of Human Services that provides care consultation and training to caregivers to address the unique and individual needs that arise throughout the various stages of dementia.
Alzheimer’s	Alzheimer’s Association Minnesota-North Dakota Chapter	An association providing services, information, and advocacy to people with dementia, their families and health care providers.
Cancer	North Dakota Cancer Coalition	A statewide coalition of health professionals and community members that work together to address priority issues in cancer and risk factor prevention. This includes developing materials and resources, providing education, media campaigns, and technical assistance to members and partners across the state.

Health Issue	Asset or Resource	Description
Cancer	North Dakota Colorectal Cancer Screening Initiative (NDCRCSI)	<p>Provides funding to support grantees to increase their organization's cancer screening rates through</p> <ul style="list-style-type: none"> <li>• Reimbursement for colorectal cancer screening tests of clinic patients who are uninsured or underinsured and meet other eligibility requirements.</li> <li>• Personnel time for cancer screening navigation of all clinic patients who are due or past due for colorectal, breast and cervical cancer screening.</li> <li>• Implementation of policy and system changes within the clinic associated with cancer screening to improve clinic work flow processes, electronic health record management and planned action steps by clinic staff and providers for patients due or past due for cancer screening.</li> </ul>
Cancer	<i>Women's Way</i>	Pays for breast and cervical cancer screenings and diagnostic testing for women who meet eligibility guidelines and are enrolled in the program. The program also provides patient navigation for enrolled women and other women requesting assistance to complete cancer screening and diagnostic procedures.
Cardiovascular Disease	North Dakota Stroke System	The ND Department of Health, Division of Emergency Medical Systems (EMS) works to establish and maintain a statewide stroke system to improve emergent care to those suffering from a stroke. This work includes the designation of hospitals to their level of stroke care readiness.
Cardiovascular Disease	North Dakota Cardiac System	The ND Department of Health, Division of EMS works to establish and maintain a comprehensive cardiac system to better treat patients with acute heart disease conditions.

Health Issue	Asset or Resource	Description
Cardiovascular Disease	Hypertension Prevention and Management Program	ND Department of Health, Division of Chronic Disease implements a hypertension prevention and management program. Funds are used for education for health care providers and grants to health systems to assist them in improving their hypertension diagnosis and treatment practices. NDDoH collaborates with many partners from across the state to address hypertension at the community level through public education/outreach and blood pressure screenings.
Diabetes	National Diabetes Prevention Program	An evidence based, year-long program designed to help people with prediabetes or who are at high risk for diabetes prevent the onset of type 2 diabetes. The ND Department of Health, Diabetes Prevention and Control Program support program implementation through the provision of program resources, Lifestyle Coach networking and education and by marketing program benefits and locations throughout North Dakota.
Diabetes	Diabetes Self-Management Education (DSME) Program Technical Assistance and Mini-grants	ND Department of Health, Diabetes Prevention and Control Program assists organizations with navigating the accreditation/recognition process, finding educational resources, networking with other DSME program coordinators and meeting continuing education needs.
Diabetes	Dakota Diabetes Coalition	The Coalition provides members with opportunities for networking, resource sharing and continuing education.
Domestic Violence	Domestic violence/rape crisis agencies	There are 20 dual domestic violence/rape crisis agencies in North Dakota that provide services to victims of domestic violence, sexual violence, dating violence and stalking.
Domestic Violence	CAWS North Dakota	A statewide coalition of domestic violence/rape crisis agencies, to provide technical assistance and training and to collect data on these issues.

<b>Health Issue</b>	<b>Asset or Resource</b>	<b>Description</b>
Employee Health	BCBSND Worksite Wellness Initiative	Serves as a resource to assist businesses, organizations and schools in North Dakota to implement worksite wellness programs and health promotion activities.
HIV	Access to HIV testing, counseling services and medical and supportive services	The ND Department of Health has programs through funding provided by the Centers for Disease Control and Prevention and the Health Resources & Services Administration. These programs ensure that people who are at high-risk for HIV infection have access to testing and counseling services as well as services to provide medical and supportive services for those already living with HIV/AIDS.
Injury	Child Passenger Safety Program	A statewide program to; distribute car seats, coordinate and support child passenger safety trainings, and coordinate, conduct and support car seat checkups.
Injury	North Dakota Injury Prevention Coalition	A statewide coalition to address the impact of injury in North Dakota.
Nutrition	Hunger Free Coalition	A statewide program that provides a platform for shared communication, education, and support regarding hunger issues.
Nutrition	Special Supplemental Nutrition Program for Women, Infants and Children (WIC)	Federal nutrition program for pregnant and breastfeeding women, infants, and children younger than age five. Provides nutrition and breastfeeding information, counseling and support.
Oral Disease	SEAL! ND	Seal! ND is a school-based dental sealant program that is offered to schools that are 45 percent or more of their students on the free and reduced-fee school lunch program. Public health hygienists go to the selected schools to do oral health education, dental screening, sealants and fluoride varnish.
Oral Disease	Ronald McDonald Care Mobile	The Ronald McDonald Care Mobile of North Dakota covers the central and western part of the state. The Care Mobile offers a full range of dental services to children that are uninsured and/or on Medicaid that have not seen a dentist in two years.

<b>Health Issue</b>	<b>Asset or Resource</b>	<b>Description</b>
Oral Disease	Oral Health Coalition	The Coalition is a chartered, collaborative, statewide coalition comprised of a variety of public and private agencies, organizations and individuals focused on improving the oral health of North Dakotans. The North Dakota Oral Health Coalition promotes best practice standards to ensure oral health is an integral part of overall health.
Population Health	Healthy North Dakota	A statewide initiative that focuses on health and wellness in our homes, schools, communities and workplaces.
School Health	Coordinated School Health	A joint effort of ND Department of Health and ND Department of Instruction that provides resources on health education, physical education, health and nutrition services, counseling and psychological services, healthy school environment, community and family involvement.
Suicide	North Dakota Century Code 15.1-19-24. Youth suicide prevention - Training	Legislation was passed in 2015 that requires middle and high school staff to participate in two hours of suicide prevention training every two years.
Suicide	Sources of Strength and other Evidence-Based school trainings	ND Department of Health and ND Department of Public Instruction (DPI) partnered to deliver evidence-based comprehensive program, Sources of Strength, to all schools which agree to participate, including tribal community schools. Non-participating schools receive evidence-based training upon request.
Tobacco Use	ND Quits	Tobacco program for North Dakotans that focused on reducing the negative health and economic consequences of tobacco use. Covers prevention, cessation, exposure to second-hand smoke, and tobacco-related disparities among specific population groups.

# Acknowledgements

Thank you to the following agencies, sections and divisions for their contributions in the development of this assessment:

- North Dakota Department of Commerce
- University of North Dakota School of Medicine and Health Sciences, Center for Rural Health
- North Dakota State University, Department of Public Health
- North Dakota Department of Health, Environmental Health Section
- North Dakota Department of Health Community Health Section
- North Dakota Department of Health, Division of Disease Control
- North Dakota Department of Human Services



**For more information, contact:**

***Kelly Nagel, MS, RD, LRD***

***Director, Office of Public Health Systems and Performance***

***North Dakota Department of Health***

***[kjnagel@nd.gov](mailto:kjnagel@nd.gov)***

***701.952.8195***