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What are health disparities?

Health disparities in North Dakota are defined as inequalities in health status, utilization or access due to structural, financial, personal or cultural barriers. ⁽¹⁾ Population categories affected include, but are not limited to, those identified by gender, gender identity, age, race or ethnicity, education or income, disability, geographic location or sexual orientation.

In North Dakota, according to the 2010 census, 90 percent of the population is White and 5.4 percent is American Indian/Alaska Native. The remaining 4.6 percent is some other race or is multiracial. Only 2 percent of the population in North Dakota is Hispanic, compared to 16.3 percent in the U.S.

The North Dakota State Data Center published a bulletin with 2010 North Dakota census population counts by race and Hispanic origin. ⁽³⁾ From 2000 to 2010, the racial and ethnic minority population (non-White and/or Hispanic) in North Dakota grew 41 percent and now comprises 11 percent of the state population.

During the same period, the White alone population increased by 2.1 percent and the American Indian/Alaska Native-only population, North Dakota's largest racial minority, grew by 16.8 percent and now comprises 5.4 percent of the state population compared to 4.9 percent a decade ago.

Also during this time period, the Hispanic population grew 73 percent and now comprises 2 percent of the state population compared to 1.2 percent in 2000.

“The increasing diversity of our state’s population, in part, is contributing to our state’s recent population growth. This trend is likely to continue.”

**Richard Rathge,
Director of the
North Dakota State Data Center**

Why is it important to address health disparities?

The demographic changes that have occurred over the past decade and which are anticipated to continue, magnify the importance of addressing disparities in health status. Groups currently experiencing poorer health status are expected to continue growing as a proportion of the total U.S. population; therefore, the future health of America as a whole will be influenced substantially by our success in improving the health of these groups. ⁽²⁾

Health equity is linked to the social determinants of health (SDOH). SDOH are the circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies and politics. ⁽⁴⁾

Minority Health and Health Disparities

"The future health of the nation will be determined to a large extent by how effectively we work with communities to reduce and eliminate health disparities between non-minority and minority populations experiencing disproportionate burdens of disease, disability, and premature death."

~ Guiding Principle for Improving Minority Health
CDC Office of Minority Health and Health Disparities

Diabetes

What is Diabetes?

Diabetes is a group of diseases marked by high levels of blood glucose resulting from defects in insulin production, insulin action or both. Diabetes can lead to serious complications and premature death, but people with diabetes, working together with their support network and their health-care providers, can take steps to control the disease and lower the risk of complications. ⁽⁵⁾

Types of Diabetes

Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. To survive, people with type 1 diabetes must have insulin delivered by injection or a pump. In adults, type 1 diabetes accounts for approximately 5 percent of all diagnosed cases of diabetes. There is no known way to prevent type 1 diabetes.

Type 2 diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. In adults, type 2 diabetes accounts for about 90 percent to 95 percent of all diagnosed cases of diabetes.

Gestational diabetes is a form of glucose intolerance diagnosed during pregnancy.

Other types of diabetes result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, medications, infections, pancreatic disease and other illnesses. Such types of diabetes account for 1 percent to 5 percent of all diagnosed cases.

Treating Diabetes ⁽⁵⁾

Diet, insulin and oral medication to lower blood glucose levels are the foundation of diabetes treatment and management. Patient education and self-care practices are also important aspects of disease management that help people with diabetes lead normal lives.

To survive, people with type 1 diabetes must have insulin delivered by injection or a pump.

Many people with type 2 diabetes can control their blood glucose by following a healthy meal plan and exercise program, losing excess weight and taking oral medication. Medications for each individual with diabetes will often change during the course of the disease. Some people with type 2 diabetes also may need insulin to control their blood glucose.

Self-management education or training is a key step in improving health outcomes and quality of life. It focuses on self-care behaviors, such as healthy eating, being active and monitoring blood sugar. It is a collaborative process in which diabetes educators help people with or at risk for diabetes gain the knowledge and problem-solving and coping skills needed to successfully self-manage the disease and its related conditions.

Diabetes Statistics

Nearly 26 million people of all ages have diabetes in the United States.

One out of four people with diabetes have not yet been diagnosed. ⁽⁵⁾

***Diabetes affects 25.8 million people
8.3% of the U.S. population***

**Diagnosed 18.8 million people
Undiagnosed 7.0 million people**

**National Diabetes Fact Sheet, 2011
Centers for Disease Control and Prevention (CDC)**

Pre-diabetes is a condition in which individuals have blood glucose or A1c levels higher than normal but not high enough to be classified as diabetes.

People with pre-diabetes have an increased risk of developing type 2 diabetes, heart disease and stroke.

**National Diabetes Fact Sheet, 2011
Centers for Disease Control and Prevention
(CDC)**

Pre-diabetes is becoming more common among adults in the United States. In 2005 to 2008, based on fasting glucose or hemoglobin A1c levels, 35 percent of U.S. adults age 20 years or older had pre-diabetes (50 percent of adults age 65 years or older). Applying this percentage to the entire U.S. population in 2010 yields an estimated 79 million American adults aged 20 years or older with pre-diabetes. ⁽⁵⁾

Prevalence of Diabetes in North Dakota by Selected Characteristics

Diabetes is a major health problem in North Dakota, affecting all population groups. Diabetes prevalence has more than doubled over the past twelve years, from 3.5 percent in 1997 to 7.5 percent in 2009. An estimated 37,000 adults in North Dakota were living with diagnosed diabetes in 2009, with an additional 12,000 adults who had diabetes but did not know it.

The following table (Table 1) shows the prevalence of diagnosed diabetes among adults 18 and older by selected characteristics. The Behavioral Risk Factor Surveillance System (BRFSS) is the data source for the rates presented in this table. The selected characteristics are sex, race, education level, poverty to income ratio (based on the U.S. poverty level for household size), disability status, age group and urban/rural county of residence. For this analysis, a five-year data set was utilized, spanning the years 2005 through 2009.

Disability status is defined as a “Yes” response to either of the following questions in the BRFSS:

“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?”

Urban counties in North Dakota are defined as counties with a city of at least 15,000 population. Eight counties meet that definition (Burleigh, Cass, Grand Forks, Morton, Stark, Stutsman, Ward and Williams).

Population subcategories that have a significantly higher diabetes prevalence rate when compared to their referent group are highlighted in blue.

**Table 1: Prevalence of Diagnosed Diabetes Among Adults 18 and Older
By Selected Characteristics
North Dakota 2005-2009**

Characteristic	Percent	(95% CI)	Ratio	Absolute difference	Relative difference %
State Total	6.9	(6.6-7.3)	na	na	na
Sex					
Male	7.3	(6.7-7.8)	1.1	0.7	10.6
Female	6.6	(6.2-7.1)	Ref.	Ref.	Ref.
Race					
White	6.6	(6.3-7.0)	Ref.	Ref.	Ref.
American Indian	12.7	(9.7-15.6)	1.9	6.1	92.4
Education level					
<High school or HS graduate	9.1	(8.4-9.7)	1.6	3.4	59.6
At least some college	5.7	(5.3-6.1)	Ref.	Ref.	Ref.
Poverty to income ratio**					
Poor or near poor, <2	8.6	(7.8-9.4)	1.4	2.4	38.7
Mid to high income, ≥2.0	6.2	(5.7-6.6)	Ref.	Ref.	Ref.
Disability status					
Disability	15.8	(14.6-17.0)	3.1	10.7	209.8
No disability	5.1	(4.8-5.4)	Ref.	Ref.	Ref.
Age group (yrs)					
18-44	2.1	(1.7-2.5)	Ref.	Ref.	Ref.
45-64	8.5	(7.8-9.1)	4.0	6.4	304.8
65 and older	16.5	(15.5-17.5)	7.9	14.4	685.7
Urban/Rural					
Urban	6.4	(5.9-6.8)	Ref.	Ref.	Ref.
Rural	7.8	(7.2-8.4)	1.2	1.4	21.9

Abbreviation:

CI = confidence interval

Ref. = referent group

na = not applicable

** On the basis of the U.S. poverty level

Significantly different from referent group based on CI

Source: Behavioral Risk Factor Surveillance System

The following disparities in diabetes prevalence are observed in Table 1.

- American Indians have a diabetes prevalence rate nearly twice as high as the rate for Whites.
- Diabetes prevalence decreases as education increases.
- Those in the lower income category have a higher diabetes prevalence when compared to those in the middle to high income category.
- Adults with disabilities have a diabetes prevalence rate three times as high as those without disabilities.
- Age is significantly related to diabetes with prevalence rates increasing as age increases.
- Those living in rural counties have a higher rate of diabetes prevalence compared to those who live in urban counties.

Some of the differences observed can be accounted for by the confounding factor of age. For example, in North Dakota people age 65 and older are more likely to live in rural areas than are those younger than 65. Therefore, the difference in diabetes prevalence may be a factor of age rather than a factor of rural versus urban residence. Age will be considered when addressing each of these identified disparities.

American Indians

Data from the 2009 Indian Health Service (IHS) National Patient Information Reporting System (NPIRS) indicate that 14.2 percent of American Indians and Alaska Natives age 20 years or older who received care from IHS had diagnosed diabetes. After adjusting for population age differences, 16.1 percent of the total adult population served by IHS had diagnosed diabetes. ⁽⁵⁾

In comparison, after adjusting for population age differences, 2007 to 2009 national survey data for people age 20 years or older indicate that 7.1 percent of non-Hispanic Whites had diagnosed diabetes. ⁽⁵⁾

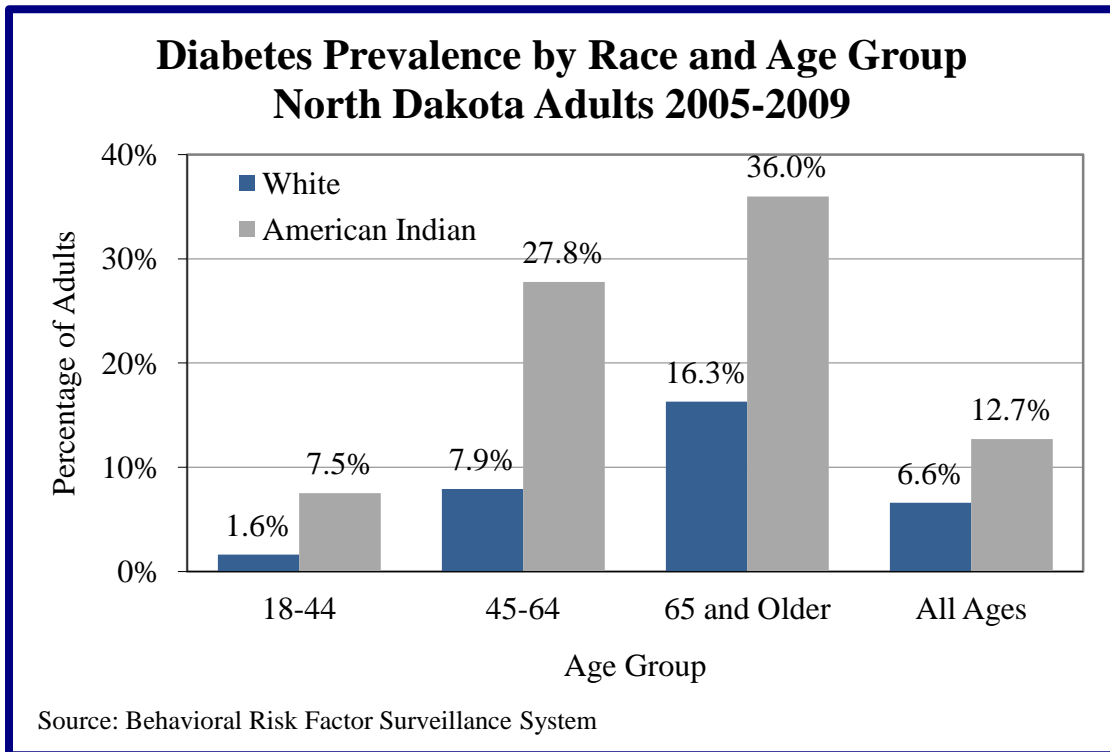
American Indians in the United States have a diabetes prevalence rate that is more than double the rate for non-Hispanic whites.

**National Diabetes Fact Sheet, 2011
Centers for Disease Control and Prevention (CDC)**

Prevalence

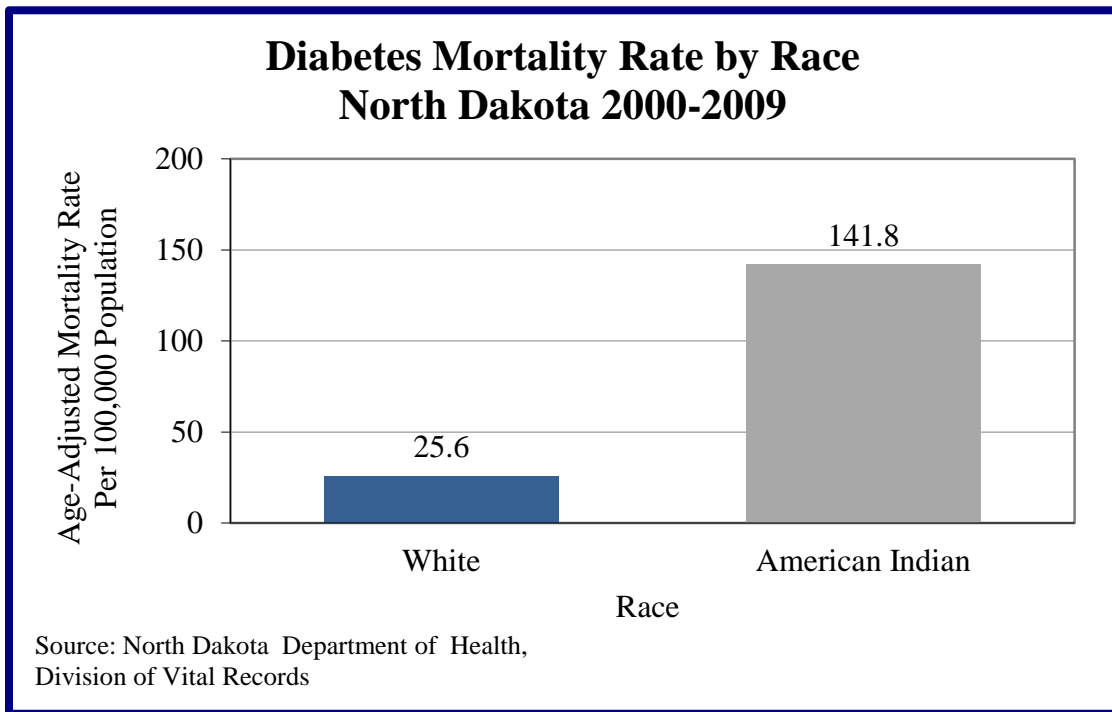
American Indians have a higher diabetes prevalence rate than Whites in all age groups. This indicates that race alone is a strong and direct factor related to diabetes prevalence.

In the 18 to 44 age group, the prevalence rate for American Indians is more than four times the rate for Whites. In the 45 to 64 age group, over one in four American Indians have diabetes and in the 65 and older age group, more than one in three. This only accounts for self-reported diagnosed diabetes. Nationally, over one-fourth of adults with diabetes are undiagnosed. ⁽⁵⁾



Mortality

The diabetes mortality rate for American Indians is more than five times the rate for Whites in North Dakota. This chart represents mortality rates for deaths where diabetes is the identified underlying cause of death. The rate is age-adjusted so that two populations with different age distributions can be compared. Clearly, diabetes mortality affects the American Indian population in North Dakota more severely than the White population.



American Indians in North Dakota lose many more years of potential life to diabetes than do Whites. Ninety percent of American Indian deaths caused by diabetes occurred in people younger than 75, compared to 61 percent of White deaths. On average, American Indians who die of diabetes prior to age 75 lose 16 years of potential life. In comparison, Whites who die of diabetes prior to age 75 lose 12 years of potential life.

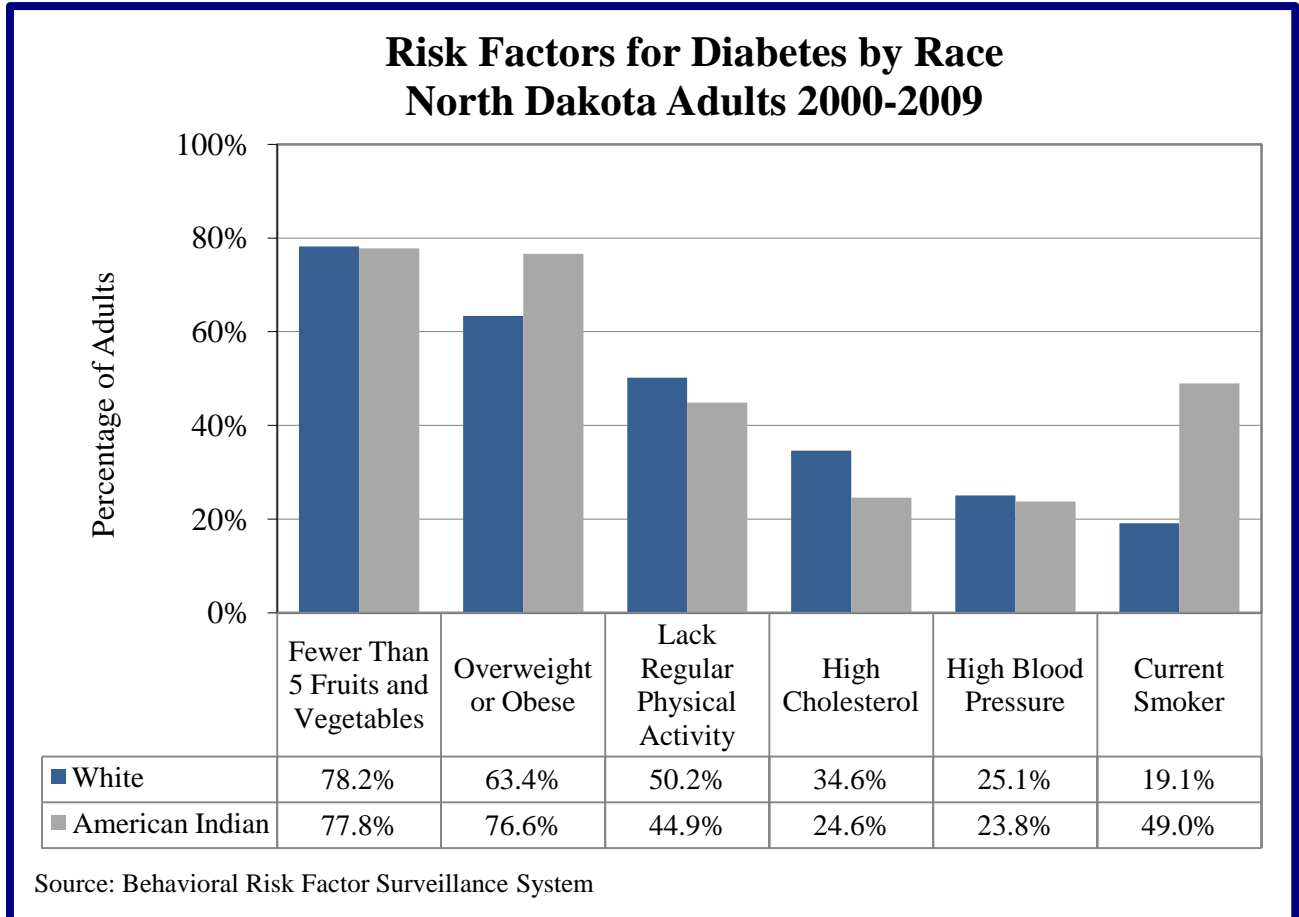
**Years of Potential Life Lost (YPLL) Before Age 75 by Race
North Dakota 2000-2009**

Cause of Death/Race	Total Deaths	Deaths Before Age 75	Total YPLL	Average YPLL Per Death Before Age 75	Percentage of Deaths That Occurred Before Age 75
Diabetes Mellitus					
White	1,920	1,164	13,968	12	61%
American Indian	187	169	2,704	16	90%

Source: North Dakota Department of Health, Division of Vital Records

Risk Factors

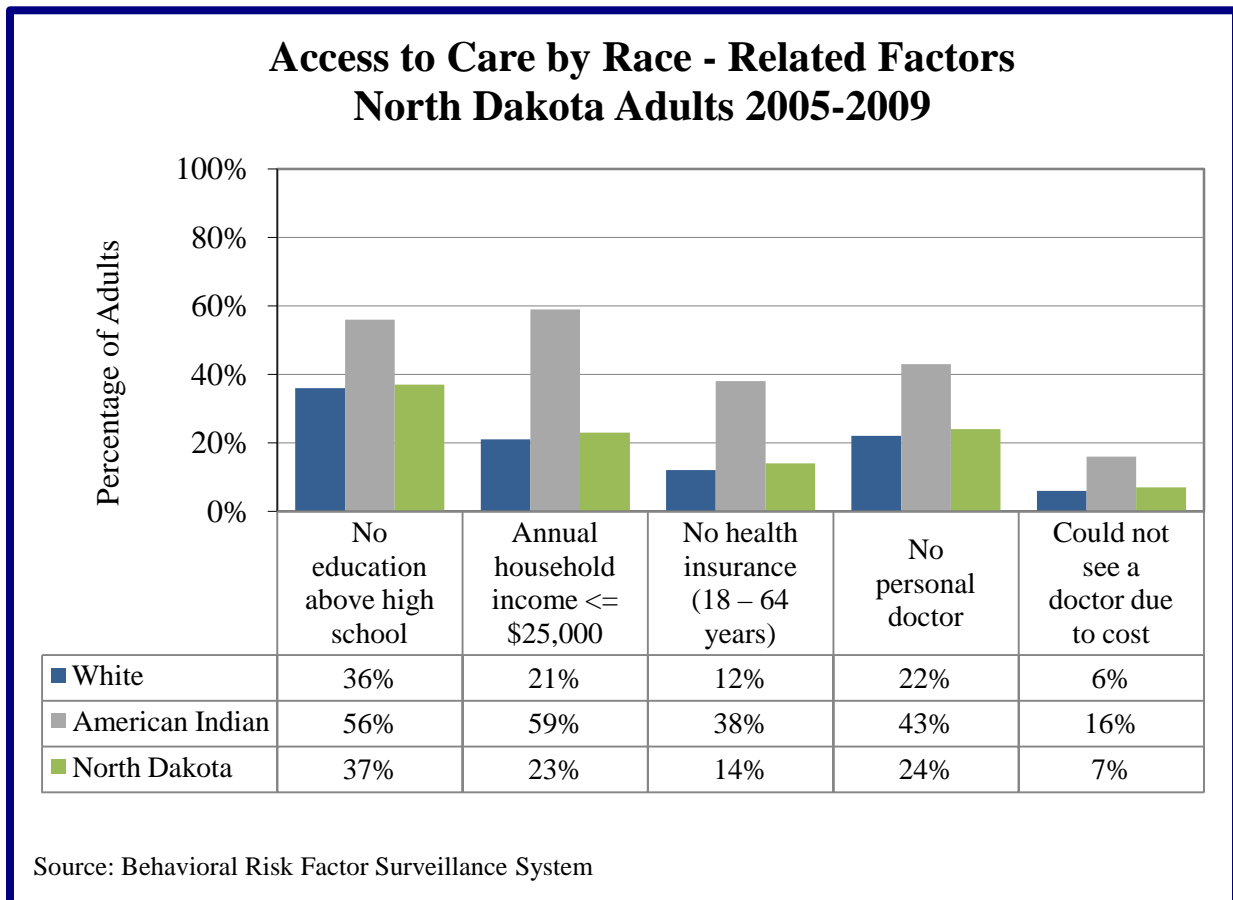
In addition to a higher prevalence of diabetes, higher mortality rates due to diabetes and many more years of potential life lost, American Indians are disproportionately affected by the risk factors of overweight or obesity and smoking.



Access to Care

Many factors contribute to a person's access to adequate health care. The following chart includes five factors that are related to access. Education and income are socioeconomic factors that may inhibit access. Lack of health insurance is a strong inhibiting factor due to the costs of health care. In addition, even those with insurance may not be able to see a doctor due to the out-of-pocket costs after insurance. Having a personal doctor has been shown to improve diabetes treatment and adherence to a treatment plan.

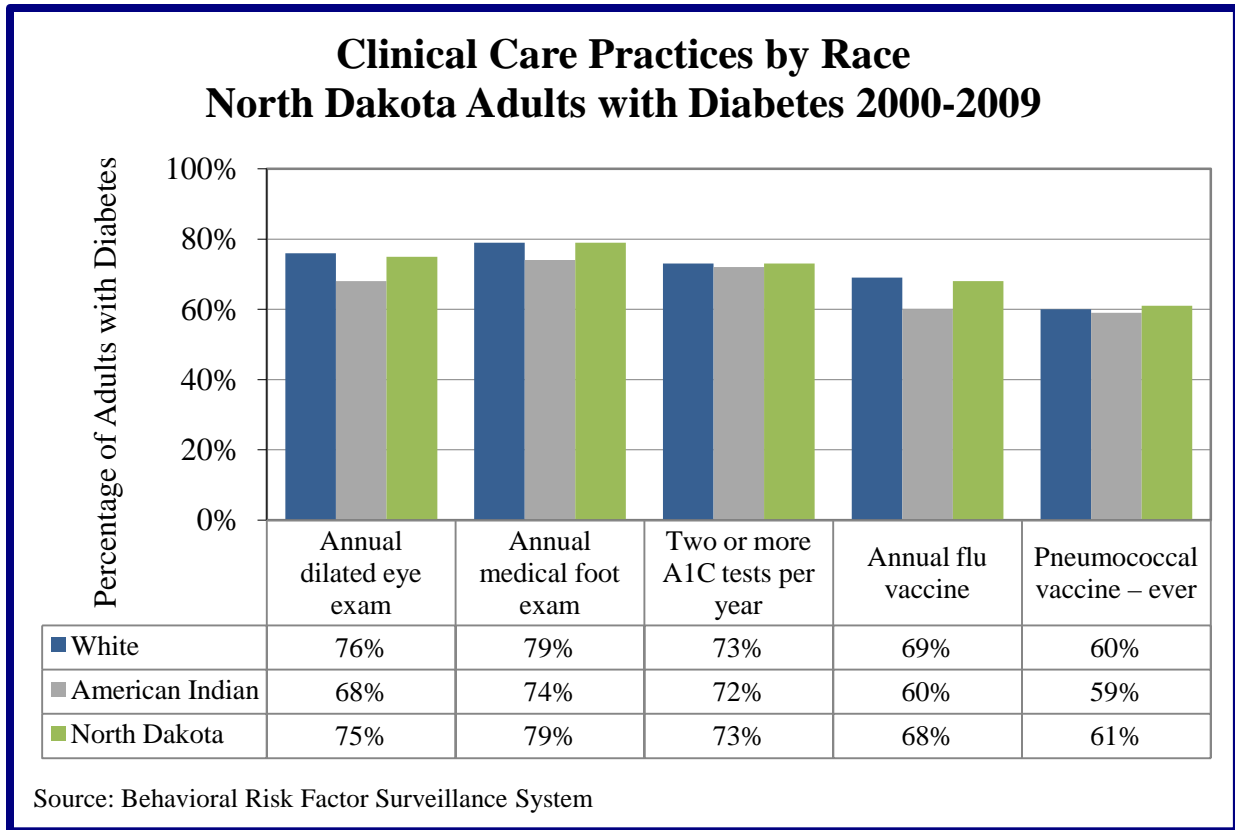
This chart shows rates for these factors by race for all adults in North Dakota, not just those with diabetes. American Indians in general have less education and lower incomes. They also are more likely to lack health insurance, to not have a personal doctor and to report that they could not see a doctor in the past year due to cost.



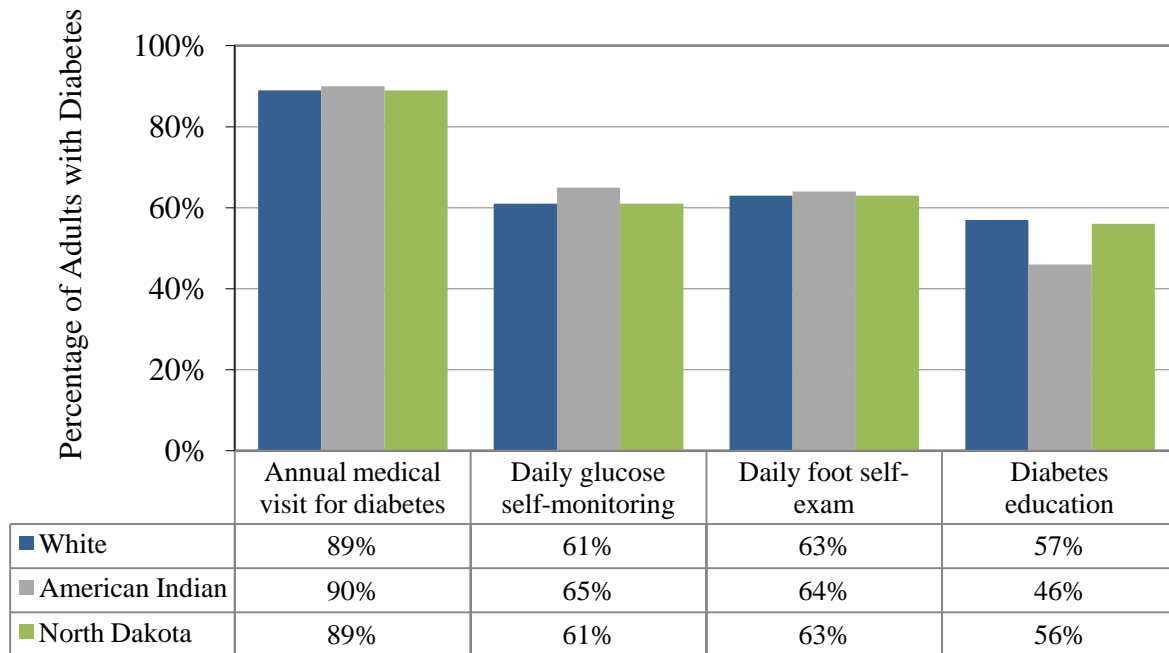
Care Practices

Established care practices have been identified for people who have diabetes that can prevent or delay the development of serious health complications, such as lower limb amputation, blindness, kidney failure and cardiovascular disease. Some of these care practices are clinical services provided by a physician or other health professionals while others are self-care practices conducted by the patients themselves.

The following two charts show the rates of clinical care practices and self-care practices by race for adults in North Dakota with diagnosed diabetes.



Self-Care Practices by Race North Dakota Adults with Diabetes 2000-2009



Source: Behavioral Risk Factor Surveillance System

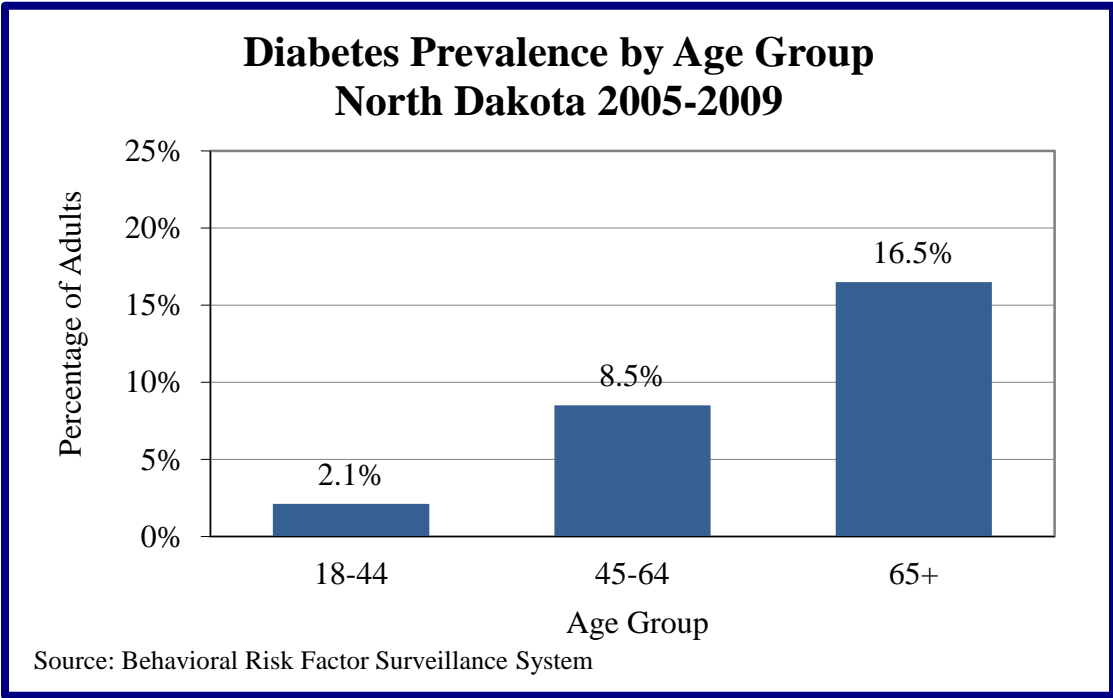
Even with demonstrated differences between races regarding access to care, there are no significant differences between American Indians and Whites regarding clinical and self-care practices for adults with diabetes. It is encouraging to see a lack of disparity regarding diabetes health-care practices.

However, there is room for improvement in all of the measures for Whites and American Indians. Ideally, 100 percent of all patients with diabetes would receive the care practices identified in the preceding two charts.

Other Populations

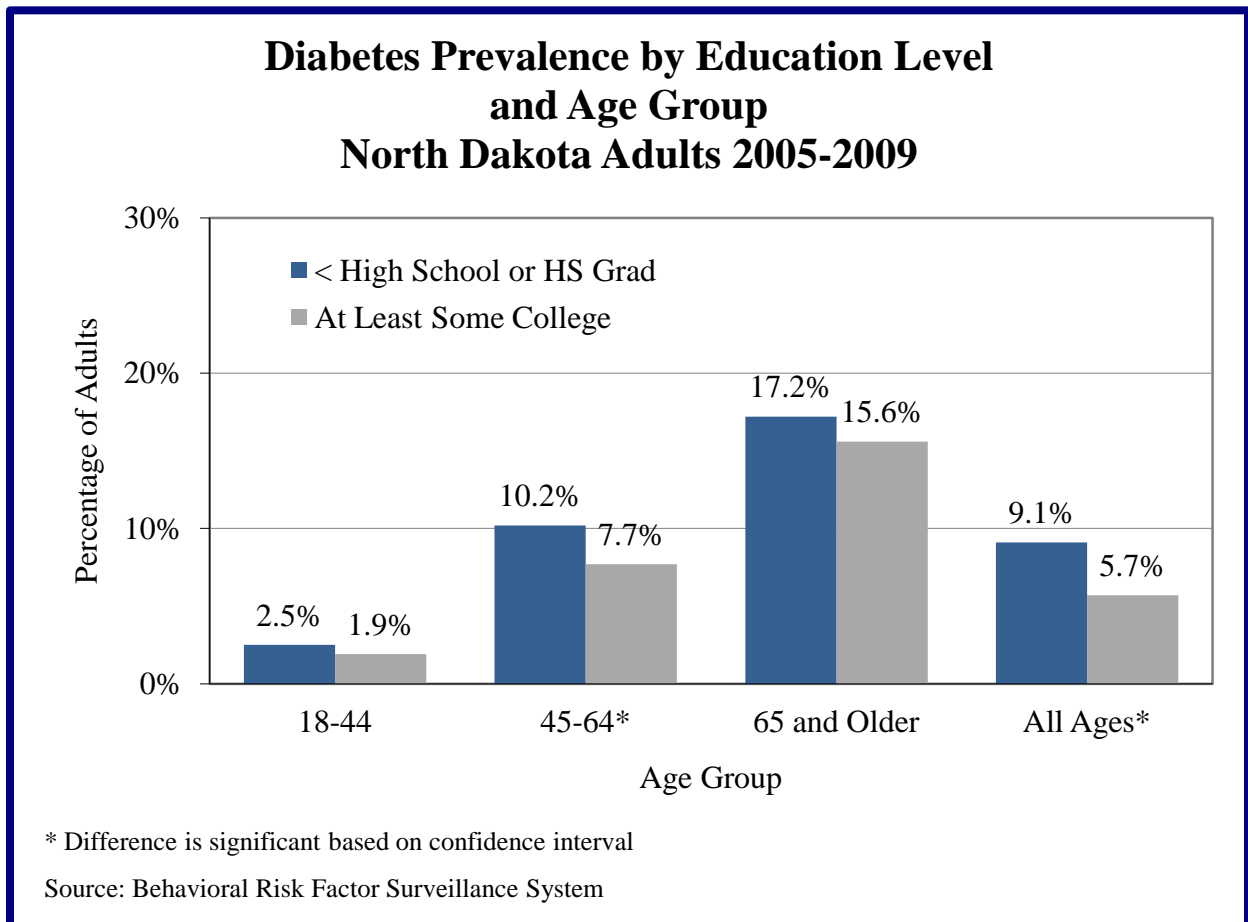
Age Group

Age consistently is linked to diabetes prevalence. The older a person becomes, the higher his or her risk for developing diabetes. The elderly are a clear disparate group when it comes to diabetes. The population 65 and older should receive particular attention when addressing issues of quality of care and access to care.



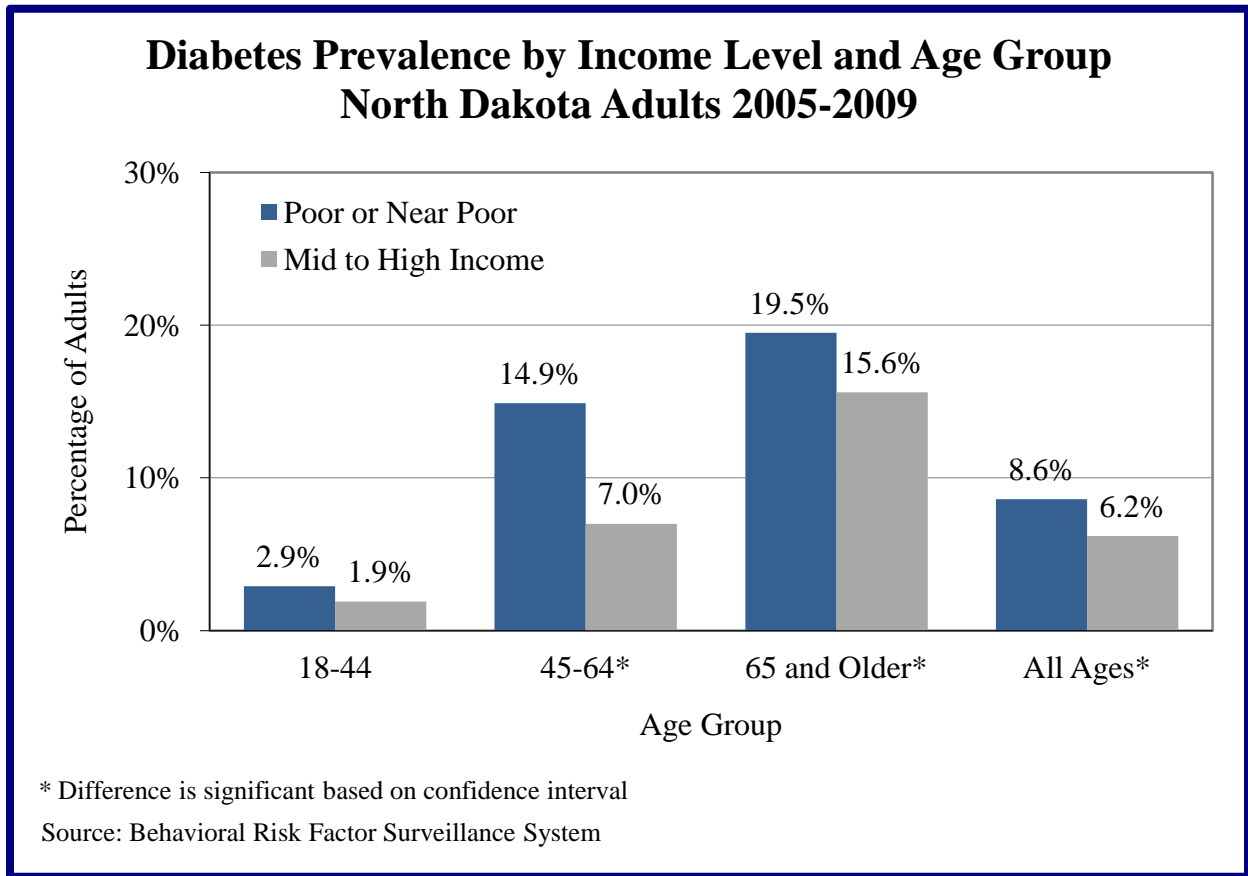
Education Level

Although education level has been identified as a significant factor related to diabetes prevalence, when analyzing by age, only the 45 to 64 age group shows a significant disparity by education level. As adults approach middle age, the risk for diabetes increases. Prevention programs aimed at this age group could have a dramatic impact.



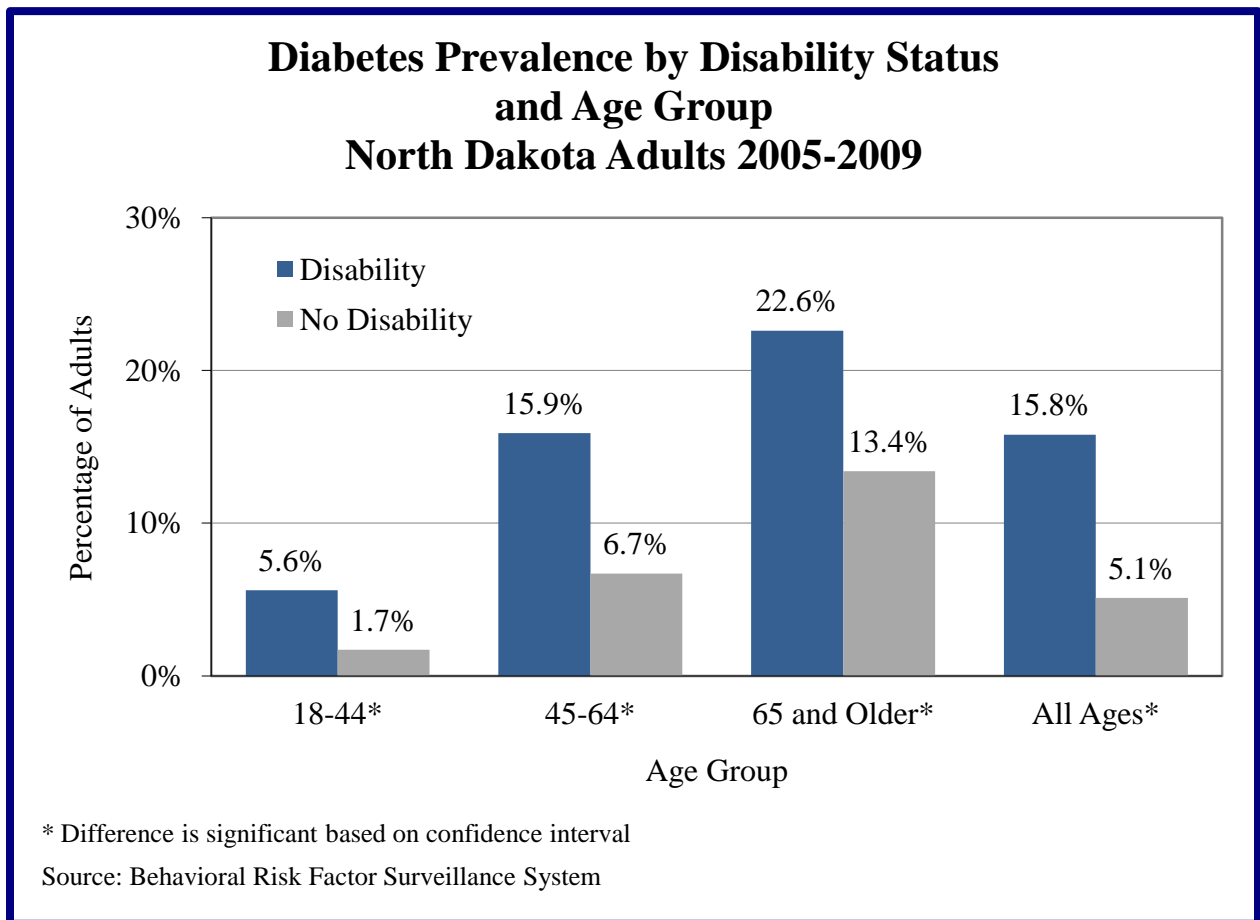
Income – Poverty to Income Ratio

Income level has been identified as a significant factor related to diabetes prevalence for all ages and for adults age 45 and older.



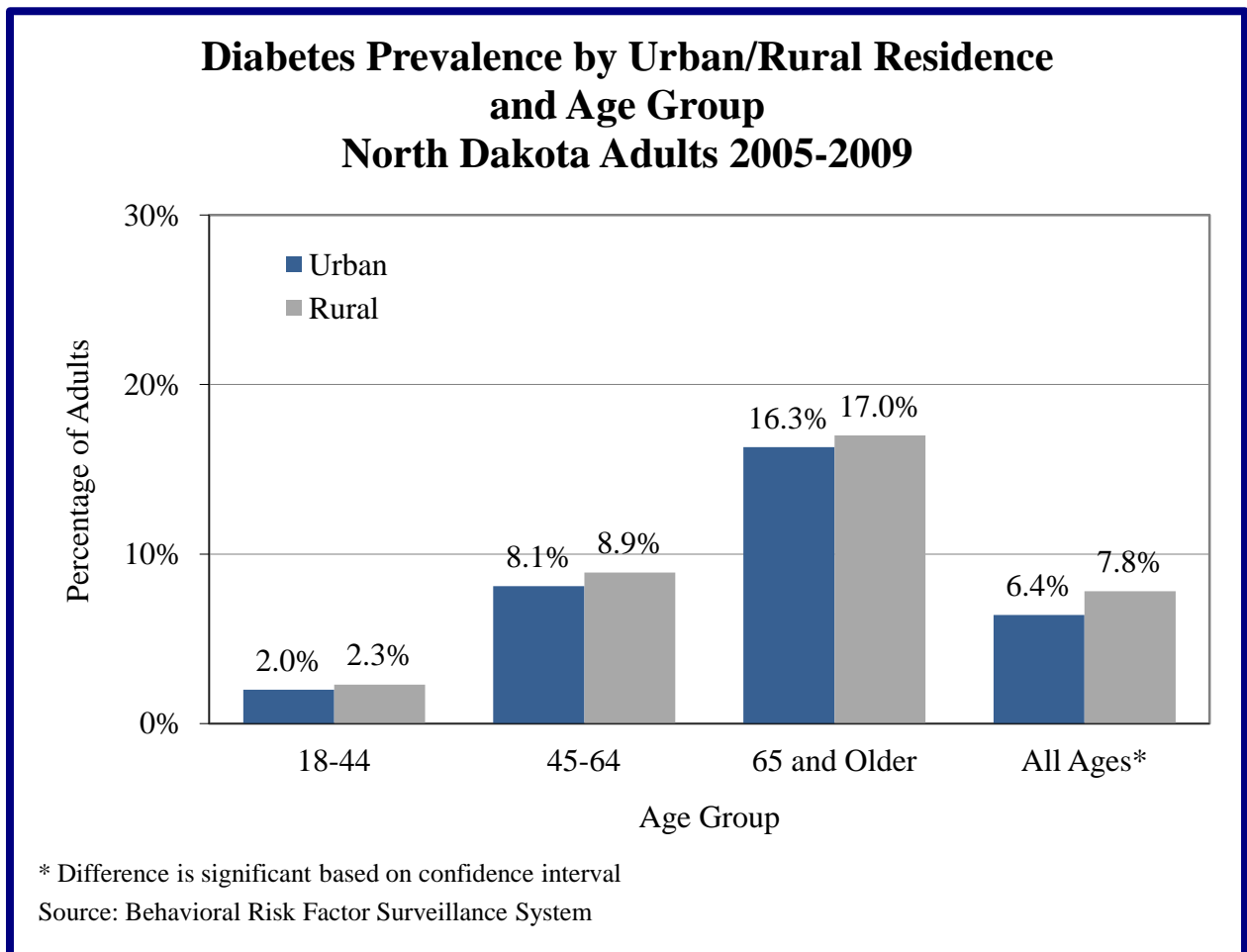
Disability Status

Disability status is related to diabetes prevalence for all age groups. For many adults with diabetes, disability is a result of the disease and its complications. Disability and diabetes are interrelated. Persons with disabilities, whether caused by diabetes or not, are often in need of specialized care.



Urban/Rural Residence

Although rural residence has been identified as a factor related to higher diabetes prevalence, when analyzing by age, there are no significant differences by age group. It appears that the difference is a factor that elderly adults in North Dakota are more likely to live in rural areas, while younger adults tend to live in urban areas.



Efforts to Address Health Disparities

The North Dakota Diabetes Prevention and Control Program (NDDPCP) is involved in several initiatives addressing health disparities.

- ❖ **Dakota Diabetes Coalition (DDC)** – The DDC is a statewide organization working in partnership with the NDDPCP. Coalition members share resources and tools proven to be effective. The DDC is working to increase tribal membership to identify ways to partner and further its reach.
- ❖ **State Plan** – A state plan for diabetes is being developed. It includes objectives to prevent and control diabetes in the American Indian population. Objectives include improving access to care, diabetes management to prevent complications and efforts to prevent diabetes. Tribal partners are assisting in the development of the state plan and will play a key role in implementing the objectives.
- ❖ **Diabetes resources** – The NDDPCP identifies and/or develops resources that resonate with target populations, including culturally-designed resources from the National Diabetes Education Program. North Dakota authored diabetes materials include:
 - **Diabetes...Finding the Balance: Caring for Your Body, Mind, Heart, and Spirit** – This popular Northern Plains American Indian diabetes wellness guide about controlling and preventing diabetes has been distributed across the state.
 - The **Arnold series** is a culturally-crafted animated series with messages about diabetes, heart disease and tobacco prevention. The NDDPCP supports airtime for this series to be played on GoodHealthTV.
- ❖ **Diabetes health communication** – The program continues to explore methods to best engage targeted populations. Both the NDDPCP and the DDC websites have been redesigned to make them more user-friendly and make information more readily available for all consumers.

- ❖ **Collaboration with Indian Health Service (IHS)** – The NDDPCP has been partnering with staff at the Aberdeen area IHS on projects relevant to diabetes among the American Indian population in North Dakota. Projects include:
 - **Information sharing** meetings between the North Dakota Department of Health (NDDoH), IHS and the Great Plains Tribal Chairmen’s Health Board. Information sharing includes current and potential collaborative projects.
 - **Diabetes Audit** – Collaboration between the IHS Aberdeen Area Diabetes Consultant and the NDDoH to produce reservation specific reports on the Diabetes Audit for all North Dakota tribes.

- ❖ **Initiatives of the Children’s Special Health Services (CSHS) division of the NDDoH**
 - **Sponsorship of multidisciplinary/interdisciplinary clinics** through two contractors: Sanford Health and the Diabetes Youth Outreach Program. Both are intended to deliver care using a team approach to help families with the ongoing management of their child’s chronic health condition.
 - **Resource booklet on diabetes** – Provides information on clinical guidelines of care for the pediatric population, specialty health services available in North Dakota, and links to other resources and information.

Conclusions

Health disparities in North Dakota are defined as inequalities in health status, utilization or access due to structural, financial, personal or cultural barriers. ⁽¹⁾

North Dakota's population has seen some changes over the years, with an increase in racial and ethnic minority populations. However, according to the 2010 census, the population is still predominantly White and non-Hispanic (89%).

Diabetes prevalence rates have been steadily increasing in North Dakota and nationally. In North Dakota, diabetes prevalence has more than doubled over the past 12 years, from 3.5 percent in 1997 to 7.5 percent in 2009.

Efforts to address disparities in diabetes for North Dakota should consider the following:

- American Indians have a diabetes prevalence rate nearly twice as high as the rate for Whites.
- Lower education and income levels are associated with increased diabetes prevalence.
- Many adults with diabetes are living with disabilities.
- Age is significantly related to diabetes with prevalence rates increasing as age increases.
- North Dakota elderly adults often live in rural areas of the state.
- Clinical and self-care health practices need to be improved for all population groups.
- Risk factors and prevention are important areas of focus for all groups, but in particular for disparate populations.

The North Dakota Diabetes Prevention and Control Program (NDDPCP) is involved in several initiatives addressing health disparities. The NDDPCP works with partners across the state in efforts to prevent diabetes and improve care for those diagnosed with diabetes. More information about the NDDPCP and the Dakota Diabetes Coalition can be found at www.diabetesnd.org.

Sources

1. North Dakota Department of Health, Office for the Elimination of Health Disparities website. Retrieved March 2011 from <http://www.ndhealth.gov/oehd/>.
2. Centers for Disease Control and Prevention, Office of Minority Health and Health Disparities website. Retrieved March 2011 from www.cdc.gov/omhd/About/disparities.htm.
3. North Dakota State Data Center Population Bulletin, “Population by Race and Hispanic Origin in North Dakota: 2010 Census”, Volume 27, Number 5, May 2011.
4. World Health Organization website, Social Determinants of Health Key Concepts. Retrieved March 2011 from www.who.int/social_determinants/thecommission/finalreport/key_concepts/en/.
5. Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.