

**North Dakota**



**Disability Health Project**

**Health Related Attributes of North Dakota  
Adults with Disabilities:  
Analysis of 2001-2007 BRFSS Data**

**Kyle Muus Ph.D.**

**October 2009**



# **Health-Related Attributes of North Dakota Adults with Disabilities: Analysis of 2001-2007 BRFSS Data**

Report prepared by:

Kyle Muus, PhD  
Research Associate  
Center for Rural Health  
University of North Dakota  
School of Medicine & Health Sciences  
Grand Forks, ND

**For alternative formats or additional copies please contact:**

ND Disability Health Project  
ND Center for Persons with Disabilities  
Minot State University  
500 University Avenue West  
Minot, ND 58707  
1-800-233-1737  
[www.ndcpd.org/health](http://www.ndcpd.org/health)



This report was developed through a contract with the ND Center for Persons with Disabilities at Minot State University, which has received funding for the North Dakota Disability Health Project (grant 1 u59 DD000278-01) from the Center for Disease Control and Prevention (CDC). Opinions expressed are those of the author and do not necessarily reflect the official policy of the CDC.

## Table of Contents

List of Tables .....	3
List of Figures .....	3
Executive Summary .....	4
Introduction.....	5
Results.....	6
Disability Prevalence & Demographics.....	6
Health Care Access .....	10
Health Status .....	13
Health Risk Behaviors .....	19
References.....	22
APPENDIX A. Methods for the North Dakota Behavioral Risk Factor Surveillance System.....	24

## List of Tables

Table 1. Demographic characteristics of North Dakota adults with and without disabilities, BRFSS combined years 2001-2007. . . . .	9
Table 2. Health care access measures among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007. . . . .	13
Table 3. Health status measures among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007. . . . .	16
Table 4. Health conditions among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007. . . . .	18
Table 5. Health risk behaviors among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007. . . . .	21

## List of Figures

Figure 1. Disability prevalence among North Dakota adults. . . . .	7
Figure 2. Disability prevalence among North Dakota adults, 2001-2007. . . . .	7
Figure 3. Disability prevalence among North Dakota adults, by gender and race. . . . .	8
Figure 4. Prevalence of fair/poor health among North Dakota adults, by disability status and age, 2001-2007. . . . .	14
Figure 5. Prevalence of overweight/obesity among North Dakota adults, by disability and age, 2001-07. . . . .	19

## **Executive Summary**

This report will profile the demographics, health care access, health status, and health risk behaviors of North Dakota adults (aged 18 and older) with disabilities. For the combined years of 2001 to 2007, 16.7 percent of North Dakota adults, or one in six persons, were defined as having a disability (ND BRFSS, 2001-2007). North Dakotans with disabilities, compared to North Dakotans without disabilities, were more likely to be female, older, American Indian descent, possess lower levels of education, earn lower incomes and be unable to work.

Findings on health care access for North Dakotans with disabilities were mixed. On a positive note, North Dakotans with disabilities were more likely than North Dakotans without disabilities to have had a pneumonia vaccine in their lifetime, a flu shot in the past year and indicate they currently had a regular health care provider. Alternatively, North Dakotans with disabilities were substantially more likely to indicate they had foregone needed health care in the past year due to costs and less likely to have recently used dental care. North Dakotans with and without disabilities were equally likely to have health insurance for all ages combined; however, among those aged 18-64 years, persons with disabilities were somewhat less likely to have health insurance.

Regarding health-related measures, North Dakotans with disabilities were more likely than persons without disabilities to have chronic joint symptoms, arthritis, high blood pressure, high cholesterol, cardiovascular disease, a recent fall-related injury, asthma and diabetes. Also, North Dakota adults with disabilities were more likely than North Dakotans without disabilities to be overweight/obese and smoke cigarettes (mainly among persons ages 18-64), and were less likely to be physically active. Finally, persons with disabilities were less likely to be binge or heavy drinkers.

## **Introduction**

This report was prepared for use by staff of the North Dakota Disability Health Project, a collaboration between the ND Center for Persons with Disabilities at Minot State University, the Center for Rural Health at the University of North Dakota, and the ND State Department of Health, Division of Chronic Disease, Office for the Elimination of Health Disparities. The ND Disability Health Project is funded by the Centers for Disease Control and Prevention for a five-year period (2007-2011). North Dakota is one of 16 states to receive funding to work on various health initiatives and to build overall capacity within the state. The project will promote the health and wellness of North Dakota citizens with disabilities, and prevent or lessen the effects of secondary conditions associated with disabilities.

The purpose of this report is to profile the demographics, health care access, health status, and health risk behaviors of North Dakota adults with disabilities. This profile was conducted via a data comparison of selected Behavioral Risk Factor Surveillance System (BRFSS) attributes between adult (i.e., ages 18 years and older) North Dakotans with and without disabilities. In this report, “disability,” is defined as a “Yes” response to either of the following questions:

- “Are you limited in any way in any activities because of physical, mental or emotional problems?”
- “Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed or a special telephone?”

These questions, used in North Dakota’s BRFSS surveys since 2001, were developed by the Centers for Disease Control and Prevention (CDC) to define disability and are frequently used by various U.S. states. The BRFSS is conducted in all 50 states with the

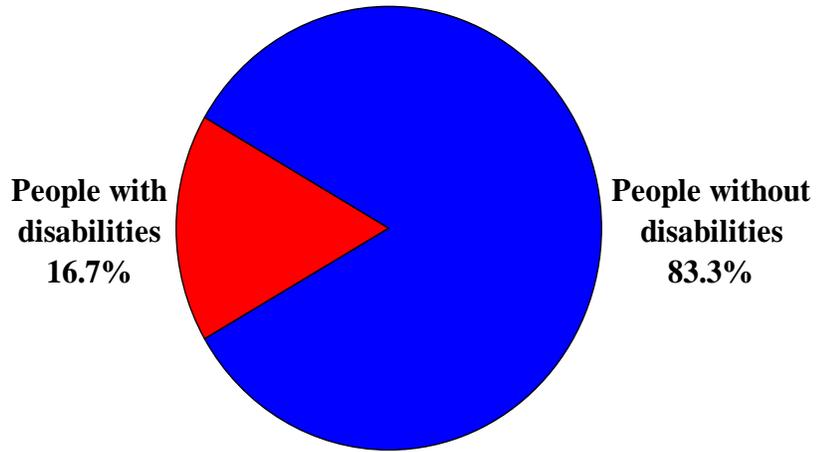
assistance of the CDC. Since 1984, North Dakota has been collecting BRFSS data which is used to develop health policy, design and evaluate public health programs, monitor behavioral health risks and health status, assess attitudes/beliefs about important health issues, and conduct research at the state and national levels (NDDoH, 2008). Each year, thousands of North Dakotans are interviewed by telephone and anonymously provide this important information about their health. Each month throughout the year, telephone calls are made to randomly selected North Dakota households, and a single adult respondent is asked if he or she will participate. Although some North Dakotans choose not to participate, North Dakota has one of the highest response rates in the United States (NDDoH, 2008).

## **Results**

### Disability Prevalence

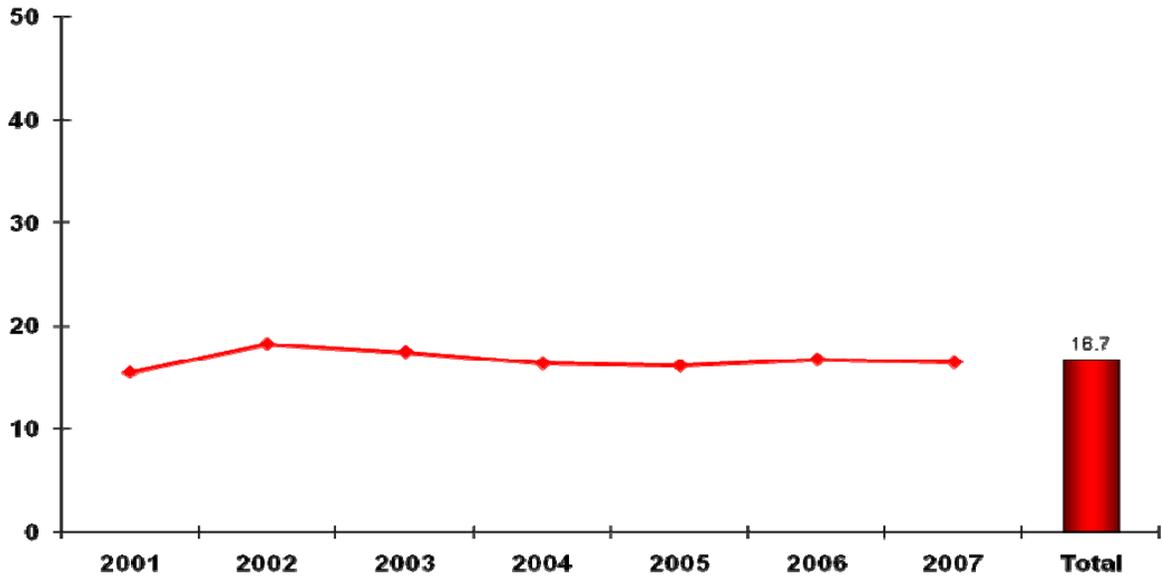
Based on the combined BRFSS data for years 2001 to 2007, 16.7 percent of North Dakota adults (about one in six persons) were defined as having a disability (Figure 1). Since 2001, the prevalence of North Dakota adults with a disability has remained relatively stable, ranging from 15 to 18 percent. The highest annual prevalence (18.2%) in the state occurred in 2002 (Figure 2). By gender, females (17.8%) were more likely than males (15.6%) to report having a disability. By race, American Indians (18.0%) were more likely than whites (16.7%) and persons of other races (13.2%) to have a disability (Figure 3; BRFSS, 2001-07).

**Figure 1. Disability prevalence among North Dakota adults**



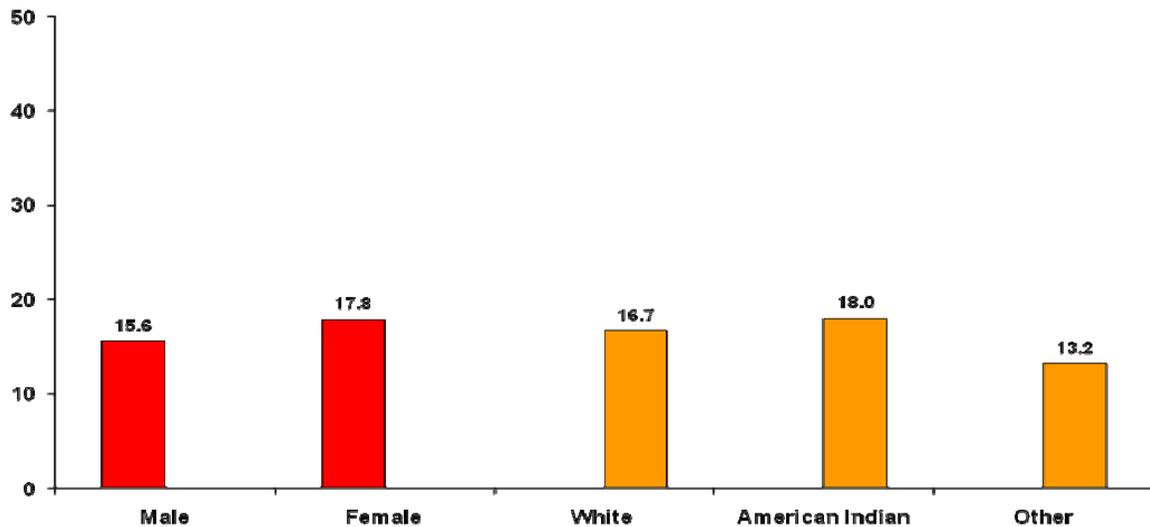
Source: ND BRFSS, combined years 2001-07  
\*Ages 18 and older

**Figure 2. Disability prevalence among North Dakota adults, 2001-2007**



Source: ND BRFSS  
\*Ages 18 and older

**Figure 3. Disability prevalence among North Dakota adults, by gender and race**



Source: ND BRFSS, combined years 2001-07  
\*Ages 18 and older

### Demographics

Older age corresponded with higher disability prevalence. That is, an increase in age of the respondent corresponded with an increase in the likelihood of having a disability. To illustrate, persons aged 65 years and older had the highest prevalence with one-third (33.1%) of respondents indicating they had a disability in the period 2001 to 2007 (Table 1). The youngest respondents, aged 18 to 24 years, had the lowest disability prevalence (6.7%) within this timeframe (Table 1).

Lower levels of education and annual income were associated with higher disability prevalence in North Dakota (Table 1). One-third (33.1%) of respondents with one to eight years of formal education had a disability whereas only 13.2 percent of those having earned a college degree had a disability. Regarding annual income, respondents indicating the lowest level (i.e., less than or equal to \$10,000) had the highest prevalence of disability (30.7%) and those indicating the highest level (i.e., greater than \$75,000) had

the lowest prevalence of disability (10.8%) (Table 1). Regarding employment status, 10.2 percent of working North Dakota adults reported a disability and the remainder (89.8%) were without a disability. Of those persons who indicated they were unable to work, about four-fifths (84.8%) had a disability and about one-fifth (15.2%) did not have a disability (Table 1).

**Table 1. Demographic characteristics of North Dakota adults with and without disabilities, BRFSS combined years 2001-2007.**

	With Disability		Without disability		p
	N	(%)	N	(%)	
<b>Age</b>					
18 to 24	34,297	(6.7)	477,469	(93.3)	<.001
25 to 34	44,226	(8.2)	496,285	(91.8)	
35 to 44	67,907	(11.4)	525,478	(88.6)	
45 to 54	99,483	(16.1)	518,329	(83.9)	
55 to 64	96,692	(23.0)	323,736	(77.0)	
65 and Older	213,358	(33.1)	431,879	(66.9)	
<b>Education</b>					
None	333	(19.8)	1,348	(80.2)	<.001
1 to 8 Yrs	41,449	(33.1)	83,636	(66.9)	
9 to 11 Yrs	37,298	(24.9)	112,701	(75.1)	
HS Grad	174,965	(17.6)	818,501	(82.4)	
Some College	172,615	(16.0)	907,473	(84.0)	
College Grad	128,553	(13.2)	846,235	(86.8)	
<b>Income</b>					
<= \$10 k	44,614	(30.7)	100,748	(69.3)	<.001
> \$10 k to \$15 k	41,664	(28.6)	104,069	(71.4)	
> \$15 k to \$20 k	53,950	(23.8)	172,688	(76.2)	
> \$20 k to \$25 k	62,445	(21.2)	231,586	(78.8)	
> \$25 k to \$35 k	73,938	(16.0)	389,104	(84.0)	
> \$35 k to \$50 k	83,157	(13.7)	525,568	(86.3)	
> \$50 k to \$75 k	64,734	(11.4)	504,573	(88.6)	
> \$75 k	53,249	(10.8)	438,659	(89.2)	
<b>Employment (ages 18-64 only)</b>					
Employed	218,225	(10.2)	1,916,510	(89.8)	<.001
Unable to Work	56,339	(84.8)	10,110	(15.2)	
Other	67,416	(14.1)	412,174	(85.9)	

## **Health Care Access**

### Health Insurance

Having health insurance coverage is an important determinant of health care access and utilization (Hoffman & Paradise, 2008). North Dakota BRFSS respondents were asked, “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” Overall, persons with and without disabilities were equally likely to have health insurance (i.e., 88.4% and 88.6%, respectively). However, among persons aged 18-64 years, those with disabilities were slightly less likely (83.1%) to possess health insurance compared to person without disabilities (86.7%). Among those aged 65 years and older, few differences were noted between persons with and without disabilities, with each group having health coverage at 97.3 and 98.1 percent, respectively. This absence of disparities within this age group may be due to all persons being eligible for Medicare coverage starting at age 65 (Table 2).

### Regular Health Care Provider

Having a regular care health provider is another important indicator of access to and utilization of preventive health care services. North Dakota BRFSS respondents were asked, “Do you have one person you think of as your personal doctor or health care provider?” Results indicated that North Dakota adults with disabilities were more likely (86.3%) than those without disabilities (74.4%) to have regular health care provider (Table 2). This finding may be due in part to greater health challenges among persons with disabilities which increase the need for having a regular health provider who is familiar with their conditions and can manage the primary and specialty care needed and received by the patient.

### Dental Care Use

Oral health is an important component of overall health. Most dental diseases are preventable via regular dental visits, proper oral hygiene and health eating habits. Untreated dental disease can lead to a variety of adverse health outcomes such as tooth loss, infection and bone/nerve damage. Oral infections can spread to other parts of the body and, in some cases, can be deadly (ADA, 2009). The North Dakota BRFSS survey asked respondents when they had last seen a dentist. Results indicated persons with disabilities were more likely than persons without disabilities to have not had a dental visit in the past two years (38.7% versus 28.4%). This disability-related disparity in dental care use was also noted among those aged 18-64 years and aged 65 years or older (Table 2).

### Cost as a Barrier to Health Care

North Dakota BRFSS respondents were asked, “Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?” Results indicated that North Dakotans with disabilities were more likely (13.3%) than those without disabilities (5.7%) to have foregone needed health care due to high costs (Table 2). This disability-related disparity in health care access was also noted among respondents aged 18-64 years and aged 65 years or older.

### Flu Vaccine

Influenza (“the flu”) is a contagious respiratory disease attributable to influenza viruses. Between five to twenty percent of the U.S. population contract the flu each year. Also, 200,000 people are hospitalized and 36,000 people die from the flu in the U.S. each year. The best way to prevent contracting the flu is via an annual flu vaccination (CDC,

2009). North Dakota BRFSS respondents were posed the following: “A flu shot is an influenza vaccine injected into your arm. During the past 12 months, have you had a flu shot?” Also, respondents were asked, “During the past 12 months, have you had a flu vaccine that was sprayed in your nose? The flu vaccine sprayed in the nose is called FluMist™.” Having a flu vaccine in the past 12 months was indicated by a yes response to either of these two questions. Results indicated that North Dakota adults with disabilities were more likely (53.2%) than those without disabilities (33.0%) to have had a flu vaccine in the past year (Table 2).

### Pneumonia Vaccine

Bacterial pneumonia, or inflammation and consolidation of the lung tissue due to an infectious bacterial agent, has a significant health and economic impact among U.S. residents (American Lung Association, 2007). In 2003, approximately 65,000 people died of pneumonia in the United States (Hoyert et al., 2005). Bacterial pneumonia, in many cases, can be prevented through regular use of primary and preventive health care, including pneumococcal vaccine. North Dakota BRFSS respondents were asked, “A pneumonia shot or pneumococcal vaccine is usually given only once or twice in a person’s lifetime and is different from the flu shot. Have you ever had a pneumonia shot?” North Dakota adults with a disability were found to be more likely (47.5% versus 21.9%) than persons without disabilities to have ever had a pneumonia vaccine (Table 2). Also, persons with disabilities were more likely to have had a pneumonia vaccine within each of the age cohorts of 18-64 years and aged 65 years or older.

## Cholesterol Testing

North Dakota BRFSS respondents were asked, “Blood cholesterol is a fatty substance found in the blood. Have you EVER had your blood cholesterol checked?” Persons with disabilities (95.1%) were found to be slightly more likely than persons without disabilities (92.7%) to have had their cholesterol levels examined (Table 2).

**Table 2. Health care access measures among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007.**

	Total		Age 18-64		Age 65 or Older	
	N	(%)	N	(%)	N	(%)
<b>Has Health Insurance</b>						
With Disability	490,629	(88.6)	283,425	(83.1)	207,205	(97.3)
Without disability	2,433,776	(88.4)	2,010,969	(86.7)	422,807	(98.1)
<b>Has Regular Health Care Provider</b>						
With Disability	478,329	(86.3)	280,507	(82.0)	197,822	(93.2)
Without disability	2,054,824	(74.4)	1,669,105	(71.5)	385,719	(89.9)
<b>No Recent Dental Visit (past two years) *</b>						
With Disability	89,622	(38.7)	56,694	(38.3)	32,929	(39.4)
Without disability	327,778	(28.4)	272,908	(27.5)	56,870	(33.7)
<b>Cost Prohibitive of Seeing a Physician **</b>						
With Disability	53,100	(13.3)	44,873	(18.3)	8,227	(5.4)
Without disability	114,578	(5.7)	106,880	(6.3)	7,698	(2.5)
<b>Flu Vaccination (past year)</b>						
With Disability	294,937	(53.2)	128,599	(37.6)	166,338	(78.1)
Without disability	911,487	(33.0)	613,024	(26.3)	298,463	(69.4)
<b>Pneumonia Vaccination (lifetime)</b>						
With Disability	245,114	(47.5)	86,981	(28.2)	158,133	(76.4)
Without disability	544,963	(21.9)	265,583	(12.9)	279,380	(66.9)
<b>Cholesterol Checked ***</b>						
With Disability	310,646	(95.1)	175,468	(93.3)	135,178	(97.7)
Without disability	1,304,994	(92.7)	1,030,236	(91.7)	274,758	(97.0)

\*2002, 2004, 2006

\*\*2003 - 2007

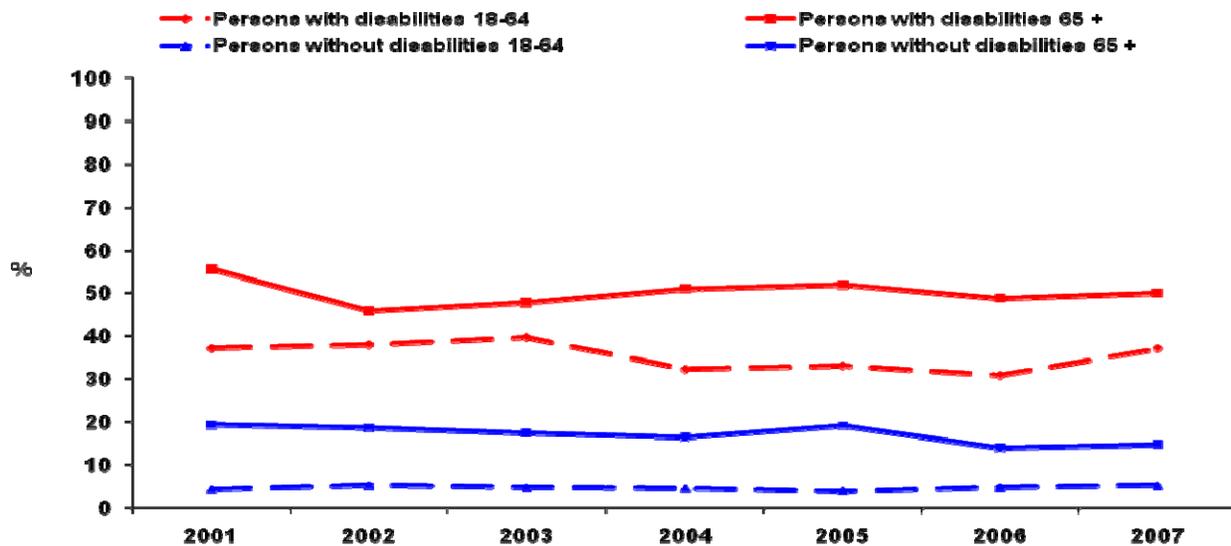
\*\*\* 2001-2003, 2005, 2007

## **Health Status**

### Overall Health

How do North Dakotans with disabilities perceive their own health status? North Dakota BRFSS respondents were asked to respond to the statement, “Would you say that in general your health is...” The possible responses were excellent, very good, good, fair or poor. Findings from analyses of the combined North Dakota BRFSS data for 2001-2007 indicated that North Dakota adults with disabilities (41.1%) were seven times more likely than those without disabilities (6.7%) to characterize their own health as ‘fair’ or ‘poor’ (Table 3). When results were assessed within age group, similar conclusions were drawn. For the age group 18 to 64 years, 35.3 percent of persons with disabilities and only 4.8 percent of persons without disabilities said their health was fair or poor. Over the period of 2001 to 2007, the prevalence of persons with disabilities who said their health was fair/poor ranged from a low of 31.0 percent in 2006 to a high of 39.7 percent in 2003, thus reflecting a decrease in recent years. However, in 2007 the prevalence of fair/poor health increased to 37.1 percent. Among persons aged 65 years and older, 50.1 percent of persons with disabilities and 17.6 percent of persons without disabilities indicated their health was fair or poor in the combined year period of 2001-2007. Within this period, the annual prevalence of persons with disabilities who said their health was fair/poor ranged from a low of 45.9 percent in 2002 to a high of 55.6 percent in 2001. In the most recent year (2007), prevalence of fair/poor health was 50.1 percent (Figure 4).

**Figure 4. Prevalence of Fair/Poor Health among North Dakota Adults, by Disability Status and Age, 2001-2007.**



Source: ND BRFSS

### Physical Health

North Dakota BRFSS respondents were asked, “Now thinking about your *physical* health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?” Valid responses ranged from 0 to 30 days. Regarding responses reflecting excellent physical health, one-third (35.0%) of persons with disabilities and three-quarters (72.2%) of persons without disabilities indicated having zero poor physical health days in the past month. Conversely, among those responses reflecting poor physical health, one-third (32.4%) of persons with disabilities and only 3.9 percent of persons without disabilities indicated having 15-30 days of poor physical health in the past month (Table 3).

### Mental Health

North Dakota BRFSS respondents were asked, “Now thinking about your *mental* health, which includes stress, depression, and problems with emotions, for how many

days during the past 30 days was your mental health not good?” Regarding responses reflecting excellent mental health, 57.6 percent of persons with disabilities and 69.7 percent of persons without disabilities indicated having zero poor mental health days in the past month. Conversely, among those responses reflecting poor mental health, 17.7 percent of persons with disabilities and only 6.1 percent of persons without disabilities indicated having 15-30 days of poor mental health in the past month (Table 3).

### Physical/Mental Health

North Dakota BRFSS respondents were asked, “During the past 30 days, for about how many days did poor physical *or* mental health keep you from doing your usual activities, such as self-care, work, or recreation?” Valid responses ranged from 0 to 30 days. Regarding responses reflecting excellent overall health, 44.1 percent of persons with disabilities and 71.8 percent of persons without disabilities indicated having zero poor health days that kept them from their usual activities in the past month.

Alternatively, among those responses reflecting poor health, 26.6 percent of persons with disabilities and only 3.1 percent of persons without disabilities indicated having 15-30 days of poor health that kept them from their usual activities in the past month (Table 3).

**Table 3. Health status measures among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007.**

	Total		Age 18-64		Age 65 or Older	
	N	(%)	N	(%)	N	(%)
<b>General Health is Fair/Poor</b>						
With Disability	227,427	(41.1)	121,410	(35.5)	106,017	(50.1)
Without disability	186,509	(6.7)	112,552	(4.8)	73,956	(17.2)
<b>Physical Health Not Good - # Days in Past Month *</b>						
<i>0 Days</i>						
With Disability	165,231	(35.0)	100,329	(34.6)	64,902	(35.6)
Without disability	1,728,940	(72.2)	1,460,258	(72.2)	268,682	(71.9)
<i>15-30 Days</i>						
With Disability	152,905	(32.4)	84,490	(29.2)	68,415	(37.5)
Without disability	92,811	(3.9)	56,859	(2.8)	35,952	(9.6)
<b>Mental Health Not Good - # Days in Past Month *</b>						
<i>0 Days</i>						
With Disability	271,718	(57.6)	141,123	(48.7)	130,595	(71.6)
Without disability	1,670,963	(69.7)	1,355,405	(67.0)	315,558	(84.4)
<i>15-30 Days</i>						
With Disability	83,409	(17.7)	61,317	(21.2)	22,092	(12.1)
Without disability	146,600	(6.1)	129,728	(6.4)	16,871	(4.5)
<b>Poor Health Prevented Usual Activities - # Days in Past Month *</b>						
<i>0 Days</i>						
With Disability	156,540	(44.1)	91,069	(40.0)	65,471	(51.4)
Without disability	778,853	(71.8)	680,192	(71.6)	98,662	(73.8)
<i>15-30 Days</i>						
With Disability	94,622	(26.6)	57,375	(25.2)	37,247	(29.2)
Without disability	33,673	(3.1)	23,445	(2.5)	10,227	(7.7)

\* 2001, 2003-3007

### Chronic/Acute Health Conditions

The prevalence of a variety of chronic and acute health conditions was assessed through the question, “Have you ever been told by a doctor that you have (disease or health condition)?” The specific diseases or health conditions included cardiovascular disease (encompassing heart attack [myocardial infarction], angina, coronary heart disease, and stroke), asthma, arthritis (encompassing rheumatoid arthritis, gout, lupus, fibromyalgia, polymyalgia rheumatica, osteoarthritis, tendonitis, bursitis, bunion, tennis elbow, carpal tunnel syndrome, tarsal tunnel syndrome, joint infection, Reiter’s

syndrome, ankylosing spondylitis, spondylosis, rotator cuff syndrome, connective tissue disease, scleroderma, polymyositis, Raynaud's syndrome, and vasculitis [giant cell arteritis, Henoch-Schonlein purpura, Wegener's granulomatosis, polyarteritis nodosa]), chronic joint symptoms, high blood pressure, high cholesterol, and diabetes (Table 4).

Also, North Dakota BRFSS respondents were asked about recent falls through use of the following statements and questions: "The next questions ask about recent falls. By a fall, we mean when a person unintentionally comes to rest on the ground or another lower level. In the past 3 months, how many times have you fallen? Did this fall cause an injury? How many of these falls caused an injury? By an injury, we mean the fall caused you to limit your regular activities for at least a day or to go see a doctor."

Results indicated that persons with disabilities were substantially more likely than persons without disabilities to have chronic joint symptoms (85.4% versus 60.3%), arthritis (57.0% versus 19.6%), high blood pressure (44.1% versus 20.6%), high cholesterol (45.3% versus 31.2%), cardiovascular disease (20.9% versus 4.8%), a recent fall-related injury (18.6% versus 11.9%), asthma (17.7% versus 9.0%) and diabetes (14.5% versus 4.5%; Table 4). When health condition prevalence was examined within the age cohorts of 18-64 years and 65 years and older, prominent disparities between those with and without disabilities existed across all health conditions (Table 4).

**Table 4. Health conditions among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007.**

	Total		Age 18-64		Age 65 or Older	
	N	(%)	N	(%)	N	(%)
<b>Chronic Joint Symptoms **</b>						
With Disability	228,669	(85.4)	140,251	(84.0)	88,417	(87.6)
Without disability	379,195	(60.3)	286,831	(57.4)	92,364	(71.4)
<b>Arthritis **</b>						
With Disability	223,541	(57.0)	117,591	(48.6)	105,950	(70.3)
Without disability	383,935	(19.6)	247,126	(15.0)	136,809	(44.9)
<b>High Blood Pressure **</b>						
With Disability	172,495	(44.1)	79,602	(33.0)	92,893	(62.0)
Without disability	404,002	(20.6)	246,957	(14.9)	157,044	(51.8)
<b>High Cholesterol **</b>						
With Disability	148,603	(45.3)	76,640	(40.7)	71,963	(51.3)
Without disability	440,688	(31.2)	302,745	(26.8)	137,943	(48.5)
<b>Cardiovascular Disease ***</b>						
With Disability	64,985	(24.9)	12,394	(23.3)	45,246	(39.2)
Without disability	65,325	(6.5)	13,815	(7.7)	39,241	(16.1)
<b>Fall-Related Injury *</b>						
With Disability	10,908	(18.6)	5,728	(21.3)	5,006	(16.3)
Without disability	21,402	(11.8)	15,219	(13.2)	6,122	(9.7)
<b>Asthma</b>						
With Disability	98,304	(17.7)	66,719	(19.5)	31,585	(14.8)
Without disability	250,394	(9.0)	220,928	(9.5)	29,466	(6.8)
<b>Diabetes</b>						
With Disability	80,572	(14.5)	35,161	(10.3)	45,411	(21.3)
Without disability	123,452	(4.5)	72,522	(3.1)	50,929	(11.8)

Note: Diabetes defined as type I or II only, not pregnancy diabetes or pre-diabetes.

\* 2003

\*\* 2001-2003, 2005, 2007

\*\*\* 2005-2007

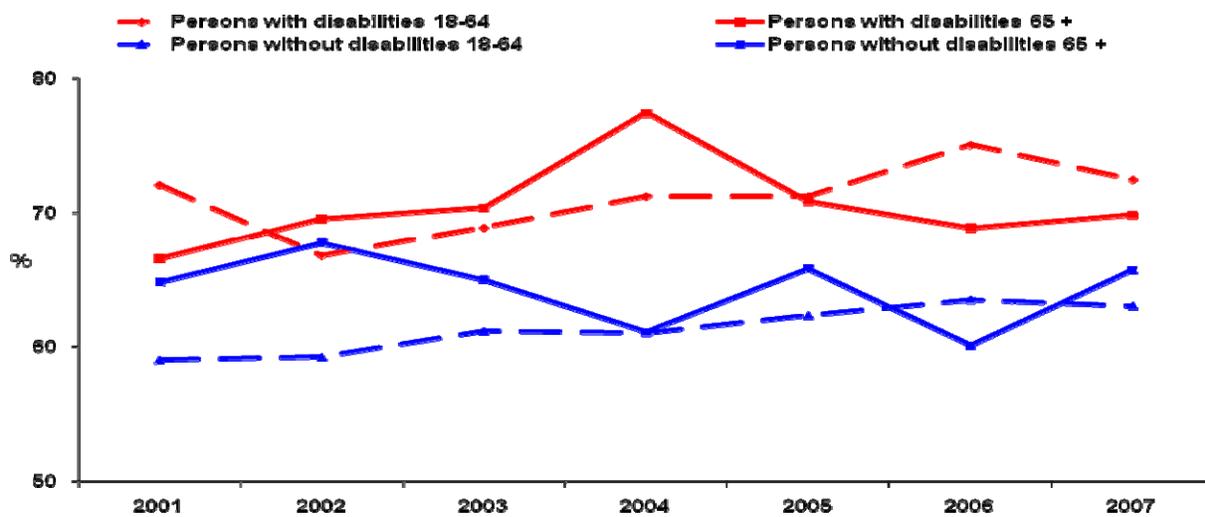
## **Health Risk Behaviors**

### Overweight/Obesity

North Dakotans with and without disabilities were compared in terms of their prevalence of overweight or obesity. The North Dakota BRFSS survey solicits respondents' height and weight information which is used to calculate body mass index scores. Overweight/obesity was defined as body mass index scores of 25 or higher

(National Heart, Lung, and Blood Institute, 1998). Results indicated that, for the combined period of 2001-2007, North Dakota adults with disabilities (70.9%) were more likely to be overweight or obese, compared to North Dakota adults without disabilities (61.8%). Over time, the prevalence of overweight/obesity has remained relatively consistent for persons with disabilities, ranging from 65 to 75 percent (Figure 5). When results were examined by the aged groups of 18-64 years and 65 year or older, it was clear that persons with disabilities were more likely than persons without disabilities to be overweight or obese (Figure 5).

**Figure 5. Prevalence of Overweight/Obesity among North Dakota Adults, by Disability Status and Age, 2001-07.**



Source: ND BRFSS

Physical Activity

North Dakota BRFSS respondents were asked a series of questions regarding the extent to which they engage in physical activity. Specifically, North Dakota BRFSS respondents were asked, “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?” Engaging in these types of activities will produce

small increases in breathing or heart rate which is beneficial to one's overall health. Persons with disabilities were less likely (37.9%) than persons without disabilities (51.2%) to have engaged in moderate activities in the past month (Table 5).

### Alcohol/Tobacco Use

The North Dakota BRFSS survey contains some questions about alcohol use. Binge alcohol use is defined by the BRFSS as consuming five or more alcoholic beverages in a row on one or more occasions in the past 30 days. Persons with disabilities were far less likely (15.6%) than persons without disabilities (27.3%) to have engaged in binge drinking in the past month (Table 5). Heavy alcohol use is defined by the BRFSS as consuming more than two alcoholic beverages per day every day for men and consuming more than one alcoholic beverage per day every day for women. Persons with disabilities were slightly less likely (3.9%) than persons without disabilities (5.3%) to be heavy drinkers (Table 5).

North Dakota BRFSS respondents were asked some questions regarding cigarette smoking. One question was, "Have you smoked at least 100 cigarettes in your entire life?" Another question entailed the following: "Do you now smoke cigarettes every day, some days, or not at all?" CDC defines 'current smokers' as persons that have smoked 100 cigarettes in their lifetime and are smoking cigarettes every day or some days. Overall, persons with disabilities were slightly more likely (22.0% versus 20.4%, respectively) to be current smokers. However, for those aged 18-64 years, persons with disabilities were substantially more likely (30.6%) than those without disabilities (22.7%) to be current smokers. No significant disability-related disparities in smoking were noted among those aged 65 years and older (Table 5).

**Table 5. Health risk behaviors among North Dakota adults with and without disabilities, by age group, BRFSS combined years 2001-2007.**

	Total		Age 18-64		Age 65 or Older	
	N	(%)	N	(%)	N	(%)
<b>Overweight/Obese</b>						
With disability	376,137	(70.9)	231,799	(71.0)	144,338	(70.6)
Without disability	1,654,572	(61.8)	1,387,016	(61.4)	267,556	(64.3)
<b>Obese</b>						
With disability	183,369	(34.5)	122,464	(37.5)	60,905	(29.8)
Without disability	599,382	(22.4)	519,200	(23.0)	80,182	(19.3)
<b>Tried Losing Weight **</b>						
With Disability	35,212	(43.2)	24,446	(48.0)	10,766	(35.2)
Without disability	141,744	(36.8)	119,896	(37.2)	21,849	(34.7)
<b>Told to Lose Weight **</b>						
With Disability	12,571	(15.4)	8,558	(16.8)	4,013	(13.1)
Without disability	27,068	(7.0)	21,990	(6.8)	5,078	(8.1)
<b>Moderate Activity *</b>						
With disability	140,517	(37.9)	102,445	(43.9)	38,073	(27.8)
Without disability	951,872	(51.2)	839,541	(52.8)	112,331	(41.4)
<b>Smokes</b>						
With Disability	121,851	(22.0)	104,718	(30.6)	17,133	(8.0)
Without disability	565,285	(20.4)	529,766	(22.7)	35,519	(8.3)
<b>Binge Drinks ***</b>						
With Disability	53,251	(15.6)	49,349	(22.0)	3,902	(3.3)
Without disability	511,003	(27.3)	498,961	(30.9)	12,042	(4.7)
<b>Drinks Heavily</b>						
With Disability	21,466	(3.9)	18,360	(5.5)	3,106	(1.5)
Without disability	144,651	(5.3)	136,522	(5.9)	8,130	(1.9)

\*2001-2003, 2005; \*\*2003; \*\*\*2001-2003, 2005-2007

## References

American Dental Association. (2009). Access to dental care. Chicago, IL: ADA. Available at: <http://www.ada.org/public/topics/access.asp>

American Lung Association. (2007). Pneumonia fact sheet. New York: American Lung Association. <http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=35692>

CDC. (2009). Influenza: the disease. Atlanta, GA: CDC. Available at: <http://www.cdc.gov/flu/about/disease/index.htm>

Hoffman, CB, Paradise, J. (2008). Health Insurance and Access to Health Care in the United States. *Ann N Y Acad Sci.* 2007 Oct 22 [Epub ahead of print].

Hoyert, DL, Kung, HC, Smith, BL. (2005). Deaths: preliminary data for 2003. *National vital statistics reports*, vol. 53, no. 15. Hyattsville, MD: National Center for Health Statistics.

National Heart, Lung and Blood Institute (1998). Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults: the evidence report. Bethesda, MD: US Department of Health and Human Services, National Institutes of Health. Available at [http://www.nhlbi.nih.gov/guidelines/obesity/ob\\_gdlns.htm](http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.htm).

North Dakota Department of Health. (2008). North Dakota Behavioral Risk Factor Surveillance System. Bismarck, ND. Available at <http://www.ndhealth.gov/brfss/>.

## **APPENDIX A. Methods for the North Dakota Behavioral Risk Factor Surveillance System**

Source: North Dakota Department of Health, 2008; Reprinted with permission; <http://www.ndhealth.gov/brfss/survey/>

### **Sampling**

Since 1999, the North Dakota BRFSS has been conducted using disproportionate stratified sampling methodology. This method of probability sampling involves assigning sets of 100 telephone numbers with the same area code, prefix, and first two digits of the suffix and all possible combinations of the last two digits ("hundred blocks") into two strata (1999-2001, 2003-2006) or three strata (2002) based on the likelihood that the number represents an actual household. Different strata are sampled at different rates to improve calling efficiency.

Approximately the same number of people is called each month throughout each calendar year to reduce bias caused by seasonal variation of health risk behaviors. Potential working telephone numbers are dialed during three separate calling periods (daytime, evening and weekends) for a total of 15 call attempts before being replaced. Upon reaching a valid household number, one household member age 18 or older is randomly selected. If the selected respondent is not available, an appointment is made to call at a later time or date. Because respondents are selected at random and no identifying information is requested, all responses to this survey are anonymous.

### **Data Weighting**

Weighting is a process by which the survey data are adjusted to account for unequal selection probability and response bias and to represent more accurately the population from which the sample was drawn. The responses of each person interviewed are assigned a weight that accounts for the density stratum, the number of telephone numbers in the household, the number of adults in the household and the demographic distribution of the sample.

### **Data Reliability**

Telephone interviewing has been demonstrated to be a reliable method for collecting behavioral risk data and can cost three to four times less than other interviewing methods, such as mail-in interviews or face-to-face interviews. The BRFSS methodology has been utilized and evaluated by the CDC and the participating states since 1984. Content of survey questions, questionnaire design, data collection procedures, surveying techniques and editing procedures have been evaluated thoroughly to maintain overall data quality and to lessen the potential for bias within the population sample.

### **Limitations**

#### **Sampling**

The BRFSS survey samples the population using a technique discussed in the methodology section. Sampling yields results that are an estimate of the true answer for the entire population. The more people interviewed, the greater the precision of the estimate will be. When the data are subdivided to look at sub-populations (e.g., an age subgroup) these estimates will be less precise; if the number of people interviewed was small because the subgroup represents a small

fraction of the population (e.g., diabetics less than 30 years old), the estimate may become too uncertain to be of value. Because the survey is conducted by telephone, people without telephones cannot be reached. Since phone ownership is highly correlated to income, people without a phone are more likely to have low incomes than are people with a telephone. This potentially will affect questions with responses that are highly dependent on income (e.g., health insurance) more than other questions. However, because phone ownership is high in North Dakota (greater than 95%), the resulting bias for most analyses is small. Because some populations, such as racial or ethnic subgroups, have lower phone ownership, results for these groups may be impacted to a greater extent. In addition, with ongoing changes in telephone technology there are more and more households that have cellular telephones and no traditional land lines in their homes. These households are presently not in the sampling frame for BRFSS, which may bias the survey results, especially if the percentage of cellular-telephone-only households increases in the coming years. The BRFSS is continuing to study the impact of cellular phones on survey response and the feasibility of various methods for data collection to complement present survey methods.

### **Questionnaire Design and Administration**

How a question is written and which questions preceded it in the questionnaire can influence responses in unpredictable ways. Not all the questions used in the survey have been tested to ensure that all participants understand the intended meaning. Those that come from modules created by the Centers for Disease Control and Prevention usually have been tested, while those in state modules may or may not have been tested, depending upon the source of the question. Furthermore, not all questions are equally easy for respondents to answer. While it may be easy for a respondent to provide a personal opinion, it may be much harder to recall a past event (last mammogram) or provide factual information (household income).

Interviewers are trained and monitored to ensure that they administer the survey in a neutral voice and read the written question verbatim and without comment. Nonetheless, it is possible for the interviewer to bias the results through tone of voice or administration technique. Coding errors also may occur if the interviewer types in the wrong response to the question. In addition, the person being interviewed may alter his or her response to give the interviewer the most socially acceptable answer.