

Oral Health in North Dakota

Burden of Disease and Plan for the Future

2012-2017



NORTH DAKOTA
DEPARTMENT *of* HEALTH

Oral Health in North Dakota

Burden of Disease and Plan for the Future



Jack Dalrymple
Governor

Terry Dwelle, M.D., M.P.H.T.M., C.P.H.
State Health Officer

Kim Mertz, R.N., BNSc.
Director, Division of Family Health

Kimberlie Yineman, R.D.H., B.A.
Director, Oral Health Program

Gregg Reed, M.P.H.
Epidemiologist, Oral Health Program



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BURDEN DOCUMENT

PRIMARY AUTHOR

Gregg Reed, M.P.H.
Oral Health/MCH Epidemiologist

STATE PLAN

PRIMARY AUTHORS

Richard Rathge, Ph.D.
Evaluation Specialist
Gregg Reed, M.P.H.
Oral Health/MCH Epidemiologist
Kimberlie Yineman, R.D.H.
Oral Health Program Director

CONTRIBUTORS

AND EDITORS

Terry Dwelle, M.D., M.P.H.T.M., C.P.H.
State Health Officer
Kim Mertz, R.N., BNSc.
Director, Division of Family Health
Stacy Eberl
Public Information Officer

NORTH DAKOTA ORAL HEALTH PROGRAM AND CONTRACT STAFF

Jamie Blumhagen – Public Health Hygienist
Mike Goebel – Public Health Dentist
Hollie Harrington – Public Health Hygienist
Marlene Hulm – Public Health Hygienist
Ashley Kopp – Administrative Support
Kim Mertz – Director, Division of Family Health
Richard Rathge – Evaluation Specialist
Gregg Reed – Epidemiologist
Helen Rosencrans – Public Health Hygienist
Cameo Skager – Communications Consultant
Robyn Stearns – Prevention Coordinator (former)
Kimberlie Yineman – Program Director

CONTACT INFORMATION

Kimberlie Yineman	Gregg Reed
701.328.4930	701.328.3209
kyineman@nd.gov	gmreed@nd.gov

ORAL HEALTH COALITION

President: Marcia Olson
Vice President: Carla Kelly
Secretary: Dave Zentner
Treasurer: Sue Matteson
Members at large:
Joe Cichy
Tony Richards
Linda Rorman

COALITION SUBCOMMITTEES

Oral Health Access Committee:
Kathy Keiser, Chair
Oral Health Data and Evaluation Committee:
Richard Rathge and Gregg Reed, Co-Chairs
Oral Health Policy Committee:
Tony Richards, Chair
Oral Health Prevention Committee:
Sue Matteson, Chair

NORTH DAKOTA

DEPARTMENT OF HEALTH

Community Health Section
Division of Children's Special Health Services
Division of Municipal Facilities

FEDERAL AND STATE AGENCIES

Centers for Disease Control and Prevention (CDC)
Health Resources and Services Administration (HRSA)
Association of State and Territorial Dental Directors (ASTDD)
Children's Dental Health Project (CDHP)
Maternal and Child Health Bureau (MCHB)

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FOREWORD

Oral diseases such as tooth decay and periodontitis affect North Dakotans of all backgrounds and are associated with many serious chronic health problems including diabetes, heart and lung disease, strokes, and premature or low-birthweight infants. The mission of the North Dakota Department of Health Oral Health Program is to “Improve the oral health of North Dakotans through prevention and education.”

This publication is designed to systematically educate North Dakotans about oral disease and be a reference point for use by partner organizations, community leaders and legislative members. The objectives in this publication were established by evidence-based assessment and surveillance at the national, state and local levels.

The contributors to this publication represent a broad range of individuals and organizations from the public and private sectors throughout North Dakota. Thank you to everyone that dedicated their time, expertise, skill and talent in developing this foundation for the future of North Dakota oral health.

By volunteering to assist with local activities, serving on committees, and supporting community and statewide efforts, we can assist with the mission of the North Dakota Department of Health: “To protect and enhance the health and safety of all North Dakotans and the environment in which we live.”

*Terry Dwelle, M.D., M.P.H.T.M., C.P.H.
State Health Officer
North Dakota Department of Health*



PREFACE

To our partners in oral health:

The North Dakota Department of Health and North Dakota Oral Health Coalition are pleased to present this combined publication of the Burden of Oral Disease and the Oral Health State Plan for the Future for years 2012 through 2017. Burden of disease is defined as “the total significance of disease for society beyond the immediate cost of treatment.” Therefore, oral health burden consists of the quality and quantity of life lost due to oral disease (WHO, 2010a).

Chronic oral diseases such as tooth decay and gingival infections are prevalent throughout all North Dakota populations. Oral disease can result in poor performance or absences from school or work, and are costly problems for families, employers and the government. Furthermore, oral disease is associated with serious systemic health concerns, including heart and lung disease, stroke, diabetes, low birthweight and premature births.

The North Dakota Oral Health Program collaborates with the U.S. Centers for Disease Control and Prevention to maintain an active surveillance system to monitor the health and safety of all North Dakotans. The main objective of this publication is to educate public representatives, private and public health organizations, communities and the general public to implement sustainable activities that will reduce the burden of oral disease and improve oral health over the next five years.

Adequate access to dental care means that people can get the dental care they need when they want it. To get that care, a person must have two things: access to a private dental office or safety-net clinic (operated by local governments, hospitals and community agencies) and a means to pay for his or her care. Thus, two of the main priorities in the plan include preventing oral diseases and removing barriers to dental care access.

Kimberlie J. Yineman, R.D.H.
Oral Health Program Director
North Dakota Department of Health

Gregg M. Reed, M.P.H.
Oral Health/MCH Epidemiologist
North Dakota Department of Health

INTRODUCTION

This publication is comprised of two reports addressing oral health in North Dakota – (1) Burden of Oral Disease and (2) State Plan for the Future. The Burden of Oral Disease report provides a comprehensive overview of demographic, socioeconomic and health status inequalities throughout the state. The State Plan for the Future outlines key action strategies to prevent oral health disparities and provide access to dental care, thereby preventing and reducing oral diseases and improving the overall health of North Dakota citizens (NDDoH, 2010a).

“Health” as defined by the World Health Organization is a “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2010b).” Oral health is essential to [maintaining] general health and well-being at every stage of life,” and looking beyond lack of oral disease (USDHHS, 2000a). Promoting oral health is an integral factor in overall health; oral health influences the physical, mental and social health components of overall health and is much more than just healthy teeth.

Good oral health can be defined as “being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity” (WHO, 2010c). The oral cavity is a portal of entry, as well as the site of disease for bacterial and viral infections that can affect general health status. Oral health is intimately related to the health of the rest of the body.

Changes in the mouth often are the first signs of problems elsewhere in the body, such as infectious diseases, immune disorders, nutritional deficiencies and cancer. These manifestations could be the initial sign of clinical disease and serve to indicate to the individual and their health-care providers the need for further assessment. Current research suggests that periodontitis (gum inflammation) increases the risk for heart disease and stroke, premature births in some females, difficulty in controlling blood sugar in people with diabetes and respiratory infection in susceptible individuals (CDC, 2011a).

The burden of oral disease is not evenly spread throughout each population by race, age and gender; that is, not everyone experiences the same degree of oral health disparity. This publication addresses the burden of disease in all populations throughout North Dakota and the nation where comparison data are available. Maintaining active surveillance on detailed oral health objectives and measures, developing strategies to improve population oral health, and taking action will allow us to eliminate this “silent epidemic” (Benjamin, 2010).

EXECUTIVE SUMMARY

The Burden of Oral Disease: Prevalence of Disease and Unmet Needs

Oral disease is prevalent throughout all North Dakota populations. The Burden of Oral Disease document identifies disease prevalences over the previous 10 years, focusing primarily on findings emerging since release of the previous Burden of Oral Disease document in 2006.

In North Dakota, cleft lip and cleft palate are the most common and visible congenital anomalies affecting newborns. Untreated dental caries rates for young children ages 2 to 4 remain higher than the national Healthy People 2010 target. The Oral Health Basic Screening Survey for third-grade children (BSS), conducted during the 2009-2010 school year, identified that a majority of North Dakota third-grade children (54.6%) have cavities and/or fillings (decay experience) – substantially higher than the Healthy People 2010 target of 42 percent. One-fifth (20.7%) have untreated dental decay (cavities), in line with the Healthy People 2010 target of 21 percent.

In 2011, the Youth Risk Behavior Surveillance System (YRBS) identified that a majority of North Dakota high school students (79.5%) reported to have had no more than three cavities in their permanent teeth. Data from the 2010 North Dakota Behavioral Risk Factor Surveillance System (BRFSS) survey indicates that more than one-fourth of adults (28.9%) had not visited a dentist or dental clinic within the past year for any reason.

North Dakota vital statistics indicate that oropharyngeal mortality rates are below the national Healthy People 2010 target. The North Dakota 2006-2010 age-adjusted mortality rate is 1.5 per 100,000 population compared with the national target of 2.7 per 100,000 population. From 2006 through 2010, 51 deaths from oropharyngeal cancer were identified. A majority of these deaths (71%) were males and nearly all (96%) were white.

American Indians are the largest minority population in North Dakota. Even though American Indians living on a reservation have access to Indian Health Services, as well as Tribal Health Services, dental-care access is still a challenge. Nearly two-thirds of American Indians (59%) are between the ages of 18 and 34. More than one-third (38%) between 18 and 64 years of age do not have insurance.

For many North Dakota women, obtaining oral health care may be a challenge. Poverty and lack of insurance can be significant barriers. Approximately one in seven North Dakota women are estimated to live in poverty (14%), one in ten are the sole heads of their households (8.2%), and one in ten lack insurance (8%). Oral disease has shown to be associated with chronic disease and birth complications. Nearly one in three births in the state were to unmarried women. One in five of these births were to teenagers. A higher proportion of women on Medicaid reported not going to the dentist during their pregnancy than women not on Medicaid.

The oral health challenges of individuals with disabilities are complex. These problems may be due to underlying congenital anomalies, as well as to the inability to receive the personal and professional health care needed to maintain oral health. More than one-third of individuals in North Dakota (40.5%) with a disability indicated on the 2010 BRFSS survey that they had not visited a dentist or dental hygienist within the last year, compared to one-fourth (25.3%) percent of individuals with no indicated disability.

Risk and Protective Factors Affecting Oral Diseases

The combination of fluoride and dental sealants has the potential to nearly eliminate tooth decay in school-age children. Fluoridation in the community water supply provides protection from tooth decay to all populations regardless of economic status. According to the U.S. Centers for Disease Control and Prevention, for every dollar spent on community water fluoridation, up to \$38 is saved in treatment costs for tooth decay (CDC, 2009). Over the past 10 years, the state has continuously maintained fluoridated water in 95 to 97 percent of our community water systems, well above the Healthy People 2010 target of 75 percent of community water systems.

The North Dakota Department of Health, Division of Oral Health, has a program to apply fluoride varnish to children. The Healthy Smiles Fluoride Varnish Program, funded by a U.S. Department of Health and Human Services, Health Resource and Services Administration Oral Health Workforce grant and Centers for Disease Control and Prevention Infrastructure and Capacity Grant, is designed to increase access to preventive dental care for underserved populations. The program currently provides services and oral health surveillance at three locations (local public health clinic users/pediatrician clinic users/school children), to serve the North Dakota population ages birth through 20. Community-based services to the residential population of Rolette County are in discussion.

Provision of Dental Services

As of March 2012, there were 360 licensed dentists and 518 licensed dental hygienists residing in North Dakota; a majority of these dental providers practice within the eight most populated counties. Thus, North Dakota has a shortage of health professionals in rural areas. According to the University of North Dakota Center for Rural Health's 2005 survey of oral health workforce, 44 of the state's 53 counties have six or fewer practicing dentists. A 2010 North Dakota Department of Health workforce survey found that nearly half of responding dentists (46%) anticipated retirement within the next 15 years. However, North Dakota does not have a dental school to continuously add to the dentist workforce and must rely on outside dental programs to accept North Dakota residents. Only one dental hygiene and dental assistant program exists in the state.

Future Considerations

North Dakota has made positive progress in improving the oral health of its residents, but disparities remain among specific populations. Disparities in North Dakota mirror the nation in that oral disease remains pervasive among families with low socioeconomic status, people who have less education, the elderly and those with disabilities. Oral diseases are preventable with access to preventive care, and as new studies indicate, oral health status can impact general overall health. It is hoped that readers of this report find the data useful as they continue their efforts to understand the factors influencing oral health in North Dakota.

BACKGROUND

According to the 2010 U.S. Census, the population of North Dakota has increased by 4.7 percent since 2000, reaching 672,591 in 2010. The state is second least populated in the nation and has a population density of 9.7 persons per square mile. Nearly two-thirds (65%) of the state population resides in only seven of North Dakota's 53 counties (Cass, Burleigh, Grand Forks, Ward, Morton, Stark and Williams). This growth is indicative of the dynamic shift from rural to urban environments with a 12.6 percent overall increase in population from 2000 through 2010 in these seven counties. Nearly two-thirds of the remaining counties possess a population base below 5,000 residents, including 36 counties designated as "frontier" (defined as having a population density of six or fewer residents per square mile).

Whites/Caucasians comprise a solid majority (90 percent) of the total North Dakota population. Racial minority populations have grown by 37 percent over the past decade. American Indian/Alaskan Natives equal 5 percent of the total population; Black/African Americans equal 1 percent; Asians equal 1 percent; other race category equals 1 percent; and multiracial equals 2 percent.

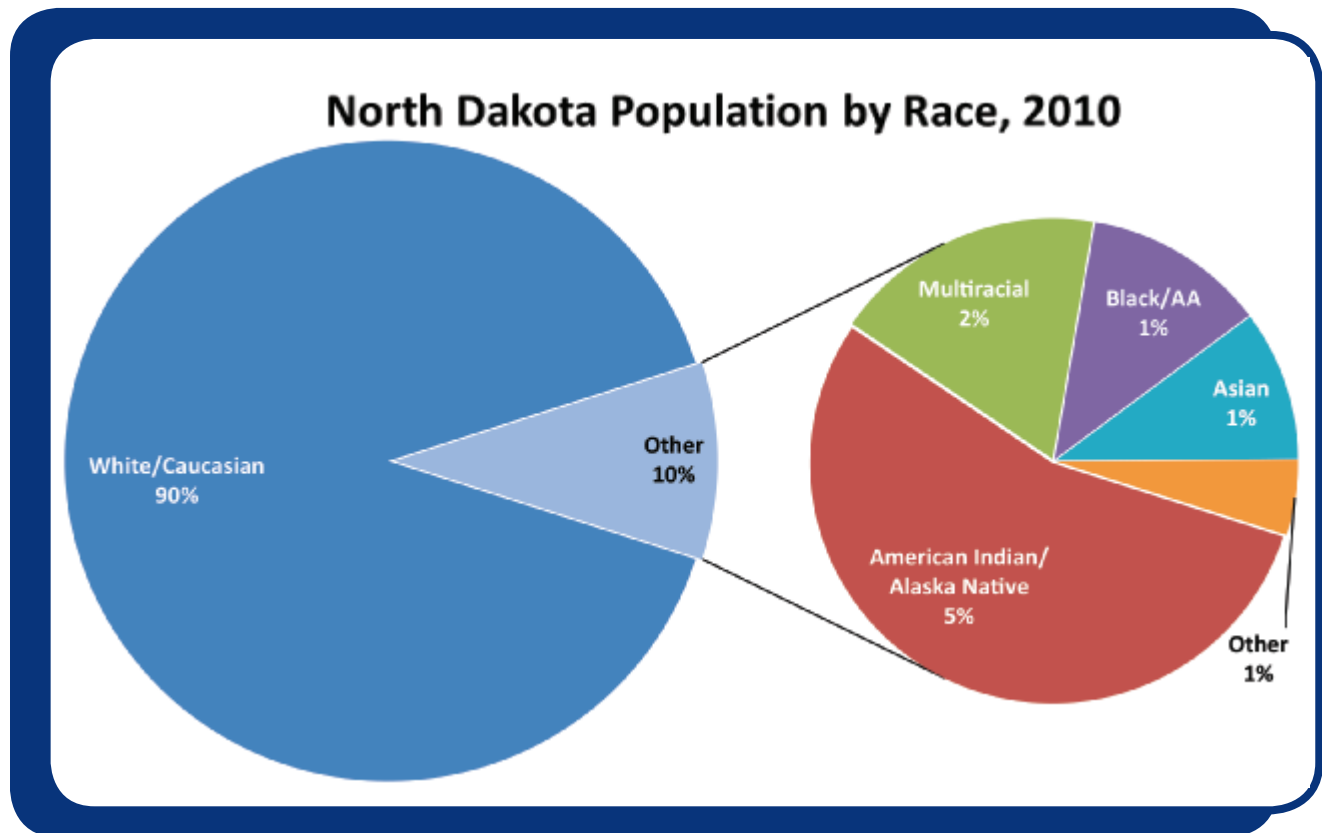


Figure 1: North Dakota Population
Data Source: U.S. Census Bureau

In 2010, many people moved to North Dakota from abroad (3,612), according to the American Community Survey. Of these, approximately half were not U.S. citizens (47%). Six percent of all North Dakota children ages 18 years and younger were estimated to be foreign born or at least reside with one foreign-born parent. The New American Services from North Dakota identifies that in 2010, 485 people classified as refugees moved into the state.

North Dakota's population distribution from the 2010 U.S. Census indicates that the male/female ratio is approximately equal. Approximately one in 15 residents are younger than 5 (6.6%), one in four is younger than 18 (22.3%), and nearly 15 percent of the population is considered elderly (65 years of age or older). Population projections indicate that the elderly proportion of the state's population will reach 23 percent by 2020.

Although North Dakota maintains one of the lowest unemployment rates in the nation, around 12 percent of North Dakotans live in poverty (~83,000) according to the 2010 American Community Survey 2006-2010 five-year estimates. The 2006-2010 median annual household income of North Dakotans was \$46,781 and the national median income was \$51,914, indicating that in general North Dakotans made less than the median of all Americans. The per capita income estimate for North Dakotans was \$25,803, compared with the national per capita estimate of \$27,334, indicating that, as a whole, the wealth of the state spread out to each resident is less than the nation's to each resident.

Energy development has transformed the state, introducing new economic, environmental, and health-care opportunities and challenges. The number of oil workers in the state has increased by more than six times from 2007 (~2,000) through 2010 (~12,750). Current oil production in the state is currently second highest in the nation behind the state of Texas.

While most residents have some form of health insurance, many are without coverage. The Current Population Survey three-year average from 2009 through 2011 estimated that more than one in nine North Dakota residents (11.8%) are uninsured. The proportion of uninsured among residents ages 1 through 17 was 9.6 percent, ages 18 through 39 was 26.2 percent; ages 40 through 49 was 18.9 percent; and ages 50 through 64 was 14.3 percent. Nearly all residents ages 65 and older were covered by some form of health insurance (98.2%).

North Dakota minority populations are faced with several disparities that can lead to oral health and other health concerns. Disparities facing the American Indian population include poverty, obesity, teen pregnancy, high STD rates, chronic disease and poor oral health. On American Indian reservation areas within North Dakota, 37 percent of residents lived in poverty in 2009. Furthermore, teenage births from American Indian mothers are approximately eight times higher than other North Dakota teenagers.

Public health challenges exist and the state of North Dakota is committed to understanding the burden and providing comprehensive public health services – thereby maintaining a high quality of life for its citizens. In the following sections, we will review national and state objectives on oral health, address the burden of oral disease in the state and the nation, and discuss implications of the findings.

NATIONAL AND STATE OBJECTIVES

Oral Health in America: A Report of the Surgeon General alerted Americans to the importance of oral health in their daily lives (USDHHS, 2000a). Issued in May 2000, the report detailed how oral health is promoted, how oral diseases and conditions are prevented and managed, and what needs and opportunities exist to enhance oral health. The report's message was that oral health is essential to general health and well-being and can be achieved. However, several barriers hinder the ability of some Americans to attain optimal oral health. The Surgeon General's report concluded with a framework for action, calling for a national oral health plan to improve quality of life and eliminate oral health disparities.

One component of an oral health plan is a set of measurable and achievable objectives on key indicators of oral disease burden, oral health promotion and oral disease prevention. One set of national indicators was developed in November 2000 as part of Healthy People 2010, a document that presented a comprehensive, nationwide health promotion and disease prevention agenda (USDHHS, 2000b). Healthy People 2010 was designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. Included are objectives for key structures, processes and outcomes related to improving oral health. Healthy People 2020 objectives have been put forth as benchmarks for the period from 2010 through 2020. The Healthy People desired outcomes include improved oral health through increased collaboration on a diverse scale, public awareness/education and tracking of the impact.

The Surgeon General's report on oral health was a wake-up call, spurring policymakers, community leaders, private industry, health professionals, the media and the public to affirm that oral health is essential to general health and well-being and to take action. That call to action led a broad coalition of public and private organizations and individuals to generate *A National Call to Action to Promote Oral Health* (USDHHS, 2003). The vision of the *Call to Action* is "To advance the general health and well-being of all Americans by creating critical partnerships at all levels of society to engage in programs to promote oral health and prevent disease." The goals of the *Call to Action* reflected those of Healthy People 2010:

- To promote oral health
- To improve quality of life
- To eliminate oral health disparities

National objectives on oral health such as those in Healthy People provide measurable targets for the nation, but most core public health functions of assessment, assurance and policy development occur at the state level. The *National Call to Action to Promote Oral Health* calls for the development of plans at the state and community levels, with attention to planning, evaluation and accountability (USDHHS, 2003).

On December 2, 2010, Healthy People objectives for the next decade were unveiled. The Healthy People 2020 (HP2020) objectives were developed through collaboration with federal and state agencies and in association with public discussion forums to serve as benchmarks for the period from 2010 through 2020. The Healthy People desired outcomes include improved oral health through increased collaboration on a diverse scale, public awareness/education and tracking of the impact. The North Dakota Department of Health has reviewed the HP2020 objectives and established a plan for data tracking and analysis. For more information about Healthy People 2020, visit www.healthypeople.gov.

National Oral Health Surveillance System

The National Oral Health Surveillance System (NOHSS) is a collaborative effort between the Centers for Disease Control and Prevention Division of Oral Health, Association of State and Territorial Dental Directors and the Council of State and Territorial Epidemiologists. It is designed to monitor the burden of oral disease, the use of the oral health-care delivery system, and the status of community water fluoridation on both a national and a state level. Fundamental revisions to NOHSS have been approved and now includes data for several population groups from kindergarten through older adults. The initial nine oral health indicators served as a foundation for the enhancement of the NOHSS oral health indicators. NOHSS has expanded the original nine indicators to 34 indicators grouped within 12 indicator concepts. The following list presents the indicators by topic, age group, and data source.

National Oral Health Indicators

Dental visit in the past year

- Adults ages 18 years and older (Data Source: Behavioral Risk Factor Surveillance System [BRFSS])
- Children and adolescents <18 years of age (Data Source: National Survey of Children's Health [NSCH])
- Federally qualified health centers (FQHC) patients (Data Source: HRSA Uniform Data Set)
- Adults with diabetes (Data Source: BRFSS)

Teeth cleaning

- Teeth cleaning in the past year among adults ages 18 years and older (Data Source: BRFSS)
- Women in the 12 months before the most recent pregnancy (Data Source: Pregnancy Risk Assessment Monitoring System [PRAMS])

Tooth loss

- Complete tooth loss among adults ages 65 years and older (Data Source: BRFSS)
- Loss of six or more permanent teeth among adults ages 65 years and older (Data Source: BRFSS)

Water fluoridation

- Percentage of the state population served by community water systems that receives optimally fluoridated water. (Data Source: Water Fluoridation Reporting System [WRFS])

Prevalence of caries experience

- On primary maxillary anterior teeth of children
 - ▲ Attending kindergarten (Data Source: Basic Screening Survey [BSS])
 - ▲ Attending Head Start (Data Source: BSS)
- On primary or permanent teeth of third-grade students (Data Source: BSS)

Prevalence of untreated tooth decay

- On primary maxillary anterior teeth of children
 - ▲ Attending kindergarten (Data Source: BSS)
 - ▲ Attending Head Start (Data Source: BSS)
- On primary or permanent teeth of third-grade students (Data Source: BSS)

-
- Coronal caries and root caries among older adults
 - ▲ Residing in long-term care or skilled nursing facilities (Data Source: BSS)
 - ▲ Attending congregate meal sites (Data Source: BSS)

Percentage of the population with dental treatment needs

- Attending kindergarten (Data Source: BSS)
- Attending Head Start (Data Source: BSS)
- Attending third grade (Data Source: BSS)
- Residing in long-term care or skilled nursing facilities (Data Source: BSS)
- Attending congregate meal sites (Data Source: BSS)

Percentage of the population with a preventive dental visit in the past year

- Medicaid enrolled children with a preventive dental visit (Data Source: CMS 416 report – Medicaid Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Utilization)
- CHIP enrolled children with a preventive dental visit (Data Source: CMS CHIP Annual Reporting Template System [CARTS])

Percentage of the population with dental sealants

- Third-grade students (Data Source: BSS)
- Children ages 6 to 9 years enrolled in Medicaid (Data Source: CMS 416 report – Medicaid EPSDT Utilization)
- Children ages 10 to 14 years enrolled in Medicaid (Data Source: CMS 416 report – Medicaid EPSDT Utilization)

Percentage of the population with a dental treatment visit in the past year

- Medicaid enrolled children with a treatment dental visit (Data Source: CMS 416 report – Medicaid ESPDT Utilization)
- CHIP enrolled children with a treatment dental visit (Data Source: CMS CARTS)

Percentage of school-based health centers that provide:

- Sealants (Data Source: National Assembly for School Based Health Care [NASBHC])
- Dental treatment services (Data Source: NASBHC)
- Topical fluoride (Data Source: NASBHC)

Oral and pharyngeal cancer

- Incidence of oral and pharyngeal cancer (Data Sources: United States Cancer Statistics, Surveillance, Epidemiology and End Results [SEER] and National Program of Cancer Registries [NPCR])
- Mortality from oral and pharyngeal cancer (Data Sources: United States Cancer Statistics, National Vital Statistics System)

North Dakota Oral Health Surveillance System

North Dakota maintains an active oral health surveillance system (NDOHSS) in line with the National Oral Health Surveillance System (NOHSS). Oral health data sources are listed below:

North Dakota Oral Health Indicators - by Age Group and Data Source

Children and Youth

Head Start Program Information Report (PIR)

- Percentage of Head Start children who had a dental examination in the past year
- Percentage of Head Start children examined who need dental treatment
- Percentage of Head Start children examined and needing dental treatment who received treatment
- Percentage of Head Start children examined who received preventive care

Basic Screening Survey (BSS)

- Percentage of third-grade students with dental sealants on at least one permanent molar
- Percentage of third-grade students with caries experience (treated or untreated)
- Percentage of third-grade students with untreated tooth decay
- Percentage of third-grade students in need of urgent care
- Percentage of third-grade students who have had a previous dental visit

Medicaid Claims

- Percentage of Medicaid-enrolled children who had a dental visit during the year

Vital Records

- Number of babies born with cleft lip/cleft palate
- Rate of babies born with cleft lip/cleft palate per 1,000 live births

Birth Defects Monitoring System Registry

- Oral Malformation Rates

Youth Risk Behavior Survey (YRBS) Grades 9-12

- Percentage of youth reporting a dental visit in the last year
- Percentage of youth reporting no cavities
- Percentage of youth reporting one or more cavities
- Percentage of youth reporting use of chewing tobacco, snuff or dip in the past 30 days

YRBS Grades 7-8

- Percentage of youth reporting a dental visit in the last year
- Percentage of youth reporting use of chewing tobacco, snuff or dip in the past 30 days

Youth Tobacco Survey (YTS) Grades 9-12

- Percentage of youth who have ever used chewing tobacco, snuff or dip
- Percentage of youth who have used chewing tobacco, snuff or dip in the past 30 days

YTS Grades 7-8

- Percentage of youth who have ever used chewing tobacco, snuff or dip
- Percentage of youth who have used chewing tobacco, snuff or dip in the past 30 days

Adults and Elderly

Medicaid Claims

- Percentage of Medicaid-enrolled adults who had a dental visit during the year

Behavioral Risk Factor Surveillance System (BRFSS)

- Percentage of adults 18 and older who have visited a dentist or dental clinic in the past year

- Percentage of adults 18 and older who have had their teeth cleaned in the past year (among adults with natural teeth who have ever visited a dentist or dental clinic)
- Percentage of adults 65 and older who have lost all of their natural teeth due to tooth decay or gum disease
- Percentage of adults 65 and older who have lost six or more teeth due to tooth decay or gum disease
- Percentage of dentate adults 18 and older with diabetes who have visited a dentist or dental clinic in the past year
- Percentage of adults 18 and older who currently use spit tobacco

New Mother’s Survey/ Pregnancy Risk Assessment Monitoring system (PRAMS)

- Percentage of women who had a dental visit during their pregnancy
- Percentage of pregnant women who received information from a health-care provider on the importance of dental care during and after pregnancy
- Percentage of pregnant women (new mothers) who had their teeth cleaned within the last year

Basic Screening Survey (BSS) for Older Adults

- Percentage of adults 65 and older having dental insurance
- Percentage of adults 65 and older having a dentist
- Percentage of older adults with dentures
- Percentage of older adults missing all teeth
- Percentage of older adults with untreated tooth decay
- Percentage of older adults with gingival inflammation
- Percentage of older adults with substantial oral debris
- Percentage of older adults with a need for periodontal care
- Percentage of older adults with soft tissue lesions
- Percentage of older adults in need of urgent care

All Ages – State Level

Cancer Registry

- Age-adjusted incidence rate per 100,000 population of new cases of oral and pharyngeal cancer*

Vital Records

- Number of oral and pharyngeal cancer deaths*
- Age-adjusted mortality rate per 100,000 population caused by oral and pharyngeal cancers*

Licensure Workforce Survey

- Number of full-time-equivalent (FTE) licensed practicing dentists
- Rate of practicing dentists per 100,000 population
- Number of FTE licensed dental hygienists
- Number of FTE certified dental assistants

Dental Workforce Survey

- Percentage of practicing dentists who work part-time
- Percentage of practicing dentists who plan to retire in one to five years
- Percentage of practicing dentists who accept any and all Medicaid patients

Water Fluoridation Reporting System (WFRS)

- Percentage of people served by public water systems who receive fluoridated water
- Percentage of public water systems that maintain optimal fluoride levels

* Referred to as “oropharyngeal cancer” in this document

The 2007-2013 North Dakota Oral Health Surveillance Plan can be accessed online at www.ndhealth.gov/oralhealth/publications.

Healthy People 2010 (HP2010)

The North Dakota Department of Health established a committee for developing a comprehensive report on state performance in meeting the HP2010 objectives. This report was completed and posted online in January 2011. Healthy People 2020 objectives are being selected at this time by the Department of Health Healthy People 2020 committee and program staff.

Table 1. Healthy People 2010 Oral Health Complete Indicators, Target Levels and Current Status in the United States and North Dakota

Healthy People 2010 Objective Objective 21: Oral Health	Target (%)	National (%)	North Dakota (%)	North Dakota Data Source
21-1) Dental caries (tooth decay) experience				
Children, ages 6-8 years	42	50	55	2009-2010 BSS
Adolescents, age 15 years	51	59	50	2009 YRBS (15 years or younger)
21-2) Untreated caries (tooth decay)				
Young children, ages 2-4 years	9	20	21	2008 Head Start
Children, ages 6-8 years	21	26	21	2009-2010 BSS
21-3) Adults with no tooth loss, ages 35-44 years	42	39	67	2008 BRFSS
21-4) Edentulous (toothless) older adults, ages 65-74 years	20	25	16	2008 BRFSS
3-6) Oral and pharyngeal cancer death rates reduction (per 100,000)	2.7	3.0	1.7	2007 Cancer Registry
21-6) Oral and pharyngeal cancers detected at earliest stages, all	50	35	54	2007 Cancer Registry
21-8) Dental sealants				
Children, age 8 years (1st molars)	50	28	60	2009-2010 BSS
21-9) Population served by fluoridated water systems, all	75	68	97	2009 WRFS
21-10) Dental visit within past 12 months				
Children ages 2-4 years	56	NA	88	2008 Head Start
Children ages 6-8 years	56	NA	76	1999-2000 BSS
Middle school adolescents	56	NA	72	2009 YRBS
High school adolescents	56	NA	76	2009 YRBS
Adults 18 years and older	56	NA	73	2008 BRFSS

Healthy People 2010 Objective Objective 21: Oral Health	Target (%)	National (%)	North Dakota (%)	North Dakota Data Source
21-12) Low-income children and adolescents receiving preventive dental care during past 12 months, ages 0-18 years	57	31	27	2009 Medicaid (birth to 21 years of age)
21-15) System for recording and referring infants and children with cleft lip and cleft palate, all	51 (all) states and District of Columbia	23 states and District of Columbia	Yes	2009 CSHS
21-16) Oral health surveillance system, all	51 (all) states and District of Columbia	0 states	Yes	2010 North Dakota Oral Health Program



THE BURDEN OF ORAL DISEASE

Prevalence of Disease and Unmet Needs

In this section, oral disease prevalence and unmet needs of North Dakotans are identified for three populations.

Children: birth through age 12
Adolescents: ages 13 through 17
Adults: ages 18 and older

Children (Birth through Age 12)

Oral Health Status

Dental caries is the single most common chronic disease. Nationally, it is five times more common than childhood asthma and seven times more common than hay fever. Public perception of tooth decay (dental caries) is that it is a natural and minor occurrence that deserves little attention or public health interaction. Dental caries is an infectious disease in which acids produced by bacteria in the mouth lead to loss of minerals from tooth enamel and dentin, substances responsible for tooth structure. Untreated dental caries can result in loss of tooth structure and inadequate tooth function leading to infection; painful and inhibited chewing and swallowing; unsightly appearance and loss of self-esteem.

Nationally, tooth decay affects over one-fourth of U.S. children ages 2 through 5 and approximately half of children ages 12 through 15. Economic status is related to tooth decay prevalence. Children from lower-income families have shown to have a higher percentage of decay – approximately 50 percent with decay (CDC, 2011a). Dental caries and untreated decay are monitored by the North Dakota Department of Health and data is provided to the National Oral Health Surveillance System, which allows comparisons with other states and the nation.



Oral Malformations

Cleft lip and cleft palate are among the most common and visible congenital anomalies affecting newborns in the U.S. These birth defects occur where the oral cavity does not form properly and may involve the lip, mouth, roof of mouth (hard palate), and/or back of the mouth (soft palate) (NDDoH, 2010). In North Dakota, these congenital anomalies occur in about one per 1,000 live births. State law requires reporting visible congenital deformities within three days of birth to the state department of health. North Dakota has a cleft lip with and without cleft palate prevalence rate of 9.3 per 10,000 live births. Cleft palate without cleft lip rate prevalence (14 per 10,000) is more than twice as high as national rates.

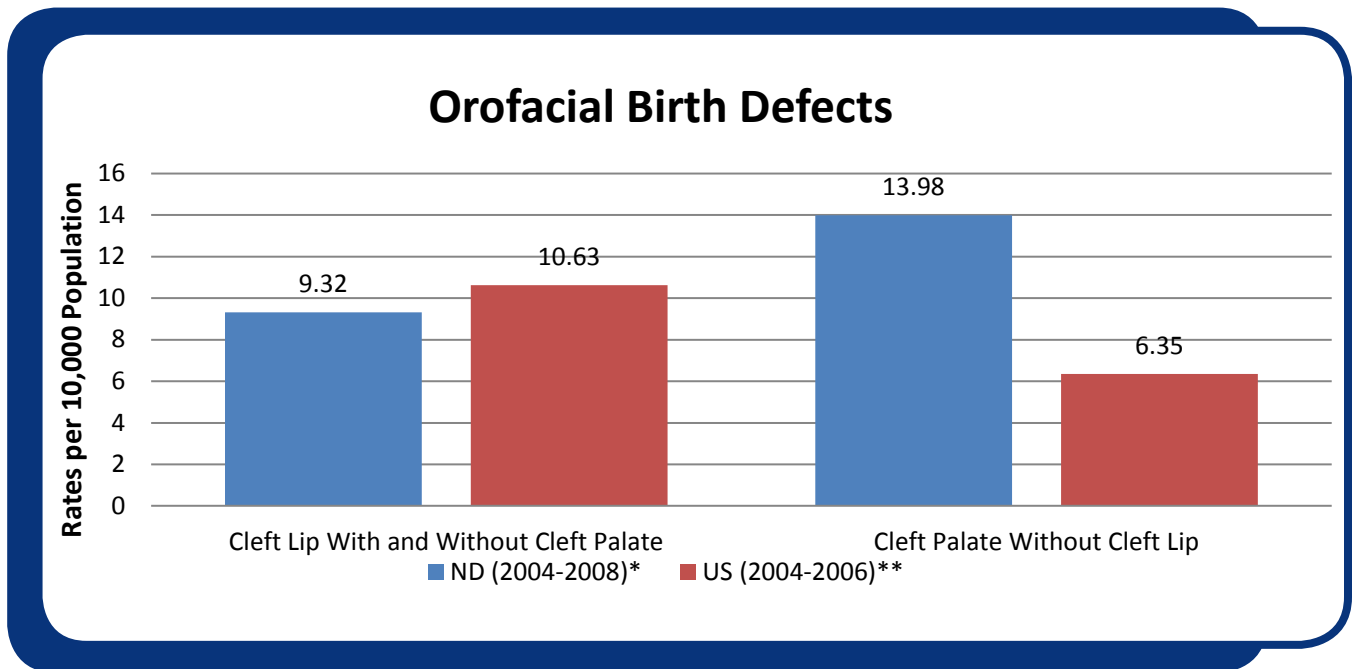


Figure 2: Orofacial Birth Defects in North Dakota Children

Data Source: National Birth Defects Prevention Network

*Estimates based on pooled data from birth years 2004-2008

**Estimates based on pooled data from birth years 2004-2006

Note: Due to variability in the methods used by state birth defects surveillance systems and differences in populations and risk factors, state prevalence estimates may not be directly comparable with national estimates or those of other states. Due to the numbers being small, we suggest caution when using these rates.

North Dakota birth defects monitoring system registry data from 2001 through 2005 indicated 43 cases of cleft palate without cleft lip and 40 cases of cleft lip with and without cleft palate, compared with 60 cases of cleft palate without cleft lip and 40 cases of cleft lip with and without cleft palate from 2004 through 2008. The five-year increments indicate a general increasing trend in cleft palate without cleft lip.

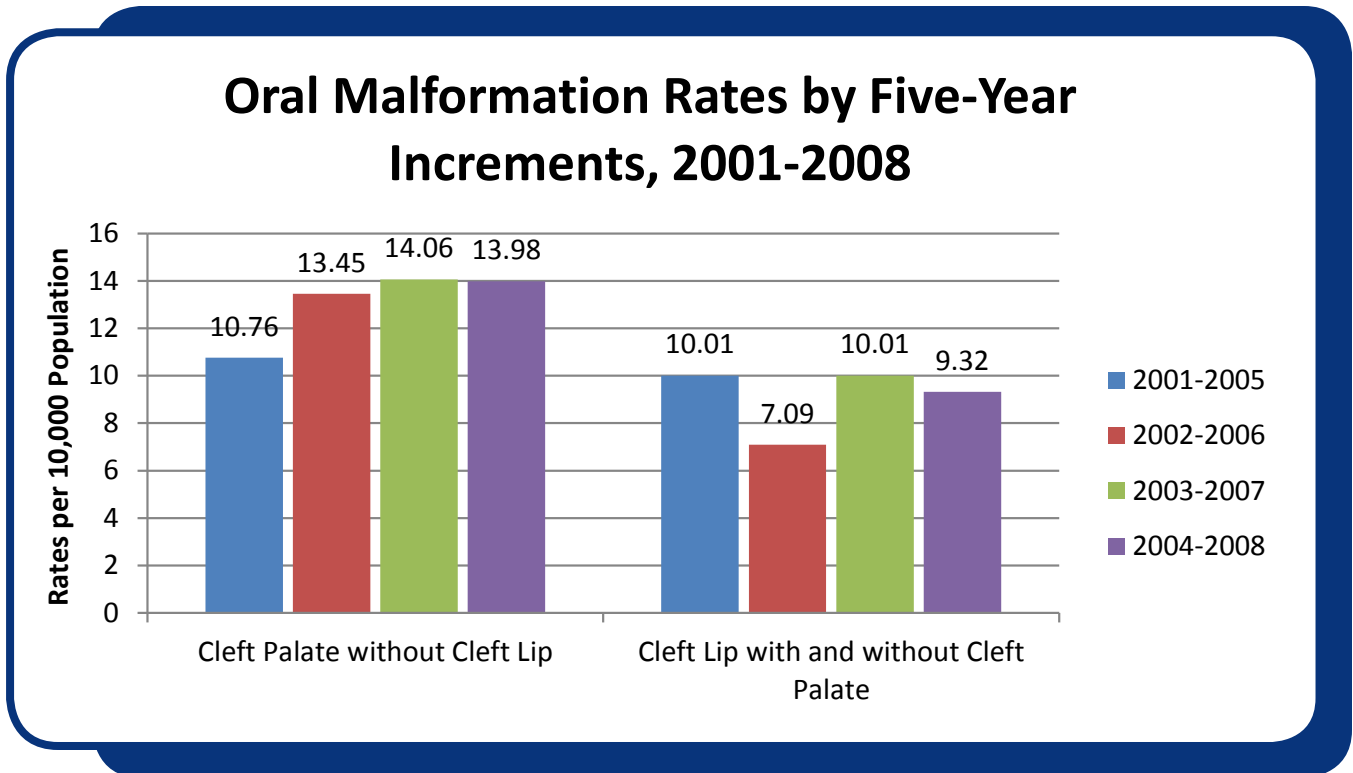


Figure 3: Oral Malformation Rates in North Dakota Children
Data Source: North Dakota Birth Defects Monitoring System Registry

Dental Caries

Dental caries (tooth decay) is the most common chronic disease among children and adolescents, and it pervasively affects over 90 percent of adults in the U.S. (CDC, 2012). Dental caries is not uniformly distributed in the United States or in North Dakota. Some groups are more likely to experience the disease and are less likely to receive treatment.

Preschool children ages 2 through 4 are at risk for oral disease. Over the last 10 years, the percentage of North Dakota Head Start preschool children with untreated caries has remained considerably higher than the national Healthy People 2010 target percentage (9%).

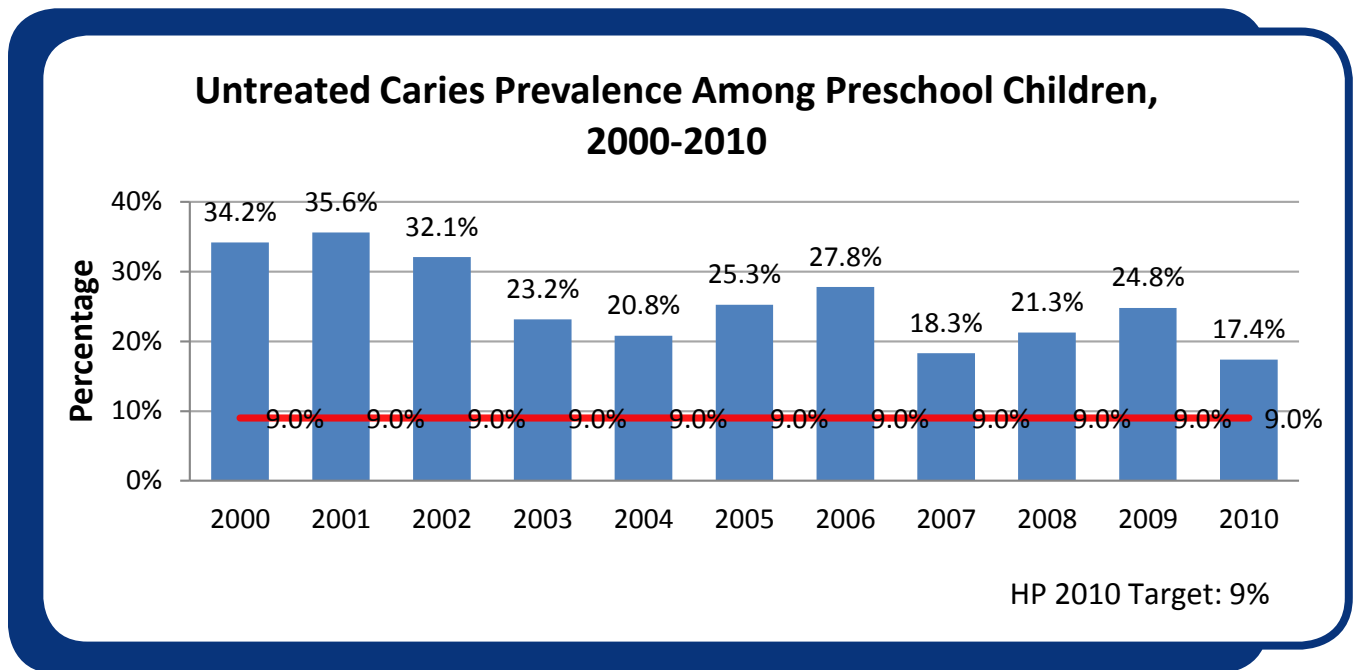


Figure 4: North Dakota Head Start Preschool Dental Caries
Data Source: North Dakota Head Start Program Information Report Data

Maintaining regular dental visits is an excellent way to prevent oral disease. The percentage of North Dakota Head Start preschool children ages 2 through 4 having received a dental visit within the previous year has fluctuated slightly over the past 10 years, remaining higher than the national Healthy People 2010 target (56%).

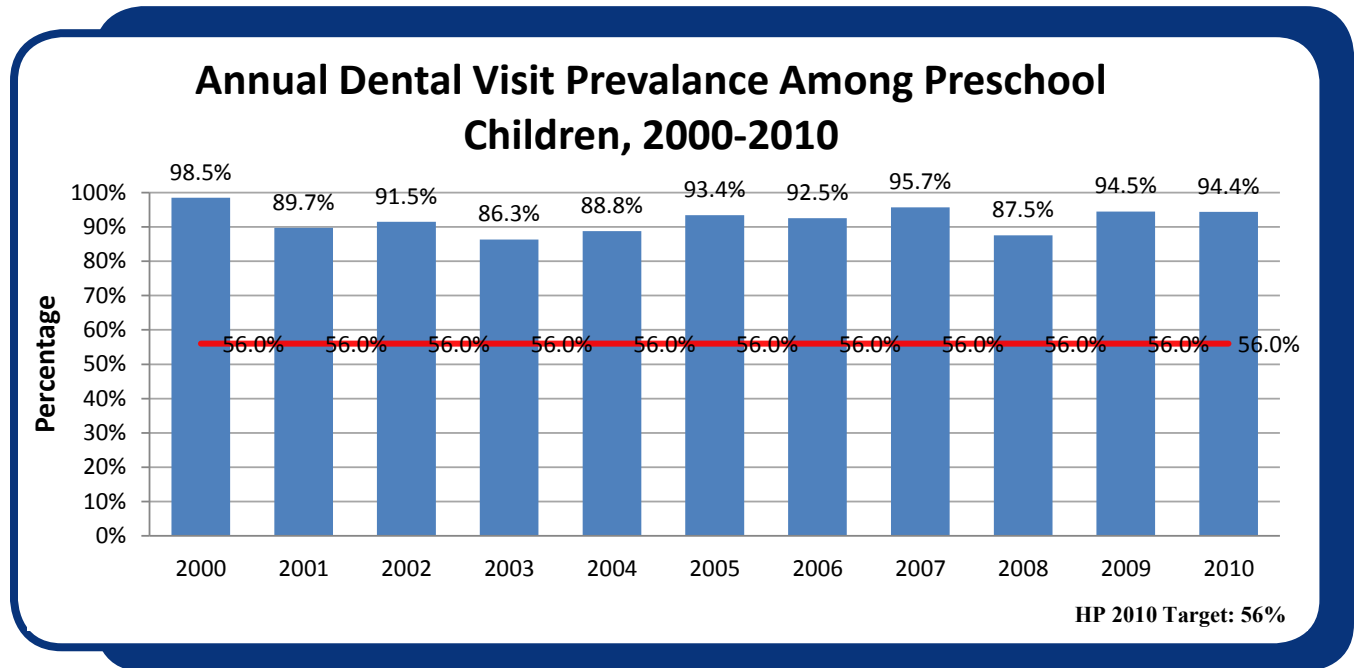


Figure 5: North Dakota Head Start Preschool Dental Visits
Data Source: North Dakota Head Start Program Information Report Data



Basic Screening Survey for Third-Grade Children

The North Dakota Department of Health’s Oral Health Program has conducted three Basic Screening Surveys (BSS) over the past 10 years (1999-2000, 2004-2005 and 2009-2010) of the third-grade student population in elementary schools located throughout the state. The BSS is used to evaluate the prevalence of oral decay in children by assessing caries experience (if they have ever had decay and now have fillings), untreated decay (active unfilled cavities), rampant decay (advanced or severe decay on multiple surfaces of many teeth), dental sealants, and early/urgent care required (reported pain or a significant dental infection that requires immediate care). Results from the 2009-2010 BSS indicate a higher percentage of oral decay among minority populations. Note that the 1999-2000 data may lack statewide representation of the population due to a limited sample.

Table 2: Oral Health of North Dakota Third-Grade Children by Race
Data Source: 2009-2010 Basic Screening Survey

2009-2010 BSS	White (n=1,162) Percent	American Indian (n=214) Percent	Other Minorities (n=96) Percent
History of decay	49.2	80.8	59.7
Treated decay	40.8	69.8	46.7
Untreated decay	16.8	39.1	26.7
Rampant decay	8.6	28.7	10.6
Dental sealants	59.4	73.8	46.9
Need treatment (early & urgent)	16.3	39.1	24.3

Note: “n” refers to the total number of students screened by race/ethnicity.

A greater proportion of North Dakota third-grade children have caries experience and untreated decay than the Healthy People 2010 target. Also, a greater proportion of North Dakota third-grade students have dental sealants (60%) than the national Healthy People 2010 target (50%).

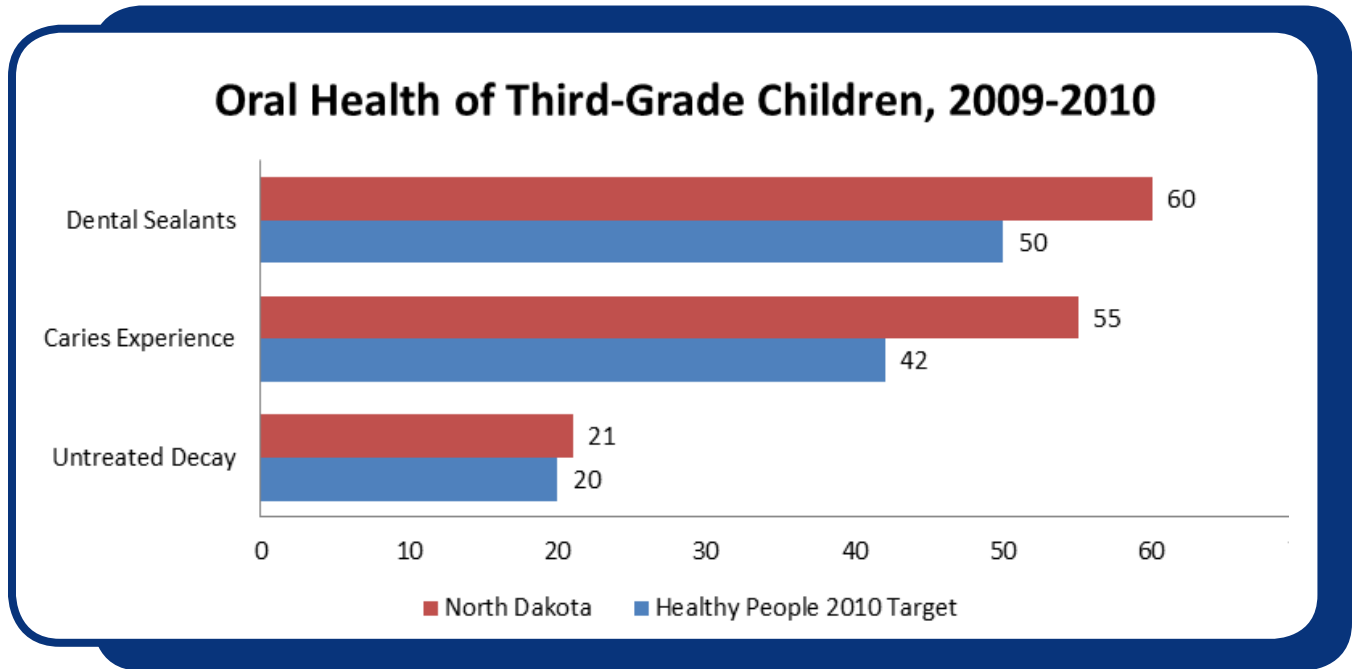


Figure 6: Oral Health of North Dakota Third-Grade Children
Data Source: Basic Screening Survey and Healthy People 2010 Oral Health Target



The 2009-2010 BSS survey identified that 55 percent of third-grade children had cavities and/or fillings (decay experience) – substantially higher than the Healthy People 2010 objective of 42 percent. Comparison with survey results from the 2000 and 2005 Basic Screening Surveys indicates an overall positive trend toward the Healthy People 2010 target.

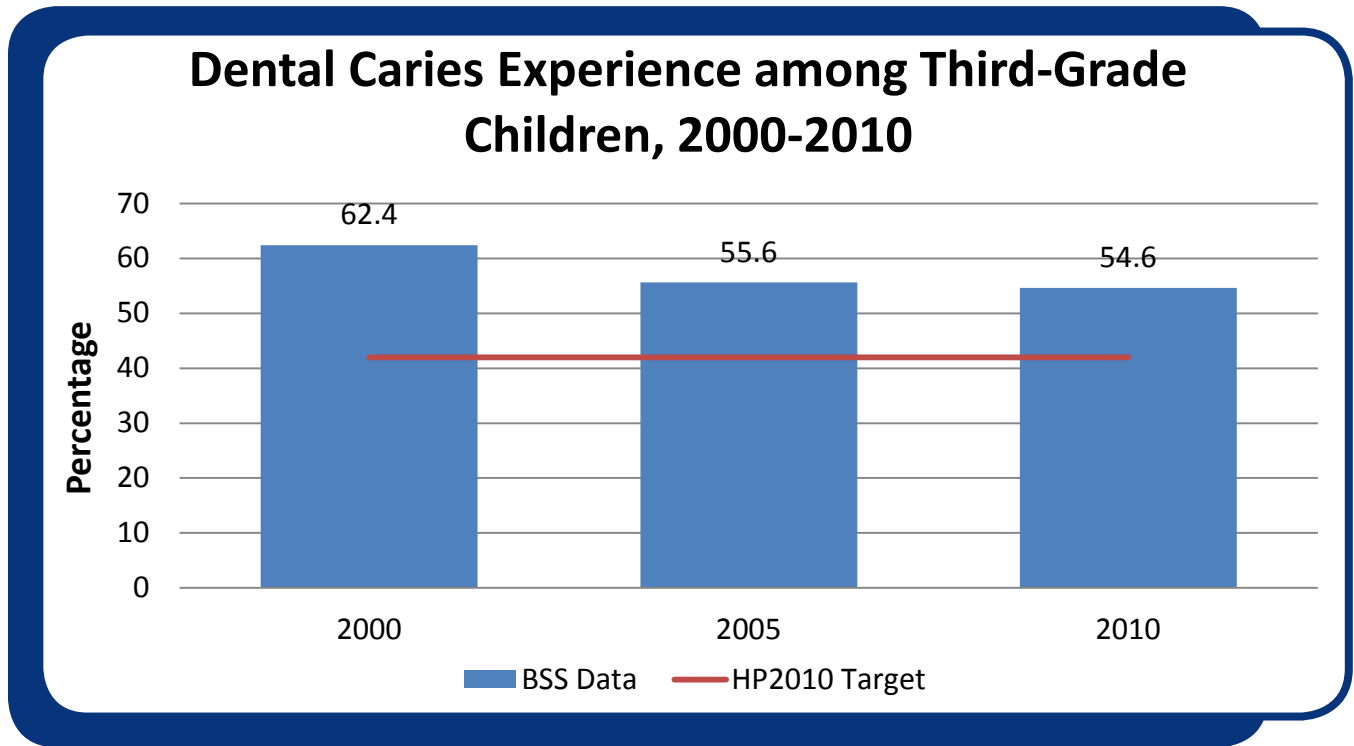


Figure 7: Dental Caries among North Dakota Third-Grade Children
Data Source: Basic Screening Survey



The percentage of children in a population with untreated caries can be an indicator of a number of oral health challenges. A high percent may indicate that children in the screened population do not have access to oral health care, do not have the funds to pay for the dental services, or perhaps that the importance of oral health, especially among the youth population, is not understood or prioritized in the community and/or among parents.

Findings from the three BSS surveys during the 2000-2010 years in North Dakota show a general decline in the percentage of third-grade children with untreated caries and an increased number visiting a dentist within the past year. However, from 2005 through 2010, there was an increase in the percentage of children with untreated caries. In 2010, the BSS identified that about 21 percent of third-grade children had untreated dental caries, equal to the national Healthy People 2010 target for the decade.

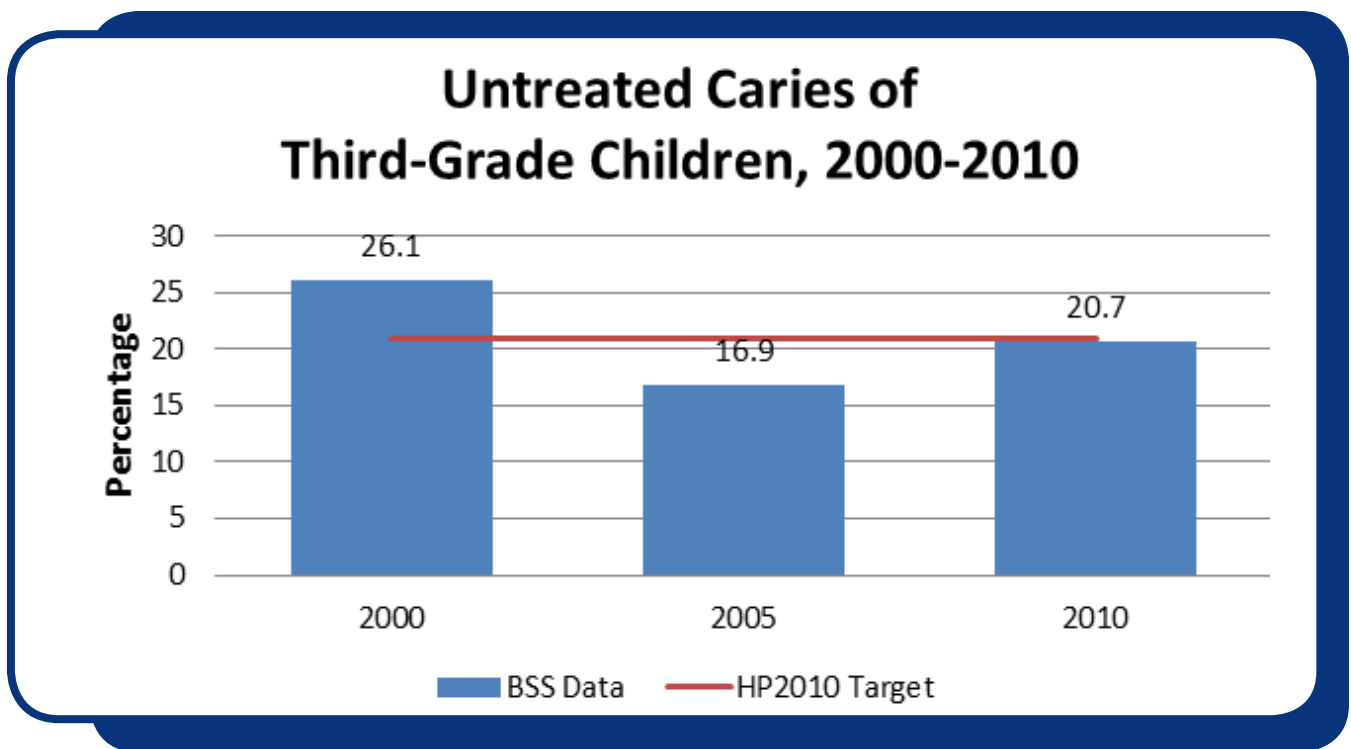


Figure 8: Untreated Caries among North Dakota Third-Grade Children
Data Source: Basic Screening Survey

Dental sealants are a thin plastic coating placed on the pits and fissures of the chewing surfaces of molars (back teeth). Sealants prevent tooth decay by sealing out food, bacteria and other pathogens, thus protecting the chewing surface of the tooth and preventing cavities and the potential need for expensive fillings. Sealants can last up to 10 years and have been shown to reduce tooth decay by more than 70 percent (USDHSS, 2010a). BSS results indicate an increase in the percentage of North Dakota third-graders with dental sealants from 55.2 percent in 2000 to 60.4 percent in 2010.

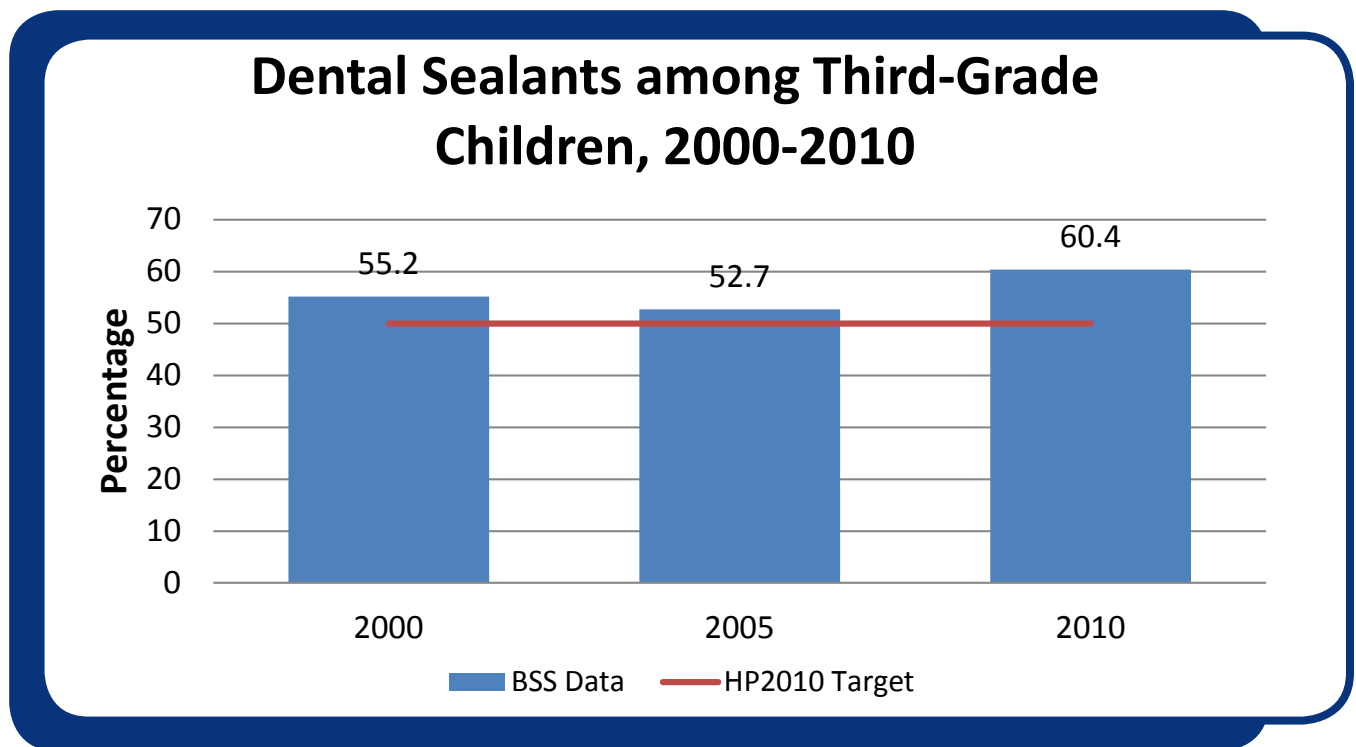


Figure 9: Dental Sealants among North Dakota Third-Grade Children
Data Source: Basic Screening Survey



The percentage of North Dakota third-grade students that reported having ever been to a dentist has remained consistent from 2005 through 2010.

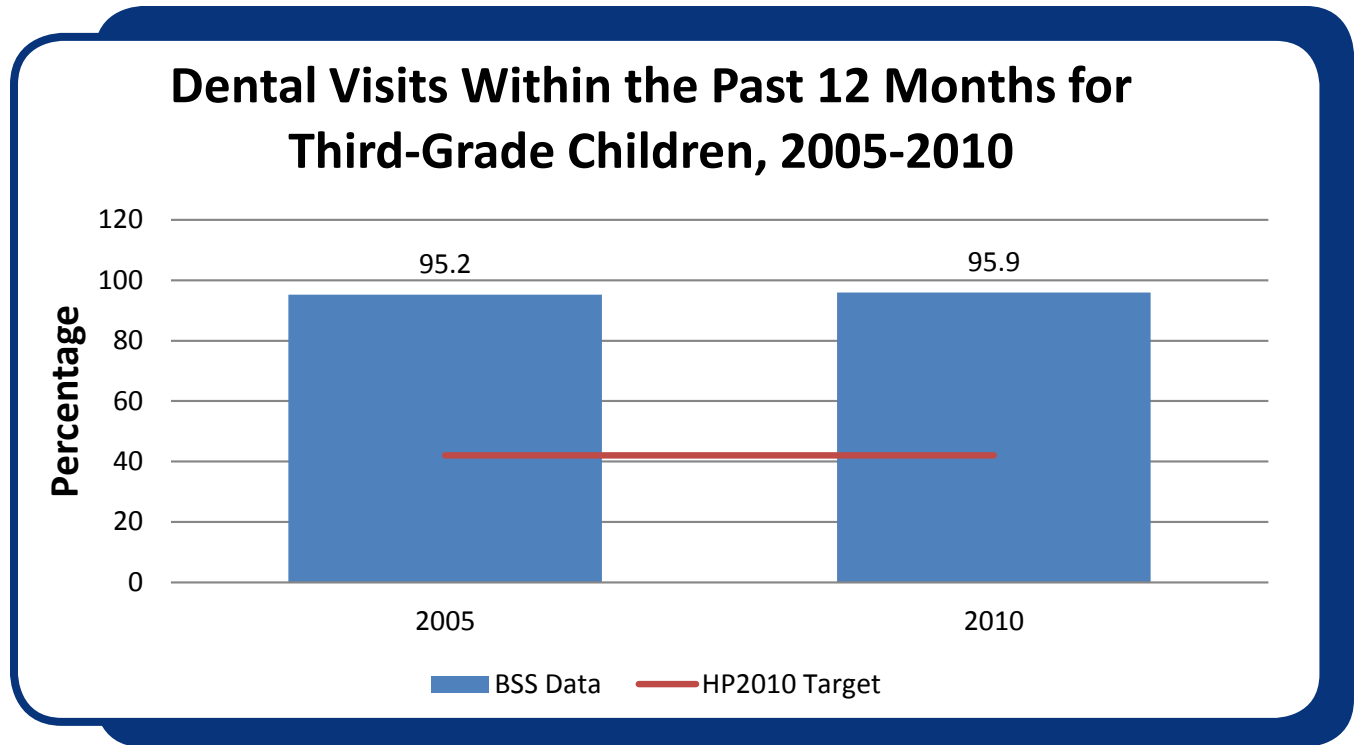


Figure 10: Dental Visits among North Dakota Third-Grade Children
Data Source: Basic Screening Survey



Research shows that fluoride varnish application is highly effective in reducing tooth decay by 25 to 45 percent in the early decay stage. The North Dakota Department of Health Oral Health Program's Healthy Smiles Fluoride Varnish Program was created to reduce oral health disparities in North Dakota children from birth to age 21 and improve access to preventive dental care for underserved populations. Medical and dental professionals (including licensed practical nurses, registered nurses, physicians, physician assistants, dental hygienists and dental assistants) are trained by North Dakota Department of Health public health hygienists to conduct dental screenings, apply fluoride varnish and assess oral health status.

More than 3,000 children have received fluoride varnish applications in North Dakota since 2008. Results from the screenings compared by race indicate that a greater proportion of White non-Hispanic children (75%) have been to the dentist within the past year.

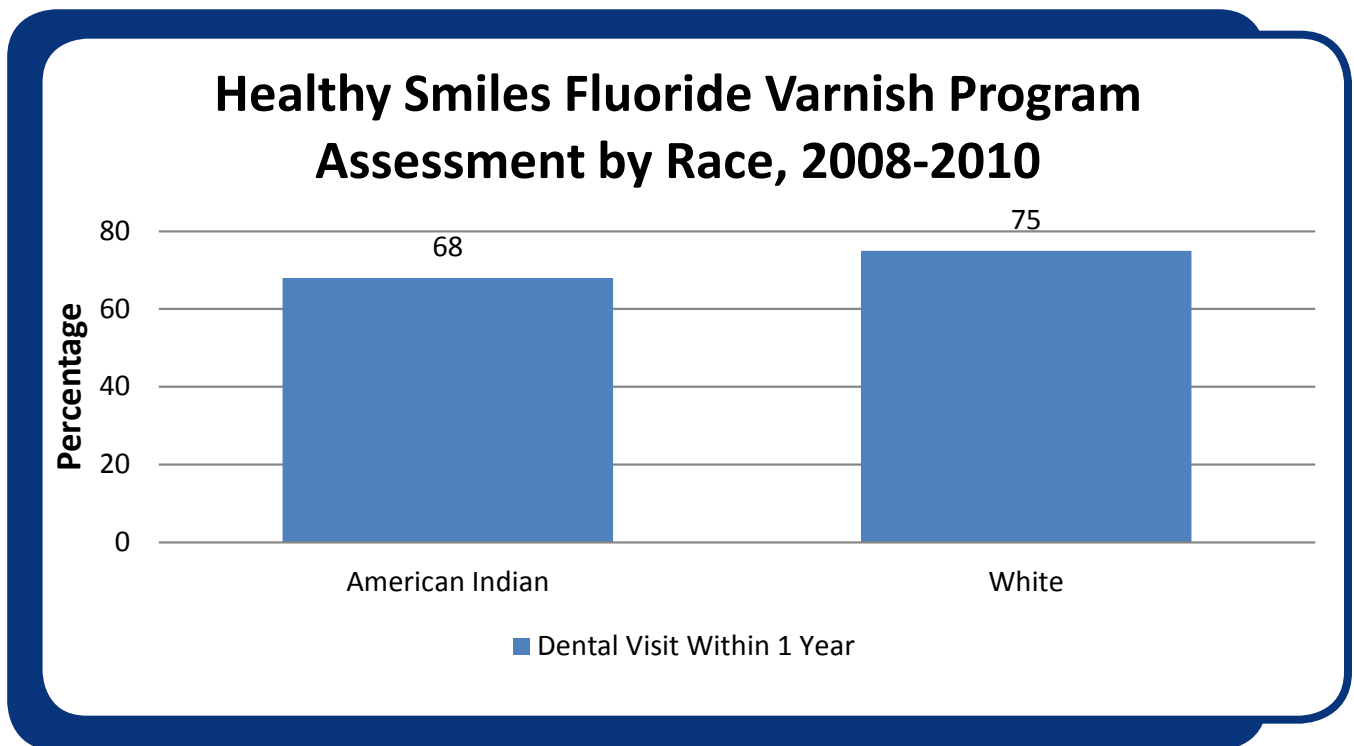


Figure 11: North Dakota Healthy Smiles Fluoride Varnish by Race
Data Source: Healthy Smiles

According to race analysis of the Basic Screening Survey (BSS), a greater percentage of American Indian children have untreated and rampant caries, caries experience and early childhood caries than White non-Hispanic children in North Dakota. Furthermore, more than half (57%) of surveyed American Indian children were noted to be in need of urgent treatment versus 13 percent of White non-Hispanic children.

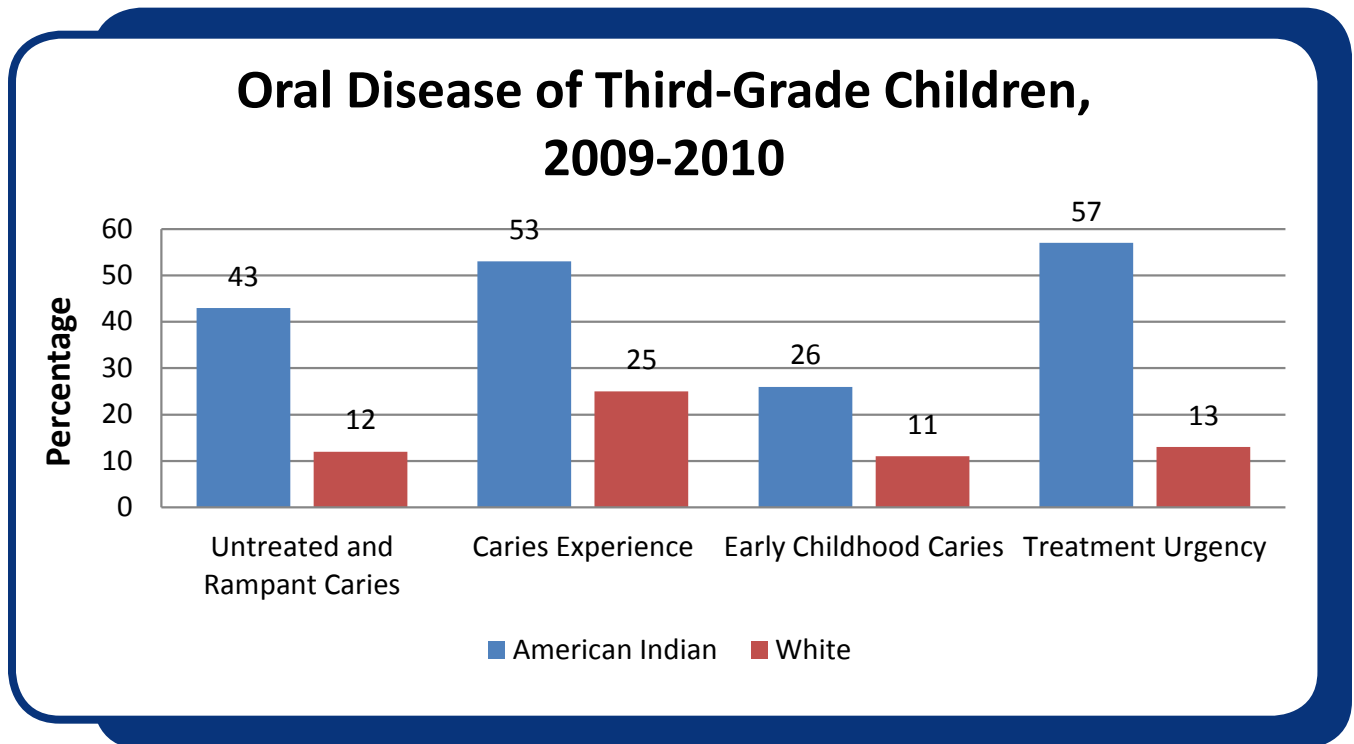


Figure 12: Oral Disease among North Dakota Third-Grade Children
Data Source: Basic Screening Survey



Adolescents (Ages 13 through 17)

Dental Caries

Adolescents in high school and middle school are at risk for dental caries. According to the Youth Risk Behavior Survey (YRBS), the percentage of high school students (grades nine through 12) reporting having had one or more cavities has remained approximately the same between 2005 and 2011.

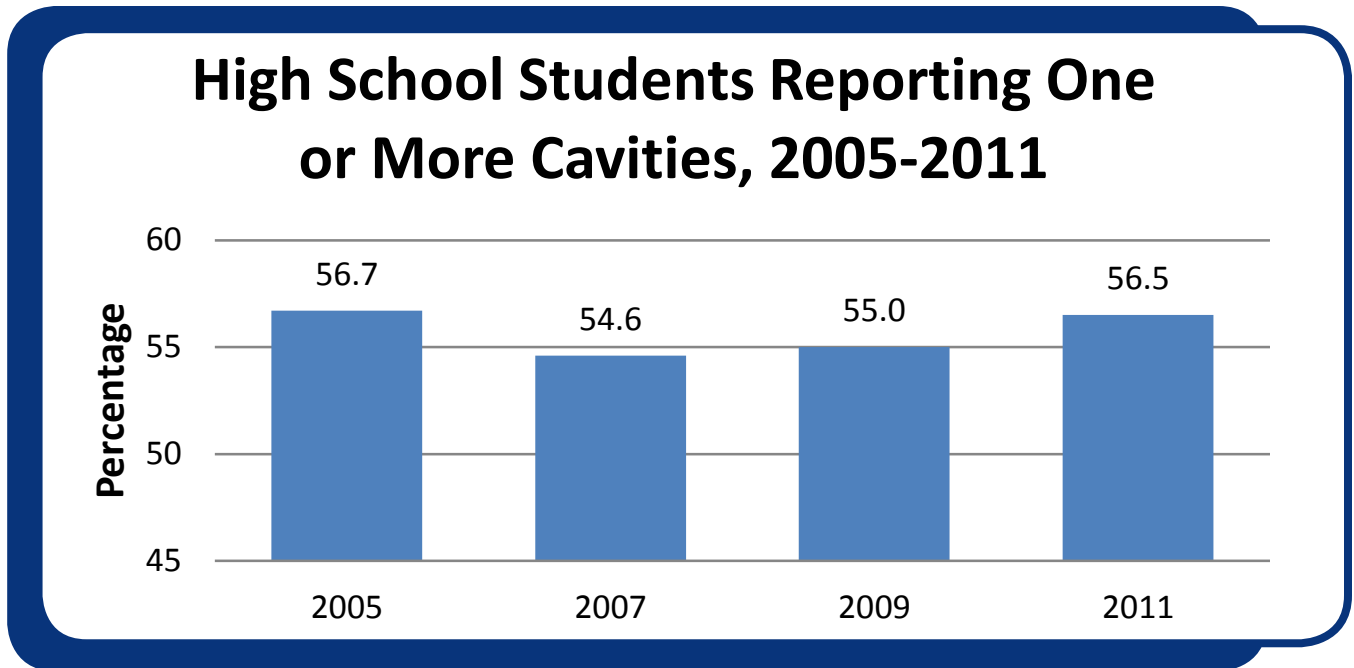


Figure 13: Dental Cavities among North Dakota High School Students
Data Source: Youth Risk Behavior Survey

YRBS data from 2009 indicates that more than half of North Dakota high school students (55.1%) reported to have had at least one cavity. More female (58.6%) than male (51.9%) students reported a cavity. In 2011, a greater percentage of students (56.5%) reported having had at least one cavity. In 2009 and 2011, more females than males reported having had at least one cavity. During this time period, the percentage of males reporting having had a cavity increased.

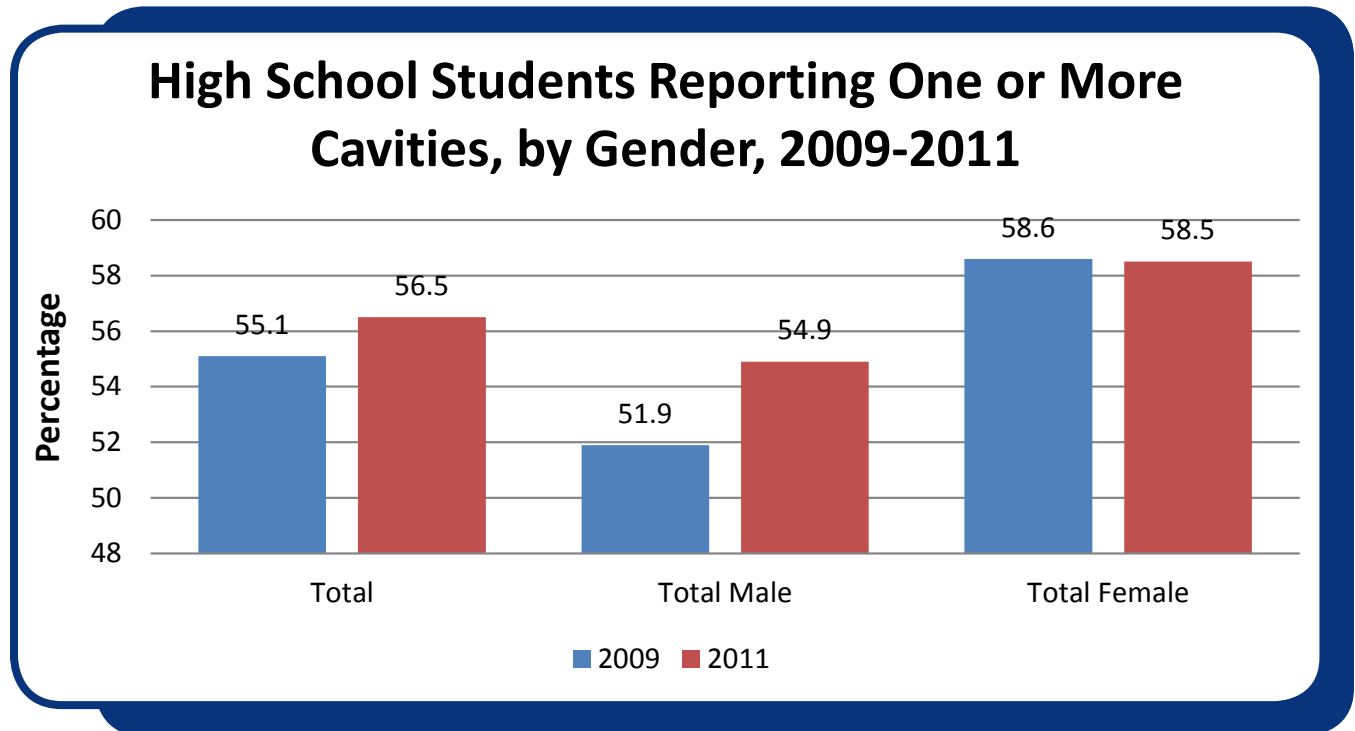


Figure 14: Dental Cavities among North Dakota High School Students, by Gender
Data Source: Youth Risk Behavior Survey

The number of North Dakota high school students reporting that they never have had a dental cavity has fluctuated slightly, remaining at just over one-third of total respondents.

High School Students Reporting No Cavities, 2005-2011

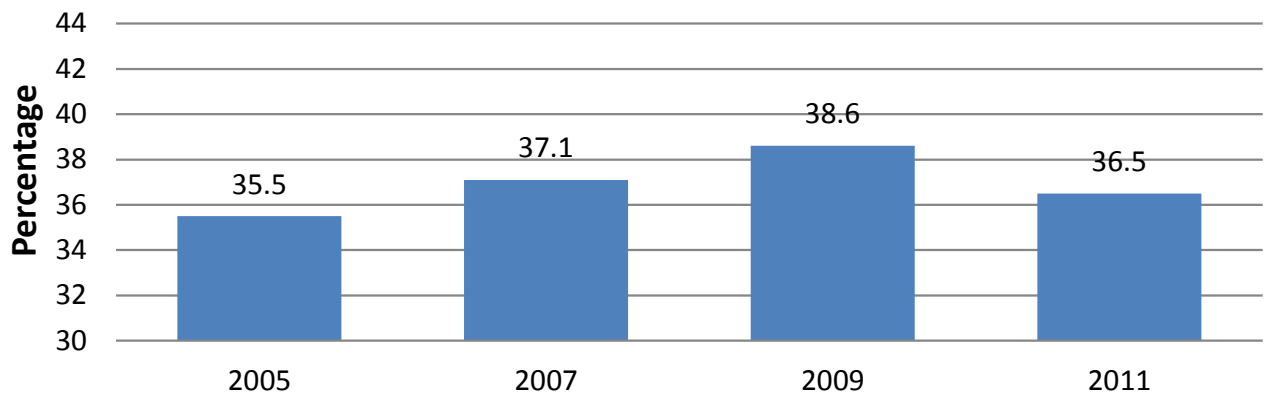


Figure 15: No Cavities among North Dakota High School Students
Data Source: Youth Risk Behavior Survey



The number of North Dakota high school students reporting a dental visit within the previous 12 months (76% in 2011) has remained nearly the same since 2007.

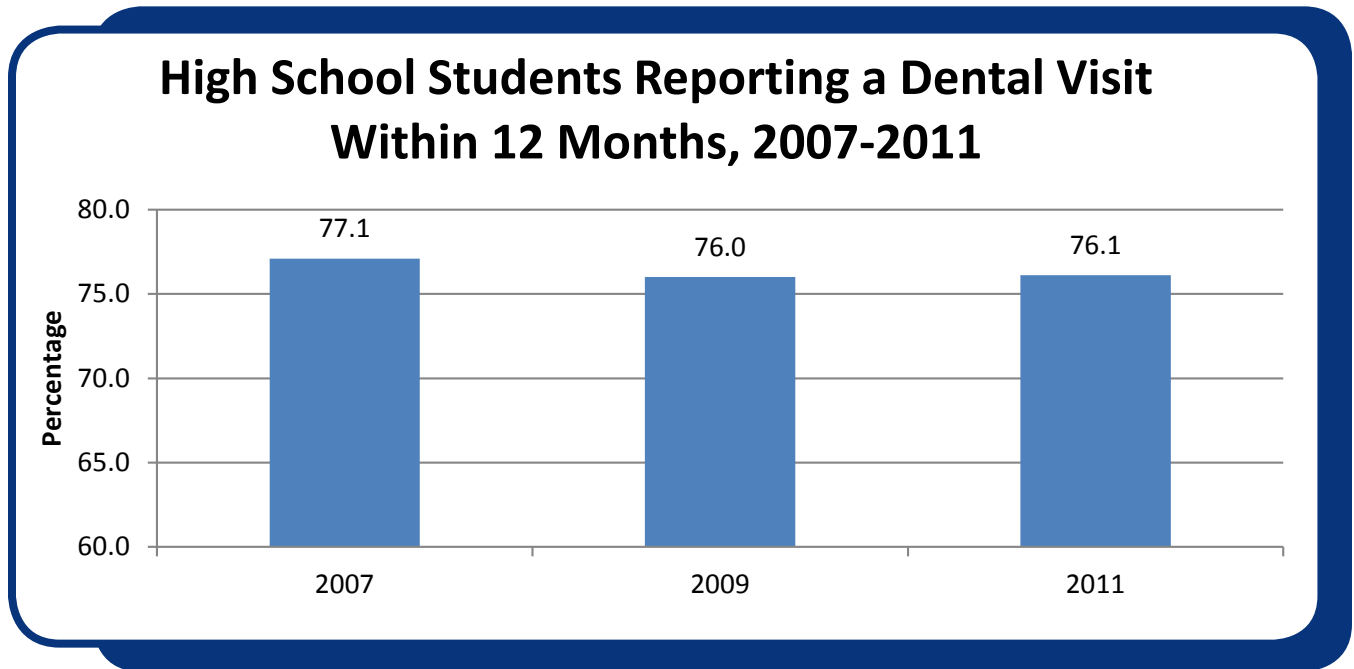


Figure 16: Dental Visits among North Dakota High School Students
Data Source: Youth Risk Behavior Survey

The number of North Dakota middle school students (grades seven and eight) reporting a dental visit within the previous 12 months (74.9% in 2011) has declined slightly since 2007.

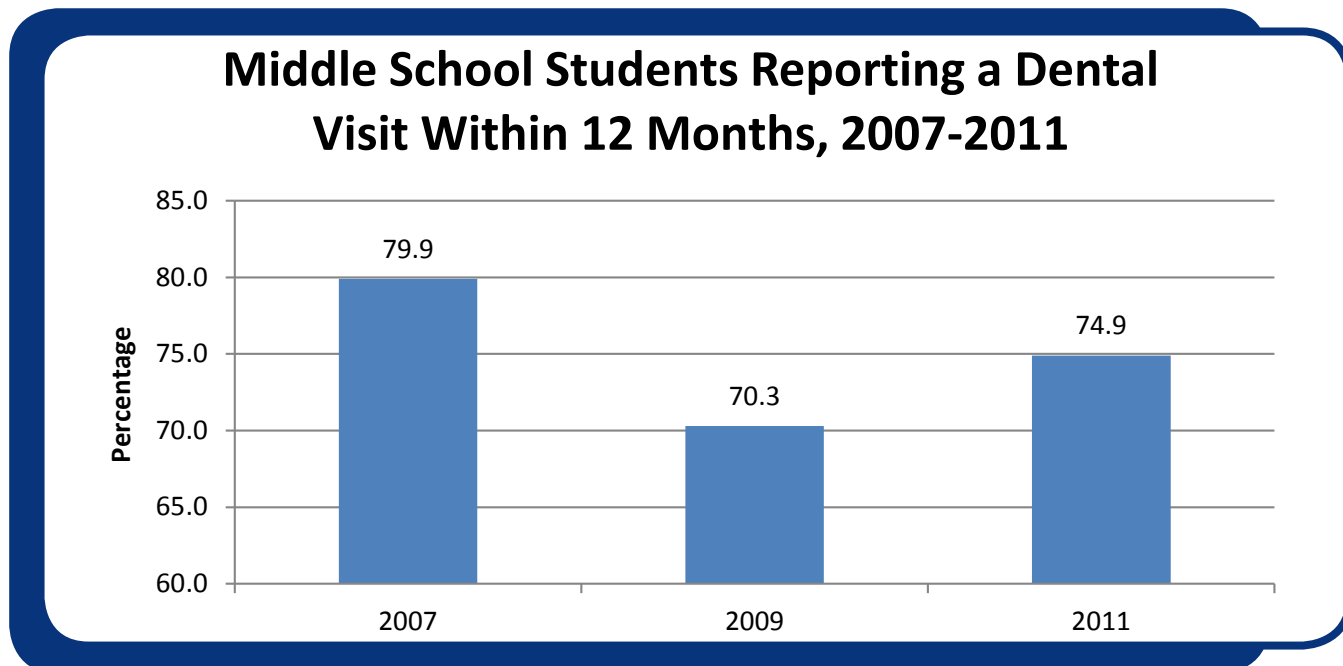


Figure 17: Dental Visits among North Dakota Middle School Students
Data Source: Youth Risk Behavior Survey



Oral Cancer Risk Factors

Tobacco and alcohol use are major known risk factors for oral cancer (Hashibe, 2012); (O'Connor, 2012); (Warnakulasuriya, 2010). Tobacco usage among North Dakota adolescents, as measured by high school and middle school student behavior in the Youth Risk Behavior Survey (YRBS), indicates that smoking has decreased over the previous 10 years. Chewing tobacco or other tobacco product usage has slightly increased among high school students over the same period.

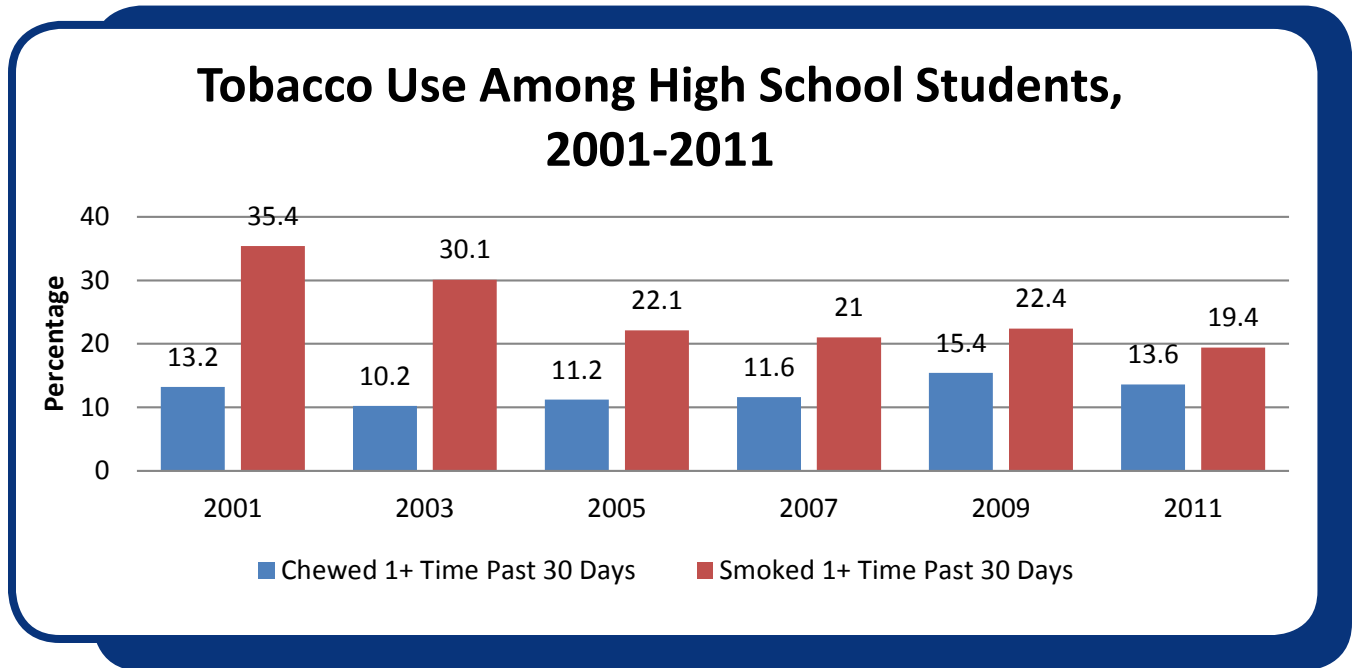


Figure 18: Tobacco Use among North Dakota High School Students
Data Source: Youth Risk Behavior Survey

Smoking and chewing tobacco use among middle school students have fluctuated slightly, but generally declined over the past ten years.

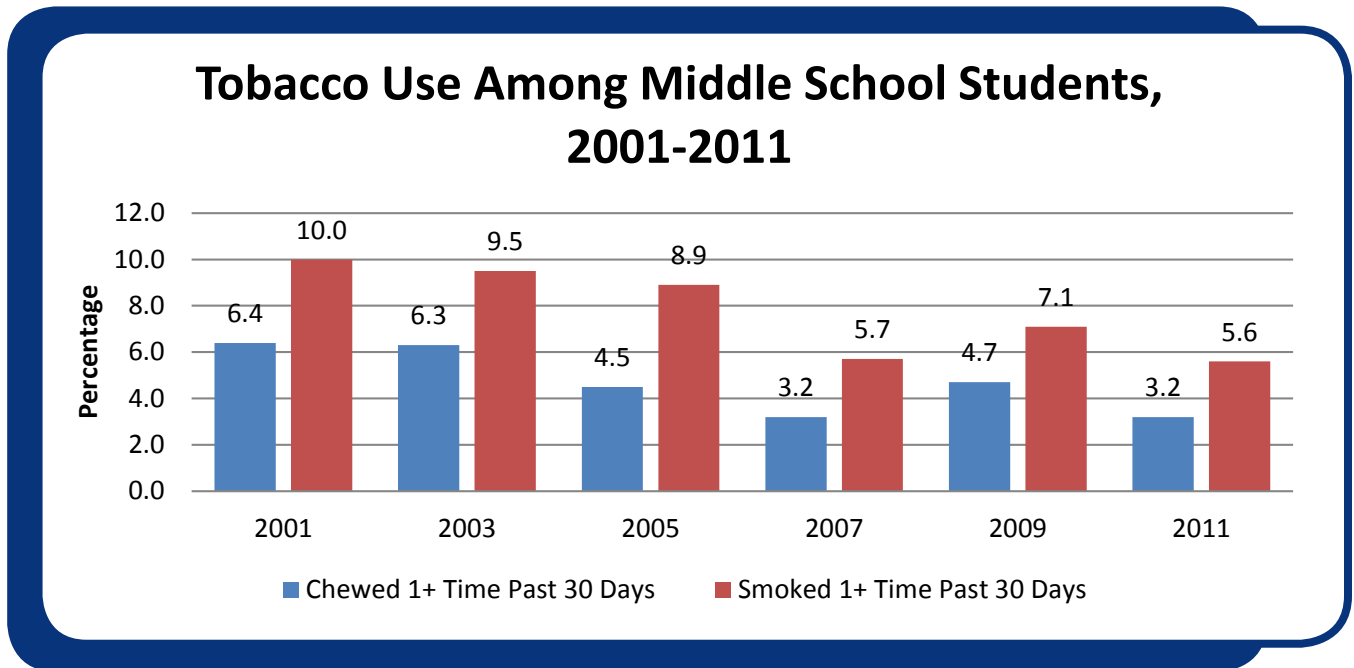


Figure 19: Tobacco Use among North Dakota Middle School Students
Data Source: Youth Risk Behavior Survey



While North Dakota maintains some of the highest rates of risky behavior among youth regarding the consumption of alcohol, high school student binge drinking declined from 2001 through 2011. About one-fourth (25.6%) of North Dakota high school students binge drank (defined in the YRBS as five or more drinks in a row) at least one time per month in 2011.

According to the CDC (2011), alcohol consumption increases the risk of oropharyngeal cancer. Furthermore, excessive alcohol use can impair judgement, lead to risky activities, unintentional injuries and unanticipated pregnancies.

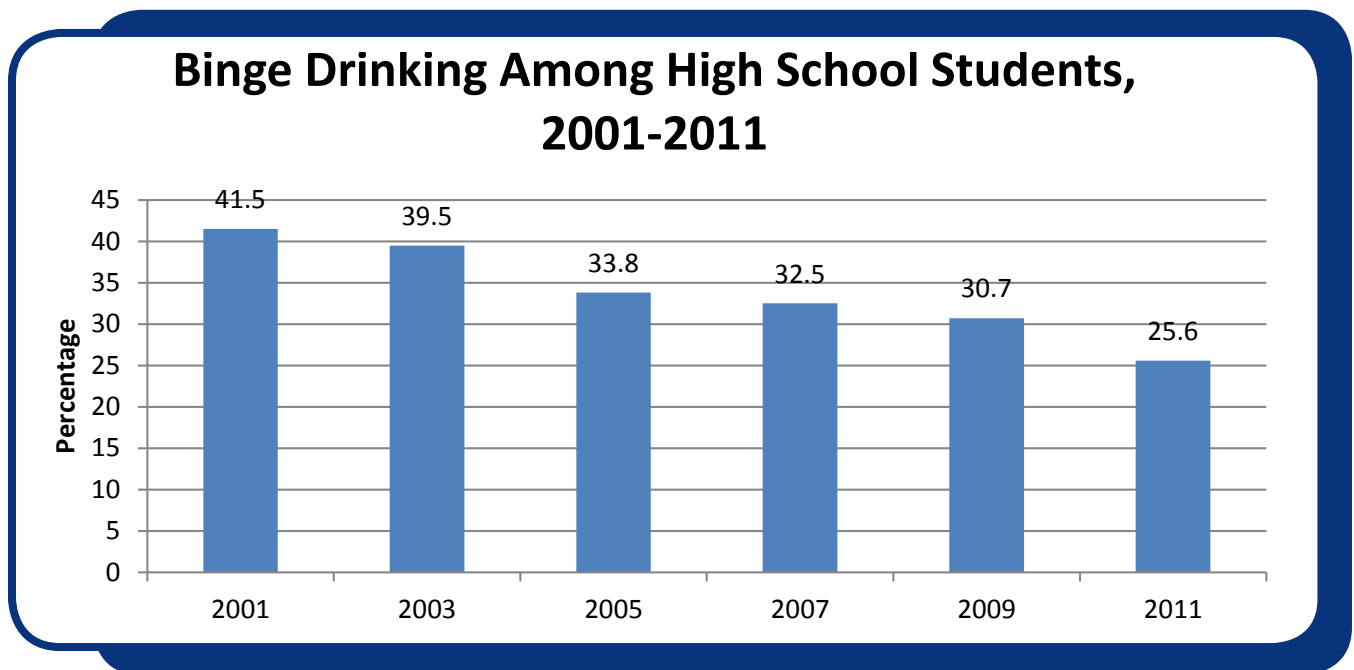


Figure 20: Binge Drinking among North Dakota High School Students
Data Source: Youth Risk Behavior Survey

Adults (Ages 18 and Older)

Dental Disease

Dental caries susceptibility is a lifetime health concern that affects most individuals. Like children and adolescents, adults can experience oral decay throughout all surfaces of the tooth, including the roots. In the most recent national examination survey, 85 percent of U.S. adults had at least one tooth with decay or a filling on the crown of the tooth. Root surface caries affects 50 percent of adults age 75 years or older (USDHHS, 2000a).

Gingivitis is characterized by localized inflammation, swelling and bleeding gums without a loss of the bone that supports the teeth. Gingivitis is usually reversible with good oral hygiene. Daily removal of dental plaque from the teeth is extremely important to prevent gingivitis, which can progress to destructive periodontal disease. Periodontitis (destructive periodontal disease) is characterized by the loss of the tissue and bone that support the teeth. It places a person at risk of eventual tooth loss unless appropriate treatment is provided. Among adults, periodontitis is a leading cause of bleeding, pain, infection, loose teeth and tooth loss and can lead to various systemic diseases (Manjunath, 2012).

The key for successful prevention of oral disease is having annual dental examinations and exercising proper oral care techniques at home. According to national weighted data from the 2008 Behavioral Risk Factor Surveillance Survey (BRFSS), 27 percent of adults had not visited a dentist, dental hygienist or dental clinic within the past year. North Dakota BRFSS data from 2008 and 2010 indicates that a majority of adults had visited a dentist, dental hygienist or dental clinic within the past year (72.9% and 71.1%, respectively).

Adults: Years Since Last Dental Visit, 2008-2010

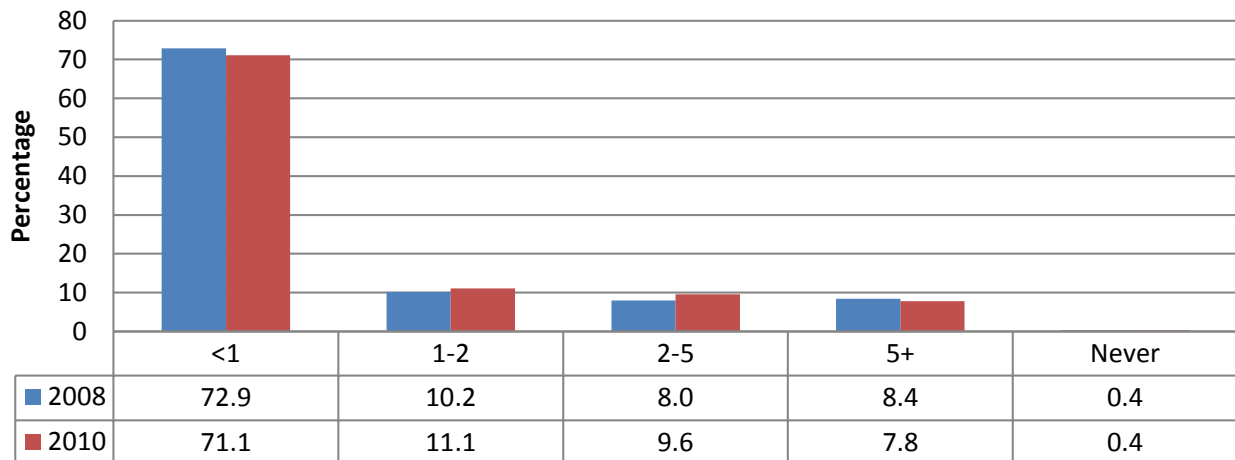


Figure 21: Dental Visits among North Dakota Adults
Data Source: Behavioral Risk Factor Surveillance System

As with general health, oral health status tends to vary in the U.S. on the basis of socioeconomic factors such as income, education and occupation. Nationally, adults with some college education (15%) have two to two-and-one half times less destructive periodontal disease than do adults with high school (28%) or with less than high school (35%) levels of education (USDHHS, 2000). The North Dakota 2010 Behavioral Risk Factor Surveillance System data indicates an inverse relationship between income level and permanent tooth loss due to tooth decay or gum disease; lower income increases tooth loss prevalence. The survey results indicate that in 2010, nearly one-sixth of North Dakotans (15.6%) with an annual income of less than \$15,000 had lost all of their teeth due to tooth decay or gum disease; tooth loss prevalence categorically decreased as income level increased. Only one percent of North Dakotans with an annual income of \$75,000 or more had lost all of their teeth.

Income is a factor in utilization of dental services. Consistent with national data, North Dakotans with a lower income tend to have greater time between dental visits. As noted in figure 22, a higher percentage of females than males in each income gradient were recipients of dental care within the last 12 months.

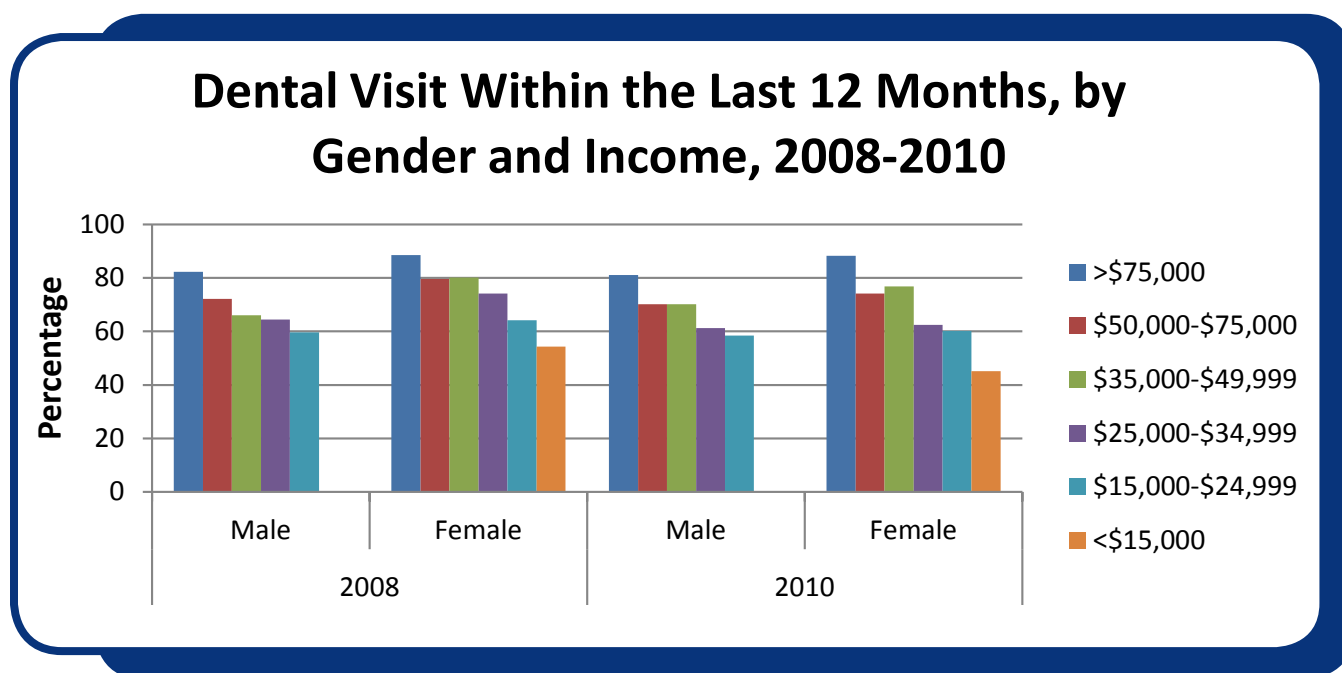


Figure 22: Dental Visits by Income Level of North Dakota Adults by Gender

Data Source: Behavioral Risk Factor Surveillance System

Note: Some 2008 and 2010 North Dakota BRFSS data for males was withheld from publication due to small sample size.

Tooth Loss

A full dentition is defined as having 28 natural teeth, exclusive of third molars (the wisdom teeth) and teeth removed for orthodontic treatment or because of trauma. Most people can keep their teeth for life with adequate personal, professional and population-based preventive practices. As teeth are lost, a person’s ability to chew and speak decreases and interference with social functioning can occur. The most common reasons for tooth loss in adults are tooth decay and periodontal (gum) disease. Tooth loss also can result from infection, unintentional injury, and head and neck cancer treatment. In addition, certain orthodontic and prosthetic services sometimes require the removal of teeth.

Education level is a factor in tooth loss. Among older adult United States residents (age 65+), 39 percent of those with less than a high school education were edentulous (have lost all their teeth) in 1997, compared with 13 percent of people with at least some college education (USDHHS, 2000).

BRFSS data from 2010 indicates that nearly one-third (31.7%) of North Dakota adults reported to have lost one to five teeth due to tooth decay and gum disease; nearly one-tenth (8.5%) reported to have lost six or more teeth. This data also indicates that nearly one-fifth (18.8%) of adults 65 years of age or older were edentulous (having lost all of their teeth due to tooth decay or gum disease), slightly lower than 20.1 percent in 2008. Nationally, in 2010, 17 percent of adults 65 years of age or older reported to be edentulous.

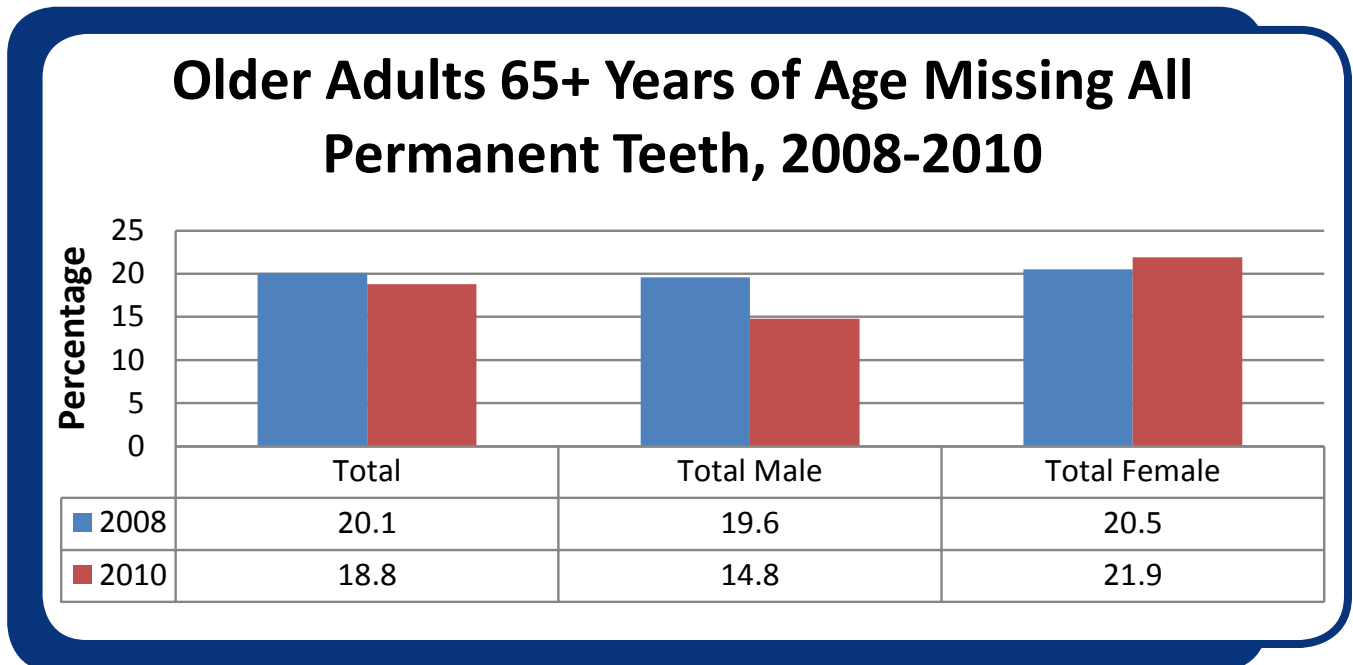


Figure 23: Edentulism among North Dakota Older Adults
Data Source: Behavioral Risk Factor Surveillance System

Periodontal (Gum) Disease

Gingivitis is characterized by localized inflammation, swelling and bleeding gums without a loss of the bone that supports the teeth. Daily removal of dental plaque from the teeth by brushing and flossing is extremely important to prevent gingivitis, which can progress to destructive periodontal disease. Gingivitis is usually reversible with regular cleanings and good oral hygiene. Periodontitis (destructive periodontal disease) is characterized by the loss of the tissue and bone that support the teeth. It places a person at risk of eventual tooth loss unless appropriate treatment is provided. Among adults, periodontitis is a leading cause of bleeding, pain, infection, loose teeth and tooth loss (CDC, 2011a; Manjunath, 2012).

North Dakota does not collect periodontal statistics. However, nationally the prevalence of gingivitis is highest among American Indians, Alaska Natives and adults with less than a high school education. Cases of gingivitis likely will remain a substantial problem and may increase as tooth loss from dental caries declines or because of the use of some medications. Although not all cases of gingivitis progress to periodontal disease, all periodontal disease starts as gingivitis. Therefore, the major method available to prevent destructive periodontitis is to prevent the precursor condition of gingivitis and its progression to periodontitis.

Oral and Pharyngeal Cancer

Cancer of the mouth, oral cavity or pharynx (oropharyngeal cancer) is the fourth most common cancer in African American men and the seventh most common cancer in white men in the United States (Ries et al., 2004). An estimated 28,000 new cases of oral cancer and 7,200 deaths from these cancers occurred in the U.S. in 2004. The 2001 age-adjusted (to the 2000 U.S. population) incidence rate of oral cancer in the U.S. was 10.4 per 100,000 people.

Some groups experience a disproportionate burden of oral cancer. Nearly 90 percent of cases of oral cancer in the United States occur among people ages 45 and older. The age-adjusted incidence for the U.S. was more than twice as high among men (15 incidents per 100,000 men) than among women (6.6), as was the mortality rate (4.1 deaths per 100,000 men vs. 1.6 deaths per 100,000 women). Nationally, African Americans are more likely than whites to develop oral cancer and much more likely to die from it.

Analysis of North Dakota resident death certificates indicates that from 1996 through 2009, there were 225 deaths due to oropharyngeal cancer. A greater proportion of these deaths occurred among males (144) than females (81). The majority of oropharyngeal cancer deaths were among whites (94%), with only 6 percent occurring among American Indians.

The North Dakota Statewide Cancer Registry indicated a decreasing trend of age-adjusted North Dakota cancer incidence rates from 1998 through 2003. From 2004 through 2007, the oropharyngeal cancer incidence rate declined considerably (from 10.85 to 7.58 incidences per 100,000 population), compared with the national trend.

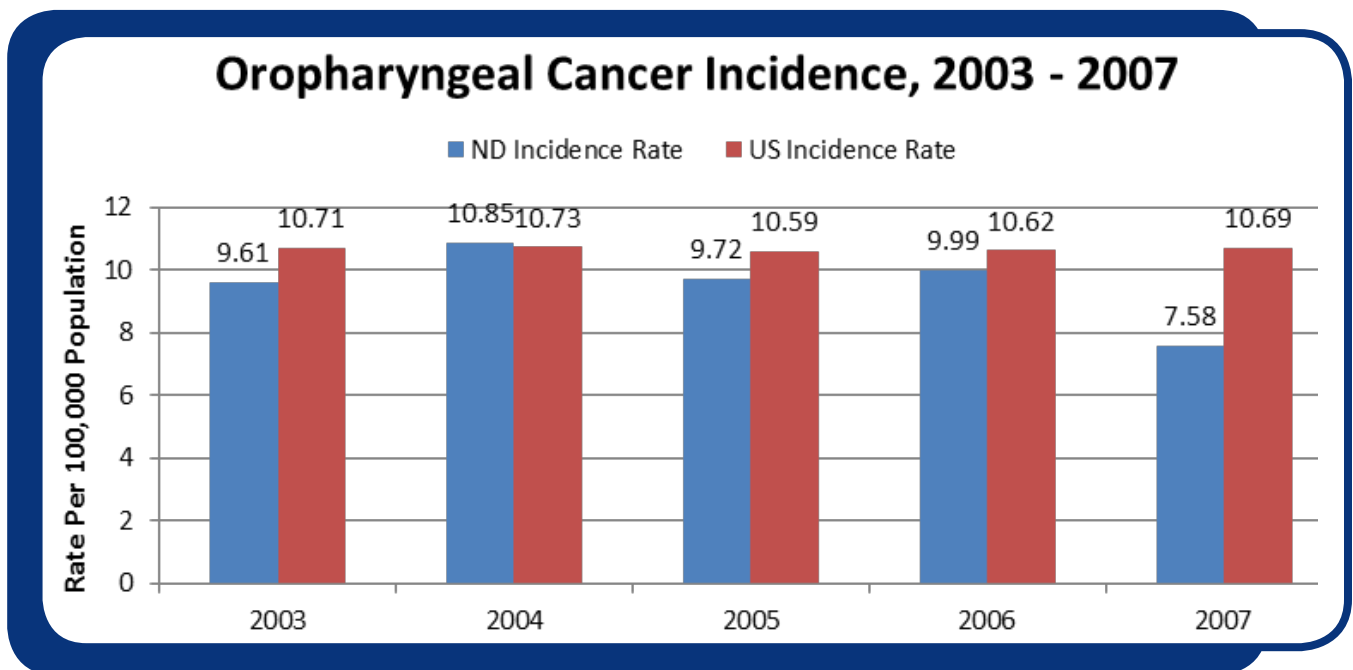


Figure 24: Oropharyngeal Cancer Incidence
Data Source: North Dakota Statewide Cancer Registry

From 2003 through 2006, North Dakota oropharyngeal cancer mortality rates declined considerably from 2.4 to 1.6 deaths per 100,000. However, in 2007, the rate increased to 2.9 per 100,000.

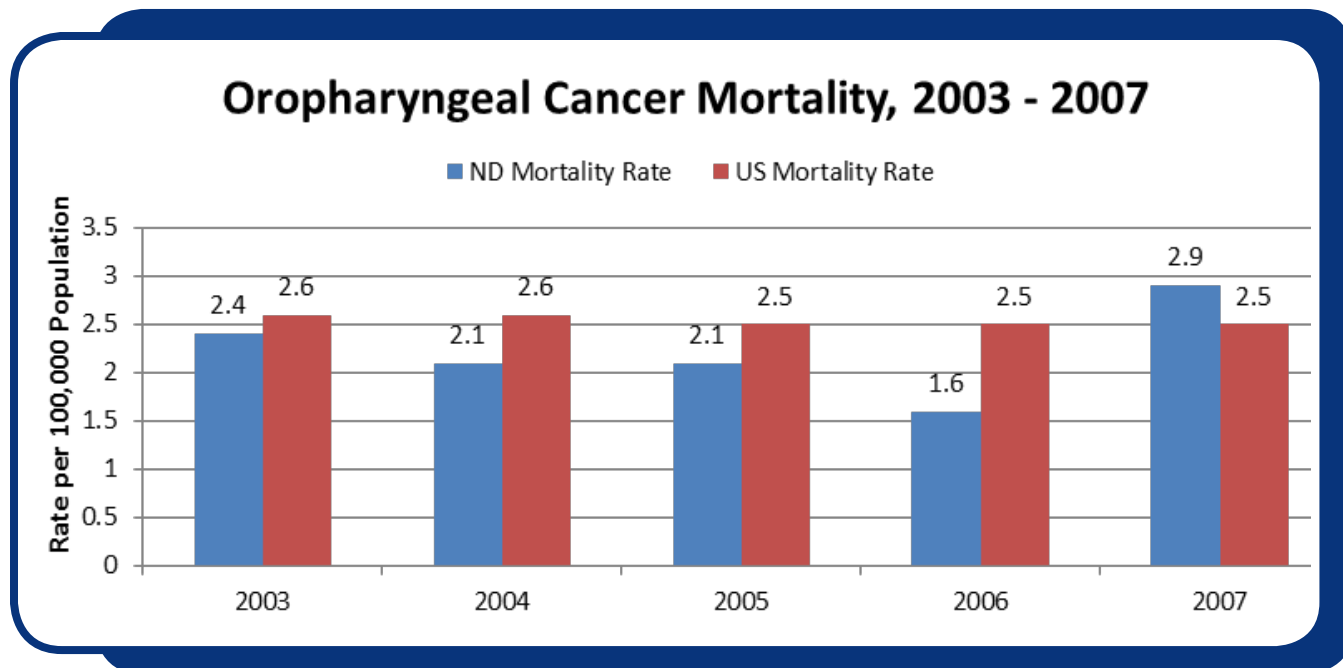


Figure 25: Oropharyngeal Cancer Mortality
Data Source: North Dakota Statewide Cancer Registry



North Dakota vital records data from 2006 through 2010 indicates that age-adjusted resident mortality rates due to oropharyngeal cancer are more than twice as high for men than women.

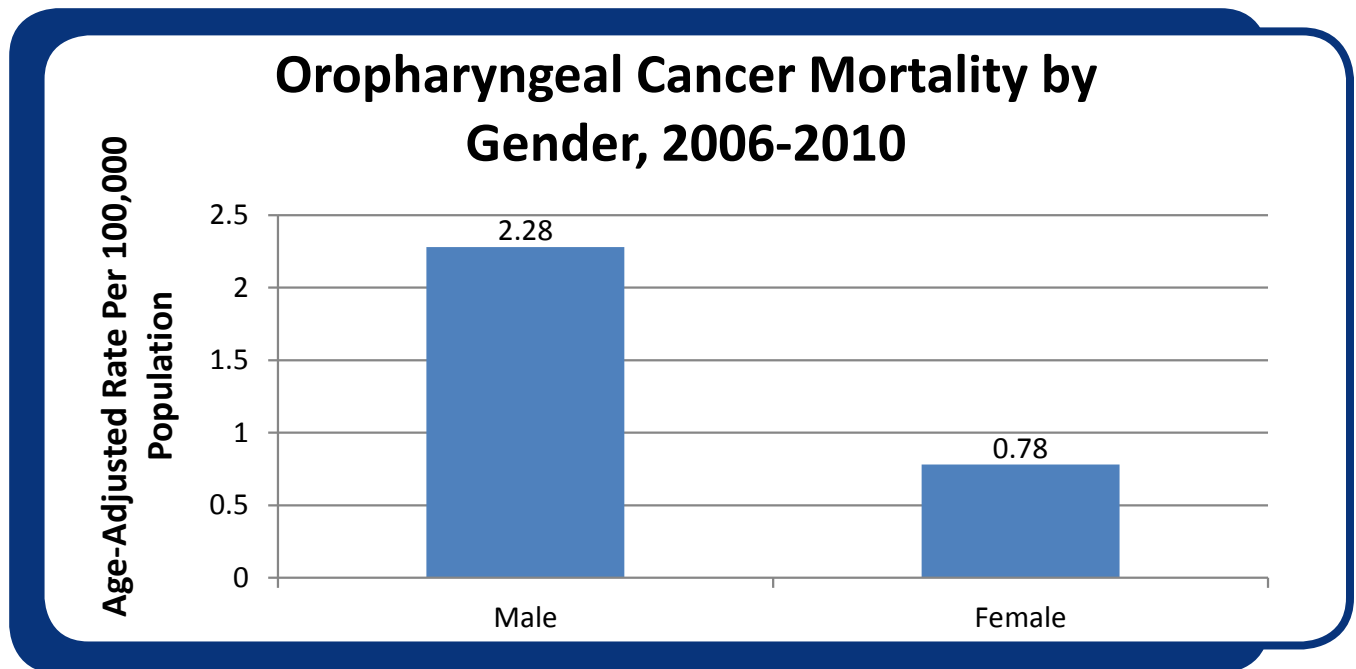


Figure 26: Oropharyngeal Cancer Death Rates by Gender
Data Source: North Dakota Department of Health, Division of Vital Records

Data from 2006 through 2010 indicates that age-adjusted resident mortality rates due to oropharyngeal cancer were higher among American Indians than whites. While the actual number of oropharyngeal cancer deaths were lower among American Indians, the rate is higher due to the smaller population size.

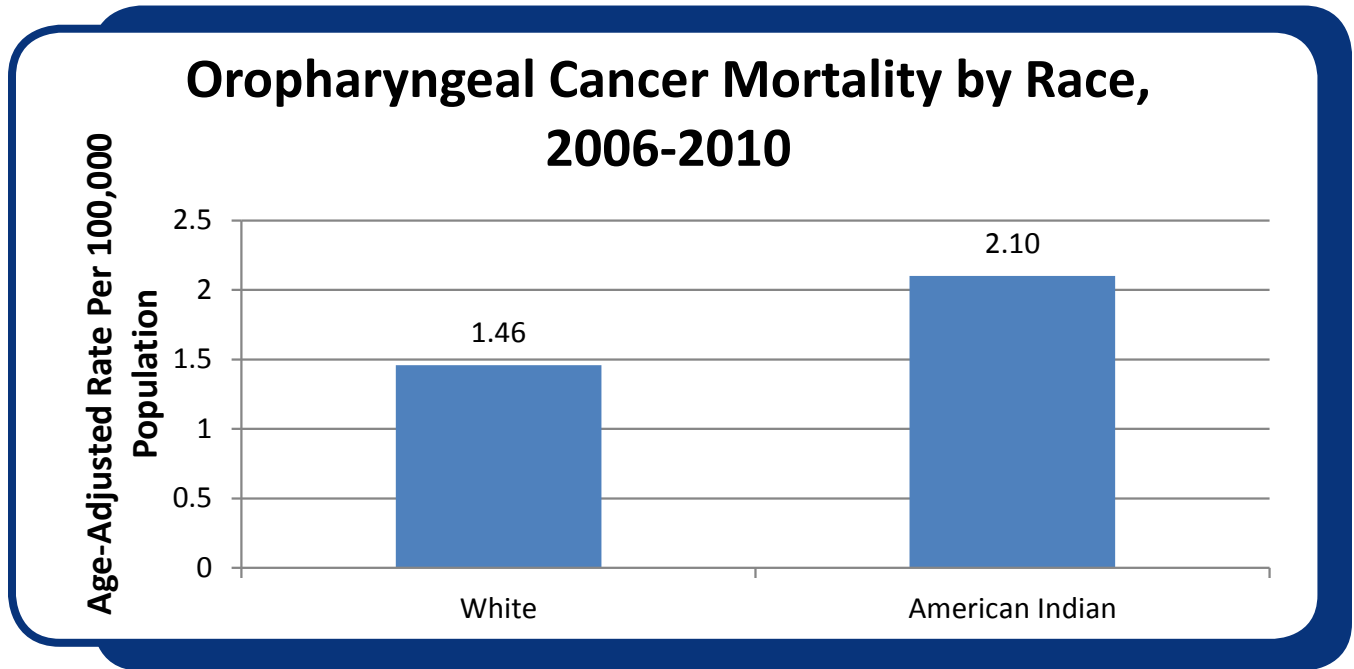


Figure 27: Oropharyngeal Cancer Death Rates by Race
Data Source: North Dakota Department of Health, Division of Vital Records

Based on available evidence that oral cancer diagnosed at an early stage has a better prognosis, several Healthy People 2010 objectives specifically address early detection of oral cancer. Objective 21-6 is to “Increase the proportion of oral and pharyngeal cancers detected at the earliest stage,” and Objective 21-7 is to “Increase the proportion of adults who, in the past 12 months, report having had an examination to detect oral and pharyngeal cancer” (USDHHS, 2000b). Survival rates for oral cancer have not improved substantially over the past 25 years. More than 40 percent of people diagnosed with oral cancer die within five years of diagnosis (Ries et al., 2004), although survival varies widely by stage of disease when diagnosed. The five-year relative survival rate for people with oral cancer diagnosed at a localized stage is 81 percent. In contrast, the five-year survival rate is only 51 percent once the cancer has spread to regional lymph nodes at the time of diagnosis and is just 29 percent for people with distant metastasis.

In North Dakota, the rate of early stage oropharyngeal cancer diagnosis is higher (5.3 per 100,000 persons) than late stage (3.9 per 100,000).

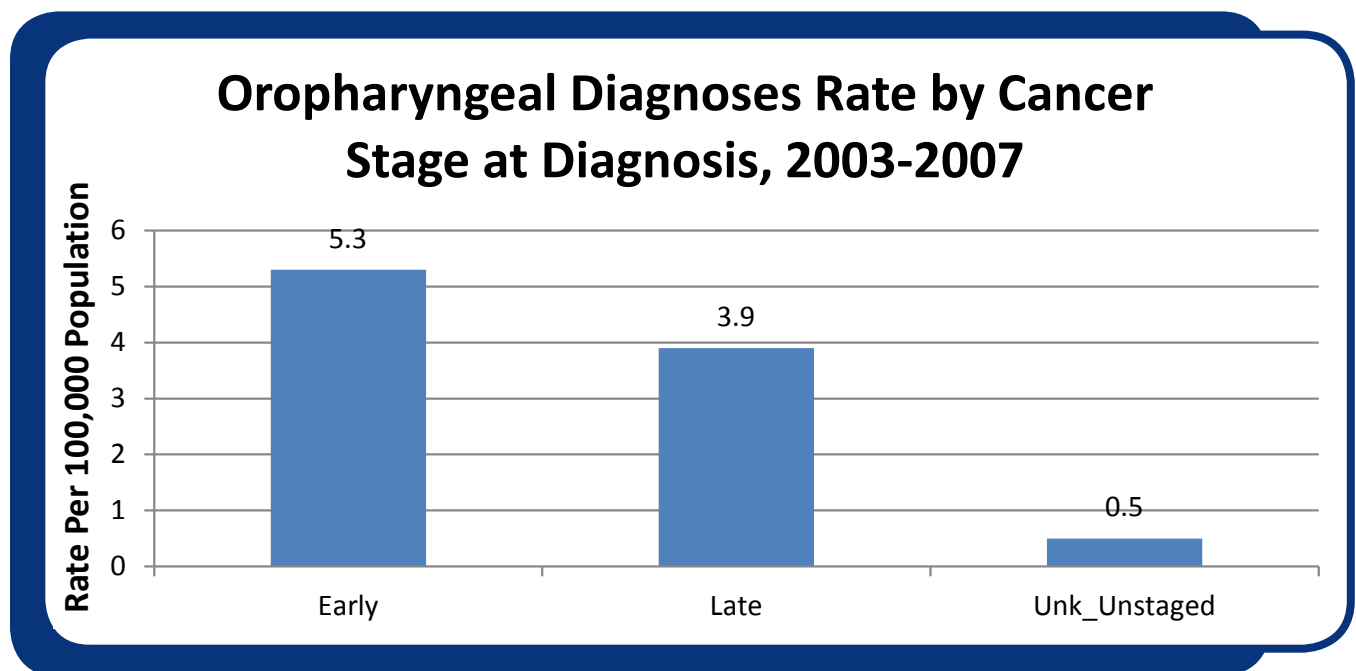


Figure 28: Oropharyngeal Cancer Stage at Diagnosis
Data Source: North Dakota Statewide Cancer Registry

Alcohol abuse and heavy drinking are risk factors for oral cancer (Pelucchi, 2011). In 2010, nearly one-third (32.4%) of North Dakota adults reported binge drinking (defined as five or more alcoholic drinks in a row for males/four alcoholic drinks in a row for females) at least once within the last 30 days. More than one-third of all male respondents (38.4%) and one-fourth of all female respondents (25.7%) reported binge drinking at least once within the past 30 days. Few adults (2.2%), and specifically males (3.1%), reported consuming at least one alcoholic drink six or more days per week within the last 30 days. As shown on figure 29, more than 10 percent of North Dakotans reported having five to eight alcoholic drinks on one occasion within the last 30 days; a majority of respondents answering in the affirmative were male.

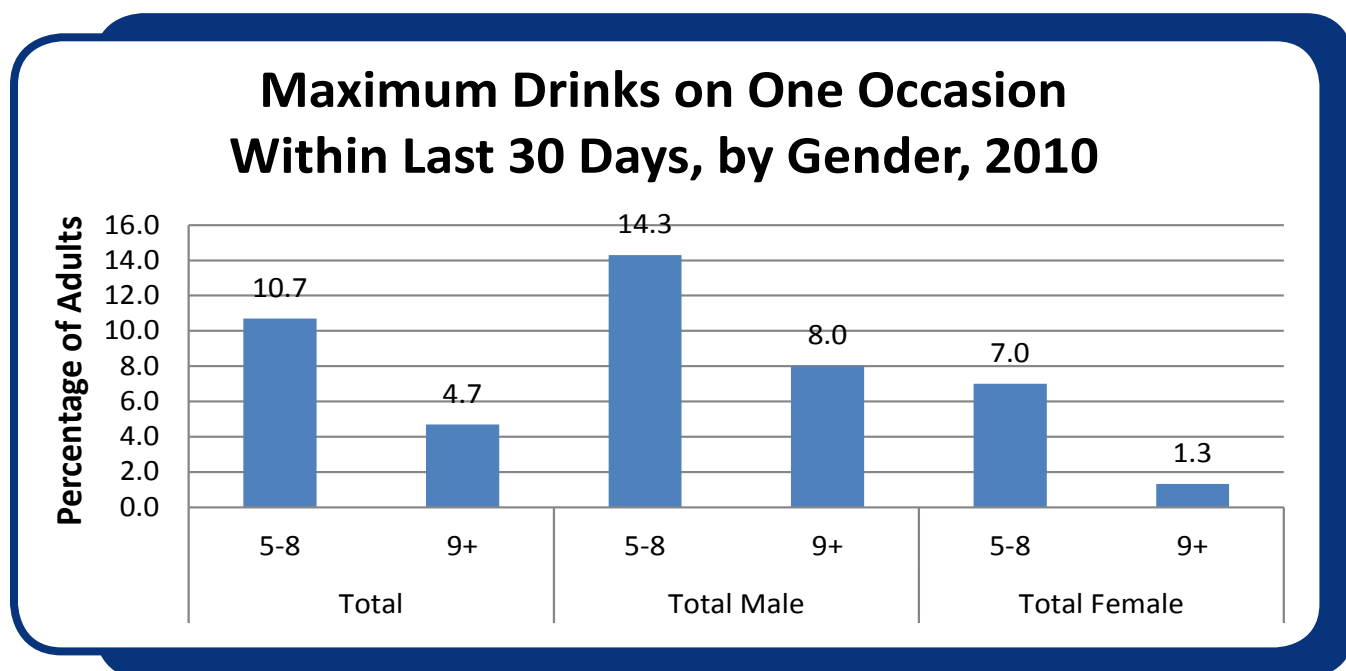


Figure 29: Maximum Drinks on One Occasion among North Dakota Adults
Data Source: Behavioral Risk Factor Surveillance System



Disparities

Race and Ethnic Groups

Nationally, gains in oral health status have been achieved as a whole, although they have not been evenly distributed across subpopulations. African Americans, Hispanics, American Indians and Alaska Natives generally have the highest rates of oral disease of any of the racial and ethnic groups in the U.S. population. These groups tend to be more likely than non-Hispanic whites to experience dental caries, less likely to receive treatment and have more extensive tooth loss. African Americans are more likely to develop oral or pharyngeal cancer and are less likely to have it diagnosed at early stages, which decreases their five-year survival rate.

According to the 2010 Basic Screening Survey (BSS), compared to non-Hispanic white children in North Dakota, a significantly higher proportion of American Indian and minority children had decay experience, untreated decay, and urgent dental needs. Nearly two-fifths (39%) of American Indian children have untreated caries and nearly one-third (29%) have rampant decay. Furthermore, almost two-fifths of American Indian children were found to need urgent and early treatment. Forty-one percent of American Indian children reported to not have brushed their teeth on the day of the screening, and 16 percent reported to not have their own toothbrush.

Women's Health

Access to oral health care can be a challenge for women lacking insurance or residing in poverty. Oral disease is associated with chronic disease among all populations and may cause birth complications for pregnant women (Manjunath, 2012; Pisocya, 2012). Living in poverty can create an oral disease burden, particularly when young children are involved. Approximately one in seven North Dakota women are estimated to live in poverty (14%) and one in 10 lack insurance (8%). Furthermore, an estimated one in 10 women are the sole heads of their households (8.2%). Nearly one in three births in the state were to unmarried women; one in five of these births were to teenagers.

Many, but not all, statistical indicators show women to have better oral health status than do men (Redford, 1993; USDHHS, 2000a). Nationally, women are less likely than men at each age group to have severe periodontal disease. Both African American and white women have a substantially lower incidence rate of oral and pharyngeal cancers than do African American and white men, respectively. However, a higher proportion of women than men have oral-facial pain, including pain from oral sores, jaw joints, face/cheek and burning mouth syndrome.

According to Pregnancy Risk Assessment Monitoring System (PRAMS) data collected in 2002 in North Dakota, the majority (57%) of surveyed women reported that they did not go to a dentist or dental clinic during their most recent pregnancy. Nearly one-third (32%) indicated that they had not had their teeth cleaned by a dentist or dental hygienist in the previous year. Additionally, a higher proportion of Medicaid (69%) than non-Medicaid (52%) recipients did not go to the dentist during their pregnancy.

Nearly two-thirds (64%) of women said that a dental or a health-care worker had not talked with them about caring for their teeth and gums during their most recent pregnancy. Nearly two-thirds of white women (62%) reported not having had discussions about oral care with a dental or health-care worker. However, a strong majority of American Indian women (84%) reported not having oral care discussions with a dental or health-care worker.

Women with higher education were more likely than those with less education to go to a dentist or dental clinic during their pregnancy (52% for 16 or more years of education vs. 37% for those with 12 years of education). American Indian women were three times more likely not to visit a dentist or dental clinic during their pregnancy than were other women (75% vs. 25% respectively). Furthermore, women who lived in rural areas were less likely to visit a dentist or dental clinic during their pregnancy (61% vs. 40%).

Behavioral Risk Factor Surveillance System data of women reporting an annual household income less than \$15,000 indicates that more than one-third have not had a dental visit for at least two years and nearly one-third have not had a teeth cleaning in two or more years. Nearly two-thirds of women with this income reported to have lost six or more teeth due to decay or disease.

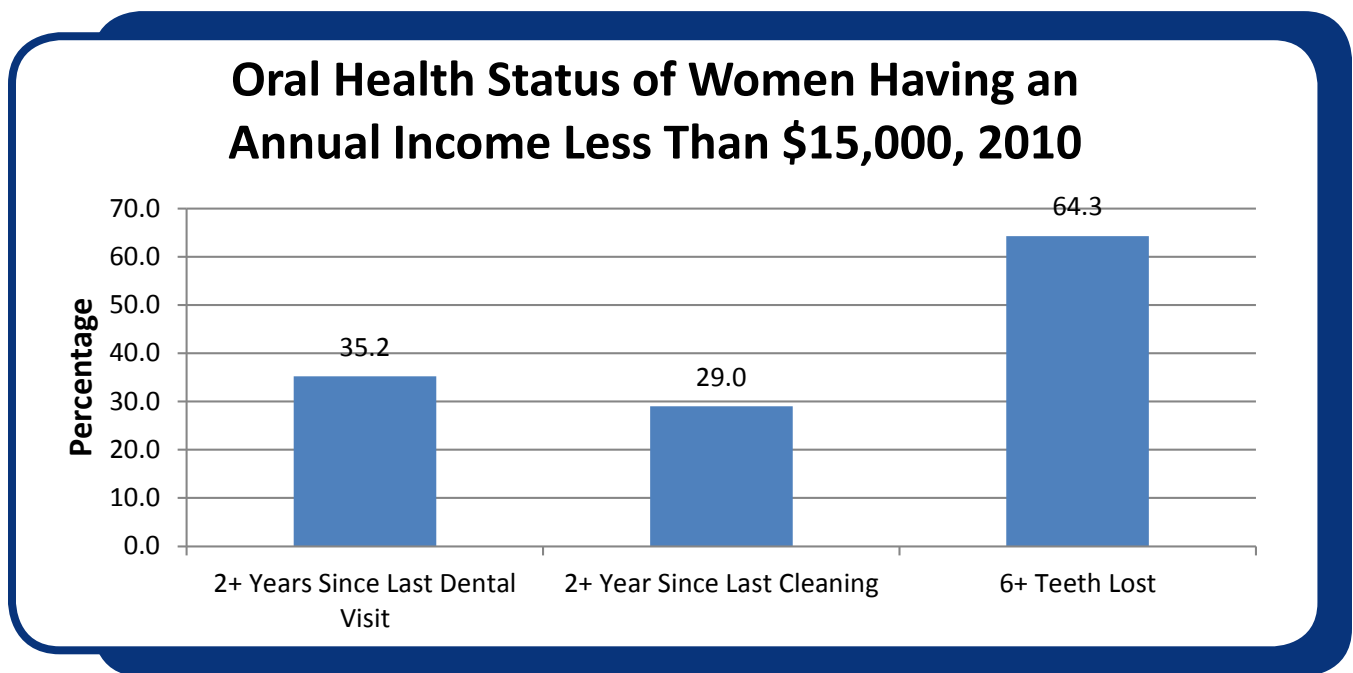


Figure 30: Oral Health Status of North Dakota Women
Data Source: Behavioral Risk Factor Surveillance System

Smoking is associated with periodontal disease, which could cause low-birthweight and premature labor. The 2002 PRAMS found that almost one-fifth of North Dakota mothers who gave birth during a particular year smoked an average of 10 or more cigarettes per day in the three months before pregnancy. Six percent of mothers smoked at least 10 cigarettes a day during the last three months of their pregnancy. There were 7,755 births in 2002, which translates to 465 infants who were born to mothers who were heavy smokers during the third trimester.

People with Disabilities

The oral health problems of individuals with disabilities are complex. These problems may be due to underlying congenital anomalies, as well as to an inability to receive the personal and professional health care needed to maintain oral health. More than 54 million people are defined as disabled under the Americans with Disabilities Act, including almost 1 million children younger than 6 and 4.5 million children from ages 6 through 16.

North Dakota children ages birth through 21 that have or may have a disability or chronic health condition may receive special health-care services through the North Dakota Department of Health, Division of Children's Special Health Services. The 2007 National Survey of Children's Health identified that the health of children with special health-care needs is lower than children without such needs; the proportion of children having been identified as having an emotional, behavioral or developmental issue and reportedly being in excellent or very good health is less than children without an identified issue. In North Dakota, the 2009/2010 National Survey of Children with Special Health Care Needs identified that nearly one in seven children (13.7%) having a special need reported to not need preventive dental care – this is higher than the nation. However, nearly a quarter of parents of children with an identified special need (22.9%) reported that their children needed other dental care beyond a preventive dental visit.

Data from the 2010 BRFSS indicates that nearly one in five adults (18%) reported to be limited in some physical, mental or emotional capacity. Disability can induce challenges to daily oral health and maintenance of annual dental care services. According to BRFSS data for 2006 through 2010, fewer North Dakota adults with disabilities had visited a dentist during the previous year than adults without a disability.

Adults Who Had a Dental Visit Within Previous 12 Months, by Disability Status, 2006-2010

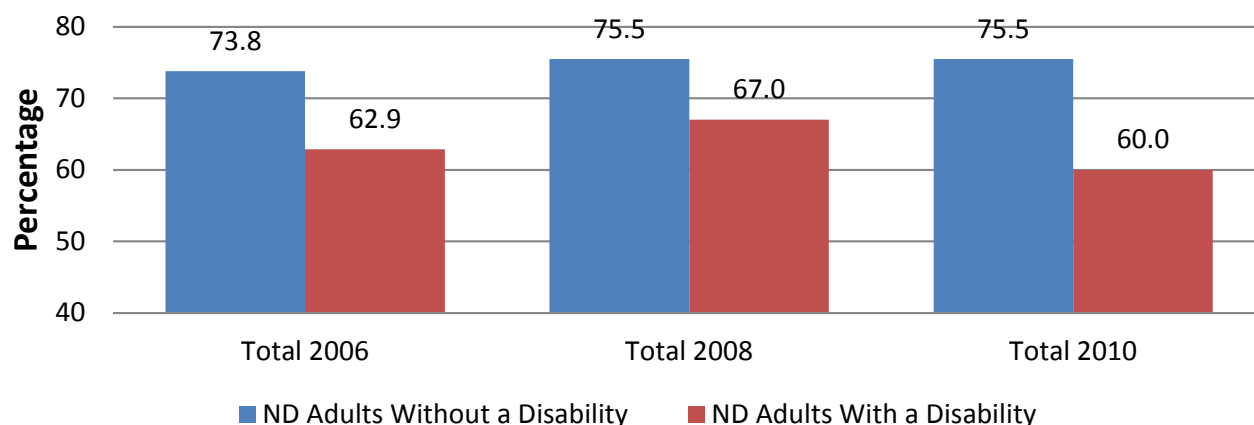


Figure 31: Dental Visits of North Dakota Adults by Disability Status
Data Source: Behavioral Risk Factor Surveillance System

Caries rates among people with disabilities vary widely, but overall their caries rates are higher than those of people without disabilities (USDHHS, 2000a). Several smaller-scale studies show that the population with intellectual disabilities or other developmental disabilities has significantly higher rates of poor oral hygiene and needs for periodontal disease treatment than the general population. This may be due to limitations in understanding and lack of physical ability to perform personal prevention practices or to obtain needed services.

Disparities in screening readily are apparent by poverty status, insurance status and type of insurance coverage. The greater the income level, the higher the proportion of North Dakota residents identified as children with special health-care needs (CSHCN) who were screened. The 2009/2010 National Survey of Children with Special Health Care Needs (NSCSHCN) indicated that a higher percentage of children with special health-care needs at or above 400 percent federal poverty level were screened early and continuously (73.7%) than those at lower federal poverty levels; only 60.4 percent of counterparts at 0-99 percent of federal poverty level were screened early and continuously. This survey also indicated that a higher percentage of children with special health care needs at or above the 400 percent federal poverty level were more likely to need or receive at least one preventive dental visit (92.4%) than those within lower federal poverty levels.

Socioeconomic Disparities

According to the 2010 BRFSS, 11.1 percent of North Dakota adults report to not have health insurance of any kind. People living in low-income families bear a disproportionate burden from oral diseases and conditions. Despite progress in reducing dental caries in the United States, children and adolescents in families living below the poverty level experience more dental decay than do children who are economically better off. Furthermore, the caries seen in individuals of all ages from impoverished families is more likely to be untreated than caries in those living above the poverty level. Nationally, 50 percent of impoverished children ages 2 to 11 have one or more untreated decayed primary teeth, compared with 31 percent of children not living in poverty (USDHHS, 2000a). Impoverished adolescents ages 12 to 17 in each racial/ethnic group have a higher percentage of untreated decay in the permanent teeth than do the corresponding adolescents not living in poverty.

The pattern is similar in adults, with the proportion of untreated decayed teeth being higher among the poor than the nonpoor. At every age, a higher proportion of those at the lowest income level than at the higher income levels have periodontitis. Adults with some college (15%) have 2 to 2.5 times less destructive periodontal disease than do adults with high school (28%) or with less than high school (35%) levels of education (USDHHS, 2000b). Overall, a higher percentage of Americans living below the poverty level are edentulous (have lost all their natural teeth) than are those living above poverty (USDHHS, 2000a). Among people ages 65 and older, 39 percent with less than a high school education were edentulous in 1997, compared with 13 percent of people with at least some college (USDHHS, 2000b). People living in rural areas also have a higher disease burden, most likely because of difficulties in accessing preventive and treatment services.

According to the National Survey of Children’s Health (NSCH), a greater proportion of North Dakota residents with private insurance have teeth in excellent or very good condition than those with public insurance or no insurance.

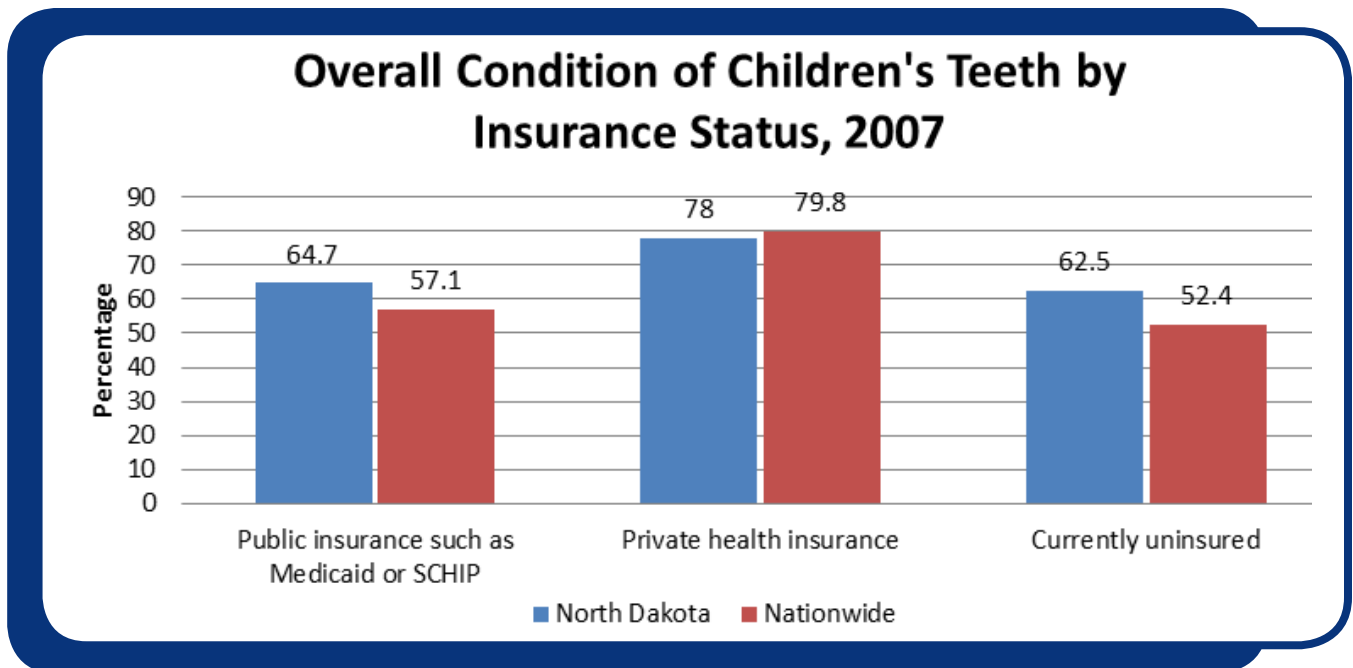


Figure 32: Overall Condition of Teeth of Children 0-17, by Insurance Status

Data Source: National Survey of Children’s Health (NSCH)

Note: Confidence Intervals indicate that there is no significant difference in teeth condition between North Dakota and the United States in each category.

According to the 2007 National Survey of Children’s Health (NSCH), a greater proportion of North Dakota children reported to be within the 100-199 percent federal poverty level received one or more preventive dental care visits within the past 12 months, compared to the national percentage.

One or More Preventive Dental Care Visits During the Past 12 Months, 2007

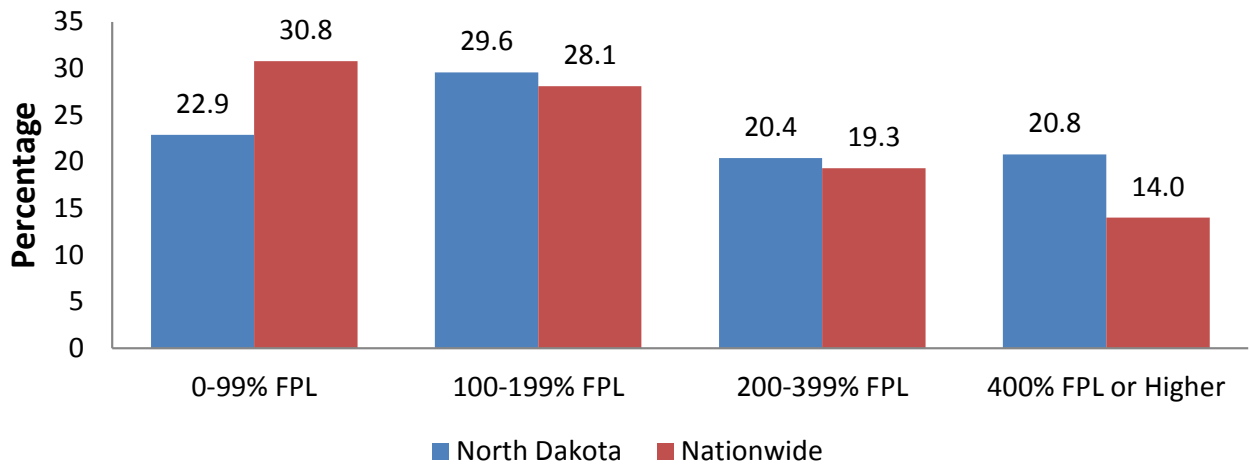


Figure 33: Preventive Dental Visits of Children 0-17, by Federal Poverty Level

Data Source: National Survey of Children’s Health (NSCH)

Note: Confidence Intervals indicate that there is no significant difference in teeth condition between North Dakota and the United States in each category.



Socioeconomic status, frequently measured in the academic setting by levels of free and reduced-price lunch, can influence the regularity and type of dental health access. The 2009-2010 Basic Screening Survey indicated that there is a relationship between the percentage of North Dakota elementary school students enrolled in the Free and Reduced Lunch Program (now identified as Free and Reduced-Priced Meals program) and dental decay of children enrolled in those schools.

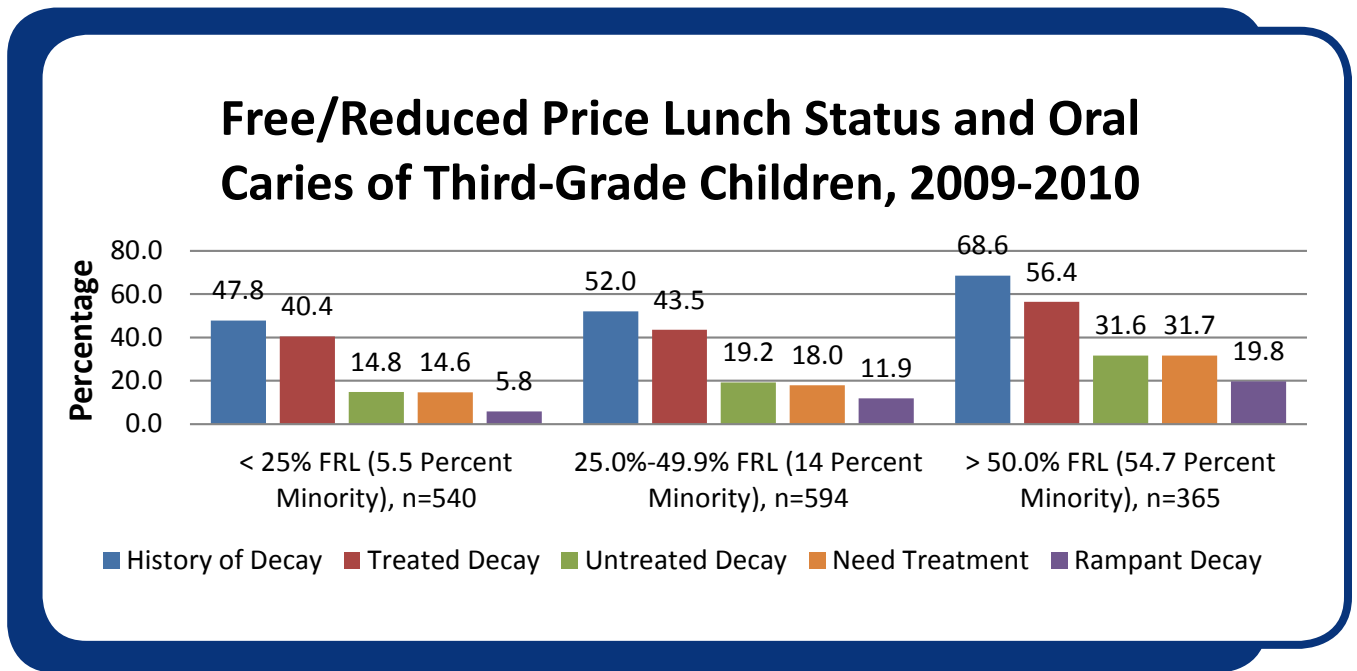


Figure 34: Oral Caries of North Dakota Third-Grade Children by Free/Reduced Lunch Status
Data Source: Basic Screening Survey

Geographic Disparities

The health status of North Dakotans is confronted by a variety of challenges including the unique geography and climate, demographics and socioeconomic factors of the state. North Dakota experiences severe temperature and precipitation fluctuations and can bear relentless wind. Furthermore, North Dakota is prone to annual flooding, tornados (22 reported annually), wind storms and hail storms. Flooding of rivers is caused by the average annual spring thaw of accumulated winter snow (35 inches annually) and significant average annual rainfall (18 inches).

The Health Resources and Services Administration (HRSA) identifies that many North Dakotans currently live in rural areas having a shortage of primary-care professionals (22%) and mental health services (33%). Health-care providers may not be inclined to practice far from regional tertiary-care hospitals, in rural areas with a large elderly population, and in areas with many residents living in poverty and lacking health insurance. A 2010 North Dakota Department of Health workforce survey indicates that nearly half (46%) of North Dakota dentists report to be planning retirement within the next 15 years.

The 2009-2010 Basic Screening Survey (BSS) results were analyzed by urban/rural county status and are shown in Table 3. Confidence intervals (CI) indicate with 95 percent confidence that the percentage of actual North Dakota third-grade children having the indicated health condition fall within the interval range.

Table 3: Oral Health of North Dakota Third-Grade Children by Urban/Rural Status
Data Source: 2009-2010 Basic Screening Survey

Condition	Urban - All Races (n=999) Percent			Rural - All Races (n=500) Percent		
	Percent	95% CI		Percent	95% CI	
History of decay	49.7	46.6	52.8	64.3	60.0	68.6
Treated decay	41.3	38.3	44.4	54.1	49.6	58.6
Untreated decay	17.1	14.7	19.4	28.0	24.0	32.0
Rampant decay	8.4	6.6	10.1	18.3	14.7	21.8
Dental sealants	58.4	55.3	61.4	64.5	60.1	68.8
Treatment urgency						
- None	83.3	81.0	85.6	73.0	69.0	76.9
- Early care needed	14.6	12.4	16.8	25.5	21.6	29.4
- Urgent care needed	2.1	1.2	3.0	1.6	0.5	2.6
Need treatment (early and urgent)	16.7	14.4	19.0	27.0	23.1	31.0

Long-Term Care Disparities

According to the World Health Organization (WHO), “the age distribution of the world’s population is changing [as the number of people 65 or older] is estimated to double in 2025. The post-war baby-boom generation reached age 65 in 2011, significantly augmenting the number of older people.”

“As people age, their susceptibility to chronic and life-threatening diseases, as well as acute infections increases, exacerbated by compromised immune systems. Cancer, cardiovascular diseases, diabetes, infections and poor oral health, most notably tooth loss and severe periodontal conditions, are more prevalent in this age group. The consequences of these diseases and conditions are significant, leading to disabilities and reduced quality of life. Barriers to oral health care among the elderly are considerable. Impaired mobility impedes access to oral health care, particularly for those who reside in rural areas with poor public transport. The situation is worsened in developing countries when oral health services and domiciliary care are not available. Given that some older people may experience financial hardship following retirement, the cost or perceived cost of dental treatment, together with poor attitudes to oral health, may deter them from visiting a dentist. The fear of violence may make them apprehensive of strangers, hindering good communications with oral health services providers” (WHO, 2011).

The North Dakota Department of Health, in conjunction with the North Dakota Long Term Care Association, will be conducting the Basic Screening Survey (BSS) for Older Adults, an oral health assessment, at long-term care facilities during 2012. Participants will be assessed for the presence of dentures, tooth loss, oral hygiene, urgency of need for dental care and insurance status. Results will be used to assess oral health needs of older adults in North Dakota, with a goal of developing A Generation of Smiles, a program that provides oral health services to older adults.



Societal Impact of Oral Disease

Oral health is related to well-being and quality of life as measured along functional, psychosocial and economic dimensions. Diet, nutrition, sleep, psychological status, social interaction, school and work are affected by impaired oral and craniofacial health. Oral and craniofacial diseases and conditions contribute to compromised ability to bite, chew and swallow foods; limitations in food selection; and poor nutrition. These conditions include tooth loss, diminished salivary functions, oral-facial pain conditions such as temporomandibular disorders, alterations in taste and functional limitations of prosthetic replacements. Oral-facial pain, as a symptom of untreated dental and oral problems and as a condition in and of itself, is a major source of diminished quality of life. It is associated with sleep deprivation, depression and multiple adverse psychosocial outcomes.

More than any other body part, the face bears the stamp of individual identity. How a person looks has an important effect on psychological development and social relationships. Considering the importance of the mouth and teeth in verbal and nonverbal communication, diseases that disrupt their functions are likely to damage self-image and alter the ability to sustain and build social relationships. The social functions of individuals encompass a variety of roles, from intimate interpersonal contacts to participation in social or community activities, including employment. Dental diseases and disorders can interfere with these social roles at any or all levels. Perhaps due to social embarrassment or functional problems, people with oral conditions may avoid conversation, laughing, smiling or other nonverbal expressions that show their mouth and teeth.

Economic Impact of Oral Disease

Direct Costs of Oral Diseases

Expenditures for dental services in the U.S. in 2003 were \$74.3 billion, 4.4 percent of the total spent on health care that year (CMS, 2011).

Dental services are the second highest out-of-pocket expenditure, second only to prescription drugs. Nationally in 2003, 44 percent of dental care was paid out-of-pocket, 49 percent was paid by private dental insurance, and 7 percent was paid by federal or state government sources. In comparison, 10 percent of physician and clinical services was paid out-of-pocket, 50 percent was covered by private medical insurance, and 33 percent was paid by government sources (CMS, 2011).

Indirect Costs of Oral Diseases

Oral and craniofacial diseases and their treatment place a burden on society in the form of lost days and years of productive work. Acute dental conditions are responsible for an estimated loss of one to two million days of school – an estimated three days for every 100 students. Adults face the burden of acute oral conditions; an estimated 2.4 million days of work are lost on an annual basis nationally (USDHHS 1999). In addition, chronic disease including cancer contribute to quality and productivity of life and may lead to premature death.

Oral Disease and Other Health Conditions

Oral health and general health are integral to each other. Many systemic diseases have oral signs and symptoms. These manifestations may be the initial sign of clinical disease and therefore may inform health-care providers and others of need for further assessment. The oral cavity is a portal of entry, as well as the site of disease for bacterial and viral infections that affect overall health status. Research suggests a relationship between periodontal inflammation and increased risk of chronic disease including diabetes, heart/cardiovascular disease, respiratory infection, as well as premature birth in pregnant women (Southerland, 2012; Pisocya, 2012; Hodge, 2011; Manjunath, 2012). The 2010 Behavioral Risk Factor Surveillance System (BRFSS) indicates that a higher percentage of North Dakotans that have been diagnosed with chronic health conditions have had tooth loss due to decay or gum disease than North Dakotans as a whole, as shown in the graph below.

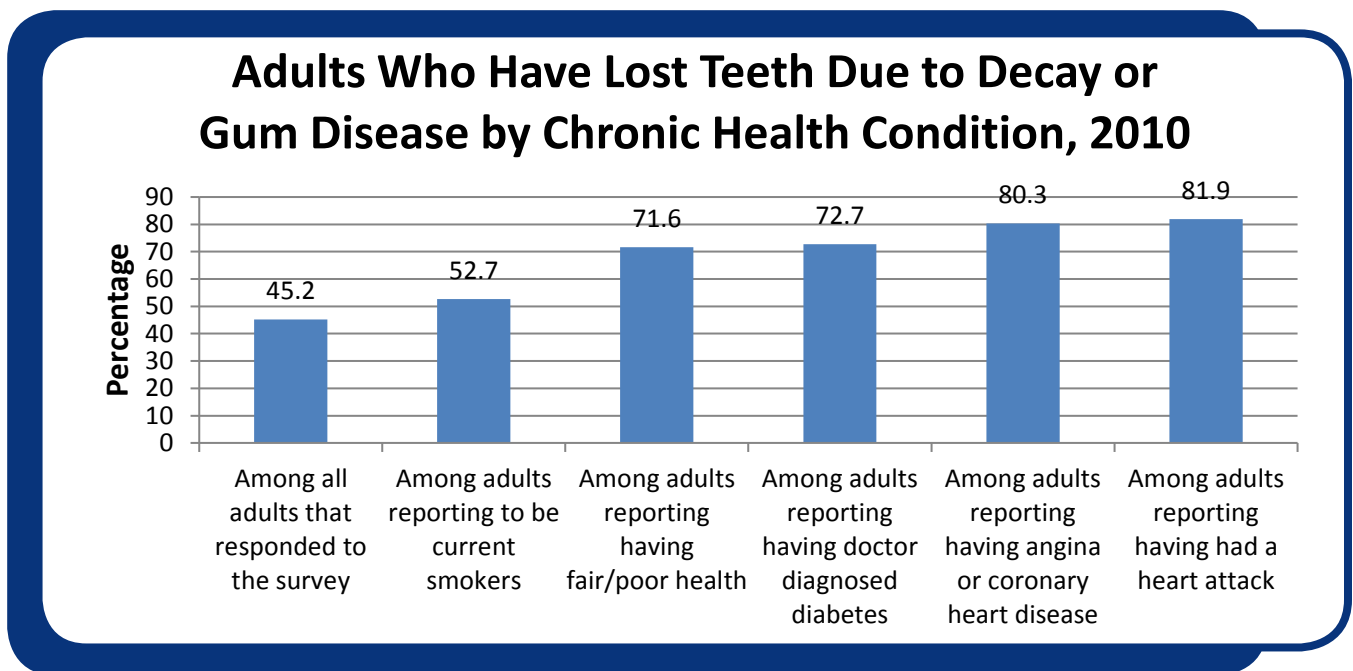


Figure 35: Tooth Loss of North Dakota Adults by Chronic Condition
Data Source: Behavioral Risk Factor Surveillance System

Complications of diabetes include susceptibility to periodontal disease and healing problems. It is important for individuals with diabetes to obtain regular oral health care. According to the 2010 BRFSS, more than one-third (34.6%) of North Dakota adults with diabetes reported to not have had a dental visit within the past year. In 2010, approximately 65 percent of adult males and 66 percent of adult females with diabetes reported they had visited the dentist within the past year, compared to 69.5 percent of males and 73.6 percent of females without diabetes who had been to the dentist within the past year.

Adults with Diabetes Having a Dental Visit Within the Past Year, by Gender, 2008-2010

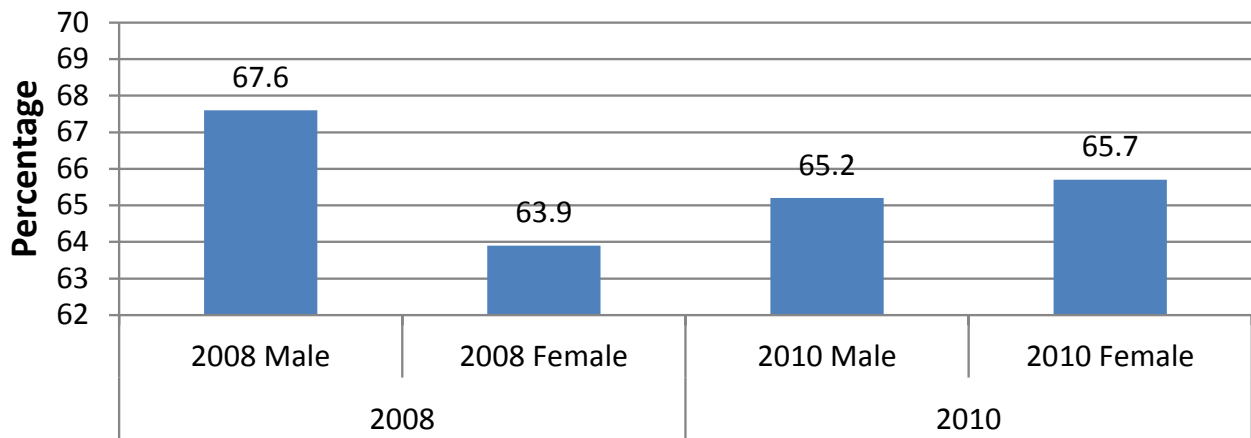


Figure 36: Dental Visits among North Dakota Adults with Diabetes
Data Source: Behavioral Risk Factor Surveillance System

RISK AND PROTECTIVE FACTORS AFFECTING ORAL DISEASES

Many common oral diseases are preventable. Safe and effective measures are available to reduce the incidence of oral disease, reduce disparities and increase quality of life. Oral health literature relevant to the charge of preventing oral disease and providing oral health for all, despite a myriad of complex public health issues, will be discussed in this chapter (NDDoH, 2010). “Oral health” means much more than an absence of disease in the oral cavity, but includes a broader approach including the “ability of individuals to carry out essential functions ... [and] contribute fully to society” (NIDCR, 2010a).

Preventive Visits

Maintaining good oral health takes repeated efforts on the part of the individual, caregivers and health-care providers. Daily oral hygiene routines and healthy lifestyle behaviors play an important role in preventing oral diseases. Preventive screenings and dental care are fundamental activities in maintaining a life of good oral hygiene and care. National and state efforts for children to receive preventive dental visits have paid off as the proportion of U.S. children visiting the dentist within the past year has increased. Preventive visits include screenings for dental caries, a relentless disease in which acids produced by bacteria cause destruction of the tooth enamel and dentin. Unchecked, dental caries can result in loss of tooth structure, inadequate tooth function, unsightly appearance, pain, infection and tooth loss.

From the medical provider’s perspective, dela Cruz and Rozier (2010) argue that dental caries prevention should be a priority and within their scope of service. Discussion continues about whether oral health assessment should be part of the medical curricula. During the preventive screenings, medical and dental-care providers can check for other health concerns, such as obesity or eating disorders, both which affect oral health, and refer patients to necessary services (Vann and Bouwens, 2010 and Hague, 2010).

Community Water Fluoridation

Community water fluoridation is the process of adjusting the natural fluoride concentration of a community’s water supply to a level that is best for the prevention of dental caries. Most water supplies contain trace amounts of fluoride. Water systems are considered naturally fluoridated when the natural level of fluoride is greater than 0.7 parts per million (ppm). When a water system adjusts the level of fluoride to 0.7 ppm, it is referred to as community water fluoridation.

In the U.S., community water fluoridation has been the basis for the primary prevention of dental caries for 60 years and has been recognized as one of the 10 great achievements in public health over the 20th century (CDC, 1999). It is an ideal public health method because it is effective, eminently safe, inexpensive, requires no behavior change by individuals and does not depend on access or availability of professional services. Water fluoridation is equally effective in preventing dental caries among different socioeconomic, racial and ethnic groups. Fluoridation helps to lower the cost of dental care and helps residents retain their teeth throughout life (USDHHS, 2000a).

Recognizing the importance of community water fluoridation, Healthy People 2010 Objective 21-9 is “Increase the proportion of the U.S. population served by community water systems with optimally-fluoridated water to 75 percent.” People living in communities with fluoridated water have about 25 percent less tooth decay than those living where the water is not fluoridated. In 2010, 73.9 percent of the U.S. population served by community water fluoridation received optimally fluoridated water, compared to 96.9 percent of the North Dakota population on community water systems (CDC, 2010).

Fluoridation prevents tooth decay. Ongoing research indicates that children from optimally-fluoridated areas have fewer caries (Armfield, 2010). Not only does community water fluoridation effectively prevent dental caries, it is one of very few public health prevention measures that offer significant cost savings to almost all communities (Griffin et al., 2001). The CDC estimates that for every \$1 invested in community water fluoridation, up to \$38 is saved in averted costs. The cost per person of instituting and maintaining a water fluoridation program in a community increases with increasing population size.

Because frequent exposure to small amounts of fluoride each day will best reduce the risk of dental caries in all age groups, all people should drink water with an optimal fluoride concentration and brush their teeth twice daily with fluoride toothpaste (CDC, 2001). For communities that do not receive fluoridated water and populations at high risk of dental caries, additional fluoride measures might be needed.

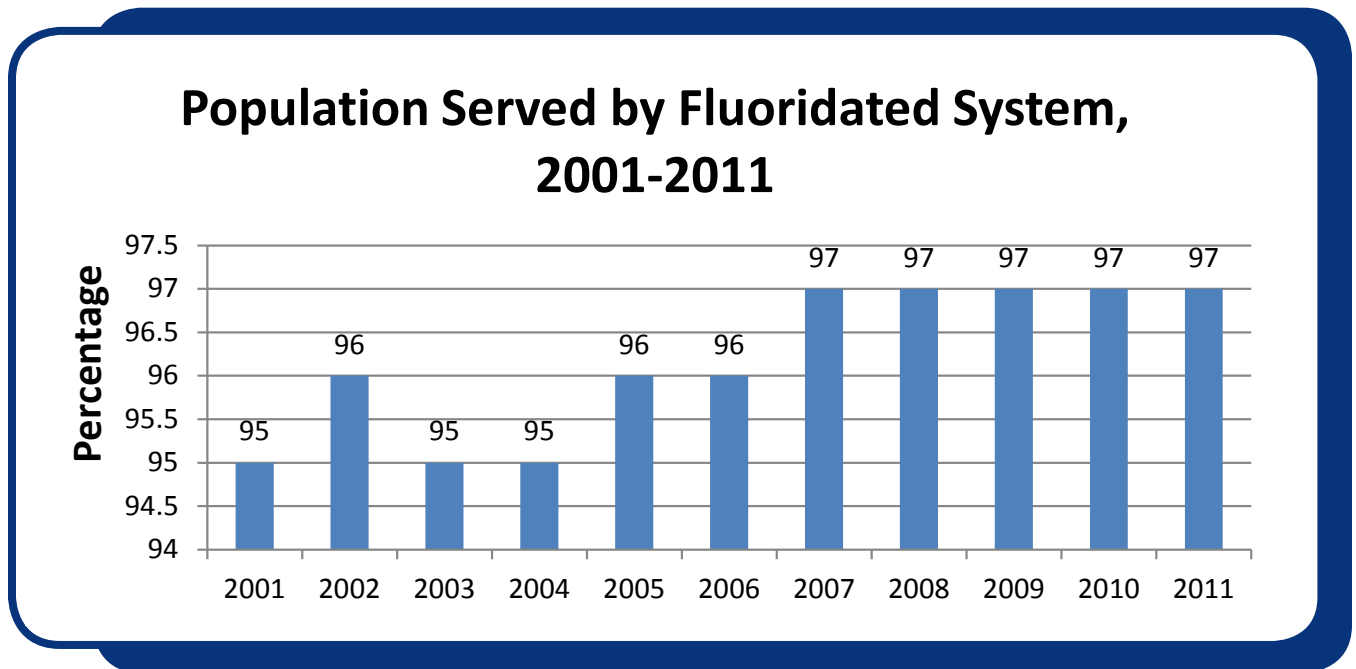


Figure 37: North Dakota Population Served by Community Water Systems Receiving Fluoridated Water

Data Source: Water Fluoridation Reporting System

Topical Fluorides and Fluoride Supplements

Fluoride varnish is available at dental offices applied by dentists or dental hygienists, as well as through public health and medical offices, applied by trained physicians and nurses. Fluoride taken systemically should be prescribed and monitored by a medical professional (physician or dentist) only and used in special cases.

An assessment of topical fluoride use in North Dakota can be obtained through a variety of community measures including fluoride mouth rinse and fluoride varnish programs, which typically are conducted in schools. Individual measures include professionally applied topical fluoride gels or varnish for people at high risk of caries. In the past, several North Dakota schools have participated in the fluoride mouth rinse program coordinated through the North Dakota Department of Health's Oral Health Program. Recently, the Oral Health Program started providing fluoride varnish treatments in schools, and facilitates trainings so treatments can be applied at public health clinics and physician's offices. The Oral Health Program also provides fluoride varnish treatments in schools and facilitates treatments at public health clinics and pediatrician offices. Implementation of a community-based program for fluoride varnish treatment application is in the planning phase.

Dental Sealants

Since the early 1970s, the incidence of childhood dental caries on smooth tooth surfaces (those without pits and fissures) has declined markedly because of widespread exposure to fluorides. Most decay among school age children now occurs on tooth surfaces with pits and fissures, particularly the molar teeth.

Pit and fissure dental sealants – plastic coatings bonded to susceptible tooth surfaces – have been approved for use for many years and have been recommended by professional health associations and public health agencies. First permanent molars erupt into the mouth at about age six. Placing sealants on these teeth shortly after their eruption protects them from the development of caries on surface areas of the teeth where food and bacteria are retained. If sealants were applied routinely to susceptible tooth surfaces in conjunction with the appropriate use of fluoride, most tooth decay in children could be prevented (USDHHS, 2000a).

Second permanent molars erupt into the mouth at approximately age 12 to 13. Pit and fissure surfaces of these teeth are as susceptible to dental caries as the first permanent molars of younger children. Therefore, adolescents need to receive dental sealants shortly after the eruption of their second permanent molars.

The Healthy People 2010 target for dental sealants on molars is 50 percent for 8-year-olds and 14-year-olds. Nationally, within each age group, African Americans and Mexican Americans are less likely than non-Hispanic whites to have sealants. The prevalence of sealants also varies by the education level of the head of household. According to the 2010 Basic Screening Survey, North Dakota American Indian third-grade children were more likely to have sealants than white or other minority children in third grade. Children of another minority race were the least likely to have dental sealants. However, American Indian children still had the greatest need for dental treatment out of all races.

Screening for Oral Cancer

Cigarette smoking and alcohol are the major known risk factors for oral cancer in the U.S., accounting for more than 75 percent of these cancers (Hashibe, 2012). The use of smokeless tobacco (Warnakulasuriya, 2010; IARC, 2007) and cigars (O'Connor, 2012) also increases the risk of oral cancer. Radiation from sun exposure is a risk factor for lip cancer (Polefka, 2012). Furthermore, dietary factors and some types of viral infections also have been implicated as risk factors for oral cancer (Wang, 2012; McLaughlin-Drubin, 2010).

Early detection of oral cancers improves overall survival rates. Therefore, it is imperative for individuals to be screened annually by dental or other health-care professionals. This is an opportunity for collaboration between public and private health-care professionals. Initial strides have been made in this area by promoting oral cavity and tongue screening for signs and symptoms of cancer among dental professionals.

Oral cancer detection is accomplished by a thorough examination of the head and neck; an examination of the mouth including the tongue, the entire oral and pharyngeal mucosal tissues and the lips; and palpation of the lymph nodes. Although the sensitivity and specificity of the oral cancer examination have not been established in clinical studies, most experts consider early detection and treatment of precancerous lesions and diagnosis of oral cancer at localized stages to be the major approaches for secondary prevention of these cancers (Maybury, 2012; Ram, 2011). If suspicious tissues are detected during an examination, definitive diagnostic tests such as biopsies are needed to make a firm diagnosis.

Recognizing the need for dental and medical providers to examine adults for oral and pharyngeal cancer, Healthy People 2010 Objective 21-7 is “Increase the proportion of adults who, in the past 12 months, report having had an examination to detect oral and pharyngeal cancers.” Nationally, relatively few adults 40 and older (13 percent) reported receiving an examination for oral and pharyngeal cancer, although the proportion varied by race/ethnicity.

An advisory group to the North Dakota Cancer Coalition, the Early Detection and Screening work group, identified activities for inclusion in the North Dakota Cancer Control Plan to encourage health professionals to routinely screen individuals for oral cancer regardless of risk factors. Individuals also were advised to avoid other potential carcinogens, such as exposure to sunlight without protection (a risk factor for lip cancer). Use of lip sunscreen and hats was recommended.

Tobacco Control

Tobacco use has a devastating effect on the health and well-being of the public. More than 400,000 Americans die each year as a direct result of cigarette smoking, making it the nation's leading preventable cause of premature mortality. In addition, smoking annually costs the U.S. more than \$193 billion (i.e., \$97 billion in lost productivity and \$96 billion in health-care expenditures) (CDC, 2012b). The effects of tobacco use on the public's oral health also are alarming. The use of any form of tobacco — including cigarettes, cigars, pipes and smokeless tobacco — has been established as a major cause of oral and pharyngeal cancer. The evidence is sufficient to consider smoking as a causal factor for adult periodontitis (USDHHS, 2004a); one-half of the cases of periodontal disease in this country may be attributable to cigarette smoking (Tong, 2010). Tobacco use substantially worsens the prognosis of periodontal therapy and dental implants, impairs oral wound healing and increases the risk of a wide range of oral soft tissue changes (Warnakulasuriya, 2010; Manjunath, 2012).

Comprehensive tobacco control would have a large impact on oral health status. The goal of comprehensive tobacco control programs is to reduce disease, disability and death related to tobacco use by:

- Preventing the initiation of tobacco use among young people.
- Promoting quitting among young people and adults.
- Eliminating nonsmokers' exposure to secondhand tobacco smoke.
- Identifying and eliminating the disparities related to tobacco use and its effects among different population groups.

Tobacco use is universally recognized as a risk factor to periodontal disease. According to Malhotra, et al., complications from tobacco use include increased space between teeth and gums (pocket depths) and structure loss (2010). The dental office provides an excellent venue for providing tobacco intervention services. More than one-half of adult smokers see a dentist each year (Maybury, 2012). Dental patients are particularly receptive to health messages at periodic check-up visits, and oral effects of tobacco use provide visible evidence and a strong motivation for tobacco users to quit. Because dentists and dental hygienists can be effective in treating tobacco use and dependence, the identification, documentation and treatment of every tobacco user they see needs to become a routine practice in every dental office and clinic (Fiore et al., 2000).

Oral Health Education

Community oral health education is a process that informs, motivates, and helps people to adopt and maintain beneficial health practices and lifestyles; advocates environmental changes as needed to facilitate this goal; and conducts professional training and research to the same end (Kressin & DeSouza, 2003). Although health information or knowledge alone does not necessarily lead to desirable health behaviors, knowledge may help empower people and communities to take action to protect their health.

A research study by Sharma and Hegde found that obese and overweight children had increased prevalence of dental caries (2009). Not only are physical and emotional health improved through healthy eating and positive lifestyle behaviors, but systemic health and oral health also are improved. Better food choices can reduce dental caries and prevent obesity-related systemic diseases, particularly diabetes (Tavares and Chomitz, 2010).

Pregnancy and Oral Health

Most oral diseases and conditions are complex and are the product of interactions between genetic, socioeconomic, behavioral, environmental and general health influences. Multiple factors may act together to place some women at higher risk of oral diseases. For women that live in poverty, are not insured or are the sole heads of their households, obtaining needed oral health care may be difficult.

Numerous studies have shown that pregnancy may impact women's oral health and that poor oral health may contribute to pre-term and low-birthweight babies (Offenbacher et al., 2001). During pregnancy, a woman may be particularly receptive to disease prevention and health promotion interventions that could enhance her health or that of her fetus (Gaffield et al., 2001). One key preventive intervention that research has shown to positively influence a pregnant woman's health and prevent orofacial clefts in infants is the use of folic acid during pregnancy (Wehby and Murray, 2010).

Tooth Loss

A full dentition is defined as having 28 natural teeth, exclusive of third molars (the wisdom teeth) and teeth removed for orthodontic treatment or because of trauma. Most people can keep their teeth for life with adequate personal, professional and population-based preventive practices. As teeth are lost, a person's ability to chew and speak decreases and interference with social functioning can occur. The most common reasons for tooth loss in adults are lack of proper oral hygiene through daily brushing and flossing, leading to tooth decay and periodontal (gum) disease. Tooth loss also can result from bacterial infections, although research suggests that periodontal pathogens may still thrive in the oral cavity of edentulous people (those who have lost all their natural teeth) (De Marchi RJ and Hugo FN et al., 2010).

In addition, unintentional injury and treatment for head and neck cancer, as well as certain orthodontic and prosthetic services, may cause or require the removal of teeth. Among all predisposing and enabling factors, low educational level often has been found to have the strongest and most consistent association with tooth loss. Overall, a higher percentage of Americans living below the poverty level are edentulous than are those living above the poverty level (USDHHS, 2000a).

PROVISION OF DENTAL SERVICES

The U.S. Surgeon General reports that “safe and effective disease prevention measures exist that everyone can adopt to improve oral health and prevent disease” (USDHHS, 2000a). Collaboration between the federal and state government, health-care facilities and schools often is required. The North Dakota Department of Health’s Oral Health Program collaborates with several organizations and agencies including the Association of State and Territorial Dental Directors (ASTDD), U.S. Centers for Disease Control and Prevention (CDC), Children’s Dental Health Project (CDHP), Community HealthCare Association of the Dakotas (CHAD), Council of State and Territorial Epidemiologists (CSTE), DentaQuest Foundation, U.S. National Oral Health Alliance (NOHA) and the North Dakota Oral Health Coalition (NDOHC), in order to establish a position for national, state and local oral health success.

Although appropriate home oral health care and population-based prevention are essential, professional care also is necessary to maintain optimal dental health. Regular dental visits provide an opportunity for the early diagnosis, prevention and treatment of oral diseases and conditions for people of all ages, and for the assessment of self-care practices. Adults who do not receive regular professional care can develop oral diseases that eventually require complex treatment and may lead to tooth loss and health problems. People who have lost all their natural teeth are less likely to seek periodic dental care than those with teeth, thus decreasing the likelihood of early detection of oral conditions such as oral cancer or soft tissue lesions.

The Healthy People 2010 target for the percentage of adults having visited the dentist in the previous year is 56 percent. The rate of dental visits for North Dakota adults (18 or older) is high, at 74.1 percent. This mirrors the 2008 national rate (including territories) of 71.2 percent. Although progress has been made in the oral health of North Dakotans, disparities remain. Access to preventive care remains a problem for some segments of the population, specifically low-income and minority individuals. Individual knowledge of how oral health relates to general health is limited, and the mouth is frequently fragmented from the rest of the body.

Dental Workforce and Capacity

The oral health-care workforce is critical to society’s ability to deliver high-quality dental care in the U.S. Effective health policies intended to expand access, improve quality or constrain costs must take into consideration the supply, distribution, preparation and utilization of the health workforce.

Dental Workforce Diversity

North Dakota is characterized by a chronic shortage of health professionals in rural areas. According to the University of North Dakota Center for Rural Health, in 2010 there were .61 dentists per 1,000 population, compared to the national estimate (.76). The Center for Rural Health's 2005 survey of oral health workforce indicated 44 of the 53 North Dakota counties had six or fewer practicing dentists. In 2012, 16 North Dakota counties (30%) were without a dental provider residing in that county.

North Dakota Counties Without a Dentist, 2007-2012

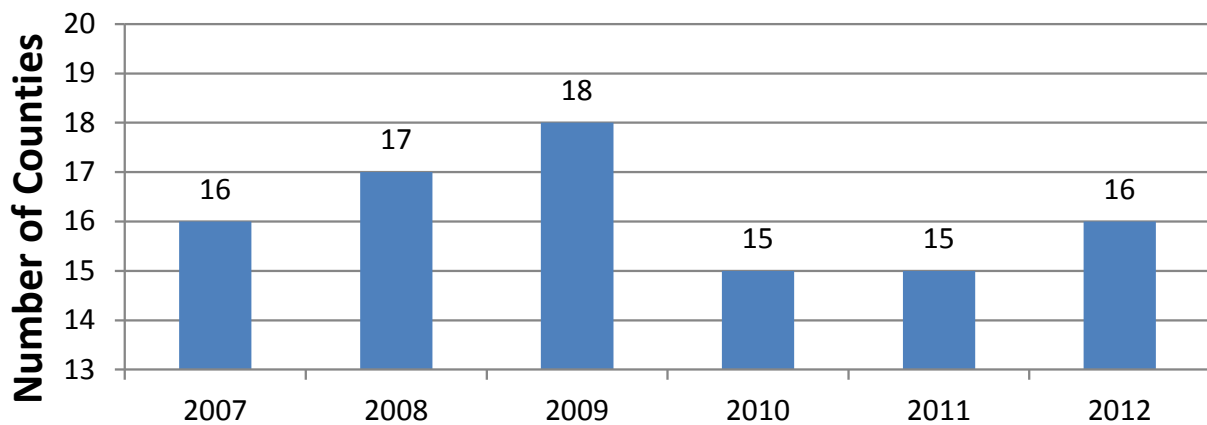


Figure 38: North Dakota Counties Without a Dentist

Data Source: North Dakota State Board of Dental Examiners

Note: The number of dentists in each county is calculated from a point in time throughout each one-year period.



The 2009 University of North Dakota Environment Scan document identifies how access to dental services is hampered by workforce shortages and the percentage of dental-care providers who limit their number of Medicaid patients, especially in rural North Dakota. Increasing the number of dental professionals from under-represented racial and ethnic groups is viewed as an integral part of the solution to improving access to care (USDHHS, 2000b).

Although the total number of dentists licensed in North Dakota has increased by nearly one-tenth (8.7%) from 2007 through 2012, a 2010 North Dakota Department of Health workforce survey found that nearly half of responding dentists (46%) anticipated retirement within the next 15 years.

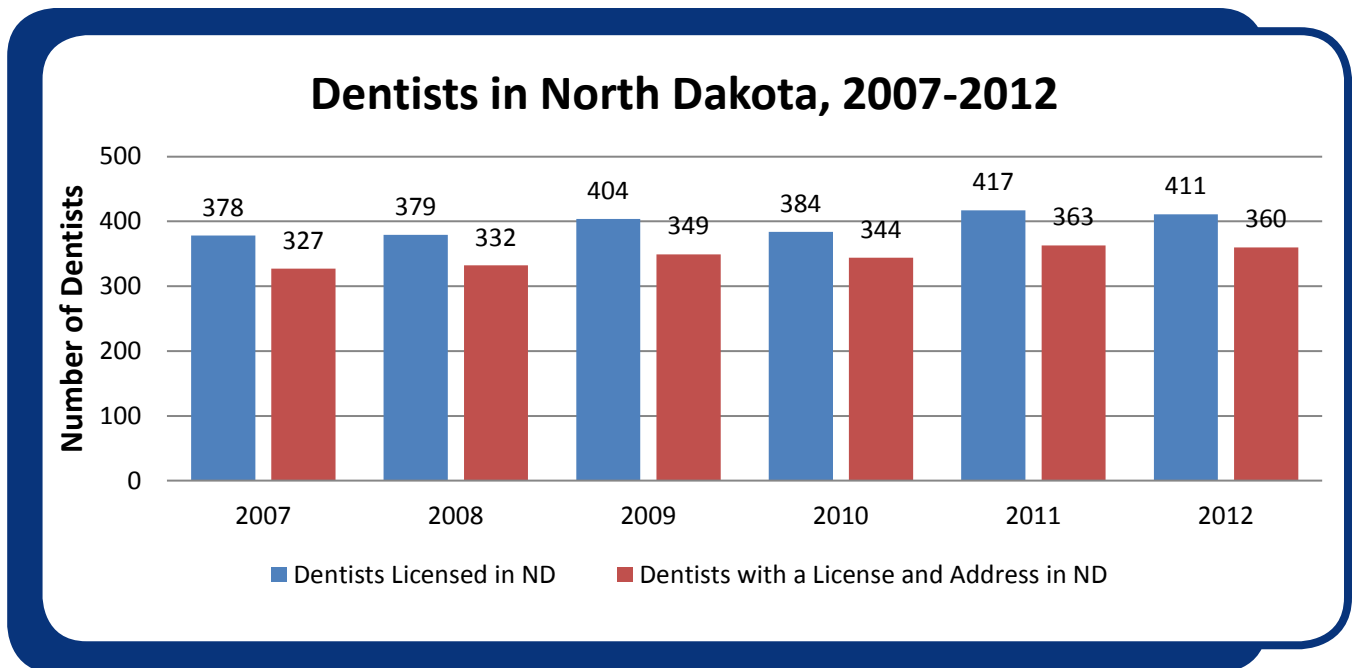


Figure 39: North Dakota Licensed and Addressed Dentists

Data Source: North Dakota State Board of Dental Examiners

Note: The number of dentists in each category is calculated from a point in time throughout each one-year period.

The number of dental hygienists in North Dakota has increased over the past six years, with a majority of the increase between 2010 and 2011.

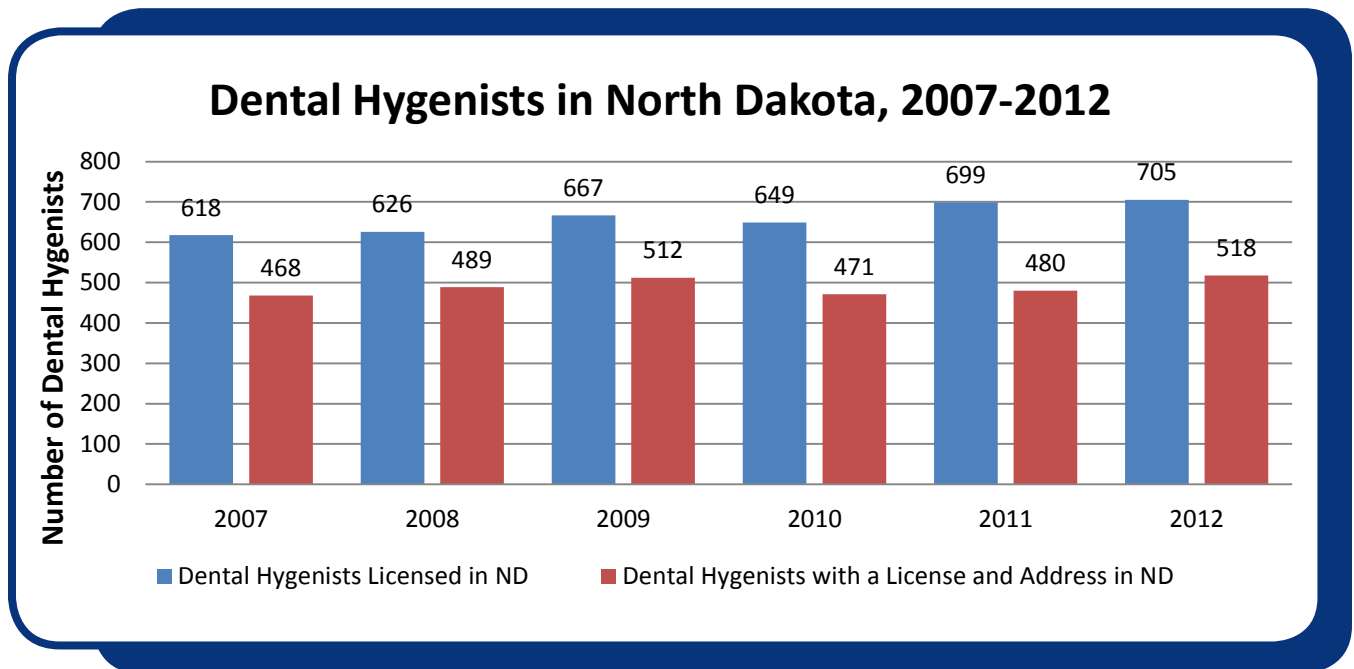


Figure 40: North Dakota Licensed and Addressed Dental Hygienists

Data Source: North Dakota State Board of Dental Examiners

Note: The number of dental hygienists in each category is calculated from a point in time throughout each one-year period.



Dental Medicaid and Children’s Health Insurance Program

Medicaid is the primary source of health care for low-income families, the elderly and people with disabilities in the U.S. This program became law in 1965 and is jointly funded by the federal and state governments (including the District of Columbia and the territories) to assist states in providing medical, dental and long-term care assistance to people who meet certain eligibility criteria. Eligibility is determined on the basis of state and national criteria. People who are not U.S. citizens can receive Medicaid only to treat a life-threatening medical emergency. Dental services are a required service for Medicaid-eligible individuals younger than 21, as a required component of Health Tracks (Early and Periodic Screening, Diagnosis and Treatment [EPSDT]). Services must include, at a minimum, relief of pain and infections, restoration of teeth and maintenance of dental health. Dental services may not be limited to emergency services for Health Tracks recipients (CMS, 2011).

Working families that earn too much to qualify for Medicaid, yet cannot afford health insurance coverage for their children, may be eligible for Healthy Steps coverage through the Children’s Health Insurance Program (CHIP). In order to qualify, a family’s net income cannot exceed 160 percent of the federal poverty level (CMS, 2012).

In North Dakota, 59 percent of dentists had at least one paid Medicaid claim in 2011, which was down from 72 percent in 2007.

Medicaid Billing Dentists With at Least One Paid Claim, 2007-2011

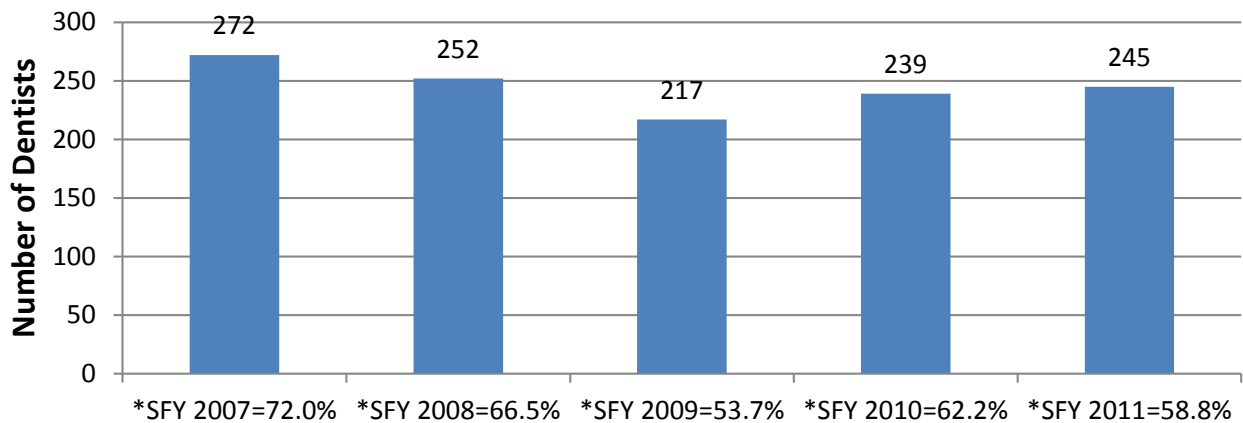


Figure 41: North Dakota Medicaid Billing Dentists With at Least One Paid Claim

Data Source: North Dakota Department of Human Services, Medical Services Division

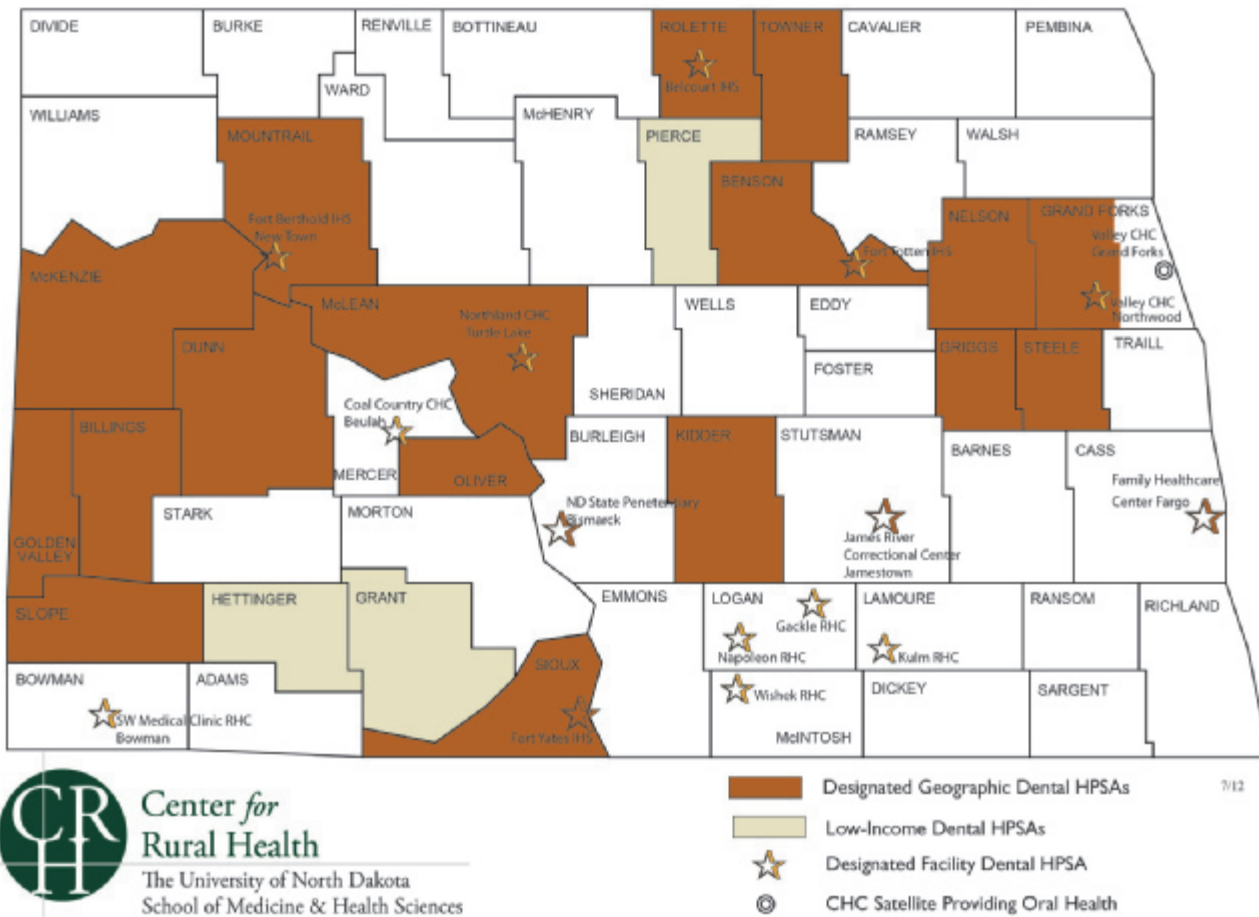
*The North Dakota State Fiscal Year (SFY) runs from July 1 through June 30. Each percentage is calculated by taking the number of SFY Medicaid billing dentists with at least one paid claim for the year divided by the total number of licensed dentists in the state at that point in the year.

Community and Migrant Health Centers, Health Professional Shortage Areas (HPSA) and Other State, County and Local Programs

Federally Qualified Health Centers (FQHCs), including Community Health Centers (CHCs) provide family-oriented primary and preventive oral health-care services for people living in rural and urban medically underserved communities. CHCs exist in areas where economic, geographic or cultural barriers limit access to primary health care. The Migrant Health Program (MHP) supports the delivery of migrant health services, serving more than 650,000 migrant and seasonal farm workers nationally. Data reported by North Dakota FQHCs indicates that 9,314 people received dental services in 2011.

North Dakota currently only has four CHCs that provide dental care. However, 19 of the 53 North Dakota counties are designated as dental health professional shortage areas. This indicates that in much of North Dakota, dentists are overworked or inaccessible; county full-time equivalent dentist ratios of 5,000:1 exist; and/or needy populations exist that warrant the necessity of dental health-care delivery (HRSA, 2011).

North Dakota Dental Health Professional Shortage Areas



For further information on health professional shortage areas, contact Terri Lang at terri.lang@med.und.edu

Figure 42: North Dakota Dental Health Professional Shortage Areas (HPSA)
Data Source: Area Health Education Center (AHEC), (used with permission)

Educational Programs

Unfortunately, North Dakota does not have a dental school offering Doctor of Dental Surgery (D.D.S.) or Doctor of Dental Medicine (D.M.D.) education. The North Dakota State College of Science is the only college within the state to provide dental education resulting in an Associate in Science (A.S.) in Dental Hygiene or a Dental Assisting certification program. Currently, the school only has room to admit 26 dental hygiene and 20 dental assisting students annually. The college is located in Wahpeton, close to the border with Minnesota, and draws in students from several states.



NOTES

NOTES

STATE PLAN FOR THE FUTURE

State Plan



FOREWORD

Dear Colleagues:

The North Dakota Oral Health Coalition is pleased to present this combined publication of the Burden of Oral Disease and Oral Health State Plan for the Future for years 2012 to 2017. The main objective of this publication is to discuss state strategies for the future. Two of the main priorities in the plan include preventing oral diseases and removing barriers to dental care access. Coalition stakeholders are committed to executing these goals, objectives and strategies.

Development of the Oral Health State Plan for the Future required input from many stakeholders, including federal, state and local agencies; professional dental organizations; and community-based programs, as well as other programs and stakeholders that are dedicated to improving oral health in North Dakota. During the state plan developmental process, coalition subcommittees identified priorities for the next five years.

North Dakota's Oral Health State Plan for the Future is an invitation for the public to become involved in prioritizing actions and implementing the strategies necessary to improve oral health for all North Dakota citizens. The North Dakota Oral Health Coalition represents a broad range of individuals and organizations from many sectors of our North Dakota community. Throughout the process of devising this plan, the coalition operated under its vision, mission and guiding principles regarding the prevention of oral disease, the promotion of oral health and the ability to provide access to dental care. By serving on committees to support wide-scale collaborative efforts aimed at eliminating oral health disparities within North Dakota, together we can provide the best oral health care for our citizens.

Marcia Olson
North Dakota Oral Health Coalition President

INTRODUCTION

In 2000, the U.S. Surgeon General released a report about oral health titled, “Oral Health in America.” The major message of this report discussed the essentiality of oral health to overall health and well-being throughout the life cycle. “Oral health” refers to well-being of the teeth, gums, hard and soft palate, lining of the mouth and throat, tongue, lips, salivary glands, chewing muscles, palate, and the upper and lower jaws.

Oral disease is prevalent throughout all North Dakota populations, thereby causing needless pain and suffering and often leading to life-threatening complications that affect overall health and well-being. Changes in the oral cavity are often the first indicators of chronic health problems such as infectious diseases, immune disorders, nutritional deficiencies and systemic disorders such as diabetes and cancer. Furthermore, research indicates that having an infection in the gums (periodontal disease) can increase a person’s risk for cardiovascular disease, increase risk for premature delivery and increase blood sugar levels for diabetics.

In an effort to address many of the oral health challenges of North Dakota residents, the North Dakota Oral Health Coalition has collaborated with the North Dakota Department of Health’s Oral Health Program to formulate the State Oral Health Plan for the Future. This plan is guided by strategic, evidence-based interventions and appropriate oral health surveillance findings at the state and local levels, including the North Dakota Burden of Oral Disease report.

The plan strives to address identified disparities facing North Dakota citizens in accessing oral health care, and the challenges faced by the oral health professional community as they work to provide quality, timely care. The plan also allows for timely tracking of data that is necessary when addressing which methods are working and which need to be changed or strengthened.

Furthermore, the plan is critical to establishing a vision for improving the oral health and well-being of the citizens of North Dakota by providing the linkages and coordination needed to set goals and objectives, develop policies, integrate interventions, target actions and efficiently use available resources at the state and local levels.



ORAL HEALTH INFRASTRUCTURE

In order for the State Plan for the Future to be implemented and have real impact, it must be supported by a collaborative partnership of stakeholders, including the North Dakota Department of Health's Oral Health Program, the North Dakota Oral Health Coalition and other interested entities.

North Dakota Department of Health (NDDoH) Oral Health Program

The Oral Health Program is located within the NDDoH Community Health Section, in the Division of Family Health. The program is staffed with a program director, prevention coordinator, grant manager, epidemiologist and administrative assistant. The program also has temporary employees, including a public health dentist, public health hygienists and a data entry support person. Additionally, the program contracts with the North Dakota State Data Center at North Dakota State University to provide evaluation support and a communications consultant for design and communications support.

The North Dakota Department of Health's Oral Health Program also partners with the North Dakota Department of Health's Division of Municipal Facilities Fluoridation Program to create a statewide fluoridation program that includes procedures for compliance, training and administration of regulations.

The Oral Health Program focuses on program priorities in alignment with the Association of State and Territorial Dental Director's (ASTDD) Guidelines for State and Territorial Oral Health Programs. These priorities include assessment, policy development and assurance.

The ASTDD guidelines include a listing of the 10 essential public health services to promote oral health in the United States. They include:

- 1) Assess oral health status and implement an oral health surveillance system.
- 2) Analyze determinants of oral health and respond to health hazards in the community.
- 3) Assess public perceptions about oral health issues and educate/empower them to achieve and maintain optimal oral health.
- 4) Mobilize community partners to leverage resources and advocate for/act on oral health issues.
- 5) Develop and implement policies and systematic plans that support state and community oral health efforts.
- 6) Review, educate about and enforce laws and regulations that promote oral health, and ensure safe oral health practices.
- 7) Reduce barriers to care and assure utilization of personal and population-based oral health services.
- 8) Assure an adequate and competent public and private oral health workforce.
- 9) Evaluate effectiveness, accessibility and quality of personal and population-based oral health promotion activities and oral health services.
- 10) Conduct and review research for new insights and innovative solutions to oral health problems.

The guidelines previously listed define the role of the Oral Health Program in achieving the 10 essential services and offer examples of activities and resources that can be used. Oral Health Program staff are involved in the following programs, services and projects:

- Community Water Fluoridation Program
- Healthy Smiles Fluoride Varnish Program
- Seal! North Dakota Dental Sealant Program
- Dental access programs
- Dental Care Mobile
- DentaQuest
- Donated Dental Services Program
- Dental Loan Repayment Program
- Elderly Care Program
- Local grant programs
- Public health hygienists
- Oral health education
- Oral health surveillance
- Safety-net dental clinics
- State oral health plan
- North Dakota Oral Health Coalition

The following programs are the key preventive programs of the North Dakota Oral Health Program:

Healthy Smiles Fluoride Varnish Program

In 2007, the North Dakota Legislature passed a law that allows fluoride varnish to be applied by medical professionals. The NDDoH Oral Health Program has developed a training program for health-care professionals. Healthy Smiles was implemented in local public health units, pediatricians' offices and schools in 2011. The applications are reimbursed by Medicaid twice a year up to age 21. Program participation can reduce decay by 25 to 45 percent and remineralize early decayed lesions. The varnish is safe, effective and easy to paint on all tooth surfaces. Nearly 3,500 applications have been applied since 2008.

Seal! North Dakota

Seal! North Dakota is a program established in 2008 designed to increase access to preventive dental care to underserved populations. The program provides dental sealants on children's permanent molars to help prevent dental decay and is an important component of oral health surveillance. This program works with schools, Head Start programs, safety-net dental clinics and local public health clinics.

Funding for the Oral Health Program

- U.S. Centers for Disease Control and Prevention (CDC)
- Health Resources and Service Administration (HRSA) Workforce and Title V/Maternal and Child Health Grants
- DentaQuest Oral Health 2014 Initiative Grant

The North Dakota Oral Health Coalition

Formed in 2005, the North Dakota Oral Health Coalition is a chartered, collaborative, statewide coalition composed of a variety of disciplines and stakeholders focused on the oral health of all North Dakotans. The work of the coalition focuses around its mission, vision and guiding principles.

Mission

Oral health is an integral part of overall health.

Vision

Develop and promote innovative strategies to achieve optimal oral health for all North Dakotans.

Guiding Principles

Accountability
Respect
Honesty
Trust

The mission is achieved by:

- Building partnerships.
- Educating the public about the value of good oral health and its impact on overall health.
- Building community capacity to address oral health needs.
- Communicating oral health needs to policymakers and the public.
- Establishing and advocating for public and private policies to improve access to or the delivery of oral health services.
- Implementing prevention interventions.



NDDoH Oral Health Program and Coalition Achievements

2011

- ◆ Advocated Dental Loan Repayment for safety-net dental clinics.
- ◆ Mandated reporting for North Dakota dental hygienists.
- ◆ Collaborated with American Indian Tribes to increase access to oral health care.
- ◆ Initiated dental sealant and fluoride varnish school-based programs.
- ◆ Facilitated pediatric dental day on a North Dakota American Indian reservation.
- ◆ Received funding for DentaQuest Oral Health 2014 Initiative.
- ◆ Prepared Burden of Oral Disease/State Plan document for 2012-2017.
- ◆ Completed Healthy People 2010 final report. Selected objectives for Healthy People 2020.
- ◆ Established methodology and data collection plan for the 2012 Basic Screening Survey for Older Adults.

2010

- ◆ Worked to implement the change of laws that occurred during the 2009 Legislative session, including:
 - Dental hygiene supervision law.
 - Dental loan repayment program for safety-net dental clinics and rural dental practices.
- ◆ Worked in conjunction with the North Dakota Department of Health's Oral Health Program, Bridging the Dental Gap and the Ronald McDonald House Charities Care Mobile project to submit a grant to the U.S. Health Resources and Services Administration (HRSA). A three-year grant was awarded for approximately \$750,000. Grant monies are split between the three programs, two of which will focus on children's dental services and one of which will focus on helping the elderly with their oral health.
- ◆ Conducted two Seal!North Dakota events (dental sealants for children) at the Bridging the Dental Gap safety-net dental clinic in Bismarck.
- ◆ Held a priority policy meeting, which included members of the Oral Health Coalition, along with many other oral health advocates including representatives from public health, community health centers, dental hygienists, advocacy groups, the state dental and dental hygiene associations, and others. Attendees helped to determine the top five priority policies for oral health in North Dakota.
- ◆ Advocated for dental loan repayments for three safety-net dental clinic dentists and three dentists serving in rural areas.
- ◆ Conducted a pilot training for the Healthy Smiles Fluoride Varnish program.
- ◆ Provided input into the updated five-year burden document and state plan.

2009

- ◆ Evaluated the Oral Health Coalition structure and function and reorganized into four committee focus areas: access, prevention, policy, and data and evaluation.
- ◆ Drafted legislation and advocated for successful passage of five oral health bills. House Bill 1012 increased reimbursement levels for dental providers, House Bill 1231 provided start-up funding for a dental care mobile, House Bill 1176 changed supervision of dental hygienists to allow greater access to oral health screening and preventive services, Senate Bill 2004 increased the appropriation for the Donated Dental Services Program, and Senate Bill 2358 created a dental loan repayment program for dentists serving in public health and nonprofit dental clinics.
- ◆ Partnered with Ronald McDonald House Charities to form an advisory committee for the Ronald McDonald Dental Care Mobile Project.

2008

- ◆ Formed a policy committee and developed a policy plan for the 2009 North Dakota Legislative Assembly.
- ◆ Provided letters of support for the Oral Health Program Infrastructure and Capacity Building Cooperative Agreement application and the Bismarck Ronald McDonald House Charities Healthy Tomorrows grant application.
- ◆ Collaborated with the Oral Health Program on the development of a fluoride varnish training manual.
- ◆ Developed work plans for the prevention, access, integration and policy committees.
- ◆ Assessed progress on the state oral health plan.
- ◆ Filed Articles of Incorporation for the North Dakota Oral Health Coalition, making the coalition a nonprofit in North Dakota.
- ◆ Adopted formal bylaws for the North Dakota Oral Health Coalition.

2007

- ◆ Obtained financial support from the Ronald McDonald House Charities to support dental loan repayment for the dentist at Bridging the Dental Gap Clinic in Bismarck. The grant of \$20,000 per year is renewable for four years and is dedicated to the support of the pediatric practice of the clinic.
- ◆ Conducted fluoride varnish training in Minot for 45 medical providers.
- ◆ Formed a subcommittee to initiate the process to obtain 501(c)(3) status to support coalition sustainability.
- ◆ Convened a Children's Oral Health Conference with advocates and policymakers to determine policy priorities.
- ◆ Developed a coalition web page.
- ◆ Drafted legislation and advocated for successful passage of House Bill 1293 to expand the application of fluoride varnish for children by medical professionals.
- ◆ Shared the state plan with state policymakers, dentists and stakeholders.
- ◆ Convened strategic planning sessions to prioritize coalition activities and continue implementation of the state plan.
- ◆ Conducted evaluation of coalition membership and efforts.

2006

- ◆ Published the state plan, Oral Health in North Dakota: Plan for the Future.
- ◆ Convened an oral health conference to release the state plan and educate key stakeholders and the public about the plan to improve oral health.

2005

- ◆ Developed the coalition charter and bylaws.
- ◆ Hosted multiple planning meetings to gather input for development of the state oral health plan.
- ◆ Advocated for successful passage of House Bill 1200 to amend the Dental Practice Act to allow dental services to be offered through a board-approved nonprofit organization serving the dental needs of an underserved population.

GOALS, OBJECTIVES AND STRATEGIES

Through the collaborative planning process of the North Dakota Oral Health Coalition, a list of goals, objectives and strategies was created. These goals, objectives and strategies are meant to assist North Dakotans in achieving and maintaining optimal oral health through access to an effective system of health services that promotes appropriate health behaviors.

GOAL 1

GOAL 1: Develop and promote partnerships and policies that improve oral health for all North Dakotans.

Since oral health is a significant indicator of the overall health and well-being of an individual, it makes sense for dental and medical entities to work together to address the needs of patients. By combining forces, these health-care providers are better able to address health issues in a timely and effective manner and improve the overall health of individuals.

By encouraging many different organizations, population groups and citizens to participate in the decision making and work efforts of the North Dakota Oral Health Coalition, the group is better able to prepare well-rounded and all-encompassing plans. All coalition members also are able to share educational and promotional materials with their specific audiences and with policymakers, increasing the knowledge about the importance of good oral health.

Objective 1.1: By 2017, the Oral Health Coalition’s membership will have expanded to encompass a greater share of key stakeholder groups and its oral health advocacy mission will be better promoted by key stakeholders through their literature, marketing materials and services.

(Data source: Survey of key stakeholders and review of their literature and marketing materials)

Strategies:

- Determine if any key segments of the North Dakota population are not effectively represented within the coalition and expand the membership accordingly.
- Explore and implement ways to promote the activities and mission of the coalition by key stakeholders in order to improve its visibility and recognition.

Objective 1.2: By 2017, the number of effective and sustainable partnerships between key oral and medical health organizations aimed at improving the integration between oral and medical health will have increased by 10 percent. (Data source: Review of accomplishments from the Oral Health Coalition subcommittees)

Strategies:

- Expand collaboration between oral health partners and other health and wellness initiatives/ coalitions.
- Collaborate with Blue Cross Blue Shield of North Dakota and other insurance companies to combine/integrate oral and medical health.
- Facilitate oral health connectivity and buy-in among the North Dakota Medical Association, the North Dakota Dental Association, the North Dakota Dietetic Association and others.
- Integrate oral and medical health where possible.
- Promote the Health Home concept.
- Promote involvement of retired dentists and dental hygienists who want to provide pro bona care in nonprofit settings.
- Engage the North Dakota American Academy of Pediatrics and the long-term care community in promoting oral health.
- Educate caretakers in institutions and facilities about the proper oral health care of those who are dependent on their assistance.
- Promote oral health care for individuals with special health-care needs, including individuals with disabilities or chronic disease, infants, children and seniors, including those in long-term care facilities.

Objective 1.3: Prior to each legislative session or as needed, a list of policy options, including changes in the laws and administrative policies, will be proposed that help improve North Dakotans access to affordable oral health and increase the effective targeting of oral health services to at-risk populations. (Data source: Minutes from Oral Health Coalition Policy subcommittee).

Strategies:

- Identify and propose legislative action that targets priority oral health needs.
- Create and promote local and regional networks that advocate for oral health.
- Inform and educate local, state and federal policymakers and officials about oral health needs, effective programs and successes.
- Develop a comprehensive report and fact sheet that details the findings from studies and the literature to document the impact that oral health has on physical health and improving health status, and the cost savings from dental care (prevention and treatment services). This document can be used in educating the public, media, politicians and policymakers.

GOAL 2

Goal 2: Improve prevention and educational activities that promote oral health.

Many people in North Dakota don't often think about the importance of oral health and the preventive methods used to ensure that all citizens enjoy a pain-free mouth.

One of the things people don't think about is the fluoridation of their water. Adding fluoride to the water system is a safe, economical and effective way of preventing tooth decay in children and adults, across all socioeconomic groups. It's important to continue this water fluoridation, and in the absence of fluoridated water, to provide fluoride in the form of mouth rinse or fluoride varnish.

Dental sealants are an excellent deterrent for dental caries (cavities) in children. Sealants involve applying a protective coating to the tops of molars and premolars to fill in the pits and fissures of the teeth and stop cavities from forming. Many children don't have access to regular dental care. Providing school-based dental sealant clinics is an excellent way of helping those children avoid painful and costly dental problems in the future and educating them about the importance of oral health care at home.

Spreading the message about oral health is an important step in helping people learn that they don't have to accept the idea that they will suffer from tooth loss or a painful mouth at some point in their lives. Educating and informing people about the importance of oral health and the options of care available will help them be proactive in their own oral health care and create an atmosphere where services are expected, needed and valued.

Objective 2.1: By 2017, North Dakota will maintain its high standard of having more than 90 percent of its communities receiving fluoridated water. (Data source: Survey of Communities, Water Fluoridation Reporting System)

Strategies:

- Maintain effective collaboration with communities to ensure that all municipal water systems are fluoridated.
- Collaborate with communities to obtain funding for expansion of fluoridation.
- Monitor and promote fluoridation to non-fluoridated communities and/or rural water systems.
- Collaborate with communities to obtain funding for replacement of aging fluoridation systems.
- Encourage best practices for fluoride delivery (mouth rinse, fluoride varnish, community water fluoridation).
- Conduct educational campaign to promote tap water use.

Objective 2.2: By 2017, North Dakota will implement a targeted school-based sealant program beyond its current test sites.

(Data source: Oral Health Coalition Prevention Subcommittee, NDDoH Seal! ND Database)

Strategies:

- Pursue a school-based sealant program through the use of dentists and hygienists.
- Conduct a cost-benefit analysis of the statewide school-based sealant program based on data from previous sites.
- Explore additional options for funding dental sealants in targeted areas with high at-risk populations.

Objective 2.3: By 2017, an oral health educational system will be in place that is effectively integrated into the state's overall health information delivery and promotion efforts.

(Data source: Review of NDDoH Oral Health Program literacy promotion materials)

Strategies:

- Evaluate the comprehensiveness of existing dental health educational materials and their corresponding delivery system.
- Explore ways to integrate oral health education into overall health literacy.
- Incorporate positive oral health behaviors with existing local health educational programs and materials.
- Utilize child-care nurse consultants, case managers and social workers to provide oral health education and prevention information in homes and child-care centers.



GOAL 3

Goal 3: Support and sustain an effective oral health infrastructure and workforce to ensure high quality oral health services to all North Dakotans.

In many areas of the state, there is a lack of dental professionals. Nearly half (46%) of currently licensed and practicing dentists responding to the 2010 oral health workforce survey reported to be planning for retirement within 15 years. The number of dental professionals moving into the state will not compensate for those leaving the field. This will cause an ongoing problem in providing dental care to a significant portion of the state's population.

Some of the ways North Dakota can be sure that all citizens are provided with high quality oral health include continued incentives to dental professionals willing to practice in rural and/or underserved communities and in nonprofit clinic settings; in-state training for dental assistants; and continued monitoring of the needs of the dental workforce.

Objective 3.1: By 2017, enhance the North Dakota Oral Health surveillance system by increasing data for at-risk populations by 20 percent.

Strategies:

- Explore options for collecting additional data on special populations to determine if oral health disparities exist among special populations.
- Make data more relevant to stakeholders, policymakers and the public by ensuring timely release of surveillance data and in a form that optimizes understanding.

Objective 3.2: By 2017, North Dakota will expand the options for dental health services and the opportunities for dental professionals to improve their knowledge and skills. (Data source: North Dakota's Workforce Survey of Dentists, North Dakota University System Office – course offering data)

Strategies:

- Define/expand roles in dental health.
- Invite dental students as interns into the safety-net dental clinics in North Dakota and mobile vans.
- Collaborate with higher education to implement dental assistant programs.

Objective 3.3: By 2017, North Dakota will designate all eligible areas as Dental Health Professional Shortage Areas so they can access federal resources.

Strategies:

- Upgrade survey tools and data collection efforts so that appropriate information can be collected to identify professional shortage areas.
- Explore incentive programs (e.g., loan repayment, grant programs) to assist underserved communities to recruit dental health professionals.
- Investigate and apply for funding opportunities associated with professional shortage areas.



GOAL 4

Goal 4: Ensure all North Dakotans have reasonable and affordable access to oral health services.

Identifying ways to provide affordable and accessible care for all North Dakota citizens is a primary concern. Providing dental services to the vulnerable and underserved populations in North Dakota is often difficult due to a number of factors including limited availability of dental professionals, limited funding for nonprofit clinics and inadequate participation in Medicaid by providers and participants.

These populations also may be difficult to reach with oral health information regarding services available and difficult to query to find out how they could be better served.

Resolving the issues surrounding Medicaid payments and finding sustained funding for safety-net dental clinics and Care Mobile vehicles would go a long way towards ensuring that the underserved populations gain access to appropriate oral health care.

A dental home is a place where a patient has received oral health care in a coordinated manner on an ongoing basis. Instilling the idea that everyone should have access to a dental home is another way to make sure all people have their oral health-care needs met.

Objective 4.1: The number of North Dakota households with a dental home will increase from 62 percent in 2008 to 70 percent by 2017. (Data source: National Survey of Children's Health)

Strategies:

- Develop educational campaign to promote the idea of a dental home.
- Use objective evidence to assess the oral health status of North Dakota residents and evaluate disparities in the use of oral health services.
- Examine oral health access issues in North Dakota and ways to implement effective solutions.
- Evaluate Head Start Program Information Report (PIR) data to help identify low income access to dental homes.

Objective 4.2: By 2017, issues that impede the optimum use of Medicaid funding to improve dental health care in North Dakota will be identified and effective solutions implemented. (Data source: North Dakota Workforce Survey of Dentists)

Strategies:

- Identify programs and policies that have successfully reduced “no show” rates in dental offices/clinics and determine the transferability of these practices.
- Explore reasons why women in the Medicaid program fail to receive comprehensive dental care.
- Evaluate ways to mitigate the leading reasons dentists cite for not actively participating in the Medicaid program.
- Track outcomes of Medicaid to determine levels of success.

Objective 4.3: By 2017, targeted efforts to provide oral health services for at-risk populations will expand the number served by 15 percent. (Data source: Number of patients served for each targeted program)

Strategies:

- Collaborate with existing community health centers to expand dental access (e.g., grant writing, letters of support).
- Support efforts exploring funding of mobile programs (e.g., Ronald McDonald House Charities to bring additional Ronald McDonald Care Mobile programs to North Dakota).
- Explore funding opportunities to create safety-net clinics in the western part of North Dakota.

Objective 4.4: By 2017, an ongoing data monitoring system will be in place that assesses the status and needs of the dental provider community. (Data source: Oral Health Coalition Data committee)

Strategies:

- Collect and disseminate dental provider surveys.
- Evaluate the needs and access for oral health within the long-term care community.
- Investigate state/private partnerships, including dental care for long-term care residents.

SUBCOMMITTEE GOALS, OBJECTIVES AND STRATEGIES

Policy Subcommittee Work Plan

Goal: To develop and promote policies that focus on oral health promotion, disease prevention and oral health care in North Dakota, especially in underserved areas.

Objective 1: By June 2012 and June 2014 (prior to legislative sessions), identify policy options, including changes in North Dakota laws and regulations that strengthen and improve North Dakota's capacity to provide quality and affordable oral health care, especially in underserved areas.

Performance Indicator:

1. Change in the number of dental facilities/programs targeting the underserved (e.g., CHCs, dental public health clinics, safety-net programs).

Data Source: Baseline is the number of dental facilities/programs in 2007

Activity/Strategies:

- Explore options for additional resources for oral health.
- Develop and update specific oral health activities for the state oral health plan to identify where new policies or changes to existing policies are needed.
- Expand support from private sector businesses for oral health.
- Engage advocacy and key stakeholder groups to best understand oral health policy needs.
- Promote oral health to state legislators.

Objective 2: By June 2015, evaluate and promote the success of oral health policy changes since the 2007 Legislative Session.

Targeted Legislation: a) dental practice act, b) dental care mobile, c) dental loan repayment program, d) donated dental program, and e) increased dental Medicaid funding.

Performance Indicators:

1. Change in Medicaid dental patients served.
2. Change in percentage of dentists serving Medicaid patients.
3. Change in number of special health-care needs patients served.

Data Source: Surveillance data starting in 2007

Activity/Strategies:

- Work with the Data Subcommittee to establish effective ways to assess the impact of policy changes.
- Inform policymakers and the public about the successes of policy changes.
- Collaborate with partners and key stakeholders regarding effective ways to develop messaging regarding policy successes.

Prevention Subcommittee Work Plan

Goal: Prevent and reduce tooth decay among all underserved populations.

Objective 1: By June 2015, maintain access to optimally-fluoridated water for 96 percent of the North Dakota population on public water systems.

Performance Indicator:

1. Change in percentage of residents receiving optimally-fluoridated water.

Data Source: Water Fluoridation Reporting System (WFRS)

Activity/Strategies:

- Educate local policymakers and the public to be proactive in preventing anti-fluoridation challenges.
- Educate the public about bottled water fluoride levels.
- Collaborate with partners and key stakeholders in developing and conducting educational efforts regarding fluoride and its positive contributions to oral health.

Objective 2: By June 2015, reduce by 2 percent the percentage of third graders with tooth decay experience.

Performance Indicator:

1. Change in the percentage of third graders with tooth decay experience.

Data Source: Basic Screening Survey (BSS)

Activity/Strategies:

- Maintain school-based fluoride programs by offering fluoride varnish in communities with children at high risk for tooth decay.
- Implement fluoride varnish projects in programs/clinics reaching high-risk infants and young children.
- Implement a school-based/linked dental sealant program in schools with children at high risk for tooth decay.
- Develop educational materials for school administration and parent education about the benefits of a school fluoride varnish program.
- Collaborate with partners and key stakeholders on maintenance and promotion activities.

Objective 3: By June 2014, increase by 2 percent the percentage of Medicaid-eligible children through age 18 who receive fluoride varnish.

Performance Indicator:

1. Change in the percentage of Medicaid-eligible children through age 18 receiving fluoride varnish.

Data Source: Medicaid

Activity/Strategies:

- Educate advocates and stakeholders and parents about the importance of oral health using anticipatory guidance fact sheets.
- Continue to apply fluoride varnish to children upon first tooth eruption through age 18.

Objective 4: By June 2013, increase by 2 percent the percentage of underserved seniors and special populations receiving dental services.

Performance Indicator:

1. Change in the percentage of Medicaid-eligible seniors and special populations receiving dental services.

Data Source: Medicaid

Activity/Strategies:

- Increase dental benefits (e.g., through private insurance, Medicare, Medicaid and health-care reform) for vulnerable populations at high risk for oral disease.
- Collaborate with partners and key stakeholders on promotion activities and policies.



Data Subcommittee Work Plan

Goal: Expand the use of oral health data for the promotion and monitoring of oral health within North Dakota.

Objective 1: By June 2013, maintain, acquire and use data to guide oral health needs assessment, policy development and assurance functions.

Performance Indicators:

1. Oral health surveillance system data is made accessible to public and policymakers.
2. Amount of oral health surveillance system data used in health policy.

Data Source: North Dakota Surveillance System Data

Activity/Strategies:

- Maintain and enhance the oral health monitoring system.
- Report trends regarding oral disease and burden among different population groups in North Dakota.
- Analyze and identify gaps of oral health data through the integration of existing and new surveys conducted by state agencies and other organizations.
- Work with oral health programs to assist with ongoing projects, data and surveillance efforts.
- Monitor changes in North Dakota oral health capacity.
- Update the oral health burden document.
- Work with the state primary care office to ensure all dental health professional shortage areas are determined and designated.

Access Subcommittee Work Plan

Goal: Improve access to oral health services in North Dakota for underserved and special populations.

Objective 1: By June 2013, assist Ronald McDonald House Charities in Bismarck with funding efforts for Dental Care Mobile dental services in the state.

Performance Indicator:

1. Change in the number of partners and funding base for the Dental Care Mobile.

Data Source: Ronald McDonald House Charities

Activity/Strategies:

- Continue to explore additional funding options for the use of a Dental Care Mobile.
- Develop initiatives to increase the number of dental providers accepting Medicaid.
- Seek partnerships in the community to assist with storage, maintenance and diesel for the Dental Care Mobile.

Objective 2: By June 2013, maintain and enhance the dental loan repayment program for safety-net dental clinics.

Performance Indicator:

1. Change in funding base of dental loan repayment program

Data Source: North Dakota Legislative Council

Activity/Strategies:

- Prepare data for legislature to show how safety-net dental clinics have increased access for the underserved.
- Prepare data for legislature to demonstrate need for additional safety-net dentists.
- Build partnerships for oral health advocacy.
- Introduce and advocate for legislation for ongoing support for the dental loan repayment program.

Objective 3: By June 2014, assist nonprofit dental clinics in the state in their funding efforts.

Performance Indicator:

1. Change in fund base for nonprofit dental clinics.

Data Source: North Dakota Century Code

Activity/Strategies:

- Continue to explore additional funding options for nonprofit clinics.
- Educate legislators about the advantage, cost saving and charity of these clinics.
- Educate the public and legislators about the importance of access to oral care.
- Continue to seek one-time funding for the existing nonprofit clinics.

BURDEN DOCUMENT/STATE PLAN CONCLUSION

During the past half century, oral disease was considered as only a “bother.” Research has evolved and proven that we need to recognize the mouth as the center of vital tissues and functions that are critical to total health and well-being across the life span. Findings presented in this Burden Document and goals and objectives identified in this State Plan for the Future are the most comprehensive to date.

Key findings from the publication include the following North Dakota dental health statistics:

- Untreated caries (tooth decay) in young children ages 2 through 4 has decreased.
- Untreated caries (tooth decay) among North Dakota third-grade children has decreased.
- More than half (55.7%) of American Indian third-grade children were overweight or obese in comparison to one-third (30.9%) of White non-Hispanic children.
- Oropharyngeal cancer incidence rates have declined.
- Nearly all (97%) North Dakota residents have access to fluoridated water.
- Of children screened, 60.4 percent have dental sealants.

Additional data about the oral health of North Dakotans is warranted. Future goals include gathering of the following data:

- Percentage of older adults who visit the dentist each year.
- Oral health and dental insurance status of older adults residing in long-term care facilities.
- Percentage of adults with periodontal disease.
- Oral cancer screenings by dental and other health professionals.
- Dental utilization data among individuals with disabilities.



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APPENDICES

APPENDIX A

LIST OF TABLES AND FIGURES

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APPENDIX B

NORTH DAKOTA ORAL HEALTH COALITION MEMBERSHIP

Allied Dental Education, North Dakota State College of Science
Bismarck-Burleigh Public Health
Bismarck Early Childhood Education Program
Bridging the Dental Gap, Inc.
Center for Rural Health, University of North Dakota, School of Medicine and Health Sciences
Community Action Region VI Head Start
Community Health Care Association of the Dakotas
Comprehensive Cancer Program, North Dakota Department of Health
Custer District Health Unit
Dakota Medical Foundation
Dacotah Foundation
Diabetes Prevention and Control Program, North Dakota Department of Health
Division of Children’s Special Health Services, North Dakota Department of Health
Division of Injury Prevention and Control, North Dakota Department of Health
Division of Family Health, North Dakota Department of Health
Early Childhood Comprehensive Systems Program, North Dakota Department of Health
Early Explorers Early Head Start
Fraser Ltd.
Grand Forks County Social Services
Grand Forks Public Health Department
Head Start State Collaboration Office, North Dakota Department of Human Services
Healthy North Dakota, North Dakota Department of Health
KAT Productions
Maternal and Child Health, North Dakota Department of Health
Medcenter One
Medicaid Program, North Dakota Department of Human Services
North Dakota Chapter, American Academy of Pediatrics
North Dakota Community Action Association
North Dakota Dental Assistants’ Association
North Dakota Dental Association
North Dakota Dental Hygienists’ Association
North Dakota Long Term Care Association
Northern Valley Dental Health Coalition
Oral Health Program, North Dakota Department of Health
Office of Community Assistance, North Dakota Department of Health
Office of Senator Kent Conrad
Ransom County Public Health
Red River Valley Dental Access Program
Ronald McDonald House Charities
Southwestern District Health Unit
Tobacco Prevention and Control Program, North Dakota Department of Health

Upper Missouri District Health Unit
Valley Community Health Center
West River Head Start

The coalition also is sustained by members of the general public who are dedicated to improving oral health. The Oral Health Coalition has a growing membership. Exclusion of members on this listing is not intended.



APPENDIX C

DATA SOURCES

Basic Screening Survey of North Dakota Third-Grade Students (BSS)
Behavioral Risk Factor Surveillance System (BRFSS)
Blue Cross Blue Shield of North Dakota
Center for Rural Health – University of North Dakota School of Medicine
U.S. Centers for Disease Control and Prevention, Division of Oral Health
Medicaid – North Dakota Department of Human Services
Medicare – Center for Medicare and Medicaid Services
North Dakota Department of Health, Cancer Prevention and Control Program
North Dakota Department of Health, Diabetes Prevention and Control Program
North Dakota Department of Health, Division of Family Health
North Dakota Department of Health, Division of Vital Records
North Dakota State Data Center
United States Census Bureau
Youth Risk Behavior Survey (YRBS)
Youth Tobacco Survey (YTS)

For more information, contact:

Oral Health Program

Division of Family Health

North Dakota Department of Health

600 E. Boulevard Ave., Dept. 301

Bismarck, N.D. 58505-0200

www.ndhealth.gov/oralhealth

701.328.2356

800.472.2286 (toll-free)



NORTH DAKOTA
DEPARTMENT *of* HEALTH