

Oral Health in North Dakota

A Background Report

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The Center for Health Workforce Studies is a not-for-profit research organization whose mission is to provide timely, accurate data and conduct policy-relevant research about the health workforce. The Center's work assists health, professional, and education organizations; policy makers and planners; and other stakeholders to understand issues related to the supply, demand, distribution, and use of health workers.

Preface

In the spring and summer of 2012, the Center for Health Workforce Studies at the School of Public Health, University at Albany, with support from the Otto Bremer Foundation and the Pew Center on the States Children's' Dental Campaign performed an environmental scan and contextual assessment of the oral health of North Dakota's residents. The research involved a literature review, analysis of available secondary data, and interviews with 48 stakeholders in oral health. This report is a summary of the literature review and data analysis which were part of the study process. A separate report describes the results of the personal telephone interviews which were conducted between April and July, 2012.

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Summary

In the spring and summer of 2012, the Center for Health Workforce Studies at the School of Public Health, University at Albany with support from the Otto Bremer Foundation and the Pew Center on the States Children's Dental Campaign performed an environmental scan and contextual assessment of the oral health of North Dakota's residents. The research involved a literature review, analysis of available secondary data, and interviews with 48 stakeholders in oral health. This report is a summary of the literature review and data analysis which were part of the study process. A separate report describes the results of the personal telephone interviews which were conducted between April and July 2012.

North Dakota is a sparsely populated state with large geographic areas classified as rural or frontier based on low population density. The state is mainly agricultural. Parts of the state are being drilled for oil due to large natural gas and oil reserves. The state's people are mainly non-Hispanic White with American Indians constituting the largest minority group.

Approximately 680,000 people reside in the state. The most populous city is Fargo with a population of about 107,000 people. Currently, there are 360 licensed dentists with practice addresses in North Dakota and an additional 24 dentists licensed in North Dakota who are principally practicing in contiguous states. There are 518 licensed dental hygienists (DHs) with practice addresses in North Dakota. There are also DHs licensed in North Dakota who are principally practicing in contiguous states including 74 DHs with primary practice addresses in Minnesota, four with practice addresses in South Dakota, and four with practice addresses in Montana. In addition, 83 DHs maintain a DH license in North Dakota but have no current practice address. This suggests that there is more capacity within the profession than jobs to accommodate the trained and credentialed supply of DHs.

As is common throughout the U.S, the oral health workforce in North Dakota is mainly distributed in the metropolitan areas of the state and in service centers where rural residents travel to purchase commodities and commercial and health services. There are 16 counties in the state with no dentist in practice. There are 31 dental health professional shortage areas (DHPSAs) in North Dakota designated by the federal government as lacking sufficient providers to meet the dental needs of the population. Ten counties are designated as whole county geographic DHPSAs while 17 counties hold partial designations as geographic (three), population (three), facility (nine), or both geographic and facility (two) DHPSAs (HRSA, 2012). The remaining DHPSAs in the state are facility designations which are automatically granted to all federally qualified health centers and other qualifying institutions.

While North Dakota has a per capita income that places it among the top 20 of all states, 9.7% of the population qualifies for North Dakota Medicaid because they live at or below the federal poverty level (FPL) (in the case of very young children or pregnant women, at 133% FPL or below). Only children and their parents who meet the poverty criteria can qualify for Medicaid. There are childless adults living at or below poverty who do not qualify for public insurance programs. An additional 4,000 children are eligible for the state Children's Health Insurance Program because their families live at or below 140% FPL. North Dakota provides a dental

benefit to both children and adults. The adult benefit is relatively comprehensive but is more limited than the benefit available to children on North Dakota Medicaid.

North Dakota is fourth in the nation in the percentage of people (96.4%) in the state on community water supplies who receive fluoridated water (CDC, 2011). However, there are people in the state, particularly in rural areas on private wells, without fluoride supplementation. Fluoridation is an important public health intervention that reduces the risk of developing dental caries over a lifetime and especially in children.

The following statements summarize the findings from the literature review and data analyses which benchmarked North Dakota with other states and the U.S. overall to describe similarities and differences in the oral health status of the population.

For many years, North Dakota stakeholders have been concerned about the oral health of the state's population. There have been some successful initiatives to improve oral health and to increase access to services.

- In 2008, North Dakota was fourth among states in the percent of the population on community water supplies who were receiving fluoridated water (96.4%).
- The dental safety net in North Dakota has grown in recent years. Safety net providers offer important preventive and restorative dental services to patients in their catchment areas. There are three safety net dental clinics sponsored by federally qualified health centers (FQHCs) and two non-profit dental clinics operating in the safety net with no federal subsidies. In addition, there is now a mobile dental van traveling in western North Dakota serving children without a dental home who are in need of dental care.
- In 2010, 72.6% of the population in North Dakota visited either a dentist or a dental clinic in the prior year comparing favorably with national data showing that 70.1% of the U.S. population visited a dentist or a clinic in the year prior to the survey (BRFSS, 2010). North Dakota has increased the percent of the population visiting a dentist or clinic annually by 5.5% since 1999 (BRFSS, 2012).
- North Dakota is one of only a few states in the U.S. that still provides an adult dental benefit for Medicaid insured people.

Despite efforts to improve the availability of oral health care, there are still access barriers. North Dakota stakeholders continue to be challenged by the state's geography and the needs of special population groups to improve access to oral health services.

- North Dakota is one of the most rural states in the nation. Thirty-six of the 53 counties in the state are designated as frontier with less than six persons per square mile (McDonald's Charities, 2011). National population density is 79.6 persons per square mile in the U.S (Rural, 2006).
- The American Indian population is the largest minority population in North Dakota, constituting 5.4% of the state's population. Nationally, American Indians constitute about 0.8% of the U.S. population (U.S. Census Quick Facts, 2012).
- Almost half (48%) of the state's American Indian population is younger than 20 years of age. The median age of the overall North Dakota population is about 38.8 years (U.S. Census, ACS, 2012). The relatively young age of the American Indian population, the cultural expectations about oral health, a lack of oral health literacy among tribal elders,

and the remote locations of the reservations where many American Indians reside constitute special challenges to the delivery of oral health services to this population group. Although people living on the reservations benefit from the presence of the Indian Health Service (IHS) and their dental programs, IHS resources are not sufficient to address the need for oral health services in the population.

- There are remote counties in the state with high numbers of Medicaid eligible children with no dentist to serve their oral health needs. For example, there are 3,000 children enrolled in Medicaid in Rolette County with no dentist in the county to serve them. There are some dental services available to children on the American Indian reservation but generally families must travel to get services. The closest pediatric dentist to Rolette County is in Minot, North Dakota which is about a two-hour drive.
- The elderly, particularly those living in nursing homes in North Dakota, are at risk for not receiving oral health care because of their decreased mobility or declining mental status, a lack of financial resources to pay for care, and the lack of portable dental service programs in the state. The rural areas of the state are disproportionately elderly so geography also complicates access for many older people. There is a successful demonstration project in two nursing homes in Bismarck using portable dental equipment. However, due to limited grant monies allotted for the project, expansion of the initiative to other nursing homes is not likely at this time.
- Low income adults without dental insurance in North Dakota have few options when seeking oral health services. While there are safety net programs that provide preventive and restorative dental services on a sliding fee scale, these programs are not widely available.

While there has been improvement in measures of oral health overall for state residents during the decade, there are difficulties with improving the oral health status of certain population groups in the state.

- While North Dakota has achieved the Healthy People 2010 and 2020 goals for the percentage of third graders with dental sealants on permanent molars (50% goal, 60% of children in North Dakota), the percentage of children in third grade who have ever experienced dental caries (55% in North Dakota) remains higher than the Healthy People objectives (41% for HP 2010 and 49% for HP 2020) (CDC, Healthy People 2020, 2012).
- The needs of minority children are higher than the needs of other children in the state. In an oral health survey of third-grade school children in North Dakota during the 2004 to 2005 school year, minority children were more likely than their non-Hispanic White peers to have decay experience, untreated caries, or urgent dental needs with 5% of minority children demonstrating decay at examination that was significant enough to cause pain or infection (NDDoH, Survey, 2005).
- In 2010, North Dakota ranked in the lowest quartile of states for the percentage of Medicaid eligible children that received any dental service (32.2%). In that year, 25.4% of Medicaid eligible children in the state received a preventive dental service and 13.1% of eligible children received a restorative service (CMS, 2011).
- North Dakota's rate of edentulism in the population was higher in 2010 (18.8%) than the national average (16.9%) and the percent of adults that had any permanent teeth extracted (45.2%) was also higher than the national average (43.6%) (BRFSS, 2010). In states such as North Dakota, where public insurance limits coverage for adult restorative services or

there is no dental benefit for adult beneficiaries, extraction may be selected as the treatment of choice when a tooth is decayed and in need of expensive endodontic treatment and restoration.

- The safety net clinics are mainly located in more populous areas of the state including Fargo, Grand Forks, and Bismarck although there are safety net services in parts of rural northern North Dakota. While some safety net providers treat patients who live quite far from the clinic site, other safety net providers limit their geographic service area due to high demand for dental services and limited capacity. Many areas in the state do not have access to a safety net provider that offers oral health services. In addition, the financial sustainability of the existing network of providers is threatened by low reimbursement rates and the high cost of providing dental care.

There has been an increase in the number of dentists licensed in North Dakota in recent years due in part to concerted efforts to build a pipeline of potential professionals by increasing the awareness of young people about the opportunities in dentistry. There has also been emphasis on recruitment of graduating dentists to the state.

- There are 5.4 dentists per 10,000 population in North Dakota in 2012. However, there is significant variation in the ratio of dentists to population by county in the state. There are 16 counties in the state with no dentist and eight counties with a single dentist. Thirty percent of the licensed dentists in the state are practicing in Cass County.
- In Cass County, there are 1,374 people per dentist which is 7.28 dentists per 10,000 population. In McLean County, there are 8,962 people per dentist which is 1.12 dentists per 10,000 population.

Despite increases in the number of dentists in North Dakota, not all dentists will treat Medicaid insured patients. Many dental providers assert that reimbursement for services to Medicaid does not cover the cost of providing dental services.

- While the North Dakota legislature has approved increases to the Medicaid reimbursement rates for dental care during recent and concurrent legislative sessions, the increases have been incremental. The cost of treating patients on Medicaid is typically higher than the reimbursement for services rendered. For that reason, some dentists in the state choose not see any Medicaid insured patients, some limit the number of new Medicaid patients in their caseload, and others treat only established Medicaid patients.
- In 2009, only 20% of dentists in North Dakota indicated that they were accepting any new Medicaid patient (Dental Fact Sheet, 2009). In contrast, 49% of dentists in North Dakota in 1992 indicated they were accepting any Medicaid patient seeking care (Dental Fact Sheet, 2009). Currently, 20% of dentists in the state provide the majority of dental services for Medicaid eligible patients.

There is a surplus of DHs in the state. For many years DHs in the state were required to work under the direct or indirect supervision of a dentist limiting their ability to provide services in places where dentists were not generally found. A recent legislative change has created new opportunities for DHs in public health settings.

- There are 83 DHs licensed in North Dakota who list no practice address, indicating that they are not working in dental hygiene. There appears to be more DHs in the state than jobs available in the field. Some DHs report working as dental assistants (DAs) while

others report working in non-oral health jobs because of the lack of opportunities in dental hygiene.

- North Dakota has one CODA-accredited DH education program which graduates about 25 students annually, while neighboring Minnesota has 10 CODA-accredited DH programs graduating approximately 212 students annually (ADA, 2012). There is a flow of graduates between states.
- Until 2011, DHs were required to work under the direct or indirect supervision of a dentist. After recent statutory and regulatory change, DHs are now permitted to provide some DH services under general supervision status in compliance with standing orders from a supervising dentist. Currently four DHs employed by the state are working under general supervision in school-based sealant programs with standing orders from a government contracted dentist.

There is a shortage of registered DAs in the state.

- North Dakota has for many years required that a DA be a graduate of a CODA-accredited program or be certified by the Dental Assisting National Board (DANB) as a certified dental assistant (CDA) to be permitted to fully function as a registered dental assistant (RDA) in the state. While there are chairside trained DAs in North Dakota who are called qualified dental assistants (QDAs), their scope of work is more restrictive than the scope allowed for RDAs. Dentists in North Dakota appear to prefer hiring RDAs because of the flexibility in tasks permitted.
- The shortage of DAs is partly attributed to the lack of educational programs in the state. There is a single CODA-accredited DA education program that graduates approximately 15 students annually. Upon graduation, some dental assisting graduates pursue immediate acceptance to the dental hygiene program which is offered on the same college campus. DAs recognize that the earning potential as a DH is greater than that for a DA, which encourages them to pursue further education. As a result, there are fewer new graduates available for employment as DAs.
- Neighboring Minnesota has 13 CODA-accredited DA education programs that graduate a total of about 420 DAs annually. These programs are likely a source of some new DAs in North Dakota (ADA, 2012).
- As previously mentioned, some DHs who are unable to find jobs as DHs are working as DAs in dental practices. This requires either formal or chairside training as the functions of DAs vary considerably from that of DHs. Dually trained DHs, however, provide flexibility in a dental practice since they can function in a number of roles and be responsive to changing demands within a practice.

Discussion

While North Dakota has made strides in increasing access to oral health services over recent years, some populations in the state still have limited access to oral health services. Children, particularly the very young and those who are Medicaid eligible, rural populations, low-income adults, the elderly, and American Indians are populations of specific concern.

North Dakota has made progress in the percent of children receiving a dental service annually yet many children on Medicaid still do not see a dentist or receive a preventive oral health

service annually. Not all dentists in North Dakota participate in Medicaid and only a few dentists are willing to accept any Medicaid patient seeking a dental service. As a result, a small number of dentists in North Dakota see the majority of children on Medicaid. The lack of participation in Medicaid by dentists further limits availability of oral health services even in areas where there may be abundant dental workforce.

There is a limited safety net for oral health services located mainly in the largest cities (Fargo, Bismarck, and Grand Forks) and in a few rural areas. As with many safety net providers throughout the U.S., long-term financial sustainability of community dental clinics and FQHCs is a concern for many of the community organizations operating dental programs. Safety net providers of oral health services are constrained from expanding by their physical infrastructures and their limited financial and human resources. Some safety net providers in North Dakota experience significant demand for the dental services they provide and must limit the catchment area from which patients are drawn because they do not have the capacity to meet need. In the past, it was difficult for not-for-profit clinics that were not FQHCs to offer dental services. North Dakota required that any entity providing dental services have a dentist as a majority owner (51%). Recent legislation exempted not-for-profit dental clinics from this requirement to now permit expansion of community clinics within the safety net.

The safety net in North Dakota is composed of four FQHCS, two not-for-profit dental clinics, and a mobile dental van serving children. There are areas of the state where there is no safety net dental provider within a reasonable driving distance of much of the population. While it is common in the rural and frontier areas of the state to drive great distances for any services, dental services seem particularly scarce even in commercial service centers in the west and south of North Dakota and in some of the northern areas of the state. There are areas in rural North Dakota with high numbers of children insured by Medicaid but no dentist to provide care or no dentist willing to accept Medicaid.

School-based oral health programs in many states have been key to addressing limited access to oral health services for children from low-income families in both urban and rural areas. School-based oral health programs are not as developed in North Dakota as they are in other states. This is likely due to the historical levels of required supervision for DHs. Recent statutory change now permits DHs to practice more autonomously in public health settings.

While DHs may now work under general supervision with the standing orders of a dentist, this type of practice has not been widely adopted. The state government operates the only school-based sealant program in North Dakota with a small number of regionally based DHs traveling to designated schools. The Ronald McDonald's Care Mobile will augment these school-based programs but van services are limited to western North Dakota where current need exceeds the capacity of the dental van to provide services. In addition, the services offered in school-based programs are oral health education and application of dental sealants and fluoride varnish. In other states, DHs working in schools are able to also provide prophylaxis and even temporary restorations for children. As previously noted, there is currently excess capacity in the dental hygiene workforce that might be used to expand school-based services across North Dakota. This expansion would require dentists to provide standing orders to DHs and might also require that DHs be permitted to seek Medicaid reimbursement for services provided in schools.

A recent demonstration project in which portable dental services were provided to residents of two nursing homes in Bismarck by dental providers from Bridging the Dental Gap was quite successful. Although there is emerging demand for such programs, there is limited grant funding to support and sustain dental services for those in institutional care. Such programs could be replicated in other areas of North Dakota using the model employed in Bismarck if funding were available. Again, the excess capacity of DHs in the state could be engaged to provide oral health services for the elderly living in nursing homes.

The oral health of the American Indian population in North Dakota is a particular concern for a number of reasons. The mean age of American Indians is considerably younger than the mean age for the state as a whole. While the population is served by both Tribal Health Services (THS) and IHS, it appears that these programs may be underfunded or under resourced to serve the needs of the growing population on the reservations (Health Action, 2012, Pine Ridge, 2012). In addition, American Indians living off the reservations do not have access to the federal programs managed by IHS. Efforts to bridge cultural differences, educate the population, especially the tribal elders and the young about the importance of oral health, and engage community dentists and other oral health workforce in areas surrounding the reservations might be helpful in addressing some of the unmet need for oral health services on Indian lands and improve the oral health literacy of the population.

Technical Report

Background

The following chapters were compiled from information and data found during the literature review for this project. Primary and secondary data about oral health in North Dakota were not widely or publicly available and although attempts were made to obtain more current, state-specific data from a variety of sources, those efforts were unsuccessful. In some cases, data cited within this report were extracted from the personal telephone interviews that were conducted for this project. Various stakeholders provided detailed information about their programs and clinics that was used herein. As a result, there are citations within this report that indicate the information was obtained through a personal communication. These communications are not listed in the references section to assure the confidentiality of the interview participant. The author has made every attempt to assure that the data supplied by informants is accurately reported here.

Chapter 1: The State of North Dakota

North Dakota, which is located in the north central region of the country, is one of the most rural states in the U.S. (World Atlas, 2012). While it is the 19th largest state in size, it is the third smallest in population and the fourth least densely populated state in the nation (Wikipedia, 2012). With an estimated population in 2011 of 683,932 people (U.S. Census, ACS, 2012) and a land area of more than 70,000 square miles, there are less than 10 people per square mile in the state compared to the national population density of 79.6 people per square mile (Rural, 2006). Thirty six of the 53 counties in the state are designated as frontier, with less than six people per square mile (McDonald's Charities, 2011). From 2000 through 2003, the population of North Dakota declined. However, by 2009, the state's population exceeded the population in 2000 (NDDoH, 2011, Title V).

North Dakota is bounded by Canada to the north, South Dakota to the south, Minnesota to the east, and Montana to the west. Rugby, North Dakota is the geographic center of the North American continent (Wikipedia, 2012). North Dakota is a High Plains state of grassy prairies and elevations including hills and buttes in western North Dakota (World Atlas, 2012). The state is predominately grasslands and the eastern region of the state has particularly fertile farmland. North Dakota is rich in fossil fuels including crude oil and coal. The western part of the state is experiencing an oil boom with the fourth largest oil production of any state in the U.S. It is estimated that there is more natural crude in the Baaken oil reserve in North Dakota than in the Alaskan National Wildlife Refuge (Wikipedia, 2012). While the state has been producing oil for many decades, oil production dramatically increased after 2007. North Dakota's economy is strong, with the lowest unemployment rate in the nation, and both job and population growth mainly due to the oil boom. In 2010, the state per capita income was the 17th highest in the nation.

Agriculture is the state's main industry. About 90% of the state's land is used for farming. The state supplies almost all canola and flax seed grown in the U.S. and more than half of all sunflower seeds. North Dakota farmers also produce cereal grains including barley, wheat, and oats. Other farm products include corn, soybeans, sugar beets, honey, peas, beans, lentils, and potatoes. North Dakota ranks ninth in the nation in value of crops grown and 18th in total value

of agricultural products sold (Wikipedia, 2012). The energy industry and the food processing industry are also major contributors to the economy.

North Dakota was mainly settled by Northern Europeans and the population is primarily non-Hispanic White (90%). The proportion of other racial groups is lower than in the nation as whole with the exception of the American Indian population which is higher (5.4%) than the national average (0.8%). There are five self-governing American Indian reservations in the state; one is Ojibwa, three are Sioux, and one is Three Affiliated Tribes (Mandan, Hidatsa, and Arikara Nations). These reservations include the Spirit Lake Nation, the Standing Rock Sioux Tribe, the Turtle Mountain Band of Chippewa Indians, the Sisseton-Wahpeton Oyate Nation, and the Trenton Indian Service Area. About 60% of the American Indians in the state live on reservations and 48% are younger than age 20. There are persistent areas of poverty within these reservations that contribute to health disparities in the state (NDDoH, 2011, Title V).

In 2011, the population of North Dakota was more likely to have graduated from high school (89.4% of adults age 25 and older) than the U.S. population as a whole (85%). However, North Dakotans were less likely to have a bachelor's degree or higher (26.3%) than the U.S. population (27.9%).

Table 1. Demographic Characteristics of the Population of North Dakota and the U.S., 2011

Population Characteristics	North Dakota	United States
Total Population	683,932	311,591,917
Persons < 5 years	6.6%	6.5%
Persons < 18 years	22.3%	24.0%
Persons > 65 years	14.5%	13.0%
Females	49.5%	50.8%
Non-Hispanic White	88.9%	63.7%
American Indian/Alaska Native	5.4%	0.9%
Black/African American	1.2%	12.6%
Asian	1.0%	4.8%
Other Race or Races	1.8%	3.1%
Hispanic/Latino	2.1%	16.4%
Foreign Born	2.4%	12.7%
Population Density Per Sq. Mile	9.7	87.4
High School Graduate (Age >25)	89.4%	85.0%
Bachelor's Degree Or Higher (Age > 25)	26.3%	27.9%
Median Household Income	\$46,781	\$51,914
Persons Living Below Poverty Level	12.3%	13.8%

Source: U.S. Census, QuickFacts, 2012

There are 53 counties in the state. Bismarck, which is located in south central North Dakota along the Missouri River, is the capital and the second largest metropolitan area in the state. Fargo is the largest city in North Dakota and is located on the eastern border with Minnesota. In 2009, the American Lung Association identified Fargo as the cleanest city in the U.S. for air quality (Wikipedia, 2012; World Atlas, 2012). Other cities in the state include Minot (home of Minot Air Force Base), Grand Forks, Jamestown, Williston, Dickinson, Valley City, and Devils Lake.

The legislature is bicameral with both a Senate and a House of Representatives with one Senator and two representatives for each of 47 districts in the state. The legislature is in session for 80 days once every two years.

Chapter 2: History of Oral Health Initiatives in North Dakota

2000

A North Dakota dental summit was convened in April 2000. This meeting of North Dakota oral health stakeholders was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services. The purpose of the summit was to engage the state with the national Oral Health Initiative and to consider policies to increase access to oral health services in North Dakota. The summit included presentations by representatives of HRSA, the Health Care Financing Administration (HCFA, now Centers for Medicare and Medicaid Services (CMS)), the North Dakota Department of Health (NDDoH), IHS, the North Dakota Medicaid program, the North Dakota Dental Association, and the Head Start Collaboration. The presentations described oral health services and access issues at regional, state, and national levels (Felix et al., 2000).

The summit was convened in Bismarck but stakeholders at four other sites participated in the afternoon session through an interactive video network. Links to the network were available in Fargo, Grand Forks, Minot, and Williston, North Dakota (Felix et al., 2000).

The presentations provided federal and state perspectives on oral health in North Dakota and discussed oral health access. Some of the salient information offered by presenters included the following:

- Oral health access was a major unmet need among low-income, minority, and special population groups in North Dakota.
- The number of private practice dentists in North Dakota was declining by, on average, six dentists per year.
- The dental safety net was inadequate to address unmet need for oral health services.
- There was no state loan repayment program for dentists in 2000, which was considered a barrier to attracting new dentists to practice in the state.
- American Indians were of concern because they are the largest minority population in the state. American Indians both on and off reservations were of interest to oral health stakeholders. While IHS provided some oral health services to those living on reservations, those who moved off reservations were no longer eligible to access those services. American Indians who were also low income might have difficulty accessing oral health care in North Dakota communities.

- In the four state Aberdeen Indian Health service area (which includes North Dakota) which serves American Indians, there were 20 dental programs all in need of dentists. One IHS program had eight dental positions but less than half of those positions were filled at the time of the summit.
- North Dakota Medicaid reimbursement for dental services was 85.7% of billed charges for children and 72.3% of billed charges for adults in 2000. In the prior year (1999), 47% of Medicaid eligible adults and children received a dental service.
- North Dakota Medicaid had 22,000 children enrolled in the program at the time of the summit.
- Head Start programs provided dental screenings for children at enrollment in Head Start and Early Head Start programs.
- Securing slots for North Dakota students in dental schools was considered important to encouraging increased supply of dentists in the state (Felix et al., 2000).

The afternoon of the summit was dedicated to facilitated discussions involving stakeholders in all locations to identify key issues affecting access to oral health services in the state. Challenges to improving access to oral health care were identified in the discussions.

- Current and future workforce supply was a concern. Discussion points included early retirements and the declining population of dentists in the state. There was a concomitant concern that decreased numbers of employing dentists would also result in decreased numbers of DAs and DHs in North Dakota. The expense of dental education was identified as a deterrent to more North Dakota students applying to dental education programs.
- The challenges of meeting the dental needs of special populations in North Dakota, including low-income populations, Medicaid insured residents, and people with special needs were a topic of discussion. Transportation barriers, patient behaviors or attitudes toward dental care, and incompatibility of dental office hours with work schedules were all identified as access barriers.
- The challenge of financing dental care was also a major topic of discussion. Some dental procedures were not well covered by public or private insurance companies. There were few incentives at the time of the summit for dentists to treat special populations (Felix et al., 2000).

Once issues of interest were prioritized, summit participants were organized into small groups to discuss possible strategies to address the problems previously identified by the group. A number of suggestions related to the three areas of greatest concern (workforce, special populations, and financing) were generated from the group discussions and next steps were defined:

- Expand oral health screening programs especially in schools by using DHs.
- Investigate expansion of public health dentistry in local health departments.
- Guarantee spots for North Dakota students in dental schools and fund such efforts to the extent necessary.
- Increase externship opportunities in North Dakota for dental students to acquaint them with working with rural and special needs populations.
- Explore expanded roles for allied dental professionals and promote collaborations among professions.
- Present results of the summit to the North Dakota legislature.

- Focus any legislative efforts in oral health on the benefits that will accrue to the people of North Dakota rather than on the benefits for stakeholders.
- Implement a state dental loan repayment program and find resources to guarantee slots for North Dakota students in dental schools (Felix et al., 2000).

The state dental director was charged with organizing and coordinating work groups to continue to address issues related to oral health identified in summit proceedings.

2006

In September 2006, the NDDoH published *Oral Health in North Dakota: Burden of Disease and Plan for the Future*. The first section of the comprehensive report discussed the oral health status of the state's population. The second part put forth a plan to enhance and improve the oral health of the state's residents.

Oral Health in North Dakota: Burden of Disease

This section of the combined report described the burden of oral disease in the population using data from the 2004-2005 Third-Grade Basic Screening Survey, the 2004 Behavioral Risk Factor Surveillance System (BRFSS), the 2002 North Dakota Pregnancy Risk Assessment Monitoring System, and the North Dakota Cancer Registry. Some of the findings described in this section were:

- Minority children in North Dakota were proportionately more likely than non-Hispanic White children to have tooth decay so advanced that they were experiencing pain or infection. North Dakota has proportionately more American Indian children than many states in the U.S. (NDDoH Survey, 2005).
- Minority children were also less likely to have dental sealants on permanent teeth (43%) than were non-Hispanic White children (54%).
- Men in North Dakota were less likely to have had a dental visit in the prior year than women. Adults with lower incomes were less likely to have had a dental visit in the prior year than adults in higher income groups (NDDoH citing BRFSS, 2004).
- Nearly 25% of North Dakota residents age 65 or older had lost all their teeth (NDDoH citing BRFSS, 2004).
- In 2002, more than half of pregnant women (57%) in the state had not visited a dentist or dental clinic during their pregnancy and 32% indicated that they had not had their teeth cleaned in more than a year. Minority women, those living in rural areas, and women with lower levels of education were the least likely to have had a dental visit during their pregnancy. Women with Medicaid coverage were less likely than women with other types of insurance coverage to have visited a dentist during their pregnancy (ND Data Center, PRAMS, 2002).
- In 2004, 70% of all adults in North Dakota reported seeing a dentist in the prior year (NDDoH citing BRFSS, 2004).
- In 2005, just 25% of Medicaid eligible adults and 25% of Medicaid eligible children had a dental visit, according to the North Dakota Medicaid Program.
- North Dakota residents with special health care needs were also a concern. In 2002, 36% of people in the state with diabetes did not visit a dentist compared to 29% of residents without diabetes (NDDoH, Burden, 2006).

The report also described North Dakota's success with community water fluoridation indicating that 96% of people on public water systems had fluoridated water. In 2006, North Dakota children in 72 schools in rural and low-income communities without fluoridation benefited from a topical fluoride program (NDDoH, Burden, 2006).

American Indians living in North Dakota were a special focus of the report. While members of the five tribes in North Dakota living on reservations were served by IHS and THS, the population of American Indians living in urban areas of the state was at risk. This population had limited access to tribal services and was at risk for being low income and without resources to pay for oral health services (NDDoH, Burden, 2006).

The report also discussed the oral health workforce in North Dakota citing the *2005 Survey of North Dakota Dentists*, which found that 44 of the state's 53 counties had six or fewer dentists practicing within the county. Only four counties in the state had 16 or more dentists (NDDoH, Burden, 2006, Re-registration, 2005).

Oral Health in North Dakota: Plan for the Future

The second section of the report discussed oral health initiatives and infrastructure in North Dakota including the Oral Health Program of the NDDoH, the North Dakota Oral Health Coalition, and the *Healthy North Dakota* initiative introduced by the Governor in 2002 (NDDoH, Burden, 2006).

In 2005, a broad group of North Dakota stakeholders was assembled as the North Dakota Oral Health Coalition to examine existing literature and data sources to develop a plan to achieve improved oral health for the state's residents. The plan established a standard for oral health for the state's population while still recognizing the diversity of need within the population and the disparate resources of North Dakota's communities (NDDoH, Burden, 2006). The North Dakota Oral Health Plan identified target populations considered especially vulnerable or underserved for oral health services, including certain racial and ethnic groups in the state, pregnant women, people with disabilities or special medical needs, and low-income populations (NDDoH, Burden, 2006). The coalition made the following recommendations:

- Oral and medical health should be integrated
- Consumers in North Dakota should recognize the value of oral health
- Communication, education, and care would be enhanced by the use of technology
- The oral health coalition should be sustainable, diverse, and recognized as an advocate in oral health
- Creative dental coverage programs should be available to the public
- Educational opportunities in the dental field should be expanded
- All state residents should be made aware of the benefits of fluoridation
- Creative solutions should be employed to improve access to oral health care (Plan, 2006).

2007

The North Dakota Children's Oral Health Conference was held in 2007 in Fargo, North Dakota, with more than 50 stakeholders participating in a full day of presentations and group activities that culminated in small group discussions about policy issues affecting delivery and utilization of oral health services in the state. The objective of the conference was to set oral health priorities for North Dakota. The policy issues that were identified and discussed during the small group process were submitted to the larger group for priority ranking (Mouden, 2007).

The five priority issues selected through voting by assembled stakeholders were ranked as follows:

1. Increase funding for Medicaid dental reimbursement
2. Increase programs for oral health awareness
3. Legislate expanded functions by DHs/collaborative practice
4. Encourage dental student rotations in community clinics
5. Offer new dentists loan repayment for working in public health settings.

After oral health policies were prioritized, stakeholders formed small groups to discuss the feasibility of potential actions for policy or system change and opportunities to make changes to increase access to oral health services in the state. Opportunity and feasibility scores were developed for each of the identified priority issues. All scores were combined to develop a new hierarchy of policy priorities. The final priorities by ranking were:

1. Offer new dentists loan repayment for working in public health settings
2. Increase programs for oral health awareness
3. Increase funding for Medicaid dental reimbursement
4. Legislate expanded functions by DHs/collaborative practice
5. Encourage dental student rotations in community clinics.

Prior to the conference, the legislature had defeated a Medicaid rate increase for dental services during the biennial 2007 session. Conference initiators had thought that the facilitated group exercise would lead to the group prioritizing increased Medicaid reimbursement as the most important policy initiative for stakeholders to pursue. However, when all scoring was completed, dentist loan repayment opportunities were ranked as the primary priority by the group with Medicaid dental reimbursement ranking third (Mouden, 2007).

2008

Beginning in 1993, program staff at the NDDoH started developing the North Dakota Oral Health Surveillance System using tools such as the BRFSS and the Youth Risk Behavior Survey (YRBS). In 2000, the state surveillance system included 27 oral health indicators from nine key data sources. By 2008, the system had expanded to include 44 oral health indicators from 12 data sources, including the:

- Head Start Program Information Report (PIR) (four oral health indicators)
- Basic Screening Survey of Third-Grade Students (BSS) (five oral health indicators)
- North Dakota Department of Human Services Medicaid Claims (two oral health indicators)
- North Dakota Division of Vital Records (four oral health indicators)

- Youth Risk Behavior Survey (six oral health indicators)
- Youth Tobacco Survey (four oral health indicators)
- Behavioral Risk Factor Surveillance System (six oral health indicators)
- New Mother's Survey/Pregnancy Risk Assessment Monitoring System (PRAMS) (three oral health indicators)
- North Dakota Cancer Registry (one oral health indicator)
- North Dakota Licensure Workforce Survey (four oral health indicators)
- Dental Workforce Survey (three oral health indicators)
- North Dakota Water Fluoridation Reporting System (WFRS) (two oral health indicators)

In 2008, the NDDoH published the North Dakota Oral Health Surveillance System Plan 2007-2013. The purpose of the surveillance system was to monitor the oral health status of the population and identify trends in oral health. These data were used to guide program development and activity; for program planning, implementation and evaluation; for policy planning and advocacy; and to improve program accountability (NDDoH, Surveillance, 2008). The surveillance system is focused on data collection and analysis, data dissemination, and evaluation. The data are used on an ongoing basis to evaluate oral disease in the North Dakota population, measure change in oral health capacity to deliver services, and monitor and report on the quality of community water fluoridation (NDDoH, Surveillance, 2008). The surveillance system is a central repository for data about oral health including both primary and secondary data. Staff are expected to ensure data quality, identify gaps in data, recognize trends in oral health in the state, produce current reports and facts sheets, and report state data to national surveillance systems (NDDoH, Surveillance, 2008).

2009

In March 2009, the Center for Rural Health at the University of North Dakota published *An Environmental Scan of Health and Health Care in North Dakota*, which discussed the environmental context in which health services were delivered in the state; the health status of the population; and the status of the health care delivery system; including infrastructure, financing, quality, and level of access.

Oral health was included in the report as a component of general health although the authors acknowledged that delivery of oral health services was somewhat different than delivery of medical care. Access to oral health care in North Dakota was described as hampered by workforce shortages and payment system shortcomings (UND, Environment, 2009). In 2005, less than one-quarter of dentists in North Dakota accepted all Medicaid patients requesting services and one-third limited the number of Medicaid patients treated in their practices (UND, Environment, 2009). Rural dentists were more likely than urban dentists to accept all Medicaid patients (UND, Environment, 2009 citing Amundson et al.). The authors identified need for both public oral health education and alternative models of care delivery for oral health services.

The report discussed particular concerns about rural populations in North Dakota with rural defined as a non-metropolitan, non-core county that contained no communities of 10,000 or more people. At the time of the report, there were 49 non-metropolitan counties in North Dakota, 36 of which were considered frontier counties and five of which were considered rural. The

remaining eight counties were micropolitan or metropolitan meaning they contained an urban core of at least 10,000 people (UND, Environment, 2009).

The environmental scan described the evidence of lack of access to oral health care in North Dakota. Many parts of the state were federally designated as DHPSAs, with about one-third of the counties designated either wholly or in part as a shortage area. Another indicator of lack of adequate access to preventive oral health care was the use of hospital emergency departments (EDs) for dental complaints. Care for dental problems in an ED is both more expensive and less effective care because dentists are generally not available in ED settings (UND, Environment, 2009). The report cited a state study of ED utilization that found that 1.1% of all ED visits in 2002 were related to a dental problem (UND, Environment, 2009 citing Muus et al.). Two-thirds of patients visiting an ED for a dental problem were either uninsured or insured by Medicaid. There was geographic variation in utilization of EDs for dental care. In the Grand Forks area, one hospital system reported 877 patient visits related to mostly non-emergent dental problems between 2000 and 2002 (UND, Environment, 2009 citing Northern Valley Oral Health Coalition).

The report also described the oral health workforce in North Dakota in 2008. Licensure lists included 322 dentists, 489 registered DHs, and 385 registered DAs. Dentists in the state mainly practiced in private practices, either solo or group, with active dentists providing services in 250 clinic or private practice sites (UND, Environment, 2009). More than two-thirds of dentists (68%) practiced in urban locations including Bismarck, Devils Lake, Dickinson, Fargo, Grand Forks, Jamestown, Mandan, Minot, and Valley City. The remainder (32%) practiced in the rural areas of North Dakota.

The safety net for oral health services included four community health centers (CHCs) in the state. In 2005, there were approximately 75,000 people enrolled in Medicaid, about half (51%) of whom were children (37,900). The Valley CHC in Northwood opened a dental clinic in Grand Forks in 2007 where uninsured clients paid for services on a sliding fee scale. The clinic participated with both the North Dakota Medicaid program and Minnesota Medicaid. In 2007-2008, two dentists, two DHs, and five DAs served over 1,800 patients during 4,800 patient encounters. Most of the services provided were reimbursed by Medicaid (75%) with 16% of patients paying on a sliding fee scale and the remainder (9%) paying privately for services (UND, Environment, 2009).

Two other rural CHCs in the state, Coal Country Community Health Center in Beulah, and Northland Community Health Center in Turtle Lake, contracted with local dentists for referral of Medicaid patients for oral health services. The FQHC in Fargo, Family Healthcare Center, managed a dental clinic open to patients of the health care clinic. There was also a volunteer dental clinic in Moorhead, Minnesota called the Red River Valley Clinic (Moorhead, Minnesota is just across the river from Fargo, North Dakota) that operated as an urgent care clinic for walk-in patients (UND, Environment, 2009). In addition, a dental clinic in Bismarck called Bridging the Dental Gap Clinic operated a not-for-profit dental clinic serving low-income and uninsured people.

There were emerging concerns about possible future challenges to provision of oral health services in North Dakota considering population demographic trends that showed increasing numbers of elderly residents and people with chronic care needs and the small size of the oral health workforce at the time of the report.

The American Indian population in the state was a special concern as the largest minority population in the state. Tribal populations were growing with ever increasing numbers of people in need of services. The median age of American Indians in North Dakota in 2007 was 18 years compared to a national median age for American Indians of 28.5 years. The overall median age of the North Dakota population was 38.8 years, so American Indians in the state were considerably younger.

The IHS was charged with providing health services to American Indians but it did not have the capacity to fully meet need. Funding for IHS came from a combination of federal and tribal funds but the IHS was generally funded at a level estimated to meet 59% of actual need (UND, Environment, 2009 citing U.S. Commission on Civil Rights, 2003). At the time of the 2008 report, IHS provided services on four tribal reservations in North Dakota and in one service area (Trenton). Each of the reservations and the IHS service area had separate annual health care budgets that varied between \$3.3 million and \$20.8 million. This equated to a budget of about \$1,800 per capita for health services. Overall spending on health care in North Dakota in 2004 was \$5,800 per capita and \$5,300 per capita in the U.S. (UND, Environment, 2009).

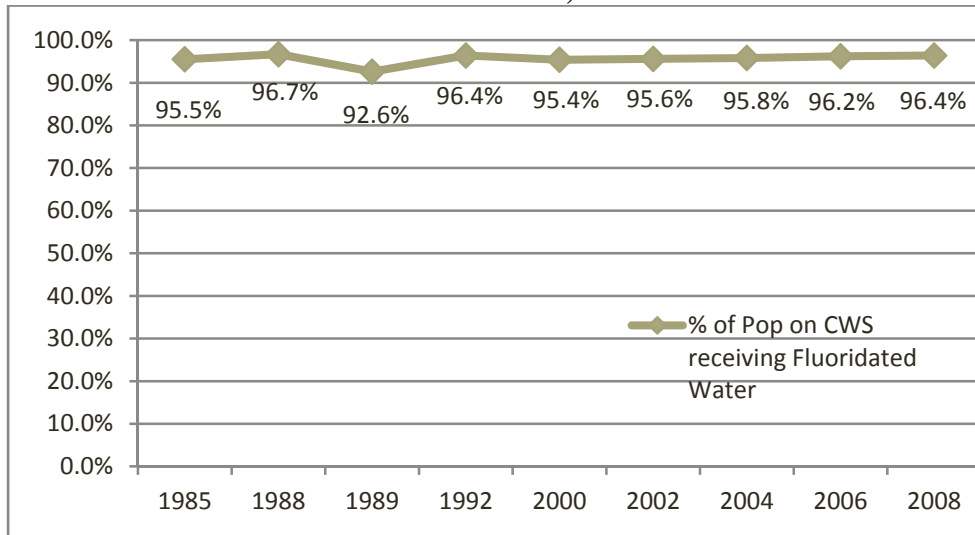
Chapter 3: Oral Health of North Dakota's Population

Water Fluoridation

Fluoride is a naturally occurring element commonly found in water sources. Fluoride is effective in preventing or controlling dental caries, especially for children. However, the levels of fluoride in water may not always be sufficient to provide the desired protective effect. Municipal water systems and other water suppliers across the U.S. often supplement water supplies with fluoride to promote oral health and help prevent tooth decay. The natural level of fluoride in public water systems is assessed prior to supplementation to determine the amount of additional fluoride needed to meet optimal levels (CDC, 2011). Studies show that water fluoridation reduces the rate of dental caries by about 25% over a person's lifetime (CDC, 2011). Earlier in this decade, recommended levels of fluoride in drinking water varied from 0.7 parts per million (ppm) for people living in warmer climates to 1.2 ppm for people living in cooler climates. The difference in recommended levels based on climate was to accommodate the tendency for people in warmer locations to drink more water (CDC, 2011). In January 2011, federal guidelines for baseline fluoride levels were revised to 0.7 ppm regardless of climate conditions. It was determined that this lower concentration offered sufficient protection while also reducing the risk of fluorosis, particularly for children (Jordan, 2011).

The percentage of the population on community water systems (CWS) that actually receive fluoridated water in North Dakota has been high for more than two decades, placing North Dakota among the top 10 states in the U.S. for the percentage of people on public water systems that receive fluoridated drinking water.

Figure 1. Percent of Population on Community Water Systems Receiving Fluoridated Water in North Dakota, 1985 to 2008



Source: CDC, Water Fluoridation, Reference Data.

In 2008, 96.4% of the people on 336 CWSs in North Dakota received fluoridated water (CDC, 2011). In that year, about 85.9% of the state’s total population had fluoridated water in their homes. The percentage of the population on private wells with adequately fluoridated water was unknown. North Dakota was fourth among states in the percentage of the population on CWS with fluoridated water in that year (CDC, 2011).

In 2010, students in 19 elementary schools in communities without the benefit of fluoridated water participated in a weekly fluoride mouth rinse program supervised by school personnel (NDDoH, 2010).

Table 2. Percent of Population on Community Water Systems and Percent of Total Population Receiving Fluoridated Water, by State, 2008

State	% Pop on CWS* receiving Fluoridated Water	Rank	Estimated % Total State Pop receiving Fluoridated Water^	State	% Pop on CWS* receiving Fluoridated Water	Rank	Estimated % Total State Pop receiving Fluoridated Water^
United States	72.4%						
District of Columbia	100.0%		100.0%				
Maryland	99.8%	1	85.9%	Oklahoma	75.3%	27	75.3%
Kentucky	99.4%	2	91.7%	New York	72.2%	28	64.8%
Minnesota	98.8%	3	78.5%	Nevada	72.0%	29	67.6%
North Dakota	96.4%	4	86.9%	Colorado	70.6%	30	70.0%
Georgia	95.8%	5	95.8%	Nebraska	69.9%	31	55.7%
Illinois	95.4%	6	85.0%	Massachusetts	65.4%	32	65.4%
Virginia	94.9%	7	76.9%	Alaska	62.8%	33	58.9%
Indiana	94.5%	8	67.9%	Washington	62.4%	34	52.9%
South Carolina	94.4%	9	75.9%	Arkansas	60.5%	35	54.2%
Iowa	93.3%	10	77.6%	California	58.8%	36	58.6%
South Dakota	91.8%	11	79.7%	Vermont	58.5%	37	49.6%
Tennessee	91.4%	12	84.8%	Mississippi	54.6%	38	54.6%
West Virginia	90.6%	13	66.6%	Utah	54.3%	Tied for	44.5%
Connecticut	89.9%	14	68.0%			39	
Michigan	89.8%	15	66.3%	Pennsylvania	54.3%	Tied for	46.6%
Wisconsin	89.7%	16	61.7%			39	
North Carolina	85.6%	17	60.3%	Arizona	52.3%	41	44.5%
Rhode Island	84.6%	18	78.7%	Kansas	44.7%	42	41.1%
Ohio	84.1%	19	74.7%	New Hampshire	42.6%	43	27.0%
Alabama	82.2%	20	82.2%	Wyoming	36.8%	44	31.0%
Missouri	79.8%	21	67.1%	Idaho	31.2%	45	20.7%
Maine	79.7%	22	38.4%	Montana	30.0%	46	24.7%
Florida	78.6%	23	72.9%	Louisiana	28.3%	47	28.4%
Texas	78.3%	24	69.8%	Oregon	27.4%	48	22.1%
New Mexico	77.0%	25	61.0%	New Jersey	13.6%	49	12.9%
Delaware	76.8%	26	72.1%	Hawaii	10.8%	50	10.8%

Source: CDC, 2011, CDC Vintage Data, 2008 *CWS = Community Water Systems ^It is not possible currently to accurately assess the percent of a state's population drinking naturally fluoridated water accessed through private wells.

Surveillance Data

It is generally difficult to accurately describe the current oral health status of a state's population since surveillance data are not systematically collected at the local level and available data are dated. One important problem with oral health outcome data currently is that data are typically collected at the national level and not typically available at the community level (Glassman, 2011). Use of national oral health data is generally limited to assessments of general trends and oral health disparities among certain demographic groups (Glassman, 2011). This situation is not easily remedied as local entities often have limited resources to do large scale oral health surveys (Glassman, 2011).

The most widely cited source of data for describing the oral health status of the population is the Behavioral Risk Factor Surveillance System (BRFSS) maintained by the Centers for Disease Control and Prevention (CDC). The BRFSS data are compiled from a state-based system of annual health surveys that collect information about health status and health behaviors of the population. The BRFSS is a telephone survey that contains fixed core questions (asked annually), rotating core questions (asked at varying intervals), and optional modules (asked at a state's prerogative) (CDC, BRFSS, 2012). Questions about oral health status and behavior are contained in the rotating core and are, therefore, not usually asked annually.

In 2008, 73% of North Dakota's residents indicated they had visited a dentist within the prior year and 71% indicated they had their teeth cleaned within the past year. This placed North Dakota in the top one-third of states in the U.S for the percent of the population accessing oral health services. However, North Dakota ranked relatively low among states on the percentage of people who had no teeth removed due to decay or disease (54%).

In states that limit the restorative benefit for Medicaid insured adults or limit care to palliation and emergency treatment, extraction of teeth is often chosen as the viable treatment option since more expensive endodontic care and finished crowns are too expensive an option for patients on medical assistance or for low-income patients paying for services on a sliding fee scale.

Table 3. Percent of Population by State Receiving a Dental Service or with All Teeth, 2008

STATE	Percent who last visited a dentist within the past year	STATE	Percent who had their teeth cleaned within the past year	STATE	Percent who had no teeth removed due to decay or disease
Connecticut	78.6%	Connecticut	79.9%	Utah	66.9%
Massachusetts	77.8%	Massachusetts	79.3%	Minnesota	65.0%
Rhode Island	77.7%	Rhode Island	78.8%	Colorado	64.1%
New Hampshire	75.9%	New Hampshire	77.1%	Washington	63.0%
Delaware	75.3%	Delaware	76.3%	Wisconsin	61.9%
Michigan	74.6%	Vermont	75.7%	Oregon	60.8%
Minnesota	74.5%	Virginia	75.4%	Alaska	60.7%
Vermont	74.4%	New Jersey	74.9%	Nebraska	60.6%
Virginia	74.0%	Michigan	75.0%	Kansas	60.0%
New Jersey	73.8%	Minnesota	74.3%	DC	59.4%
Hawaii	73.4%	Iowa	74.1%	Iowa	59.3%
North Dakota	72.9%	Hawaii	73.4%	Connecticut	59.3%
Washington	72.6%	New York	73.1%	Delaware	59.3%
New York	72.5%	Maine	72.1%	Michigan	58.9%
Wisconsin	72.4%	North Dakota	71.4%	Hawaii	58.9%
Iowa	72.4%	Wisconsin	72.2%	Virginia	58.8%
South Dakota	72.1%	Ohio	71.9%	Idaho	58.3%
Utah	71.5%	Washington	71.6%	New Hampshire	57.6%
Utah	71.4%	DC	71.3%	Massachusetts	57.5%
Ohio	71.2%	South Dakota	70.8%	Rhode Island	57.5%
DC	70.5%	Kansas	70.7%	California	57.3%
Kansas	70.5%	Maryland	71.0%	Illinois	57.0%
Oregon	70.4%	Pennsylvania	70.9%	Maryland	57.0%
Nebraska	70.4%	Oregon	70.1%	South Dakota	56.8%
Maine	70.2%	Nebraska	70.1%	Texas	56.1%
Georgia	70.0%	Utah	70.1%	Arizona	56.1%
Pennsylvania	69.9%	Georgia	70.0%	Wyoming	56.0%
California	67.6%	Louisiana	69.0%	Montana	55.9%
Idaho	68.0%	California	68.8%	Nevada	55.8%
Louisiana	67.7%	North Carolina	68.3%	New Mexico	55.6%
Florida	67.3%	Indiana	68.1%	Georgia	55.4%
Illinois	67.6%	Florida	67.4%	Vermont	54.9%
North Carolina	67.2%	Idaho	67.4%	Ohio	54.6%
Colorado	67.2%	South Carolina	66.5%	North Dakota	54.3%
Wyoming	66.7%	Colorado	66.6%	Louisiana	54.1%
Indiana	66.5%	Illinois	66.3%	New Jersey	52.6%
Arizona	66.4%	Arizona	66.2%	North Carolina	52.2%
South Carolina	65.7%	Wyoming	65.7%	Florida	52.1%
Alaska	65.3%	Tennessee	65.5%	Indiana	51.8%
Montana	64.6%	New Mexico	64.3%	Maine	51.8%
Tennessee	64.4%	Alabama	64.0%	Missouri	50.7%
New Mexico	64.0%	Kentucky	62.5%	Oklahoma	49.9%
Kentucky	63.9%	Nevada	62.4%	Kentucky	49.3%
Alabama	63.4%	Alaska	62.3%	Pennsylvania	49.2%
Nevada	61.5%	Montana	62.2%	New York	49.1%
Arkansas	61.5%	Arkansas	62.1%	South Carolina	49.1%
Missouri	61.1%	West Virginia	61.6%	Alabama	46.9%
Texas	59.8%	Missouri	61.6%	Arkansas	46.1%
West Virginia	59.9%	Texas	60.2%	Tennessee	45.2%
Mississippi	57.5%	Mississippi	57.2%	Mississippi	41.9%
Oklahoma	56.7%	Oklahoma	56.6%	West Virginia	39.7%

Source: CDC, BRFSS, 2008

In 2010, the percent of North Dakota's population that had visited a dentist or dental clinic in the prior year was about the same as in 2008. The state's rank among all states declined because other states showed greater improvement in the rates of dental visits over the two-year period.

Table 4. Percent of Population Visiting a Dentist or with Tooth Extraction or Loss, 2010

State	Visited Dentist or Dental Clinic in Past Year,	State	Adults that have any permanent teeth extracted,	State	Edentulism in Adult Population 65 Years Plus
United States	70.1%	United States	43.6%	United States	16.9%
Massachusetts	81.7%	Minnesota	32.6%	West Virginia	36.0%
Connecticut	81.6%	Utah	32.8%	Tennessee	33.7%
Minnesota	78.9%	Colorado	35.4%	Kentucky	27.4%
Virginia	78.4%	Washington	36.6%	Mississippi	27.1%
Rhode Island	78.1%	Oregon	37.2%	Louisiana	25.6%
New Hampshire	76.7%	Alaska	37.7%	Alabama	25.5%
Iowa	76.0%	Connecticut	37.8%	Oklahoma	24.6%
New Jersey	76.0%	Iowa	37.8%	Arkansas	23.3%
Vermont	75.6%	Wisconsin	37.9%	South Carolina	21.6%
Maryland	75.5%	Virginia	38.6%	North Carolina	21.5%
District of Columbia	75.3%	Hawaii	39.6%	Indiana	21.3%
Wisconsin	75.1%	Nebraska	39.8%	Georgia	21.0%
Utah	74.3%	Maryland	40.3%	Maine	20.7%
Delaware	74.2%	Massachusetts	40.3%	Ohio	19.8%
South Dakota	73.5%	Michigan	40.6%	Missouri	19.5%
Kansas	72.9%	Kansas	40.9%	North Dakota	18.8%
Hawaii	72.6%	California	41.5%	Wyoming	18.6%
North Dakota	72.6%	New Hampshire	41.7%	New Mexico	18.5%
Michigan	72.5%	New Mexico	41.9%	South Dakota	18.2%
New York	72.5%	Delaware	42.1%	Pennsylvania	18.0%
Pennsylvania	72.3%	Rhode Island	42.2%	Kansas	17.9%
Washington	72.1%	South Dakota	42.6%	Montana	17.6%
Ohio	71.5%	Wyoming	42.8%	Vermont	17.5%
Oregon	70.4%	Nevada	43.2%	Nevada	17.2%
Georgia	70.2%	Georgia	43.6%	New Hampshire	17.2%
Arizona	70.1%	Illinois	43.6%	Iowa	16.9%
Illinois	69.7%	Idaho	43.8%	Rhode Island	16.5%
California	69.6%	Vermont	44.1%	Delaware	16.4%
Nebraska	69.5%	Montana	44.3%	Wisconsin	16.3%
Alaska	69.4%	Ohio	45.0%	Alaska	16.2%
Idaho	69.3%	North Dakota	45.2%	Idaho	15.7%
Wyoming	69.0%	Texas	45.4%	Illinois	15.2%
Indiana	68.8%	New Jersey	46.5%	Massachusetts	15.2%
Maine	68.7%	Missouri	46.7%	Nebraska	15.2%
North Carolina	68.4%	North Carolina	46.7%	Virginia	15.0%
Colorado	68.0%	District of Columbia	48.2%	New York	14.7%
Nevada	67.2%	Indiana	48.3%	New Jersey	14.1%
New Mexico	67.2%	Oklahoma	49.5%	Texas	14.1%
Florida	66.4%	Maine	50.6%	Oregon	13.7%
Tennessee	66.3%	Louisiana	50.9%	Maryland	13.6%
Alabama	64.7%	South Carolina	50.9%	Arizona	13.4%
Missouri	64.3%	New York	51.1%	Colorado	13.4%
Louisiana	63.9%	Arizona	51.3%	Florida	13.3%
South Carolina	63.4%	Pennsylvania	51.5%	Michigan	13.1%
Kentucky	63.2%	Florida	53.0%	Utah	12.8%
Texas	61.7%	Kentucky	53.1%	Washington	12.0%
Arkansas	61.1%	Arkansas	54.1%	District of Columbia	11.2%
Montana	61.1%	Tennessee	54.9%	Minnesota	11.2%
West Virginia	60.5%	Mississippi	56.1%	California	10.6%
Mississippi	58.1%	Alabama	56.5%	Connecticut	9.2%
Oklahoma	57.2%	West Virginia	60.1%	Hawaii	7.4%

Source: CDC, BRFSS, 2010

An analysis of current and historical BRFSS data reveals trends in population rates for visiting a dentist or dental clinic within the previous year for any reason. The following table shows that the percent of North Dakota's population with a visit to a dental provider in 2010 rose from 1999 by 5.5%.

Table 5. 10-Year Trends of Visits to a Dental Provider in the Prior Year, by State, 2010

State	1999	2002	2004	2006	2008	2010	% Change 1999 to 2010
United States	69.8%	70.9%	70.8%	70.3%	71.3%	70.1%	0.3%
Nevada	59.1%	65.4%	64.5%	66.2%	63.7%	67.2%	8.1%
South Dakota	67.8%	72.4%	72.1%	69.5%	72.6%	73.5%	5.7%
North Dakota	67.1%	70.3%	69.6%	72.2%	74.1%	72.6%	5.5%
Virginia	73.8%	70.8%	73.5%	73.2%	75.2%	78.4%	4.6%
Washington	67.6%	71.2%	71.0%	71.6%	73.3%	72.1%	4.5%
New Mexico	63.1%	67.4%	67.9%	64.9%	66.0%	67.2%	4.1%
Iowa	72.1%	75.8%	75.1%	73.7%	73.4%	76.0%	3.9%
Massachusetts	78.2%	78.3%	79.5%	78.1%	79.3%	81.7%	3.5%
Wyoming	65.5%	68.5%	68.1%	68.2%	68.0%	69.0%	3.5%
Minnesota	75.5%	76.4%	79.7%	78.7%	75.3%	78.9%	3.4%
New Hampshire	73.3%	77.9%	77.5%	77.1%	76.8%	76.7%	3.4%
Idaho	65.9%	68.5%	67.7%	66.9%	69.5%	69.3%	3.4%
West Virginia	57.8%	61.2%	62.5%	61.4%	60.7%	60.5%	2.7%
Kansas	70.5%	74.0%	74.5%	70.4%	71.9%	72.9%	2.4%
Oregon	68.1%	69.9%	68.5%	68.6%	71.4%	70.4%	2.3%
Georgia	68.0%	67.0%	68.2%	70.7%	71.8%	70.2%	2.2%
New Jersey	73.9%	75.3%	75.8%	74.5%	75.9%	76.0%	2.1%
Missouri	62.4%	66.5%	64.0%	61.7%	62.7%	64.3%	1.9%
Arizona	68.3%	69.5%	68.6%	68.5%	68.3%	70.1%	1.8%
Connecticut	79.9%	81.6%	80.6%	80.5%	80.3%	81.6%	1.7%
Alabama	63.1%	69.1%	69.2%	68.0%	65.0%	64.7%	1.6%
Maryland	73.9%	76.0%	75.8%	75.0%	72.6%	75.5%	1.6%
Vermont	74.0%	75.6%	74.3%	73.5%	75.5%	75.6%	1.6%
Rhode Island	76.8%	78.5%	78.5%	80.4%	79.0%	78.1%	1.3%
California	68.3%	70.3%	70.5%	68.5%	70.3%	69.6%	1.3%
Delaware	73.0%	75.2%	77.2%	76.3%	76.9%	74.2%	1.2%
Ohio	70.3%	74.7%	72.2%	73.4%	72.2%	71.5%	1.2%
Indiana	68.3%	68.9%	66.6%	68.0%	68.3%	68.8%	0.5%
New York	72.0%	73.4%	71.7%	71.8%	74.2%	72.5%	0.5%
Utah	73.9%	74.2%	72.3%	70.6%	72.7%	74.3%	0.4%
Arkansas	61.0%	62.2%	60.9%	60.2%	63.5%	61.1%	0.1%
Louisiana	64.3%	68.5%	68.2%	63.5%	69.8%	63.9%	-0.4%
Wisconsin	75.6%	78.1%	77.5%	76.3%	73.3%	75.1%	-0.5%
North Carolina	69.0%	69.3%	69.4%	67.0%	68.5%	68.4%	-0.6%
Pennsylvania	73.0%	72.4%	69.9%	71.3%	71.1%	72.3%	-0.7%
District of Columbia	76.1%	75.1%	72.2%	71.4%	72.6%	75.3%	-0.8%
Texas	62.5%	61.7%	61.3%	63.5%	62.6%	61.7%	-0.8%
Maine	69.8%	71.9%	69.6%	70.9%	71.5%	68.7%	-1.1%
Kentucky	64.4%	68.2%	71.3%	63.3%	64.4%	63.2%	-1.2%
Colorado	69.5%	68.5%	72.3%	70.3%	68.5%	68.0%	-1.5%
Alaska	71.9%	66.6%	69.6%	66.9%	66.3%	69.4%	-2.5%
Illinois	72.4%	74.9%	72.6%	68.8%	68.9%	69.7%	-2.7%
Florida	69.3%	71.2%	68.2%	68.7%	69.1%	66.4%	-2.9%
Mississippi	61.5%	62.1%	59.4%	59.4%	59.5%	58.1%	-3.4%
Montana	65.0%	68.4%	65.9%	68.3%	66.0%	61.1%	-3.9%
Hawaii	77.0%	67.6%	N/A	73.7%	75.4%	72.6%	-4.4%
Nebraska	74.5%	75.2%	75.3%	72.6%	71.3%	69.5%	-5.0%
Oklahoma	62.3%	62.8%	61.3%	58.0%	57.9%	57.2%	-5.1%
Tennessee	72.0%	72.1%	71.5%	64.8%	66.8%	66.3%	-5.7%
Michigan	78.9%	76.9%	76.9%	75.1%	76.0%	72.5%	-6.4%
South Carolina	71.3%	70.9%	68.7%	66.2%	67.7%	63.4%	-7.9%

Source: CDC, BRFSS, 2011

Many states have collected data on third-grade students to understand the oral health status of school-aged children. The years in which these data were collected varies widely. These data are presented in this context to show that there remain children in all U.S. states who are in need of dental services.

Table 6. Oral Health Status, Third-Grade Student Surveys, by State, Various Years

State	Year in Which Data were Collected	% of Third-Graders with Treated or Untreated Caries	% of Third-Graders with Untreated Tooth Decay	% of Third-Graders with Dental Sealants on at Least One Permanent Tooth	% of Students Eligible for School Lunch Program
Alabama	2005-2007	60.1%	27.6%	28.8%	56.0%
Alaska	2007-2008	59.6%	26.2%	55.3%	46.0%
Arizona	2009-2010	75.0%	40.4%	47.1%	48.0%
Arkansas	2009-2010	64.0%	29.0%	27.0%	65.0%
California	2004-2005	70.9%	28.7%	27.6%	57.0%
Colorado	2006-2007	57.2%	24.5%	37.1%	41.0%
Connecticut	2006-2007	40.6%	17.8%	38.1%	35.0%
Delaware	2001-2002	54.5%	29.9%	34.3%	40.0%
District of Columbia	N/R	N/R	N/R	N/R	N/R
Florida	N/R	N/R	N/R	N/R	N/R
Georgia	2010-2011	52.0%	18.7%	37.4%	61.0%
Hawaii	N/R	N/R	N/R	N/R	N/R
Idaho	2008-2009	67.1%	22.5%	57.1%	45.0%
Illinois	2008-2009	53.2%	29.1%	41.5%	N/R
Indiana	N/R	N/R	N/R	N/R	N/R
Iowa	2008-2009	46.7%	21.9%	49.2%	34.0%
Kansas	2003-2004	58.6%	27.6%	33.1%	N/R
Kentucky	2000-2001	59.8%	34.6%	28.8%	N/R
Louisiana	2007-2009	65.7%	41.9%	33.2%	65.0%
Maine	1998-1999	44.7%	20.4%	47.6%	32.0%
Maryland	2000-2001	42.4%	25.9%	23.7%	36.0%
Massachusetts	2006-2007	40.7%	17.3%	45.5%	32.0%
Michigan	2009-2010	55.9%	27.1%	26.4%	43.0%
Minnesota	2009-2010	54.9%	18.1%	64.1%	42.0%
Mississippi	2009-2010	62.8%	30.6%	23.5%	72.0%
Missouri	2004-2005	54.7%	27.0%	28.6%	46.0%
Montana	2005-2006	64.4%	28.9%	46.2%	35.0%
Nebraska	2004-2005	59.3%	17.0%	45.3%	34.0%
Nevada	2008-2009	64.9%	28.1%	37.5%	40.0%
New Hampshire	2008-2009	43.6%	12.0%	60.4%	22.0%
New Jersey	N/R	N/R	N/R	N/R	N/R
New Mexico	1999-2000	64.6%	37.0%	43.2%	N/R
New York	2001-2003	54.1%	33.1%	27.0%	51.0%
North Carolina	N/R	N/R	N/R	N/R	N/R
North Dakota	2009-2010	54.6%	20.7%	60.4%	36.0%
Ohio	2009-2010	51.2%	18.6%	50.4%	45.0%
Oklahoma	2009-2010	58.0%	22.6%	33.1%	61.0%
Oregon	2006-2007	66.3%	35.4%	42.7%	47.0%
Pennsylvania	1998-1999	52.6%	27.3%	26.1%	N/R
Rhode Island	2007-2008	47.6%	28.2%	36.3%	42.0%
South Carolina	2007-2008	54.3%	22.6%	23.9%	51.0%
South Dakota	2009-2010	62.3%	29.1%	54.8%	32.0%
Tennessee	N/R	N/R	N/R	N/R	N/R
Texas	2007-2008	73.3%	42.7%	34.4%	N/R
Utah	2000-2001	61.0%	23.0%	50.0%	N/R
Vermont	2002-2003	45.1%	16.2%	66.1%	31.0%
Virginia	2008-2009	47.4%	15.4%	49.4%	34.0%
Washington	2009-2010	57.9%	14.9%	51.2%	45.0%
West Virginia	2010-2011	42.1%	17.1%	29.0%	55.0%
Wisconsin	2007-2008	54.7%	20.1%	50.8%	37.0%
Wyoming	N/R	N/R	N/R	N/R	N/R

Source: CDC, BRFSS, 2011, NOHS (various years) (NR = not reported)

The county level BRFSS data for the state of North Dakota is limited by small cell sizes in many counties. As a result, data that measure oral health status of the population are reported for only nine counties, which are also the most populated counties in the state. There was variation in the levels of utilization of dental services across those counties. Cass County, which is the most populous county in North Dakota, had the highest rates of dental and dental hygiene visits among the nine counties. It is reasonable to assume that oral health services are more readily available to people in the metropolitan areas and service centers in North Dakota than to the populations in the more sparsely populated counties in the state. It is, therefore, likely that surveillance data for many of the rural counties would differ from that presented below.

Table 7. Percent of Population with a Dental Visit, No Teeth Removed, or that Obtained a Dental Prophylactic Service, in Nine Counties of North Dakota, 2010

County	2012 County population	Percent who visited a dentist or dental clinic less than 12 months ago, 2010	Percent with no teeth removed due to decay or gum disease, 2010	Percent who had their teeth cleaned less than 12 months ago, 2010
Burleigh	81,308	78%	60%	80%
Cass	149,778	82%	58%	83%
Grand Forks	66,861	71%	57%	71%
Morton	27,471	55%	52%	64%
Richland	16,321	60%	70%	64%
Stark	24,199	72%	59%	71%
Stutsman	21,100	74%	45%	72%
Ward	61,675	77%	60%	74%
Williams	22,398	57%	68%	56%

Source: CDC, BRFSS, 2011

Healthy People 2010 and Healthy People 2020 are nationally established goals and objectives to improve the health of the U.S. population. These goals provide benchmarks against which states can measure their progress in achieving improved health status for their populations. There are several oral health goals contained within the Healthy People (HP) objectives. North Dakota has met or surpassed some of the benchmark measures but there are still several objectives that are not yet met.

While North Dakota has achieved the national goals (21%) for percentage of third-grade students with untreated caries (21%) and for the percentage of third-grade children with dental sealants on their permanent molars (goal 50%, 60% in North Dakota), the percentage of children in third-grade who have experienced dental caries (55% in North Dakota) remains higher than the national objectives (41% for HP 2010 and 49% for HP 2020).

North Dakota demonstrates particular success with the number of people in all age groups who have had a dental visit in the previous year with the percentages in all age groups exceeding the HP 2010 and HP 2020 national goals.

Table 8. Healthy People 2010 and 2020 Goals Benchmarked to North Dakota Oral Health Surveillance Data 2000 to 2009

Healthy People 2010 Goal	HP 2010 Goal	HP 2020 Goal	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Decrease percentage of third-grade students who have experienced dental caries	42%	(age 6 to 9 years) 49%	Percent of Third Grade Students with Treated or Untreated Dental Caries										
			62%	*	*	*	*	56%	*	*	*	55%	
Decrease percentage of third-grade students who have untreated dental caries	21%	(age 6 to 9 years) 25.9%	Percent of Third Grade Students with Untreated Dental Caries										
			26%	*	*	*	*	17%	*	*	*	21%	
Decrease percentage of adolescents, age 15 years, who have experienced dental caries	51%	(age 13 to 15 years) 48.3%	Percent of Adolescents Age 15 who Have Experienced Dental Caries										
			*	*	*	*	*	*	*	55%	*	55%	
Decrease the percentage of young children age 2 to 4 years who have untreated caries	9%	(age 3 to 5 years) 21.4%	Percent of Children Ages 2 to 4 Years with Untreated Caries										
			34%	36%	32%	23%	21%	25%	28%	18%	21%	*	
Increase the percentage of third-grade students who have dental sealants on their first molars	50%	(age 6 to 9 years) 28.1%	Percent of Third Grade Students with Dental Sealants on First Molars										
			55%	*	*	*	*	53%	*	*	*	60%	
Increase the percentage of adults ages 35 to 44 years who have not lost any teeth to decay or disease	40%		Percent of Adults Ages 25 to 44 with No Tooth Loss Due to Decay or Disease										
			*	64%	63%	*	65%	*	67%	*	67%	*	
Decrease the percentage of older adults age 65 to 74 who have lost all of their teeth	22%	21.6%	Percent of Adults Ages 65 to 74 Who Have Lost All of Their Teeth										
			*	23%	20%	*	20%	*	18%	*	16%	*	
Increase the percentage of low income children age birth to 18 years receiving preventive dental care in the previous year	66%	29.4%	Percent of Low Income Children Receiving Preventive Service in Prior Year										
			*	26%	19%	22%	21%	21%	16%	25%	24%	27%	
Increase the percentage of people (older than age 2) with a dental visit in the prior year	56%	49%	Percent of People by Age Group With A Dental Visit in the Prior Year										
			<i>Head Start</i>	99%	90%	92%	86%	89%	93%	93%	96%	88%	*
			<i>Third-Grade</i>	76.1%	*	*	*	*	*	*	*	*	*
			<i>Middle School</i>	*	82%	*	*	*	80%	*	70%	*	72%
			<i>High School</i>	*	76%	*	*	*	77%	*	77%	*	76%
			<i>Adult</i>	*	68%	67%	*	68%	*	72%	*	74%	*

Source: CDC, Healthy People 2010 North Dakota Final Report, 2010, CDC, Healthy People 2020

Oral Health of Children

During the 2004-2005 school year, the NDDoH conducted an oral health survey of a probability sample of third-grade school children in 53 public, state, or Bureau of Indian Affairs elementary schools. Fifty schools participated in the research. Over 1,000 children representing 73% of the total student population in those schools participated in the screening program conducted by DHs (NDDoH, Survey, 2005). While the findings revealed that North Dakota children were generally well served for oral health, improvement in some areas was necessary.

- Among children in the survey, 56% had treated (dental fillings) or untreated caries. At the time of the survey, 17% of children examined had untreated tooth decay.
- More than half of the children examined (53%) had at least one dental sealant on their teeth.
- About one-quarter of the children (27%) had not brushed their teeth on the day of the examination and 3% reported they did not have their own toothbrush.
- More than one-third of minority children in the school survey (36%) had not brushed their teeth on the day of the screening and 12% did not have their own toothbrush.
- Minority children were more likely than non-Hispanic White children to have decay experience, untreated caries, or urgent dental needs with 5% of minority children demonstrating decay at examination that was significant enough to cause pain or infection.
- While 93% of children examined for the survey indicated they drank milk daily, 80.5% also indicated they had consumed at least one can of soda during the previous week.
- Most children (95.2%) indicated they had been to a dentist at least once in their lifetime (NDDoH, Survey, 2005).

The federally mandated Early Periodic Screening, Diagnostic, and Treatment (EPSDT) benefit in Medicaid for children from birth to age 21 provides inclusive coverage for all pediatric health services including vision and dental care. This preventive health program is called North Dakota Health Tracks in the state.

State Medicaid programs report yearly to the CMS on utilization of the EPSDT benefit. In 2010, North Dakota ranked in the lowest quartile of states for the percentage of Medicaid eligible children that received any dental service. In that year, 32.2% of Medicaid eligible children in North Dakota received any dental service, 25.4% of Medicaid eligible children received a preventive dental service, and 13.1% of eligible children received a dental treatment service (See Table 9). While North Dakota has made progress over recent years in the percentage of Medicaid eligible children receiving dental services, annual measures show only incremental change (see Table 10 for 1995 to 2010 data).

Table 9. Dental Services Provided to Children under EPSDT Benefit by State, 2010

State	Number of EPSDT Eligible Children	Any Dental Service	Any Preventive Service	Any Dental Treatment Services	Received Sealant on Permanent Molar	Any Diagnostic Dental Service	Oral Health Service From Non-Dentist Provider	Any Dental or Oral Health Service
Alabama	559,430	46.3%	43.6%	18.8%	10.5%	45.0%	0.9%	47.1%
Alaska	90,258	42.9%	36.6%	24.1%	7.9%	39.6%	0.0%	42.9%
Arizona	805,482	46.4%	41.4%	23.6%	6.7%	44.7%	0.0%	46.4%
Arkansas	481,847	23.3%	20.9%	10.1%	4.2%	21.3%	0.0%	44.8%
California	4,691,754	35.8%	29.2%	18.8%	4.4%	30.4%	0.9%	36.3%
Colorado	419,880	44.7%	40.4%	22.9%	6.3%	41.6%	0.1%	44.7%
Connecticut	*	*	*	*	*	*	*	*
Delaware	101,199	39.3%	35.9%	18.5%	7.8%	35.7%	0.0%	39.3%
District of Columbia	91,341	43.1%	35.6%	19.8%	4.4%	35.3%	0.0%	43.1%
Florida	2,035,073	21.6%	13.1%	7.2%	2.2%	20.7%	1.6%	23.1%
Georgia	1,206,083	42.0%	39.1%	19.2%	4.5%	40.7%	0.0%	42.0%
Hawaii	*	*	*	*	*	*	*	*
Idaho	179,998	58.9%	51.3%	31.0%	6.9%	55.1%	0.3%	60.4%
Illinois	1,630,605	45.6%	42.9%	17.2%	8.9%	41.2%	0.4%	32.5%
Indiana	772,155	29.6%	26.1%	13.3%	4.7%	27.8%	0.3%	29.9%
Iowa	299,743	39.1%	34.4%	16.4%	5.0%	36.5%	15.0%	47.5%
Kansas	245,034	17.5%	15.0%	6.2%	10.3%	47.0%	5.2%	50.8%
Kentucky	541,565	43.5%	38.2%	21.9%	23.0%	43.1%	1.7%	43.5%
Louisiana	809,566	42.9%	39.2%	22.6%	21.4%	39.8%	0.0%	42.9%
Maine	*	*	*	*	*	*	*	*
Maryland	591,820	47.5%	42.8%	22.4%	8.0%	43.7%	1.8%	48.9%
Massachusetts	615,599	45.0%	42.0%	24.8%	9.9%	41.4%	0.9%	45.5%
Michigan	1,247,782	32.4%	31.7%	13.9%	3.6%	30.3%	5.2%	36.7%
Minnesota	465,712	38.8%	34.9%	17.5%	5.6%	35.7%	4.2%	40.8%
Mississippi	427,655	41.8%	37.4%	19.4%	6.5%	40.2%	0.4%	42.0%
Missouri	686,693	30.0%	26.7%	14.5%	4.6%	3.0%	*	*
Montana	79,443	34.4%	30.0%	18.7%	5.2%	31.8%	7.0%	38.1%
Nebraska	164,960	44.3%	40.7%	19.8%	7.2%	42.2%	1.0%	44.6%
Nevada	228,169	30.6%	19.8%	7.2%	32.5%	5.0%	37.9%	0.0%
New Hampshire	100,374	52.3%	48.5%	22.6%	7.3%	48.4%	0.0%	52.6%
New Jersey	696,923	40.3%	35.2%	21.4%	4.7%	26.9%	0.0%	40.3%
New Mexico	374,064	48.8%	39.3%	22.2%	5.8%	46.6%	0.4%	49.2%
New York	2,150,748	36.0%	33.2%	17.2%	4.0%	29.2%	9.5%	36.4%
North Carolina	1,115,753	42.2%	38.6%	20.8%	5.4%	40.6%	7.8%	48.3%
North Dakota	50,372	32.2%	25.4%	13.1%	4.2%	25.4%	2.5%	33.2%
Ohio	*	*	*	*	*	*	*	*
Oklahoma	569,228	45.2%	41.5%	25.0%	3.7%	41.7%	0.0%	45.2%
Oregon	*	*	*	*	*	*	*	*
Pennsylvania	1,222,852	37.1%	32.8%	18.0%	5.0%	33.9%	0.1%	37.2%
Rhode Island	111,774	37.7%	35.4%	16.7%	0.0%	35.4%	35.4%	37.7%
South Carolina	591,865	49.2%	46.8%	23.0%	5.7%	46.3%	0.5%	49.4%
South Dakota	96,781	42.6%	38.6%	17.6%	5.1%	36.0%	0.3%	42.8%
Tennessee	880,919	42.5%	38.6%	21.2%	4.8%	40.1%	0.0%	42.5%
Texas	3,347,025	58.4%	47.6%	31.0%	12.3%	56.1%	2.8%	59.7%
Utah	212,806	39.0%	38.3%	19.2%	6.0%	38.9%	0.2%	39.2%
Vermont	62,862	54.2%	53.2%	22.3%	7.1%	48.8%	1.3%	54.7%
Virginia	653,352	44.0%	40.6%	22.7%	5.7%	42.1%	0.4%	44.3%
Washington	782,424	49.8%	45.8%	28.9%	7.6%	46.7%	14.6%	50.7%
West Virginia	219,576	44.3%	38.6%	43.9%	5.4%	41.6%	0.0%	44.3%
Wisconsin	563,760	15.4%	13.6%	6.0%	2.4%	9.6%	1.3%	10.8%
Wyoming	59,949	37.5%	37.4%	20.5%	5.4%	35.4%	4.3%	41.1%

Source: CMS, Annual EPSDT Participation Report, Form CMS-416, 2010, CHWS, 2012

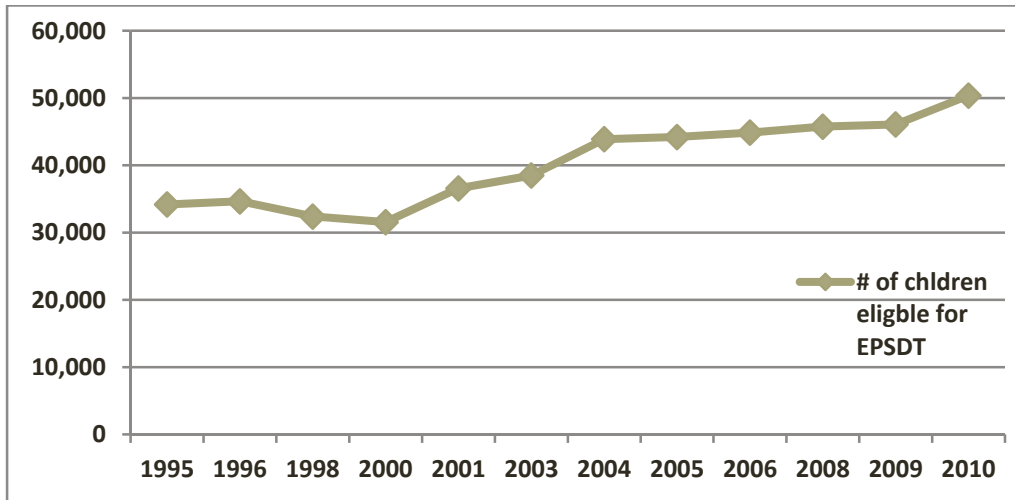
*State did not report data to CMS

Table 10. EPSDT Services Provided to Children in North Dakota 1995 to 2010.

EPSDT Participation	No. 1995	%	No. 1996	%	No. 1998	%	No. 2000	%	No. 2001	%	No. 2003	%
Number of EPSDT Eligible Individuals	34,185		34,652		32,386		31,552		36,575		38,494	
Average Period of Eligibility in Year	0.67		0.67		0.65		0.65		0.52		0.72	
Number of Eligibles Receiving Dental Screenings	2,104	6.2%	2,257	6.5%	2,374	7.3%	*	*	*	*	*	*
Total Eligibles Receiving Any Dental Services	*	*	*	*	*	*	3,954	12.5%	11,417	31.2%	11,638	30.2%
Total Eligibles Receiving Preventive Dental Services	*	*	*	*	*	*	3,103	9.8%	7,903	21.6%	9,210	23.9%
Total Eligibles Receiving Dental Treatment Services	*	*	*	*	*	*	2,112	6.7%	5,192	14.2%	5,620	14.6%
EPSDT Participation	No. 2004	%	No. 2005	%	No. 2006	%	No. 2008	%	No. 2009	%	No. 2010	%
Number of EPSDT Eligible Individuals	43,893		44,210		44,868		45,755		46,075		50,372	
Average Period of Eligibility in Year	0.66		0.66		0.70				0.74		0.85	
Number of Eligibles Receiving Dental Screenings	*	*	*	*	*	*	*	*	*	*	*	*
Total Eligibles Receiving Any Dental Services	11,037	25.1%	11,022	24.9%	8,478	18.9%	13,320	29.1%	15,153	29.1%	16,228	32.2%
Total Eligibles Receiving Preventive Dental Services	9,125	20.8%	9,303	21.0%	6,984	15.6%	10,910	23.8%	12,354	23.8%	12,785	25.4%
Total Eligibles Receiving Dental Treatment Services	5,513	12.6%	5,505	12.5%	4,047	9.0%	5,338	11.7%	5,855	11.7%	6,608	13.1%

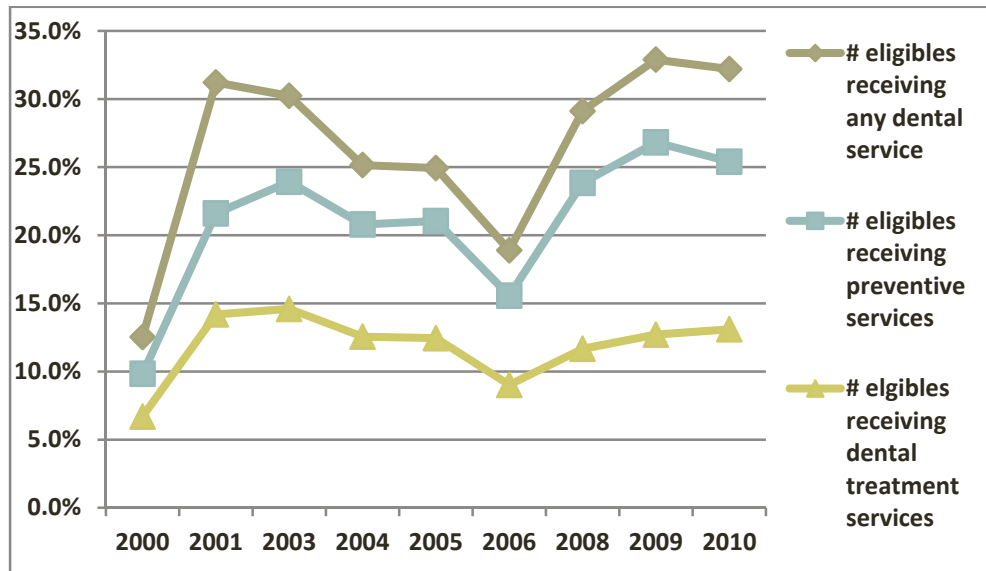
Source: CMS, Annual EPSDT Participation Report, Form CMS-416, 1995 to 2010.

Figure 2. Number of Children Eligible for EPSDT Services, North Dakota 1995 to 2010



Source: CMS, Annual EPSDT Participation Report, Form CMS-416, 1995 to 2010.

Figure 3. Percentage of Medicaid Eligible Children Receiving EPSDT Dental Services, North Dakota, 2000 to 2010



Source: CMS, Annual EPSDT Participation Report, Form CMS-416, 1995 to 2010.

The state of North Dakota offers several programs to help children in families that are not eligible for Medicaid but cannot afford to purchase dental insurance.

- The North Dakota Medicaid Program covers preventive and restorative dental care for qualified low-income individuals in the state.
- Children's Health Insurance Program (CHIP) has a program called Healthy Steps. The program helps cover dental expenses for children who are younger than age 18 in income-qualified families. The services available to children in the program include preventive and restorative care.
- Another state sponsored program, Children's Special Health Services, covers children from birth to age 21 with special health care needs related to particular conditions like cleft lip and/or palate that are income eligible based on family income. A condition of the program is that the specialty dental provider involved in the child's care be enrolled with the program. The program covers a spectrum of preventive, restorative, surgical, and emergency services and prosthetic and orthodontic devices.
- The state also coordinates a donated dental services program through the North Dakota Dental Association in which volunteer dentists provide services to the disabled, the elderly, and medically compromised patients who do not qualify for public insurance programs but who cannot afford necessary treatment. The program provides a comprehensive set of dental services to qualified patients in all age groups (NDDoH, Directory, 2010). The state supports the administrative costs related to the program and participating dentists and dental laboratories provide the donated dental services.

Currently, 140 North Dakota dentists (45% of North Dakota Dental Association membership) have volunteered for the program. This is the third highest rate of participation among the 40 states with similar programs. In addition, there are 32 dental laboratories donating needed fabrications and appliances to the people served by the program. Since its inception in North Dakota in 2001, the program has served 659 people and provided \$1,719,956 worth of donated dental services (Dental Lifeline Network, 2012). In 2010 to 2011, 90 patients in North Dakota received \$301,341 in dental services under the auspices of the program (Dental Lifeline Network, 2012).

Chapter 4: Dental Health Professional Shortage Areas

A health professional shortage area (HPSA) is a geographic area, population group, or facility determined by the U.S. Department of Health and Human Services, HRSA, Office of Shortage Designation to have a shortage of health professionals. A HPSA may be designated for a shortage of primary care physicians, dentists, or mental health providers. These designations are defined in the following ways:

- **Geographic** – This designation covers one or more counties or a sub-county area with a shortage of providers. In a geographic HPSA, the entire residential civilian population is considered underserved.
- **Special Population** – This designation covers a special population residing in a geographic area with limited access to providers. Special populations include: Medicaid eligible people, low income populations, migrant and seasonal farm workers, homeless populations, American Indians, Alaska Natives, and other populations isolated by linguistic and/or cultural barriers.

- Facility – This designation covers a facility with insufficient capacity to meet the needs of the area or the population groups it serves. Facilities include federal and state correctional institutions, youth detention facilities, public or nonprofit outpatient facilities, and state or county mental health hospitals. A number of facility types receive automatic designation, including FQHCs, FQHC look-alikes, rural health clinics, and outpatient health programs or facilities run by tribal organizations or urban American Indian organizations.

The qualifying dental HPSA or DHPSA population to dental full-time equivalent (FTE) ratio varies by type of designation.

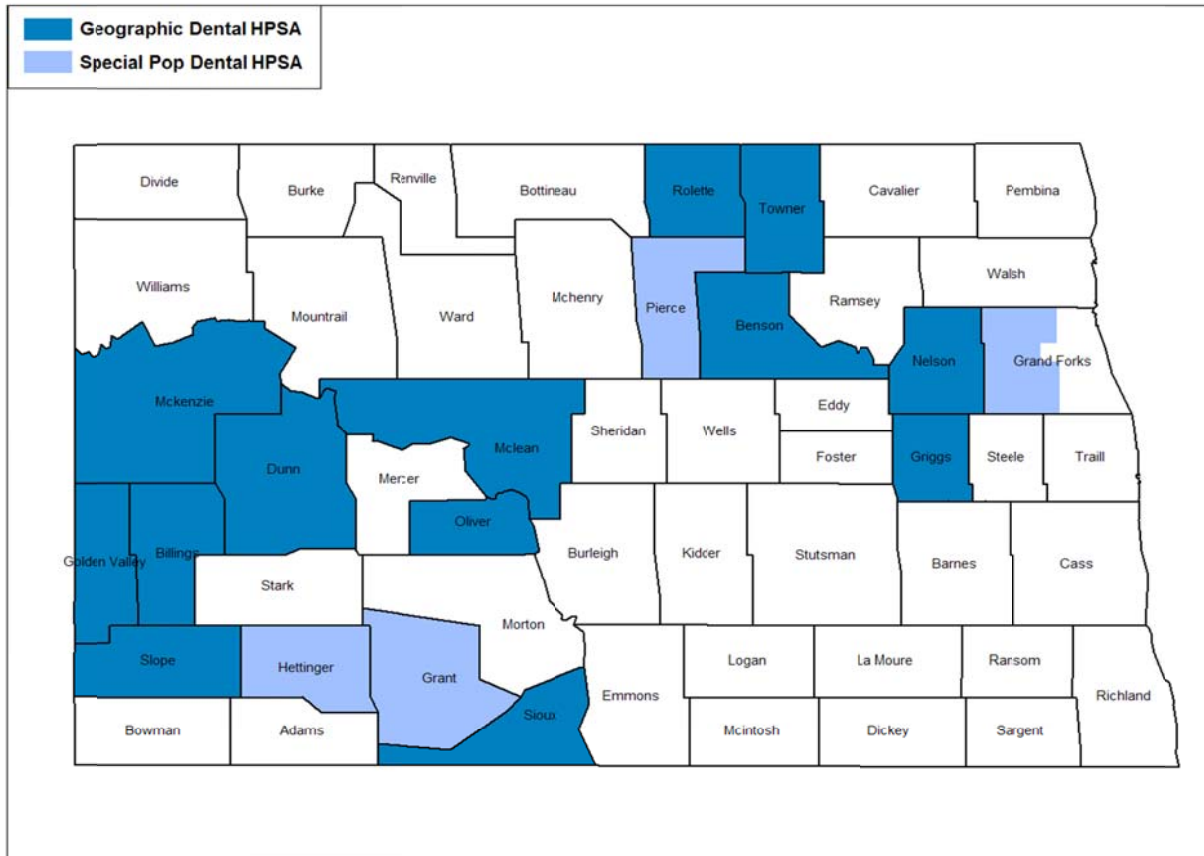
- Geographic DHPSA designations require a population to dental FTE ratio of at least 5,000:1.
- A special population or geographic high-need DHPSA designation requires a ratio of at least 4,000:1.
- Public or nonprofit outpatient facility designations must document insufficient capacity (5,000 outpatient dental visits per 1 dental FTE or a wait time of at least six weeks for routine dental services) and insufficient access for the population or in the area designated as a dental HPSA.
- Correctional facilities or youth detention facilities must have at least 250 residents and an inmate to dental FTE ratio of 1,500:1 in order to qualify for designation.

HRSA has established formulas for counting dental professionals, which include the contributions of dental auxiliaries and also account for differences in productivity due to differences in age of dental professionals. HPSA designations are used to by a variety of federal and state health professional recruitment and retention programs, including the National Health Service Corp (HRSA, 2011).

In 2011, there were 4,383 DHPSAs in the U.S. with a total population of 47 million people (HRSA, 2011). HRSA estimates that it would require 9,266 additional oral health professionals to meet the needs of those who are currently underserved in those designated geographic areas, facilities, or special populations (HRSA, 2011).

In September 2011, there were 31 DHPSA designations in North Dakota (HRSA, 2011). About 7.6% of the population (51,001 people) lived in a DHPSA (Kaiser, 2012). Twenty six of the 53 counties in North Dakota have no DHPSA designation. Ten counties are designated as whole-county geographic DHPSAs with the remaining 17 counties holding partial designations as geographic (3), population (3), facility (9) or both geographic and facility (2) DHPSAs. The remaining DHPSAs are facility designations. The following map shows the geographic and population DHPSAs in North Dakota.

Figure 4. Geographic and Special Population DHPSAs, North Dakota, 2011



Source: HRSA, 2011, CHWS, 2012

Chapter 5: Safety Net Programs and Providers of Oral Health Services in North Dakota

The American Dental Association (ADA) estimates that about 30% of the U.S. population has difficulty accessing oral health care services in the private dental care delivery system (Glassman, 2011 citing ADA, 2006). For many of these patients, oral health safety net providers are an important source of care. Defining the safety net is difficult because it encompasses an array of providers including some private dental practices. Generally, the safety net includes FQHCs, community dental clinics and rural health clinics, mobile dental vans, hospital EDs, and individual providers working with populations that are underserved for oral health care. A variety of health and education programs managed by local and state governments also integrate oral health services into their structures including Head Start programs and public school systems.

Head Start and Early Head Start Programs

Young children in North Dakota who come from families that meet income eligibility criteria are served by Head Start (HS) and Early Head Start (EHS) programs across the state. These are early education programs focused on comprehensive child development goals. HS and EHS programs

are required by federal program performance standards and other regulations (45 CFR 1304) to assure that a child has an ongoing source of “continuous, accessible health care” including medical, dental, and mental health care within 90 days of first attending a program. In addition, the HS or EHS program must obtain evidence of medical and dental examinations that demonstrate the child is receiving age appropriate care from medical and dental professionals (NDDoH, Head Start, 2012). The programs are also responsible for working with parents to establish a source of medical or dental care for the child when it is ascertained that one does not already exist.

As described in the regulation, ongoing dental care includes necessary preventive measures and further dental treatment recommended by dental professionals as well as fluoride supplements and/or topical treatments in communities without adequate fluoridation (NDDoH, Head Start, 2012). The requirements apply to children in either program beginning at age 1 and thereafter based on accepted intervals of care, specifically those included in the periodicity schedule for the EPSDT benefit of Medicaid (National Oral Health Policy Center, 2005).

A report titled *North Dakota Head Start Needs Assessment, 2011-2012 Survey Results* discusses findings from a survey of HS programs in the state. The survey gathered information about a variety of program functions and the ability of the programs to cooperate, coordinate, and collaborate with other community organizations and providers to meet the needs of their enrolled populations. At the time of the survey there were 14 HS programs in the state, eight of which also had EHS Programs. Three of the HS programs served American Indian children living on Indian reservations in North Dakota (NDDoH, Head Start, 2012).

The extensive survey collected information on relationships with community dental providers in each of the respective geographic areas served by the individual HS programs. The majority of HS programs in North Dakota indicated they had some working relationship with dental home providers for treatment and care of enrolled children with 31.8% of survey respondents indicating a cooperative relationship with dental health centers in their communities. An even greater percentage (39.1%) of programs indicated they had a coordinating relationship with dental home providers in their communities described as working together on projects or activities. But less than one-third of programs (30.4%) indicated a collaborative relationship with dental providers in their respective communities with whom they shared resources and/or had a formal written agreement.

When asked to rank the level of difficulty in finding health care resources in their communities, 36.3% of programs identified greatest difficulty (either difficulty (22.7%) or extreme difficulty (13.6%)) in linking children to dental homes that served young children (Survey, 2011). The second greatest difficulty among all health care objectives was assisting parents to communicate effectively with medical and/or dental providers (22.7% of programs identified this task as difficult).

School Based Oral Health Programs

In 2009, the North Dakota state legislature modified the law describing supervision of DHs changing the level of required supervision from direct or indirect to general supervision. The Board of Dental Examiners released the new regulations covering the statutory change in 2011.

DHs can now work under the standing orders of a dentist in public health settings. These regulations permitted the NDDoH to institute a school-based oral health program that provides dental sealants and fluoride varnishes to qualified children in schools in the state with high percentages of low-income children. The state employs four DHs in separate regions of North Dakota to provide these school-based services. These DHs work under the standing orders of a government contracted dentist. In the 2011-2012 school year, there were 40 schools targeted for the program. At the close of that academic year, the DHs had visited all but three of the designated schools. While most students received either a sealant(s) or a fluoride varnish service, there were 78 students in the first year who were provided with both services (personal communication (June, 2012)).

The program was funded with a grant from HRSA. Individual school administrators and school assistive personnel help with obtaining parental permission and organizing student participation. This differs from many school-based oral health programs nationally in that there is not a school nurse in many of the North Dakota schools to manage parent communications. School nurses in other states are often the liaison between school-based oral health programs and children and their families.

FQHCs and Community Dental Clinics

FQHCs are required to either offer dental services in their facilities or to have appropriate referral mechanisms in place in the community for patients who need dental care. In 2012, HRSA provided grants to four FQHCs in North Dakota operating a total of 12 health center sites. One of these health centers is located in the urban Fargo area and the other three are located in smaller cities or rural areas and serve multiple rural communities. Family Health Care Center is headquartered in Fargo and serves patients in Cass County, North Dakota and Clay County, Minnesota. Northland Community Health Center is headquartered in Turtle Lake in McLean County, but also provides services in Rolla and Rolette in Rolette County and in McClusky in Sheridan County. Valley Community Health Centers, headquartered in Northwood, provides services in Grand Forks and Larimore for patients in the surrounding communities. And Coal Country Community Health Centers, which offer health services in clinics in Beulah, Towner, and Center. These clinics served 30,797 patients with health care services in 2010 (Kaiser, 2012). The total number of patients who received oral health services in the dental clinics operated by three of the four FQHCs was not available. The dental clinics administered by these FQHCs include the following:

- Family Health Care Center has offered dental services in its clinic in Fargo, North Dakota since 1995 and in the clinic in Moorhead, Minnesota since 1999. The dental clinics offer comprehensive oral examinations, prophylaxis, fluoride treatments, sealants, periodontal care, routine restorations, root canal treatments, stainless steel crowns, extractions, and emergency assessment and treatment (Family Health Care Center, 2012). Initially the clinic focused on health care for the homeless but expanded its patient base to include low income populations. The total population of the Fargo Morehead metropolitan area is about 120,000 to 130,000 people. In 2011, the center served 12,000 unique patients, or about 10% of the population in that geographic area, and clinic staff completed 40,000 patient encounters of which 28,000 were for medical care and 12,000 were for dental care. Most patients (85%) had annual incomes under 200% of the FPL. About 35% were

Medicaid insured, 5% were Medicare insured, 40% were uninsured and relied on a sliding fee scale (35%) or private pay for dental services (5%), and the remainder had private insurance (personal communication, June, 2012). Family Health Care Center will soon move to a new building in Fargo with an expanded dental suite that is co-located with medical services. The facility will make transitioning between medical and dental services seamless and encourage integration of care. The new facility will include more dental operatories and a dental laboratory, creating an opportunity to expand service offerings.

- Northland Community Health Center operates a dental clinic in Turtle Lake with five operatories which is staffed by two dentists, two DHs, and three DAs (Northland CHC, 2011). Services provided at the clinic include oral hygiene examinations, prophylaxis, sealant and fluoride varnish applications, x-rays, restorative services, and extractions. When patients in other clinic sites managed by Northland (those with no dental clinics on site) have a need for dental services, they are provided with dental vouchers to procure care from community dentists who have contracted with the health center to provide dental services to Northland's patients. The largest dental voucher is about \$200 per family member per year. These vouchers are funded by federal grants. About 25% of the dental patients at Turtle Lake have Medicaid insurance and about 15% qualify for the sliding fee scale. The remaining patients are self-pay (personal communication, June, 2012).
- Since 2007, Valley Community Health Centers have provided dental services in their Grand Forks clinic to people in the northern Red River Valley region of North Dakota. The clinic offers a range of primary dental services and preventive care including screenings, prophylaxis, restorations, and root canals. The clinic employs two full-time dentists, two full-time DHs, and four DAs with 500 to 600 patient encounters monthly. Many of the patients are children but adults are also served in the clinic (personal communication, April, 2012).

In its first year of operation, 95% of the 1,800 patients seen in the dental clinic had not seen a dentist in at least five years and almost one-third of the children (30%) had at least one cavity. Three-quarters of the caseload in that year were patients insured by North Dakota Medicaid (Center for Rural Health, 2009).

- Coal Country CHC contracts with local dentists to see patients in need of dental care (Center for Rural Health, 2009).

The dental safety net in North Dakota includes other provider organizations that do not qualify for federal subsidies including Bridging the Dental Gap in Bismarck, North Dakota and the Red River Valley Dental Access Project in Fargo, North Dakota.

Bridging the Dental Gap in Bismarck is a not-for-profit stand-alone dental clinic serving patients in the 50-mile geographic radius of the Bismarck-Mandan area. The clinic was realized through the vision of community activists, the engagement of a community coalition, and with the support of grant funds. The first meeting of the coalition occurred in September 2000 and the

clinic opened in August of 2004 (personal communication, April, 2012). The mission of the organization is to provide access to dental services for underserved populations including low income people, those who are either uninsured or underinsured, and to North Dakota Medicaid patients. The clinic offers a sliding fee scale and treats patients of all ages. Currently, Bridging the Dental Gap has 11,000 patients of record. Many of these patients are currently active patients in the clinic. The clinic is staffed by two full-time dentists, two full-time DHs, and three full-time DAs working in eight dental operatories at the clinic site (personal communication, April, 2012). In addition, Bridging the Dental Gap has a contractual agreement to staff the Ronald McDonald's Care Mobile, which is providing dental services to children in western North Dakota. Bridging the Dental Gap also provides oral health services using portable equipment to elderly residents of two nursing homes in the Bismarck area.

The Red River Valley Dental Access Project provides walk-in dental services and urgent care for people who do not have a dental home; are low-income, uninsured, or Medicaid eligible (although the program does not bill Medicaid); with a special interest in American Indians, migrant workers, the disabled, the elderly, and refugees. The program is currently staffed by 44 volunteer dentists and a paid staff dentist. The dental access project serves a 14 county area of North Dakota and a 10 county area in Minnesota (RRV, Dental Access Project, 2012). Available services include temporary fillings, assessment of dental trauma, extractions, palliative treatments, and treatment of oral infections. From July 2010 to June 2011, the clinic served 821 patients from more than 80 different local communities. Donated dental services were valued at \$196,512 with dentists providing a total of 271 volunteer hours. More than three-quarters of patients served (79%) were between the ages of 19 and 50 years (RRV, Dental Access Project, 2012).

The North Dakota State School of Science at Wahpeton Dental Education Clinic provides preventive and prophylactic oral health services to a variety of consumers in the safety net each year. Dental hygiene and dental assisting students staff the clinic along with a staff dentist. Patients from all age cohorts are seen at the site with many children and elderly patients with assessed need for dental services. The clinic serves about 3,000 patients annually. Clinic services include full cleanings, bitewing x-rays, and fluoride varnishes at a reduced fee. Many of the patients are uninsured or underinsured and use clinic services because of the low cost of services. Patients drive as much as three hours to obtain care at the clinic. Clinic students also provide care to local Head Start children and to students from a nearby American Indian boarding school (personal communication, April, 2012). Students also participate in an annual Give Kids a Smile Day in collaboration with local dentists.

HRSA Support for the Safety Net

In 2010, the NDDoH Oral Health Program was awarded a three-year HRSA grant of approximately \$750,000 to address oral health care needs of children and the elderly in the state. The grant was provided to a consortium of the NDDoH, the safety net clinic at Bridging the Dental Gap in Bismarck, and the Ronald McDonald's Charities Care Mobile project.

Bridging the Dental Gap used the grant funds to purchase equipment and supplies and hire staff do oral health outreach, and provide oral health services for their nursing home demonstration project in the Bismarck-Mandan metropolitan area. The program focused on elderly people,

particularly non-ambulatory elders, without easy access to preventive oral health services or dental treatment services (NDDoH, 2010). The program was successfully implemented in two nursing homes in the Bismarck area with hopes for future expansion to other nursing homes in the geographic area.

Ronald McDonald's Charities used their HRSA grant funds to develop and implement a mobile dental van program (the Care Mobile) in western North Dakota. The first-year funds were used to purchase a vehicle and dental equipment and supplies; hire a dentist, a DH, a DA, and a program manager to staff the program; and develop operating procedures and safety standards for the program. Second- and third-year funding was allocated for program services and workforce expenses. The 40-foot-long, state-of-the-art dental van visits schools and communities in western North Dakota with high numbers of low income children as determined by the percentage of children on free or reduced fee school lunch. The Care Mobil also expects to service Head Start programs, community and rural health centers without dental clinics, and American Indian Reservation areas (McDonald's Charities, 2012). Program staff members provide dental services to children from birth to age 21, who have not seen a dentist in the prior two years (NDDoH, 2010). The Care Mobile also received funding from the North Dakota state legislature, the Otto Bremer Foundation, the Thomas and Frances Leach Foundation, McDonald's Charities, MDU Resources Foundation, and the Impact Foundation. Also, the Touchstone Electric Cooperative provided both monetary sponsorship and garaging for the van throughout its service area (McDonald's Charities, 2012).

The NDDoH used its portion of the grant to support the Seal! North Dakota program for children without access to dental services. Grant funds were initially used to purchase portable dental operatories and chairs and sealant supplies for the professionals providing services under the auspices of the program. Funds during subsequent years were used to pay program professional staff and expand the program statewide (NDDoH, 2010). There are currently five RDHs working in various regions of the state under the standing orders of a government contracted dentist to provide oral health screenings, sealants, and fluoride varnishes.

In September 2011, the NDDoH Oral Health Program instituted the Seal! North Dakota and Healthy Smiles Fluoride Varnish programs across the state in schools where 50 percent or more of the students were eligible for free or reduced price meals (NDDoH, 2011). Health professionals (including nurses and others) working in the varnish program visited identified schools twice during the year to screen students and apply fluoride in communities where water fluoridation is not at optimal levels. This program serves students in qualifying schools enrolled in pre-kindergarten through sixth-grade.

The Seal! North Dakota program targets schools with high numbers of low-income children to provide oral health screenings, fluoride varnishes, and sealants to children in the second- and sixth-grades in need of these services. The DHs working in the program refer students in need of further treatment to community dentists in the areas served by the program (NDDoH, 2011)

Other Safety Net Initiatives

Other programs of note in the state include the North Dakota Caring Foundation, which was established by North Dakota Blue Cross Blue Shield (North Dakota BCBS) and its affiliates

(including Dental Services Corporation) to connect uninsured children with medical, dental, or mental health professionals who provide needed care at no cost to qualified families. North Dakota BCBS provides administrative support to the North Dakota Caring Foundation, which has provided services to more than 7,000 children since its founding in 1989 (North Dakota Caring, 2012). To be eligible for the program, children must *not* be eligible for North Dakota Medicaid, Healthy Steps (CHIP), or for private insurance coverage and their parents must meet specific income eligibility requirements.

Table 11. Safety Net Dental Clinics, North Dakota, 2012

Characteristics	Name of Provider Organization				
	Bridging the Dental Gap	Family Health Care Center Dental Clinic	Northland Community Health Center Dental Clinic	Red River Valley Dental Access Project Moorhead Dental Clinic	Valley Community Health Centers Dental Clinic
City/ Town	Bismarck/ Mandan Area	Fargo/Red River Valley Region of Minnesota and North Dakota	Turtle Lake/Central North Dakota	Moorhead, Minnesota	Grand Forks/Northern Red River Valley
County	Burleigh	Cass	McLean		Grand Forks
Year Began Offering Services	2004	1995	2010		2007
FQHC		X	X		X
Non-Profit Community Dental Center	X				
Free Clinic					
City Clinic					
State Clinic					
Indian Health/ Federal Clinic					
Clinic of Educational Program					
School Based Dental Program					
Volunteer Clinic				X	
Voucher Program					
Sliding Fee Scale	X	X	X	\$20/visit copay for qualified patients	X
Preventive Services Program					
Mobile Dental Clinic					
Preventive Services	X	X	X		X
Palliative Services/ Urgent Care				X	
Restorative Services	X	X	X		X
Serves Children	Low Income, Medicaid or SCHIP Insured, and Uninsured	Low Income, Insured, and Uninsured	Low Income, Insured, and Uninsured	Low Income, Medicaid Insured, and Uninsured with Urgent Dental Pain	Low Income, Insured, and Uninsured
Serves Adults	Low Income, Insured, and Uninsured with Emergency Needs	Low Income, Insured, and Uninsured	Low Income, Insured, and Uninsured	Low Income, Medicaid Insured, and Uninsured with Urgent Dental Pain	Low Income, Insured, and Uninsured
Serves Particular Patient Community	Serves Elderly in Nursing Homes				
Number of Patients Serviced Per Month	500	12,000 annually		65 to 70	600

Source: NDDoH, Directory, 2010

Emergency Departments as Safety Net Providers in Oral Health

Across the U.S., stakeholders are examining the increased usage of EDs for treatment of ambulatory care sensitive conditions related to a dental diagnosis. The cost of ED utilization for conditions that could be more effectively and less expensively treated in dental homes is driving concern about how to better treat and manage patients in need of emergency treatment and palliation for dental pain and infection.

Data from a variety of states suggest that patients who are uninsured or on medical assistance are more likely than commercially insured patients to access EDs for treatment of a dental complaint. The reasons for this are numerous including limited or no dental insurance benefit for adults under state Medicaid programs, lack of dental homes for certain populations, and lack of patient understanding or education about appropriate use of urgent or emergency care services.

In 2012, North Dakota has 54 certified hospitals including 36 classified as critical access hospitals, eight general acute care hospitals, two Indian health service hospitals, three psychiatric hospitals, one rehabilitation hospital, two long-term care hospitals, and two transplant hospitals (NDDoH, 2012). All rural hospitals with the exception of the two hospitals on reservations have been designated as critical access hospitals, which often serve as the primary access point for health services in a geographic area (Center for Rural Health, 2012). These critical access hospitals are all affiliated with one or another of nine hospital networks in the state with some hospitals having multiple network affiliations (Center for Rural Health, 2012). Hospitals in North Dakota are located throughout the state but there is no hospital in 19 of the 53 counties.

No available data for the state of North Dakota exist to allow for a systematic assessment of ED use for dental pain and infection. However, Medcenter One Emergency and Trauma Center in Bismarck, has tracked ED visits from patients with dental complaints for several years.

In 2011, 4.29% of patients in the ED at Medcenter One were identified at triage with a dental complaint. Overall, dental complaints ranked third among all complaints at patient presentation at the ED at Medcenter One. Among patients who were seen in the ED for dental problems, 6.26% returned to the ED at Medcenter with the same dental problem within 72 hours of first presentation. Estimates based on past experience suggest that the Medcenter ED in Bismarck will service between 1,200 and 1,300 people with a dental complaint in 2012 (personal communication, April, 2012).

The options for treatment of dental complaints in EDs are limited since generally there are no dentists on hospital staff or on call for patient treatment. Services offered in EDs may include dental blocks, abscess incision and drainage, temporary fillings using Dycal, reduction of traumatic subluxations, and treatment of infections. The cost of treatment for a dental condition in an ED may range from about \$300, if no procedure is required, to upwards of \$1,000, if there is a need for a dental block and incision and drainage (personal communication, April, 2012). This is significantly more expensive than similar treatment would be in other ambulatory settings, like dental practices. Based on their experience with patients, ED physicians at Medcenter One donate money to a fund to help patients with dental pain purchase medication when they cannot afford the cost of antibiotics to treat their infections. Treating a dental infection

is viewed as essential to reduce the likelihood of developing more severe systemic complications and prevent eventual hospitalization (personal communication, April 2012).

Chapter 6: Financing Oral Health Care in North Dakota

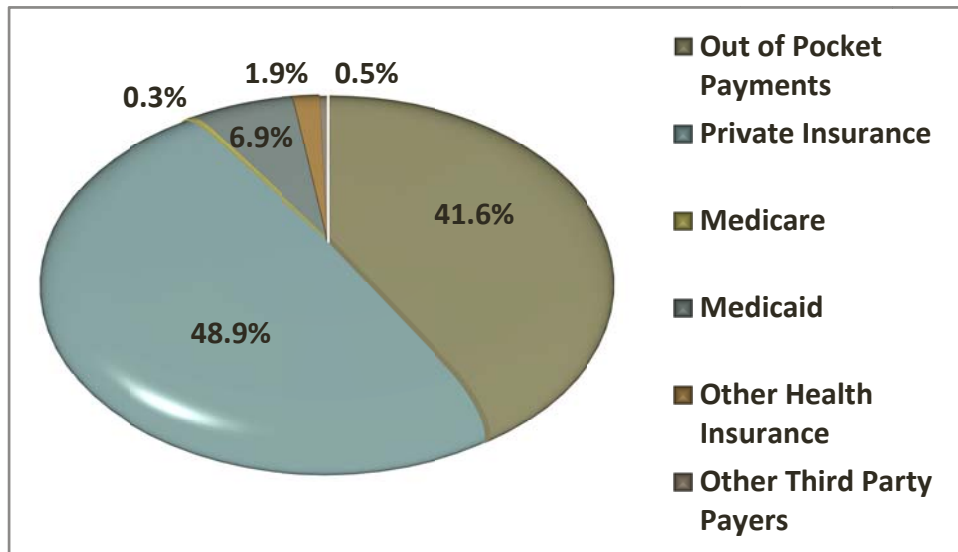
The matrix of funding sources that pays for dental care in North Dakota includes both private and public resources for oral health services. While most care provided in private dental practices is either paid by dental insurers or through patient self-pay, services in the dental safety net may be funded through public dental insurance benefits like Medicaid or CHIP, through federal or state monies that fund oral health programs, or through private foundations and other sources interested in improving the oral health status of the population.

Dental Expenditures in the U.S.

In 2009, oral health expenditures in the U.S. totaled \$102.2 billion of which out-of-pocket payments accounted for \$42.5 billion and private dental insurance paid \$50 billion. The remainder was covered by public insurers and other third-party payers like the Department of Defense, the Department of Veterans Affairs, IHS, Workers' Compensation, etc. (CMS, Actuary, 2010). Medicaid spending on oral health services in 2009 was \$7.1 billion. Medicare expenses for dental services totaled \$300 million.

Dental expenditures are rising faster than medical expenditures nationally and are increasing at a rate higher than the increase in the consumer price index (CPI) (Glassman, 2011). In 2010, the CPI was 127% of the CPI in 2000. In contrast, the CPI for Dental Services (CPI-DS) in 2010 was 154% of the 2000 CPI-DS, while the CPI for Medical Care (CPI-MC) was 149% of the 2000 level (Glassman, 2011).

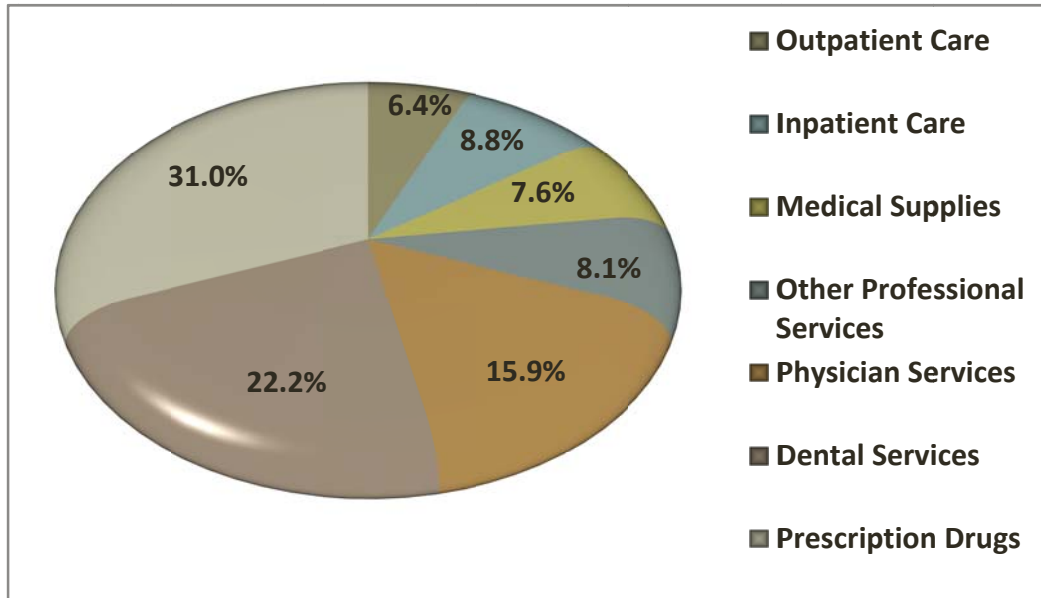
Figure 5. Allocation of Expenses for Dental Services in the U.S., 2009



Source: CMS, Office of the Actuary, 2010

Dental expenditures represented about one-quarter of patient out-of-pocket expenses for health care services (22.2%) in 2008. In that year, total consumer out-of-pocket spending for health care in the U.S. was \$138.5 billion, of which \$30.7 billion was for dental services (Glassman, 2011). This \$30 billion represented 49.7% of all dental expenditures in 2008 (Glassman, 2011 citing MEPS). Out-of-pocket dental expenditures were second only to out-of-pocket pharmacy expenses for consumers paying for health care.

Figure 6. Consumer Out of Pocket Health Care Expenditures, U.S. 2008



Source: Glassman, 2011 citing BLS, 2008

Still, dental expenditures represent a small portion of total health care expenditures in the U.S. In 2010, total health care spending was \$2.6 trillion or \$8,402 per person, while spending for dental services was \$340 per person (Palmer, 2011). Growth in health care spending in 2009 and 2010 was less than in prior years (Martin et al., 2012). The slow growth likely reflects, at least in part, caution on the part of consumers wary about the slow recovery from the recent economic recession. Public spending on Medicare and Medicaid in 2010 also increased at lower percentage rates than in previous years indicating some deceleration in national health care spending (Martin et al., 2012). Dental expenditures in the U.S. in 2009 and 2010 reflected this slower growth pattern while continuing to be a small portion of total health care spending. Average per capita spending on dental care in the U.S. was relatively constant in 2008, 2009, and 2010.

Table 12. National Health Care Expenditures and Dental Care Expenditures, 1980 to 2010

Year	National Health Care Expenditures in Billions of Dollars			Annual Percentage Change in Expenditures		Average Per Capita Spending	
	All Health	Dental	Dental Portion of All Health Expenses	All Health	Dental	All Health	Dental
1980	255.8	13.4	5.2%	13.1%	11.0%	\$1,110	\$58
1990	724.3	31.7	4.4%	11.0%	9.0%	\$2,854	\$125
2000	1377.2	62.3	4.5%	6.6%	7.0%	\$4,878	\$221
2007	2297.1	97.3	4.2%	7.6%	6.6%	\$7,628	\$324
2008	2403.9	102.4	4.3%	4.7%	5.2%	\$7,911	\$337
2009	2495.8	102.5	4.1%	3.8%	0.1%	\$8,149	\$335
2010	2593.6	104.8	4.0%	3.9%	2.3%	\$8,402	\$340

Source: Martin et al., 2012, CHWS

Dental Insurance Status of the U.S. and North Dakota Populations

Access to dental care is directly linked to having dental insurance that partly or fully pays for dental services. According to a telephone survey of consumers between the ages of 25 and 65 conducted by the Long Group for Delta Dental in September 2009, 81% of those with dental insurance benefits visited a dentist twice a year or more while only 34% of the uninsured did so (Delta Dental, 2009).

Dental insurance benefits are generally not included in private health insurance plans. In 2010, only 1% of health insurance plans provided coverage for dental care (NADP, 2011). Most dental coverage (98%) is provided through dental insurance policies purchased separately from medical plans (NADP, 2011). The majority of dental insurance available in the U.S. is purchased by employers as an employee benefit. While dental coverage can also be purchased by individuals, in 2010, only 1% of dental insurance coverage was purchased by individuals (NADP, 2010).

In 2010, approximately 176 million people in the U.S. had dental benefits according to the National Association of Dental Plans (NADP). This represented about 56.9% of the U.S. population. NADP estimated that 189,306 people in North Dakota (27.9% of the state’s population) were enrolled in a private dental plan in 2011. The percentage of the state’s population that was covered by public insurance benefits (other than Medicaid) for dental services was unknown. In 2009, 75,328 people in North Dakota were Medicaid eligible with a dental benefit available. Of these, 39,501 were children, 15,567 were adults, 9,179 were elderly, and 11,081 were disabled. This represented about 12% of the state’s population in that year.

Medicaid spending for health care for children averaged \$2,153 per capita. Medicaid spending on adults averaged \$3,351 per capita. Medicaid spending for health care for the elderly and disabled averaged \$20,763 per capita and \$22,135 per capita, respectively (Kaiser, 2012).

More than two-thirds (69.5%) of patients insured through a private dental plan in North Dakota were enrolled in a dental preferred provider plan, 19.9% were enrolled in a dental indemnity plan, 10.5% were covered by another type of private dental insurance plan, and 0.1% were enrolled in a dental health maintenance organization.

Nationally, 95% of people with dental insurance are covered through a group dental plan provided by their employer. Among employer-provided dental plans, 67.4% of employers require cost sharing between employer and employee for those benefits. About 22.3% of employment-based dental benefit plans are fully paid by an employer that assumes all costs related to covered dental care. The remaining 10.3% of plans require the employee to cover all costs associated with the benefit with little or no cost sharing by the employer (NADP, 2012).

Large organizations are more likely to offer dental benefits to employees. Almost all (96%) organizations with 1,000 or more employees offer a dental care benefit. Only 45% of companies with between six and 24 employees offer dental benefits (NADP, 2012). This is important because the economic base in rural areas is primarily small companies, which may not be able to afford the cost of a dental benefit for their employees. This may be a contributing factor to decreased access or demand for dental care in rural areas where the populations may have to pay out-of-pocket for dental services. North Dakota is very rural with 51% of its population living in non-metropolitan areas in 2010 (Kaiser, 2012).

People with higher incomes are more likely than others to have dental insurance. While 55% of U.S. households have an annual total household income of \$50,000 or less, only 44% of those with dental benefits are in that income category. Conversely, households with incomes of \$150,000 or more constitute just 6% of the U.S. population and also 6% of the population with dental benefits.

The current economic downturn in the U.S. has impacted the insurance status of the population. Dental benefits are often among the first benefits to be eliminated during difficult economic times (Glassman, 2011). Patients lose benefits when they become unemployed or employers reduce benefits to reduce costs and/or require employees to increase their cost share to participate in a dental benefit. However, the low unemployment rate in North Dakota in recent years suggests that the impact of the recent national economic downturn may have been somewhat less pronounced in the state due to the better employment picture. However, people in North Dakota employed by and receiving insurance benefits from a national or international company may have experienced changes in their insurance benefits due to the economic recession.

Health insurance status is a useful proxy for dental insurance for several reasons. People without health insurance are generally also without dental insurance. In addition, even those who have health insurance through an employer-sponsored health plan may not have dental insurance. It can, therefore, be assumed that North Dakota residents without health insurance coverage are

also without dental coverage, that some of those with health insurance lack dental coverage, and that many of the elderly on Medicare are without dental insurance unless they are on a managed care plan (Medicare Advantage plan) or purchase separate dental insurance. North Dakota has an aging population so the lack of a dental benefit in Medicare is especially concerning.

In January 2006, 51,920 people were without health insurance in North Dakota, and of those 11,000 or 22% were children. Rural residents, males, and American Indians were less likely to have health insurance than others in the state. Socioeconomic status was associated with being uninsured. Almost 75% of the uninsured population resided in a household with income below 200% of the FPL (Wakefield, 2006). By 2009-2010, the number of uninsured in the state had increased to 74,100 people.

Table 13. Health Insurance Coverage, North Dakota Population, 2009-2010

Private	Employer Plans	341,500	54%
	Individual Plans	66,000	10%
Public	Medicaid	57,300	9%
	Medicare	82,700	13%
	Other Public	8,800	1%
Uninsured		74,100	12%

Source: Kaiser State Health Facts, 2012

The full implementation of the Affordable Care Act (ACA) in 2014 is expected to improve the health insurance status of many U.S. residents with a related shift in allocation of dental payments also expected. Personal out-of-pocket spending for oral health care is projected to decrease by 5.7% under ACA. This is in contrast with expected increases in personal out-of-pocket dental spending in the three years preceding the effective date of the ACA (CMS, Actuary, 2010). In addition, the ACA will affect cost shifting such that dental insurer expenses are projected to increase by 14.4% in 2014 despite projections of more modest 4% to 5% increases in each of the three years prior to the effective date of ACA (CMS, Actuary, 2010). Much of this increase (10.9%) will be absorbed by private dental insurance companies whose \$55.7 billion in dental expenses in 2013 are expected to increase to \$61.7 billion in 2014 (CMS, Actuary, 2010).

Public insurers are likely to be affected a bit differently under ACA. While Medicare is projected to experience a 4.4% decrease in expenses for dental care in 2014, the Medicaid program is expected to experience a 34.1% increase in expenses for dental care over the previous year. Medicaid's \$10 billion in dental expenses in 2013 is expected to increase to \$13.4 billion in 2014 (CMS, Actuary, 2010). This is due in part to the ACA mandate that all children in the U.S. have access to dental care.

North Dakota Medicaid

The Medicaid program in North Dakota provides coverage for both children and adults for dental care. Covered services include dental examinations, x-rays, cleaning, fillings, dental surgery, extractions, crowns, root canals, dentures (both partial and full) and anesthesia services

(NDDoH, Medicaid, 2012). Some of these services require pre-authorization particularly for adults on Medicaid.

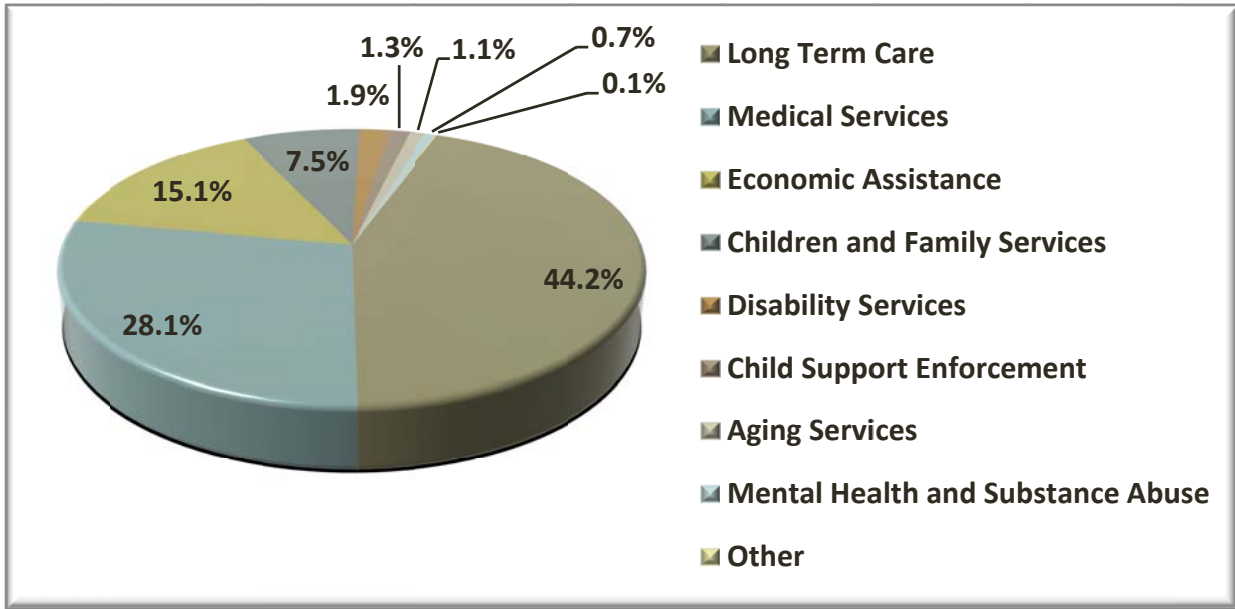
Restorative services are more limited for adults in North Dakota than for children in the state. Endodontic treatments and final restorations/crowns are generally not covered for adults on Medicaid. Prior authorization is required for root canals for adults (age 21 and older) and only root canals in anterior teeth are considered for approval. As well, only anterior crowns are considered for authorization.

Eligibility for Medicaid is limited to those children at or below 100% FPL. Children from birth to age 6 and pregnant women qualify at 133% FPL. Low-income working parents qualify at 59% FPL. Childless adults do not qualify for Medicaid in North Dakota regardless of income level (Kaiser, 2012). In May 2012, there were 38,930 children from birth to age 21 and 27,663 adults age 22 to 64 enrolled in Medicaid in North Dakota and 3,861 children enrolled in the state's CHIP (personal communication, June, 2012). In 2010, the U.S. census estimated there were 81,176 people living in poverty in North Dakota (U.S. Census, SAIPE, 2011).

Children in families with incomes to 140% FPL who do not qualify for Medicaid can qualify for the CHIP program, Healthy Steps, which is administered by North Dakota BCBS as an indemnity plan with a fee for service reimbursement model. The Healthy Steps program covers dental x-rays; prophylaxes; fluoride and sealant applications; restorative services; crowns and other fixed prosthodontics, such as orthodonture, periodontal services, emergency care, and with some limitations, temporomandibular joint services for qualified children.

For the two year period 2007-2009, total Medicaid spending in North Dakota was \$1.8 billion dollars, including administrative and capital costs and management and support services. The cost of medical services including dental services during the biennium was about 28% of the total Medicaid budget.

Figure 7. Apportioned Medicaid Spending, North Dakota, 2007-2009



Source: NDDoH, Biennial Report, 2012

During the two-year period from 2007 to 2009, North Dakota Medicaid expended more than \$419 million on medical services (including dental but excluding mental health and substance abuse services) for eligible individuals. Of that amount, 3.5% of spending for medical services or \$14.5 million was spent on dental services. This represented 0.8% of total Medicaid spending in North Dakota during the two-year period. In 2009, North Dakota ranked 30th among states and the District of Columbia in the proportion of total annual Medicaid spending expended on dental services (1.3%). Nationally, 1.4% of total Medicaid spending was for dental services (CMS, Expenditure, 2012).

In 2007, the state legislature passed a 4% inflationary increase in Medicaid reimbursement rates for dental services for that year and a 5% inflationary increase for the second year beginning July 1, 2008 (ADA Compendium, 2010).

Table 14. Medicaid Dental Expenditures as a Percent of Medicaid Spending by State, 2009

State	Total Medicaid Expenditures	Total Medicaid Expenditures for Dental Services	Dental Expenditures as a Percent of Total Medicaid Spending
United States	\$308,238,010,334	\$4,328,777,912	1.40%
Texas	\$18,542,735,982	\$1,011,153,669	5.45%
Oklahoma	\$3,573,964,386	\$149,552,949	4.18%
North Carolina	\$9,664,700,395	\$344,822,053	3.57%
Arkansas	\$1,067,104,934	\$34,368,454	3.22%
Indiana	\$5,389,555,915	\$172,721,554	3.20%
Arkansas	\$3,579,323,741	\$88,272,342	2.47%
Washington	\$5,733,928,802	\$139,658,921	2.44%
Colorado	\$3,288,286,409	\$80,088,224	2.44%
Louisiana	\$5,429,727,130	\$130,278,243	2.40%
South Carolina	\$4,711,572,834	\$110,990,563	2.36%
Delaware	\$1,264,188,551	\$28,546,070	2.26%
Tennessee	\$7,261,642,567	\$163,822,679	2.26%
Wyoming	\$551,809,947	\$12,308,691	2.23%
Nebraska	\$1,589,577,302	\$34,823,360	2.19%
Hawaii	\$1,201,415,347	\$26,056,591	2.17%
Virginia	\$5,547,961,438	\$120,109,009	2.16%
Connecticut	\$5,289,135,076	\$113,813,932	2.15%
Alabama	\$3,625,502,688	\$77,960,218	2.15%
Montana	\$714,265,274	\$15,233,773	2.13%
Mississippi	\$3,197,866,028	\$67,379,478	2.11%
New Hampshire	\$994,863,529	\$20,896,000	2.10%
Illinois	\$11,774,115,862	\$218,452,726	1.86%
Iowa	\$2,877,205,249	\$52,819,503	1.84%
Vermont	\$969,806,518	\$17,416,296	1.80%
Nevada	\$1,196,285,377	\$20,123,123	1.68%
West Virginia	\$2,588,751,602	\$42,189,993	1.63%
Kentucky	\$5,017,405,611	\$81,626,457	1.63%
Maine	\$1,480,889,902	\$23,403,158	1.58%
Kansas	\$2,315,887,435	\$30,898,610	1.33%
North Dakota	\$587,510,830	\$7,665,474	1.30%
Michigan	\$10,170,613,978	\$99,431,845	0.98%
District of Columbia	\$1,940,311,635	\$18,762,297	0.97%
New York	\$44,882,625,489	\$397,357,990	0.89%
Rhode Island	\$1,555,518,543	\$13,560,833	0.87%
Idaho	\$1,351,162,249	\$10,005,596	0.74%
Georgia	\$7,376,395,061	\$43,893,046	0.60%
Pennsylvania	\$14,206,861,168	\$74,664,183	0.53%
Florida	\$14,053,739,488	\$62,015,988	0.44%
Minnesota	\$7,029,496,504	\$30,296,563	0.43%
New Mexico	\$2,912,818,269	\$12,328,150	0.42%
Ohio	\$13,971,825,590	\$49,745,209	0.36%
New Jersey	\$8,293,072,391	\$25,083,752	0.30%
Missouri	\$5,771,062,410	\$12,813,568	0.22%
Maryland	\$6,324,889,459	\$11,371,005	0.18%
California	\$35,223,988,027	\$28,712,294	0.08%
Oregon	\$2,797,118,847	\$1,089,585	0.04%
South Dakota	\$732,227,771	\$33,872	0.00%
Arizona	\$8,617,296,794	\$160,023	0.00%
Massachusetts	*	*	*
Utah	*	*	*
Wisconsin	*	*	*

Source: CMS, Expenditure, MSIS Tables, 2012

* Data not available

In 2008, enrollee Medicaid spending in North Dakota was \$7,516 per person while the average Medicaid spending per enrollee in the U.S. was \$5,337. North Dakota spent less on average per child enrollee (\$1,910) than the U.S. as a whole (\$2,164), but significantly more on the elderly (\$20,068 versus \$12,938 in the U.S.) and on the disabled (\$21,704 versus \$14,840 in the U.S.) (Kaiser, 2012). In 2009, 65.4% of all Medicaid spending in North Dakota was for long-term care services including nursing home and home health/personal care expenses (Kaiser, 2012).

In 2006, Milliman, Inc. performed an analysis of North Dakota Medicaid fees for service payment rates comparing them with fee schedules and payment rates from other health insurance providers in the region. The analysis examined inpatient hospital, physician, dental, radiology, laboratory, mental health, physical therapy, speech therapy, durable medical equipment, and ambulance payment rates across the several payers selected for the comparison. Large volumes of claims data were used in the analysis. The following table shows the North Dakota Medicaid fee schedule was lower overall than that of other referenced payers. While North Dakota Medicaid exceeded payment rates in some cases for particular services or was essentially comparable in some instances, Medicaid payments to dental providers for services provided were lower overall.

Table 15. Comparison of Dental Fee Schedule/Payment Rates by Regional Insurance Providers, 2005

Type of Service	Average Dental Fee/ Payment Rate in Dollars, 2005				
	North Dakota Medicaid	Montana Medicaid	North Dakota BCBS/ Noridian	Minnesota Fee For Service	North Dakota Workforce Safety and Insurance
Total Ratio to North Dakota Fees	100.0%	110.4%	222.9%	103.5%	167.2%
Oral Exam	18.95	20.89	45.83	21.75	32.87
Prophylaxis	34.90	35.95	68.00	31.96	52.62
Fluoride	13.86	14.13	28.40	17.23	20.21
X-Rays	17.53	18.50	39.05	20.74	29.23
Palliative/ Emergency Care	38.19	48.09	95.00	31.75	46.43
Simple Extractions	41.52	53.50	108.00	54.66	80.48
Surgical Extractions	106.13	120.54	242.45	107.78	177.62
Oral Surgery*	100.64	88.17	215.00	113.14	161.88
Anesthesia*	72.06	+	264.00	74.49	147.97
Restorations*	56.94	63.04	121.93	54.99	95.33
Periodontics*	68.52	72.88	153.69	64.12	105.39
Endodontics*	232.91	102.62	560.00	213.46	164.64
Inlays and Crowns*	90.32	132.00	206.90	123.13	180.90
Dentures	565.67	582.10	1,310.12	612.72	896.34
Repair Simple	50.62	51.83	+	63.90	77.45
Other Prosthetics*	135.76	122.63	322.62	142.08	187.30
Other *	62.96	69.18	+	52.32	66.81

Source: NDDoHS, Milliman, Inc., 2006

*North Dakota Medicaid Fee/ payment rate varied somewhat in each payer comparison Data not available.

A study which compared the effect of state Medicaid dental fees on children receiving care in 2000 and 2008 found that increases in the level of state Medicaid payments for dental services were associated with increased use of dental care by children and adolescents who were covered by state Medicaid plans (Decker, 2011). The study found that an increase of \$10 in the Medicaid fee paid for a prophylactic dental service resulted in a 4% increase in the probability that a Medicaid insured child or adolescent would receive a dental service. Changes in Medicaid fees were positively associated with increased usage of dental services (Decker, 2011).

The following tables comparing Medicaid rates for dental services to children across states were compiled by the ADA in 2008 for some common dental procedures (ADA Compendium, 2008). They are presented to allow comparison of North Dakota's 2008 reimbursement rates with those of other states at a point in time, and are valuable to understand the variation by state in Medicaid reimbursement for dental services at a point in time.

Table 16. State Medicaid Dental Payment Rates for Selected Procedures for Children, 2008

Medicaid Dental Payment Rates for Children - Compiled by ADA 2008		AL	AK	AZ	AR	CA	CO	CT	DE	FL	GA
CDT											
120	Periodic oral evaluation	18.00	38.50	29.50	26.60	15.00	20.80	35.00	85% OF BILL	15.00	22.77
140	Limited oral evaluation – problem focused	29.00	56.00	39.00	34.20	35.00	31.20	48.00	85% OF BILL	8.00	38.29
150	Comprehensive oral evaluation	22.00	63.00	43.30	0.00	25.00	35.88	65.00	85% OF BILL	16.00	39.33
210	Intraoral - complete series (including bitewings)	60.00	87.50	77.00	18.50	40.00	53.04	101.00	85% OF BILL	32.00	72.45
272	Bitewings - two films	18.00	32.90	25.30	24.70	10.00	19.24	32.00	85% OF BILL	9.00	21.73
330	Panoramic film	49.00	79.10	65.40	62.70	25.00	47.84	87.00	85% OF BILL	30.00	56.92
1120	Prophylaxis – child	28.00	62.40	45.40	36.10	30.00	28.60	46.00	85% OF BILL	14.00	32.08
1203	Topical application of fluoride (prophylaxis not included) - child	15.00	25.90	21.00	19.95	8.00	15.60	29.00	85% OF BILL	11.00	17.59
1206	Topical application of fluoride (including prophylaxis) - adult	15.00	25.90	21.00	0.00	0.00	0.00	29.00	85% OF BILL	11.00	0.00
1351	Sealant - per tooth	26.00	41.30	28.50	28.50	22.00	23.40	40.00	85% OF BILL	13.00	27.94
2150	Amalgam - two surfaces, primary or permanent*	60.00	131.60	92.80	79.80	48.00	71.60	114.00	85% OF BILL	41.00	77.62
2331	Resin - two surfaces, anterior*	72.00	141.40	116.10	95.00	60.00	83.20	136.00	85% OF BILL	39.00	91.08
2751	Crown-Porcelain fused to predominately metal base	472.00	680.00	600.30	0.00	340.00	426.40	805.00	85% OF BILL	228.00	0.00
2930	Prefabricated stainless steel crown - primary tooth	73.00	196.00	142.40	139.65	75.00	116.48	230.00	85% OF BILL	68.00	143.86
2932	Prefabricated resin crown	97.00	197.00	140.30	0.00	45.00	145.60	0.00	85% OF BILL	68.00	176.98
3220	Therapeutic pulpotomy	49.00	126.00	85.50	85.50	71.00	80.60	133.00	85% OF BILL	50.00	90.04
3310	Endodontic therapy -Anterior (excluding final restoration)	365.00	478.80	390.40	400.90	216.00	301.60	589.00	85% OF BILL	148.00	379.84
3330	Endodontic therapy - Molar (excluding final restoration)	516.00	686.70	591.90	593.75	331.00	430.04	875.00	85% OF BILL	235.00	0.00
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	53.00	115.50	88.00	71.25	41.00	68.12	115.00	85% OF BILL	27.00	64.17
9248	Non-intravenous conscious sedation	0.00	185.00	63.30	96.74	25.00	130.00	0.00	85% OF BILL	40.00	50.00

Source: Medicaid CHIP Assoc., 2012, ADA, 2008

Table 16. State Medicaid Dental Payment Rates for Selected Procedures for Children, 2008 (cont.)

Medicaid Dental Payment Rates for Children - Compiled by ADA 2008		HI	ID	IL	IN	IA	KS	KY	LA	ME	MD
CDT											
120	Periodic oral evaluation	29.12	17.76	28.00	22.58	16.63	21.00	0.00	24.80	13.00	29.08
140	Limited oral evaluation – problem focused	29.12	28.58	16.20	37.08	25.99	29.35	33.00	0.00	20.00	43.20
150	Comprehensive oral evaluation	29.12	29.37	21.05	35.50	23.91	29.00	26.00	41.45	150.00	51.50
210	Intraoral - complete series (including bitewings)	58.24	62.28	30.10	72.25	51.97	60.00	63.70	62.18	43.50	57.00
272	Bitewings - two films	18.93	16.71	9.40	24.81	16.63	20.00	18.20	21.91	15.00	15.00
330	Panoramic film	47.32	41.78	22.60	64.52	46.77	57.00	39.00	54.48	43.00	42.00
1120	Prophylaxis – child	26.00	30.70	41.00	34.50	24.95	30.00	48.10	32.57	30.00	42.37
1203	Topical application of fluoride (prophylaxis not included) - child	4.16	14.26	26.00	22.25	14.55	17.00	15.00	18.36	12.00	21.60
1206	Topical application of fluoride (including prophylaxis) - adult	4.16	0.00	26.00	0.00	14.55	0.00	0.00	24.28	12.00	24.92
1351	Sealant - per tooth	24.32	21.93	36.00	29.35	20.79	24.92	19.50	26.65	16.00	33.23
2150	Amalgam - two surfaces, primary or permanent*	40.40	59.29	48.15	81.14	59.25	64.00	65.00	82.90	48.00	88.00
2331	Resin - two surfaces, anterior*	0.00	70.06	51.90	96.47	67.56	80.00	71.50	94.74	81.00	102.00
2751	Crown-Porcelain fused to predominately metal base	0.00	332.14	235.20	0.00	426.14	450.00	0.00	0.00	0.00	375.00
2930	Prefabricated stainless steel crown - primary tooth	74.36	93.22	73.40	155.86	103.94	120.00	119.60	135.00	120.00	154.00
2932	Prefabricated resin crown	46.80	99.23	56.45	138.75	119.53	0.00	113.10	175.28	120.00	75.00
3220	Therapeutic Pulpotomy	67.60	52.22	52.70	105.11	60.29	60.00	67.60	94.74	50.00	60.00
3310	Endodontic therapy -Anterior (excluding final restoration)	260.00	219.34	136.40	377.52	259.84	250.00	274.30	354.70	220.00	230.00
3330	Endodontic therapy - Molar (excluding final restoration)	416.00	329.01	202.30	569.32	400.15	350.00	481.00	503.33	338.00	325.00
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	0.00	46.35	39.12	77.24	51.97	42.50	49.40	77.57	67.00	103.01
9248	Non-intravenous conscious sedation	0.00	61.20	35.00	38.50	155.91	0.00	0.00	159.29	0.00	186.91

Source: Medicaid CHIP Assoc., 2012, ADA, 2008

Table 16. State Medicaid Dental Payment Rates for Selected Procedures for Children, 2008 (cont.)

Medicaid Dental Payment Rates for Children - Compiled by ADA 2008		MA	MI	MN	MS	MO	MT	NE	NV	NH	NJ
CDT											
120	Periodic oral evaluation	27.00	14.89	18.70	0.00	24.00	21.89	16.00	33.24	29.00	37.00
140	Limited oral evaluation - problem focused	49.00	14.89	24.65	30.60	21.18	31.27	16.00	33.24	45.00	55.00
150	Comprehensive oral evaluation	54.00	18.90	25.50	33.00	38.50	31.27	16.00	33.24	54.50	64.00
210	Intraoral - complete series (including bitewings)	88.00	40.95	57.80	52.20	37.73	62.54	45.00	58.94	58.00	98.00
272	Bitewings - two films	28.00	12.60	17.00	17.40	13.09	18.76	12.00	21.22	26.00	22.00
330	Panoramic film	82.00	17.56	46.75	47.40	32.73	50.03	34.00	41.25	37.00	85.00
1120	Prophylaxis – child	47.00	19.53	18.34	25.20	19.25	31.27	21.00	57.28	38.00	50.00
1203	Topical application of fluoride (prophylaxis not included) - child	24.00	13.23	14.00	13.20	10.78	15.64	9.00	18.39	18.00	28.00
1206	Topical application of fluoride (including prophylaxis) - adult	26.00	9.00	14.00	19.20	12.71	28.16	9.00	53.30	0.00	33.00
1351	Sealant - per tooth	38.00	15.12	17.30	22.20	19.00	25.02	20.00	23.58	30.00	41.00
2150	Amalgam - two surfaces, primary or permanent*	95.00	48.41	41.65	67.80	48.51	68.79	63.00	86.04	109.00	126.00
2331	Resin - two surfaces, anterior*	109.00	60.48	48.95	74.40	56.60	93.81	77.00	75.85	97.00	147.00
2751	Crown-Porcelain fused to predominately metal base	723.00	0.00	0.00	440.40	315.00	500.32	350.00	328.00	200.00	780.00
2930	Prefabricated stainless steel crown - primary tooth	191.00	84.00	76.51	110.40	79.70	125.08	123.00	92.25	220.00	207.00
2932	Prefabricated resin crown	224.00	0.00	86.74	0.00	102.03	150.10	110.00	61.50	80.00	265.00
3220	Therapeutic Pulpotomy	105.00	66.15	40.80	73.80	57.37	93.81	70.00	61.50	91.00	149.00
3310	Endodontic therapy - Anterior (excluding final restoration)	478.00	239.40	178.55	311.40	211.75	318.95	234.00	205.00	370.00	550.00
3330	Endodontic therapy - Molar (excluding final restoration)	727.00	378.00	271.40	490.80	306.08	437.78	354.00	328.00	552.00	795.00
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	93.00	44.47	44.70	58.80	46.59	68.79	52.00	45.10	82.00	121.00
9248	Non-intravenous conscious sedation	Individual consideration	44.56	25.40	0.00	87.40	139.15	150.00	91.23	35.00	227.00

Source: Medicaid CHIP Assoc., 2012, ADA, 2008

Table 16. State Medicaid Dental Payment Rates for Selected Procedures for Children, 2008 (cont.)

Medicaid Dental Payment Rates for Children - Compiled by ADA 2008		NM	NY	NC	North Dakota	OH	OK	OR	PA	RI	SC
CDT											
120	Periodic oral evaluation	22.97	29.00	27.01	24.10	17.08	23.50	24.07	20.00	10.00	23.40
140	Limited oral evaluation - problem focused	29.85	14.00	38.50	33.39	22.58	33.57	32.08	0.00	10.00	38.34
150	comprehensive oral evaluation	35.33	0.00	46.72	36.00	26.35	33.57	37.44	20.00	20.00	40.94
210	Intraoral - complete series (including bitewings)	62.02	58.00	75.19	75.47	60.00	67.14	31.07	45.00	40.00	0.00
272	Bitewings - two films	20.67	17.00	19.38	23.22	10.00	20.14	11.10	16.00	14.00	20.15
330	Panoramic film	53.98	40.00	62.05	58.19	46.32	53.71	23.31	37.00	32.00	53.29
1120	Prophylaxis – child	32.15	43.00	28.50	30.92	20.00	33.57	29.07	30.00	22.00	29.90
1203	Topical application of fluoride (prophylaxis not included) - child	18.37	14.00	16.80	21.14	15.00	16.79	13.19	18.00	18.00	14.95
1206	Topical application of fluoride (including prophylaxis) - adult	0.00	0.00	16.80	19.43	0.00	0.00	13.19	18.00	0.00	22.10
1351	Sealant - per tooth	24.32	43.00	29.93	24.73	22.00	26.86	19.64	25.00	18.00	24.05
2150	Amalgam - two surfaces, primary or permanent*	74.66	84.00	85.68	75.03	54.00	73.85	47.39	55.00	37.00	84.49
2331	Resin - two surfaces, anterior*	88.44	87.00	85.26	91.85	63.49	100.71	54.28	60.00	44.00	92.29
2751	Crown-Porcelain fused to predominately metal base	461.71	580.00	0.00	516.50	0.00	537.12	266.35	500.00	450.00	0.00
2930	Prefabricated stainless steel crown - primary tooth	120.11	116.00	151.11	116.02	101.92	134.28	74.37	99.00	88.00	134.53
2932	Prefabricated resin crown	135.53	116.00	177.55	237.98	0.00	161.14	62.15	50.00	88.00	162.48
3220	Therapeutic Pulpotomy	81.55	87.00	84.93	78.21	63.49	100.71	50.07	75.00	59.00	87.09
3310	Endodontic therapy -Anterior (excluding final restoration)	311.26	250.00	297.00	348.78	247.63	342.41	149.82	275.00	175.00	368.49
3330	Endodontic therapy - Molar (excluding final restoration)	501.60	406.00	429.30	526.36	379.02	469.98	216.40	500.00	300.00	581.66
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	67.76	45.00	66.55	63.63	52.45	73.85	77.90	65.00	39.00	73.44
9248	Non-intravenous conscious sedation	24.11	0.00	0.00	0.00	0.00	149.39	77.70	184.00	0.00	70.00

Source: Medicaid CHIP Assoc., 2012, ADA, 2008

Table 16. State Medicaid Dental Payment Rates for Selected Procedures for Children, 2008 (cont.)

Medicaid Dental Payment Rates for Children - Compiled by ADA 2008		SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	DC
CDT												
120	Periodic oral evaluation	34.00	25.00	29.44	17.55	20.00	20.15	22.44	20.00	15.92	32.00	35.00
140	Limited oral evaluation – problem focused	35.00	24.00	19.16	20.37	40.00	24.83	20.40	25.00	20.25	45.00	50.00
150	Comprehensive oral evaluation	26.00	35.00	36.04	26.03	32.00	31.31	34.68	30.00	21.17	35.00	77.50
210	Intraoral - complete series (including bitewings)	74.00	75.00	72.08	58.58	56.00	71.91	45.90	62.00	46.11	48.00	91.00
272	Bitewings - two films	22.00	22.00	23.86	17.55	17.00	20.15	10.61	19.00	13.39	24.00	40.00
330	Panoramic film	58.00	60.00	65.08	46.12	48.00	53.99	43.86	55.00	40.45	60.00	80.00
1120	Prophylaxis – child	32.00	35.00	37.50	28.20	32.00	33.52	23.69	30.00	21.82	35.00	47.00
1203	Topical application of fluoride (prophylaxis not included) – child	19.00	20.00	15.00	11.19	15.00	20.79	13.66	15.00	13.47	20.00	29.00
1206	Topical application of fluoride (including prophylaxis) - adult	19.00	20.00	15.00	0.00	15.00	20.79	0.00	0.00	12.89	35.00	0.00
1351	Sealant - per tooth	26.00	28.00	28.82	21.50	35.00	32.28	22.66	24.00	17.16	28.00	38.00
2150	Amalgam - two surfaces, primary or permanent*	77.00	75.00	87.46	52.06	73.00	75.53	63.88	72.00	45.00	82.00	115.00
2331	Resin - two surfaces, anterior*	91.00	90.00	105.14	50.91	99.00	89.18	66.97	85.00	52.47	98.00	135.00
2751	Crown-Porcelain fused to predominately metal base	491.00	552.00	528.00	271.57	420.00	500.00	659.96	510.00	0.00	600.00	0.00
2930	Prefabricated stainless steel crown - primary tooth	133.00	125.00	156.06	81.16	160.00	136.93	91.81	120.00	88.17	136.00	0.00
2932	Prefabricated resin crown	139.00	165.00	68.75	0.00	136.00	128.22	100.00	122.00	116.68	127.00	0.00
3220	Therapeutic Pulpotomy	70.00	95.00	87.96	27.16	75.00	83.19	45.33	42.00	48.06	86.00	134.00
3310	Endodontic therapy -Anterior (excluding final restoration)	337.00	355.00	355.98	140.90	400.00	375.00	416.52	168.00	209.64	335.00	498.00
3330	Endodontic therapy - Molar (excluding final restoration)	526.00	519.00	624.26	254.60	650.00	679.00	571.69	0.00	330.93	520.00	728.00
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	69.00	68.00	67.04	52.06	88.00	69.00	59.43	44.00	42.22	70.00	110.00
9248	Non-intravenous conscious sedation	0.00	89.00	187.50	93.00	125.00	110.00	51.01	0.00	104.06	100.00	0.00

Source: Medicaid CHIP Assoc., 2012, ADA, 2008

In recent years, North Dakota's legislature has affected increases in Medicaid reimbursement rates for dental benefits to bring rates closer to reimbursement levels for the same services by the Dental Services Corporation of North Dakota (a North Dakota BCBS affiliate), which is the state's largest dental plan.

Table 17. North Dakota Medicaid Dental Payment Rates for Selected Dental Services, 2009, 2010, 2011

North Dakota Medicaid Dental Payment Rates		Child	Adult	Child	Adult	Child	Adult
CDT		2009	2009	2010	2010	2011	2011
120	Periodic oral evaluation	24.10	22.72	25.55	24.08	26.32	24.80
140	Limited oral evaluation - problem focused	35.81	35.07	37.96	37.17	39.10	38.29
150	Comprehensive oral evaluation	36.00	37.73	38.16	39.99	39.30	41.19
210	Intraoral - complete series (including bitewings)	75.47	68.31	80.00	72.41	82.40	74.58
272	Bitewings - two films	23.22	21.92	24.61	23.24	25.35	23.94
330	Panoramic film	58.19	56.86	61.68	56.86	63.53	58.57
1110	Prophylaxis – adult	*	45.08	*	47.78	*	49.21
1120	Prophylaxis – child	30.99	*	32.85	*	33.84	*
1203	Topical application of fluoride (prophylaxis not included) - child	21.14	*	22.41	*	23.08	*
1204	Topical application of fluoride - adult	*	16.87	*	17.88	*	18.42
1351	Sealant - per tooth	24.73	*	26.21	*	27.00	*
2150	Amalgam - two surfaces, primary or permanent	75.03	76.07	79.53	80.63	81.92	83.05
2331	Resin - two surfaces, anterior	91.85	90.09	97.36	95.50	100.28	98.37
2751	Crown-Porcelain fused to predominately metal base	516.50	453.95	547.49	481.19	563.91	495.63
2930	Prefabricated stainless steel crown - primary tooth	126.09	125.44	133.66	132.97	137.67	136.96
2931	Prefabricated stainless steel crown – permanent tooth	156.80	157.69	166.21	167.15	171.20	172.16
2932	Prefabricated resin crown	237.98	*	252.26	*	259.83	*
3220	Therapeutic pulpotomy	78.54	*	83.25	*	85.75	*
3310	Endodontic therapy -Anterior (excluding final restoration)	348.78	329.56	369.71	349.33	380.80	359.81
3330	Endodontic therapy - Molar (excluding final restoration)	526.36	*	557.94	*	574.68	*
7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)	67.43	72.53	71.48	76.88	73.62	79.19

*Not a covered service or rate not available.

Source: North Dakota Department of Human Services, North Dakota Medicaid Dental Child and Adult Fee Schedule, Effective 07/01/12

North Dakota Dentists and Medicaid Participation

Nationally, only about one in four dentists treats at least 100 Medicaid patients annually (California Foundation, 2008). While there are many reasons that dentists limit their participation in Medicaid, a chief complaint among dental providers is the low reimbursement rates and cumbersome administrative requirements for Medicaid service providers (California Foundation, 2008). Many dentists provide services in private practices and therefore, have overhead costs for office expenses, estimated to be 60% to 65% of dental income. In many states across the U.S., Medicaid reimbursement rates are less than 50% of dentists' usual and customary fees (California Foundation, 2008). In a study of dentists' participation in Medicaid by state in 1998 and 2000, the number of dentists in North Dakota that received a payment from Medicaid for a service to an eligible patient was 288 dentists in both years. In 1998, 107 dentists received payments totaling more than \$10,000 for services provided to Medicaid eligible patients. However, in 2000, the number of dentists receiving payments totaling more than \$10,000 decreased to 68 (Gehshan et al., 2001). These data suggest that fewer dentists were providing a substantial number of dental services to Medicaid eligible patients in 2000 compared to 1998.

Many North Dakota dentists either do not treat patients insured by Medicaid or limit the number of patients under their care who are insured by Medicaid. In a 2004 survey of dentists in North Dakota, 19% of dentists in North Dakota indicated they accepted all Medicaid patients seeking care in their practice; 33% of dentists limited the number of Medicaid insured patients in their practices; 31% treated only their current Medicaid patients; and 14% of dentists saw no Medicaid insured patients. Rural dentists were more likely to accept all Medicaid patients than were dentists in more populous areas of the state. Among practicing dentists in 2004, 26% of dentists in the northwest, 25% of dentists in the southwest, 17% of dentists in the southeast, and 7% of dentists in the northeast region of North Dakota were accepting all Medicaid patients seeking care (Amundson et al., 2005).

In 2008, 13% of dentists in the state did not treat any Medicaid insured patients, 28% treated only established patients insured by Medicaid, 37% limited the number of new Medicaid insured patients accepted for treatment, and 18% accepted all Medicaid insured patients seeking care (McDonald's Charities, 2011). In 2009, 20% of the dentists in the state treated any Medicaid patient who presented for care. This percentage is much lower than the 49% of dentists who indicated that they would treat any Medicaid patient needing services in 1992 (Dental Fact Sheet, 2009).

Chapter 7: Oral Health Workforce in North Dakota

When the problem of limited access to oral health services is discussed, increasing the supply of the oral health workforce is often introduced as a solution with the rationale that augmenting the number of providers of oral health services would enhance capacity to provide those services. However, the link between the supply of oral health workers and increased oral health access (and ultimately, improved outcomes) is difficult to establish.

An ample number of dentists and auxiliary personnel does not always result in the provision of services at a desired level. It is important to understand the difference between need and demand

for oral health services. The need for oral health services in a population does not always translate to demand for oral health care. Both lack of patient awareness about the importance of oral health and a patient's access to resources to pay for care affect patient behavior. Although oral health services may be needed and perhaps available, they are not always sought. It is difficult to convert unmet need into effective demand, especially among populations who lack resources to pay for care (ADA, 2001).

Adequacy of workforce supply is difficult to establish because there are a number of factors that influence the supply/demand equation (Mentasti et al., 2008, Beazoglou et al., 2002). These variables include both intrinsic factors like dental practice productivity, dental fees, use of auxiliary workforce within a practice, and use of new technologies (Mentasti et al., 2008, Beazoglou et al., 2002) and extrinsic factors including innovation in therapeutic and preventive interventions, overall demand for oral health services, the status of the general economy, and socioeconomic shifts within the local population (Mentasti et al., 2008, Beazoglou et al., 2002). Characteristics of the dental workforce also affect provision of care including the aging of dental professionals; shifts in gender, race, and geographic distribution; and changing preferences for part-time versus full-time practice (Mentasti et al., 2008.) Consequently, focusing only on educating and recruiting an adequate supply of oral health workers to expand access to oral health care may not achieve the desired goal. Expanding access to oral health care is a complex issue, usually requiring multifaceted solutions.

Efficiencies in dental practices vary. Literature on the subject of supply of dentists in the U.S. suggests that increased efficiencies and improved capacity in dental practices could compensate for the currently diminishing supply of dentists per capita nationwide (Haden et al., 2003, ADA, 2001). In fact, while average hours engaged in dental practice per dentist have decreased over the last two decades, average annual patient visits to dentists have increased (Wendling, 2010). There may actually be some excess capacity to provide services within dental practices that have leveraged technology and auxiliary personnel with higher levels of skill. This capacity might be very useful in addressing the need to expand access to oral health care among some populations (Wendling, 2010).

Dentists

In 2005, there were 316 licensed dentists in North Dakota (Amundson et al., 2005). A 2004 survey of dentists revealed that over half (51%) of the dentists practicing in the state were born in North Dakota and over half (53%) were trained at the University of Minnesota (Amundson, 2005). North Dakota does not have a dental school. Fifty-seven percent of practicing dentists in North Dakota in 2004 were in practice prior to 1980, and the average age of dentists was 52, with 60% of dentists expecting to retire within 15 years (Amundson et al., 2005). The majority of dentists in North Dakota were male (90%) and non-Hispanic White (97%). About three-quarters of dentists in the state (73%) practiced general dentistry. Most (86%) were employed full time (Amundson et al., 2005).

In 2007, there were 5.1 active dentists in North Dakota per 10,000 people, which was lower than the national rate of 6.0 active dentists per 10,000 people in the U.S (Kaiser, 2012). In Minnesota

there were 6.1 dentists per 10,000 people. In Montana, there were 5.7 dentists per 10,000 people. And in South Dakota there were 5.0 dentists per 10,000 people.

In 2008, 97% of dentists in North Dakota were non-Hispanic White and 86% were male, even though there were more women practicing dentistry in the state than in 2004. Among dentists responding to the workforce survey in 2008, 72% were between the age of 46 and 65 and 51% indicated an expectation to retire in the next 15 years. A high percentage of dentists (86%) were practicing full time, with 53% indicating self-employment and 27% indicating both self-employment and solo practice (Moulton et al., 2010). By 2010, there were 392 dentists licensed in North Dakota. The percentage of dentists in the state who were male had decreased to 82% (Moulton et al., 2010).

In 2012, there were 360 dentists licensed in North Dakota who also listed a North Dakota practice address. In addition, there were dentists licensed in North Dakota with primary practice addresses in contiguous states, including 18 dentists with a practice address in Minnesota, three in Montana, and three in South Dakota. Some of these dentists likely also served patients from North Dakota.

Overall, in 2012, there were 5.4 dentists per 10,000 population in the state, which was similar to the national rate of about 5.5 dentists per 10,000 people. However, there was significant variation across counties in the state in the ratio of dentists to population. In addition, there were 16 counties in the state with no dentist and eight counties with only one dentist practicing within county limits.

These dentists-to-population rates are important to consider because they provide a measure of the capacity of workforce to meet the needs of the population in a geographic area. Dental caseloads vary in the U.S. depending on productivity levels, hours worked, age, and other factors. In 2005, an average general dentist in the U.S. spent 1,532 hours annually treating patients, with an average patient appointment time of 48.7 minutes (Wendling, 2009). In that year, an average patient came to the dental practice 3.7 times to see a member of the dental team. It is estimated that dentists on average provide between 1,500 and 2,500 patient visits per year. When the number of people per dentist exceeds this average there is likely to be more demand for dental services than can be met by available professionals.

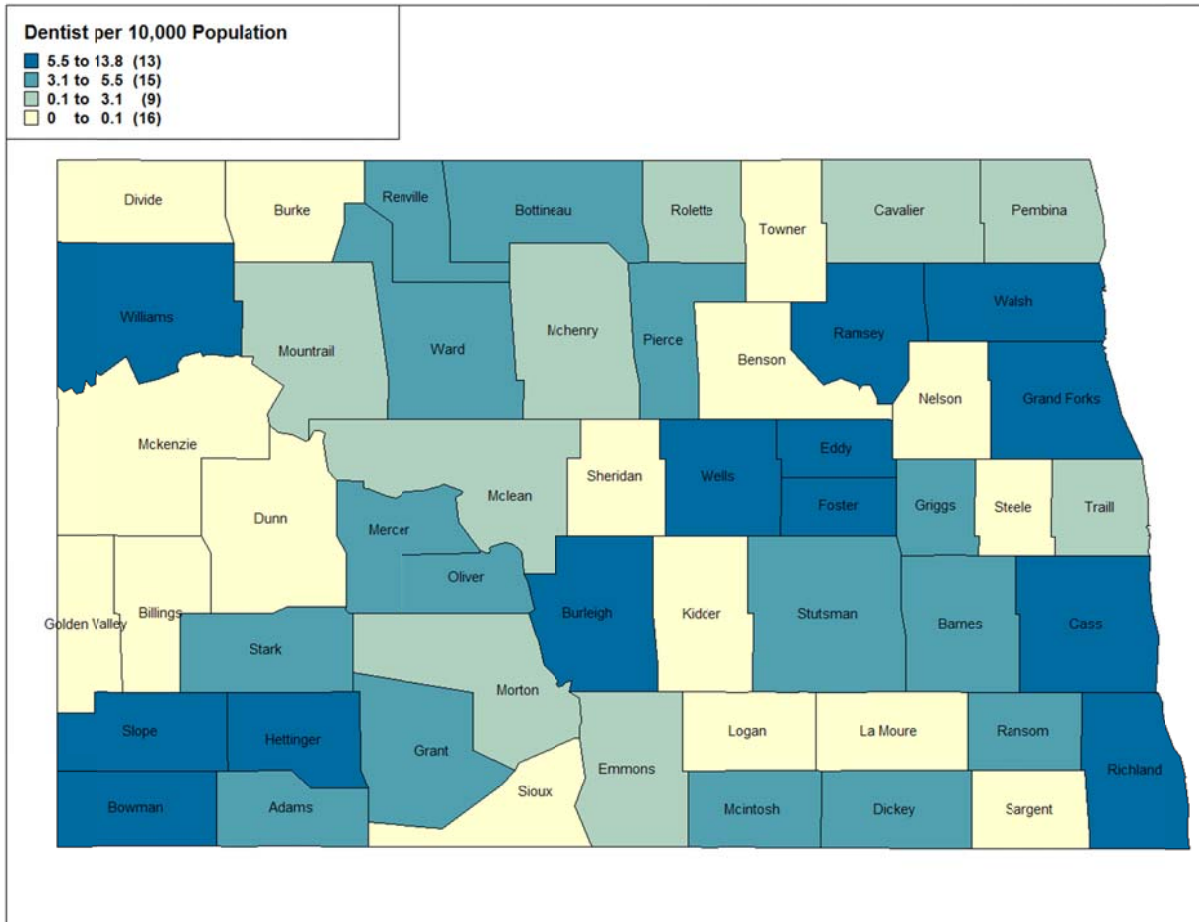
Table 18. Dentist to Population Ratio and Number of People per Dentist by North Dakota County, 2012

County	2012 Population	Total Number of Licensed Dentists	Dentists to 10,000 population	Number of People per Dentist
Adams County	2,343	1	4.3	2,343
Barnes County	11,066	4	3.6	2,767
Benson County	6,660	0	0.0	0
Billings County	783	0	0.0	0
Bottineau County	6,429	2	3.1	3,215
Bowman County	3,151	2	6.3	1,576
Burke County	1,968	0	0.0	0
Burleigh County	81,308	60	7.4	1,355
Cass County	149,778	109	7.3	1,374
Cavalier County	3,993	1	2.5	3,993
Dickey County	5,289	2	3.8	2,645
Divide County	2,071	0	0.0	0
Dunn County	3,536	0	0.0	0
Eddy County	2,385	2	8.4	1,193
Emmons County	3,550	1	2.8	3,550
Foster County	3,343	2	6.0	1,672
Golden Valley County	1,680	0	0.0	0
Grand Forks County	66,861	37	5.5	1,807
Grant County	2,394	1	4.2	2,394
Griggs County	2,420	1	4.1	2,420
Hettinger County	2,477	2	8.1	1,239
Kidder County	2,435	0	0.0	0
LaMoure County	4,139	0	0.0	0
Logan County	1,990	0	0.0	0
McHenry County	5,395	1	1.9	5,395
McIntosh County	2,809	1	3.6	2,809
McKenzie County	6,360	0	0.0	0
McLean County	8,962	1	1.1	8,962
Mercer County	8,424	4	4.7	2,106
Morton County	27,471	8	2.9	3,434
Mountrail County	7,673	2	2.6	3,837
Nelson County	3,126	0	0.0	0
Oliver County	1,846	1	5.4	1,846
Pembina County	7,413	2	2.7	3,707
Pierce County	4,357	2	4.6	2,179
Ramsey County	11,451	8	7.0	1,431
Ransom County	5,457	3	5.5	1,819
Renville County	2,470	1	4.0	2,470
Richland County	16,321	9	5.5	1,813
Rolette County	13,937	3	2.2	4,646
Sargent County	3,829	0	0.0	0
Sheridan County	1,321	0	0.0	0
Sioux County	4,153	0	0.0	0
Slope County	727	1	13.8	727
Stark County	24,199	10	4.1	2,420
Steele County	1,975	0	0.0	0
Stutsman County	21,100	11	5.2	1,918
Towner County	2,246	0	0.0	0
Traill County	8,121	2	2.5	4,061
Walsh County	11,119	8	7.2	1,390
Ward County	61,675	33	5.4	1,869
Wells County	4,207	3	7.1	1,402
Williams County	22,398	19	8.5	1,179

Source: ND BDE, CHWS, 2012

Dentists in North Dakota were usually located in the larger metropolitan areas of the state and in the service centers where rural populations seek health services. Nationally dentists are more likely to locate in areas where there is a sufficient combination of population size and income to support the cost of establishing and sustaining a dental practice.

Figure 8. Ratio of Dentists to 10,000 Population by North Dakota County, 2012



Source: ND BDE, CHWS, 2012

North Dakota Dental Loan Repayment Programs

One strategy used by states to both recruit and retain dentists in rural or underserved areas is loan repayment programs. Student indebtedness can be a serious encumbrance to practice in safety net settings or in rural areas where income for a dentist may not be as high as that available in private practice in larger population areas. Loan repayment programs are designed to attract new dentists with an interest in working in underserved areas. These programs provide a mechanism for loan repayment based on service to patients in identified areas of a state where access is compromised. In recent years, North Dakota has offered a number of loan option programs available to qualifying dentists, including:

- A state loan repayment program for dentists willing to locate in rural or underserved areas and work full time for four years. This program is available to dentists working in FQHCs and preference is given to dentists willing to work in rural, underserved areas of

the state. The program provides \$20,000 per year in loan repayment up to \$80,000 over the term of the contract. Funding is available to support three dentists annually (Center for Rural Health, 2012).

- The National Health Service Corps (NHSC) offers a loan repayment program to dentists who are willing to work in any public, non-profit, or private-for-profit primary care clinic with a sliding fee scale and a DHPSA designation. The program requires a minimum commitment of two years and is available for up to five years, with a total award of up to \$170,000 (Center for Rural Health, 2012).
- A pilot loan repayment program for dentists willing to practice in a public health setting or non-profit clinic that offers a sliding fee scale to patients in North Dakota. Dentists qualify for \$60,000 in loan repayment funds (\$20,000 per year) if they commit to practice full time for three years. There are three program awards available. In the last legislative session, this program was not reauthorized but it is expected to be reconsidered during the next convening of the legislature.
- A grant program that provides a licensed North Dakota dentist who recently graduated from dental school (within the previous five years) with \$50,000 to establish a dental practice in a rural community. The grant, which is partly paid by the state (\$25,000) and partly by the community where the practice is established (\$25,000), is to be used to purchase a building or equipment or fund operating expenses. The dentist who receives the grant is required to commit to practicing in the community for a minimum of five years (NDDOH, 2010).

Since the inception of the state loan repayment program in 2002, 30 dentists have participated, all of whom remain in practice in North Dakota. Students in dental schools who will graduate within a year of application are eligible to apply. The program gives preference to dentists who are willing to locate in communities with fewer than 7,500 people and accept Medicaid patients (NDDOH, 2010).

Dental Education

North Dakota has no dental school. The University of North Dakota does have a pre-dentistry program to help prospective dental students meet the requirements for admission to an out-of-state dental school (UND, 2011). Since 1984, North Dakota has been a member of the Western Interstate Commission for Higher Education (WICHE), a consortium of 15 states providing student exchanges of slots in professional education programs not available in the state of origin (WICHE, 2012). WICHE was launched specifically to address the shortage of training opportunities in medicine, dentistry, and other professional fields in some states (WICHE, Workforce, 2006).

Students from North Dakota can enroll in out-of-state education programs at reduced rates, often at in-state tuition rates, because North Dakota allows out-of-state students (from WICHE states) to enroll in North Dakota education programs at similarly discounted tuition rates. The benefit to education programs is that they retain control over the number of out-of-state students admitted to any program and that may permit the host college or university to fill under-enrolled programs. States in which WICHE colleges and universities are located also benefit because students who complete their education in a state may choose to stay in that state for employment after graduation.

WICHE also offers a professional student exchange program in 14 highly competitive fields, including dentistry, medicine, nursing, optometry, and veterinary medicine (WICHE, Workforce, 2006). In 2011 to 2012, 54 institutions (some of which were outside the WICHE region) offering a total of 123 programs participated in the WICHE professional student exchange program (WICHE, Report, 2012). There was also a graduate exchange program for “distinctive” programs (those only offered at four or fewer of the 45 WICHE institutions providing graduate education).

In the academic year 2011-2012, North Dakota sponsored nine students in dental school at a cost of \$207,000 (Report, 2012). Three dental students were in dental school in Colorado and the remaining six attended dental programs outside the WICHE region. Out-of-region dental schools that hosted WICHE students from North Dakota included University of Missouri-Kansas City (in Missouri), University of Nebraska, Creighton University (in Nebraska), and Marquette University (in Wisconsin). All North Dakota dental students participating in the professional education exchange program were non-Hispanic White (WICHE, Report, 2012).

In 2010, 47% of dentists practicing in North Dakota indicated they had attended the University of Minnesota Dental School, 12% attended Creighton University Dental School, 5% attended the University of Nebraska Dental School, 4% attended Marquette University Dental School, and 32% attended other dental schools (Moulton, 2010).

In 2012, 48% of licensed dentists with a practice address in North Dakota attended the University of Minnesota Dental School, 12.5% attended Creighton University Dental School, 6.9% attended Marquette University Dental School, and 6.9% attended University of Nebraska Dental School (CHWS, ND BDE, 2012).

In a 2008 study comparing dental school applicants in the academic year 2005-2006 to state populations and dental supply, North Dakota, along with Utah, Idaho, and Nevada, had the most favorable ratios among U.S. states of dental school applicants to practicing dentists in each respective state. Also, the number of applicants to dental school from North Dakota per the state population exceeded the national average. However, while North Dakota had a better than average dental-school-applicant-to-population ratio than the national average, the active dentist-to-state-population ratio in North Dakota in 2008 was worse than the national average (Mentasti et. al. 2008).

As a group, the states participating in the WICHE educational consortium have a higher dentist-to-population ratio (67 dentists/100,000 population) than the national ratio of 60 dentists/100,000 population (WICHE, 2008). While actively practicing dentists in the states in the WICHE consortium region are slightly younger than dentists nationwide, the states in WICHE are still expecting a considerable number of departures from the dental workforce over the coming decade (WICHE, 2008). Retirements of dentists born during the baby boom and that effect on dentist supply are a concern nationally.

Dental Hygienists

In 2010, there were 633 DHs licensed in North Dakota. The average age of DHs in that year was 39. The vast majority of DHs were female (99%), which was consistent with the national gender profile of DHs (Moulton, 2010).

In March 2012, there are 518 DHs who are actively practicing in North Dakota according to practice addresses supplied by DHs in their re-registration with the state dental board. There are also 102 licensed DHs in North Dakota who list an out-of-state practice address. Of those, many list practice addresses in contiguous states. Seventy-six are licensed in Minnesota, four in South Dakota, and four in Montana. In addition, there are 83 licensed DHs in the licensure file with no work address listed (CHWS, ND BDE, 2012).

The qualitative work for this project found that there is general agreement among oral health stakeholders that there are more licensed DHs in North Dakota currently than available positions for DHs in dental practices and other settings where dental services are provided. Informants in the state suggested that there is excess capacity within this workforce and that some licensed DHs are unable to find work in dentistry, which would explain the absence of work addresses for some DHs in the licensure file.

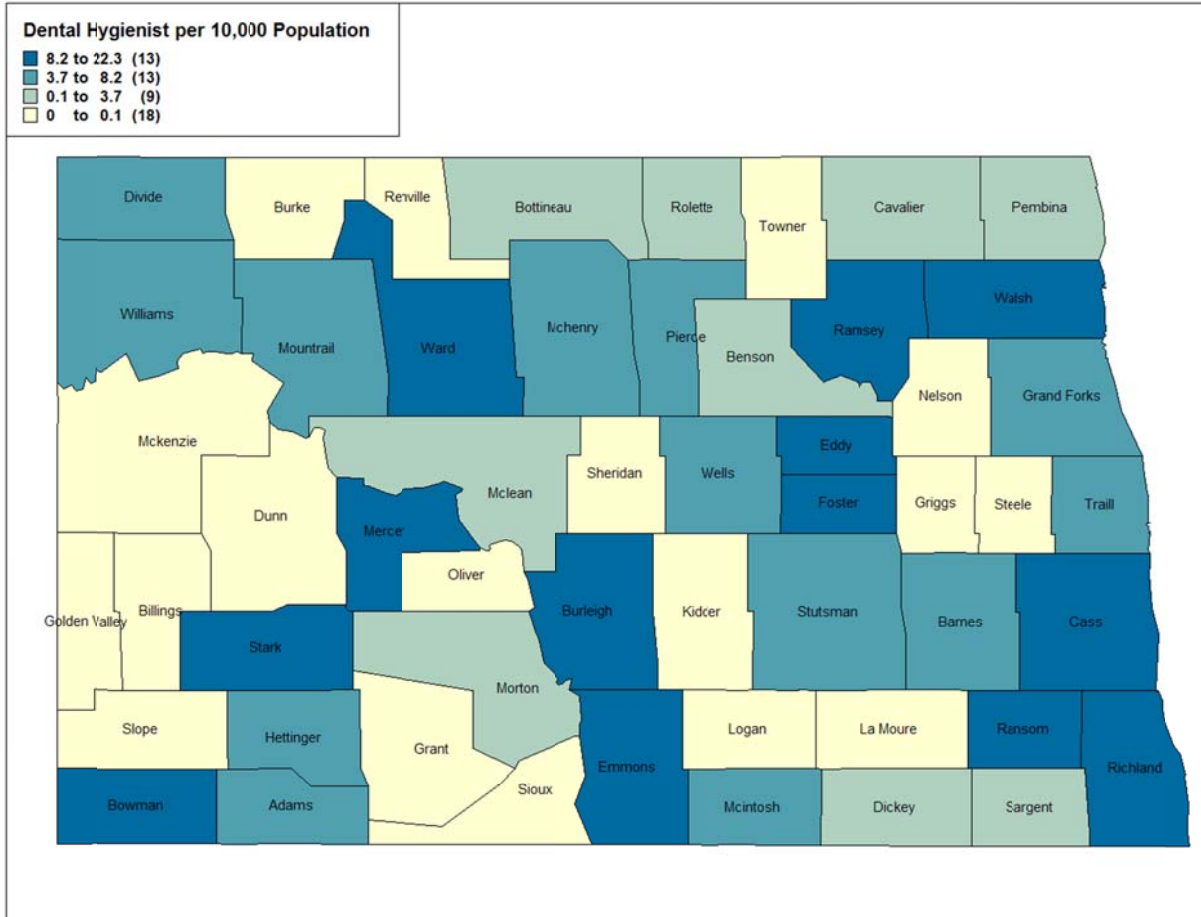
Table 19. DHs to Population Ratio and Number of People per DH by North Dakota County, 2012

County	2012 Population	Total Number Licensed Dental Hygienists	Ratio of Dental Hygienists to 10,000 population	Number of People per Dental Hygienist
Adams County	2,343	1	4.3	2,343
Barnes County	11,066	7	6.3	1,581
Benson County	6,660	1	1.5	6,660
Billings County	783	0	0.0	0
Bottineau County	6,429	1	1.6	6,429
Bowman County	3,151	7	22.2	450
Burke County	1,968	0	0.0	0
Burleigh County	81,308	93	11.4	874
Cass County	149,778	153	10.2	979
Cavalier County	3,993	1	2.5	3,993
Dickey County	5,289	1	1.9	5,289
Divide County	2,071	1	4.8	2,071
Dunn County	3,536	0	0.0	0
Eddy County	2,385	3	12.6	795
Emmons County	3,550	3	8.5	1,183
Foster County	3,343	3	9.0	1,114
Golden Valley County	1,680	0	0.0	0
Grand Forks County	66,861	44	6.6	1,520
Grant County	2,394	0	0.0	0
Griggs County	2,420	0	0.0	0
Hettinger County	2,477	1	4.0	2,477
Kidder County	2,435	0	0.0	0
LaMoure County	4,139	0	0.0	0
Logan County	1,990	0	0.0	0
McHenry County	5,395	2	3.7	2,698
McIntosh County	2,809	2	7.1	1,405
McKenzie County	6,360	0	0.0	0
McLean County	8,962	2	2.2	4,481
Mercer County	8,424	8	9.5	1,053
Morton County	27,471	8	2.9	3,434
Mountrail County	7,673	3	3.9	2,558
Nelson County	3,126	0	0.0	0
Oliver County	1,846	0	0.0	0
Pembina County	7,413	2	2.7	3,707
Pierce County	4,357	2	4.6	2,179
Ramsey County	11,451	12	10.5	954
Ransom County	5,457	9	16.5	606
Renville County	2,470	0	0.0	0
Richland County	16,321	17	10.4	960
Rolette County	13,937	4	2.9	3,484
Sargent County	3,829	1	2.6	3,829
Sheridan County	1,321	0	0.0	0
Sioux County	4,153	0	0.0	0
Slope County	727	0	0.0	0
Stark County	24,199	20	8.3	1,210
Steele County	1,975	0	0.0	0
Stutsman County	21,100	10	4.7	2,110
Towner County	2,246	0	0.0	0
Traill County	8,121	6	7.4	1,354
Walsh County	11,119	11	9.9	1,011
Ward County	61,675	56	9.1	1,101
Wells County	4,207	2	4.8	2,104
Williams County	22,398	16	7.1	1,400

Source: ND BDE, 2012, ACS, 2012, CHWS, 2012

There are 18 counties in North Dakota where there are no practicing DHs and eight counties with one practicing DH.

Figure 9. Ratio of DHs to 10,000 Population by North Dakota County, 2012



Source: ND BDE, CHWS, 2012

Education of Dental Hygienists in North Dakota

There is only one Commission on Dental Accreditation (CODA)-accredited dental hygiene education program in the state at the North Dakota State College of Science in Wahpeton. In the 2010-2011 academic year, there were 51 students enrolled in the dental hygiene program and 25 graduates in 2010 (ADA, 2012). The program employed four full-time faculty members and eight part-time faculty members.

In 2010, 67% of licensed DHs in the state indicated they had attended the dental hygiene program at North Dakota State College of Science; 8% attended Minnesota State Community and Technical College; 7% attended Northwest Technical College in Bemidji, Minnesota; 3% attended University of Minnesota; and 15% attended other educational programs (CHWS, ND BDE, 2012).

Scope of Practice for Dental Hygienists in North Dakota

North Dakota statute defines the practice of dental hygiene as “removal of accumulated matter from the natural and restored surfaces of teeth and from restorations in the human mouth, the polishing of such surfaces, and the topical application of drugs to the surface tissues of the mouth and teeth” (North Dakota Century Code, Chapter 43-20) under direct, indirect, or general supervision of a dentist. Regulations also clearly specify the tasks permitted to DHs under direct or general supervision as well as those tasks that are specifically prohibited.

Dental Assistants

In North Dakota there are both registered DAs (RDAs) and qualified DAs (QDAs). Chairside-trained DAs are QDAs and a DA with formal training and/or certification is called an RDA. In 2012, there are 472 RDAs in North Dakota that list practice addresses in the state. There are 107 RDAs in the state who list no practice address. As with DHs in North Dakota, the lack of a practice address might indicate an oversupply of RDAs in the state. However, the qualitative work associated with this project revealed that RDAs are in high demand in many areas of the state. In addition, there are 22 RDAs with practice addresses in Minnesota and three with practice addresses in South Dakota. There are no available data about the number of qualified DAs in the state (CHWS, ND BDE, 2012).

Education of Dental Assistants

There is a single CODA-accredited DA education program in North Dakota that graduates approximately 15 students annually (ADA, 2012). Upon graduation, some dental assisting graduates pursue immediate acceptance to the dental hygiene program which is offered on the same college campus. DAs recognize that the earning potential as a DH is greater than that for a DA which encourages them to pursue DH education. As a result, the number of new graduates available for employment as DAs is fewer than the number that graduates from the DA education program.

Neighboring Minnesota has 13 CODA-accredited DA education programs that graduate a total of approximately 420 DAs annually. These programs educate some DAs who practice in North Dakota (ADA, 2012).

Among RDAs who are currently practicing in North Dakota and who also listed the college or technical program where they received their education, 32.5% graduated from the North Dakota State College of Science in Wahpeton, 19.7% graduated from Northwest Technical College, 14.8% graduated from Minnesota State Community Technical College, and the remainder obtained their education in other places (CHWS, ND BDE, 2012).

Scope of Practice

The regulations guiding practice for DAs in North Dakota lists 33 tasks permitted to RDAs under the direct, indirect, or general supervision of a dentist. However, of these only seven tasks are permitted to a QDA and then only under the direct supervision of a dentist. This is likely the reason that dentists prefer to hire RDAs as their ability to provide patient services is much greater than what is permitted for QDAs.

Medical Personnel Providing Oral Health Services

The traditional oral health workforce includes dentists, DHs, RDAs, and other DAs. However, increasingly, medical providers are offering oral health screening and preventive services to children who are seen in their practices. Since 2007, physicians, physician assistants, and advance practice registered nurses in North Dakota have been permitted to provide oral health screenings for children and apply fluoride varnishes. In addition, registered nurses, licensed practical nurses, DHs, and RDAs can screen and apply fluoride varnishes as long as those services are provided under the direct or general supervision of a dentist or a physician (NDDoH, 2011). This program is called the Healthy Smiles Fluoride Varnish Program. Services are reimbursed by either private insurance or through the state Medicaid program (NDDoH, 2011).

References

- American Dental Association (ADA). 2010-2011 Survey of Allied Dental Education, April, 2012. Available at: http://www.ada.org/sections/professionalResources/pdfs/survey_allied.pdf. Accessed July 13, 2012.
- American Dental Association (ADA). The Future of Dentistry: Today's Vision, Tomorrow's Reality. 2001. Available at: http://www.ada.org/sections/professionalResources/pdfs/future_execsum_fullreport.pdf. Accessed July 13, 2012.
- American Dental Association (ADA). State Innovations to Improve Access to Oral Health: A Compendium Update, 2008. Available at: <http://www.ada.org/2123.aspx>. Accessed January 13, 2012.
- Amundson M, Moulton P, Beyer M, Kruger G, Speaker K, Zavalney B, Monley K, Center for Rural Health, University of North Dakota School of Medicine and Health Sciences, North Dakota Dentists Survey Results, Health Professions Tracking Program, March 2005. Available at: <http://ruralhealth.und.edu/pdf/dentalreport3-05.pdf>. Accessed May 16, 2012.
- Backpacks for Pine Ridge, Stats about Pine Ridge. Available at: http://www.backpacksforpineridge.com/Stats_About_Pine_Ridge.html. Accessed August 14, 2012.
- Beazoglou T, Heffley D, Brown L, Bailit H. The importance of productivity in estimating need for dentists. *Journal of the American Dental Association*. 2002;133(10):1399. Available at: <http://jada.ada.org/cgi/reprint/133/10/1399.pdf>. Accessed April 27, 2011.
- California HealthCare Foundation. Increasing Access to Dental Care in Medicaid: Does Raising Provider Rates Work? National Academy for State Health Policy. March 2008. Available at: <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/I/PDF%20IncreasingAccessToDentalCareInMedicaidIB.pdf>. Accessed April 5, 2012.
- Centers for Disease Control and Prevention (CDC). 2008 Water Fluoridation Statistics. Available at: <http://www.cdc.gov/fluoridation/statistics/2008stats.htm>. Accessed February 1, 2012.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2008, 2010. Available at: http://www.cdc.gov/brfss/technical_infodata/surveydata.htm. Accessed January 31, 2012.
- Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System, Prevalence and Trends Data, 2008 and 2010. Available at: <http://apps.nccd.cdc.gov/BRFSS/>. Accessed February 3, 2012.

Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System, Prevalence and Trends Data, Multiple Years. Available at: <http://apps.nccd.cdc.gov/BRFSS/>. Accessed January 31, 2012.

Centers for Disease Control and Prevention(CDC). Community Water Fluoridation, 2011. Available at: <http://www.cdc.gov/fluoridation/benefits/background.htm>. Accessed February 1, 2012.

Centers for Disease Control and Prevention (CDC). Community Water Fluoridation, Reference Statistics on Water Fluoridation Status, Available at: http://www.cdc.gov/fluoridation/statistics/reference_stats.htm. Accessed February 1, 2012.

Centers for Disease Control and Prevention (CDC). Healthy People 2020. Available at http://www.cdc.gov/nchs/healthy_people/hp2020.htm. Accessed March 8, 2012. Or available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=32>. Accessed March 8, 2012.

Centers for Disease Control and Prevention (CDC). National Oral Health Surveillance. Oral Health Indicators, 2008. Available at: <http://www.cdc.gov/nohss/index.htm>. Accessed February 3, 2012.

Centers for Disease Control and Prevention (CDC). Oral Health Data Systems. Private Well Water and Fluoride. Available at: http://www.cdc.gov/fluoridation/fact_sheets/wellwater.htm. Accessed February 1, 2012.

Center for Rural Health. Loan Repayment Programs. Available at: <http://ruralhealth.und.edu/topics/workforce/loanrepayment.php>. Accessed July 13, 2012.

Center for Rural Health. North Dakota Flex Program and Critical Access Hospital, State Rural Health Plan, 2008. Available at: http://ruralhealth.und.edu/projects/flex/pdf/state_rural_health_plan112608.pdf. Accessed March 22, 2012.

Center for Rural Health. Rural Health Facts, Demographics, Spring 2006. Available at: http://ruralhealth.und.edu/pdf/fs_demographics.pdf. Accessed January 30, 2012.

Center for Rural Health. University of North Dakota School of Medicine and Health Sciences. An Environmental Scan of Health and Health Care in North Dakota: Establishing the Baselines for Positive Health Transformation (Environment). March 2009. Available at: <http://ruralhealth.und.edu/projects/escan/pdf/vol1-2.pdf>. Accessed February 23, 2012.

Center for Rural Health. University of North Dakota School of Medicine and Health Sciences. Hospital Networks. March 2012. Available at: http://ruralhealth.und.edu/pdf/hospitals_2012.pdf. Accessed May 16, 2012.

Centers for Medicare and Medicaid Services (CMS). Medicaid.gov. ESPDT Reports. Available at: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-Periodic-Screening-Diagnosis-and-Treatment.html>. Accessed August 14, 2012.

Centers for Medicare and Medicaid Services (CMS). Medicaid.gov. Medicaid/CHIP Oral Health Services, Fact Sheet, October 2010. Available at: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Downloads/2010-Dental-Factsheet.pdf>. Accessed August 14, 2012.

Centers for Medicaid and Medicare Services (CMS). National Health Expenditure Data. Available at: <https://www.cms.gov/NationalHealthExpendData/downloads/highlights.pdf> and <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/res-tables.pdf>. Accessed August 14, 2012.

Centers for Medicare and Medicaid Services (CMS). Office of the Actuary (Actuary). National Health Expenditures Projections, 2010-2020. Available at: <https://www.cms.gov/NationalHealthExpendData/downloads/proj2010.pdf>. Accessed August 1, 2012.

Centers for Medicare and Medicaid Services (CMS). State Agency Responsibilities, Annual EPSDT Report, 1995-2008 State Data. Available at: https://www.cms.gov/medicaidearlyperiodicscrn/03_stateagencyresponsibilities.asp. Accessed August 2, 2012.

Community HealthCare Association of the Dakotas (CHAD). Access Points, February 2011. Available at: <http://www.communityhealthcare.net/knowchcs/AccessPoints/2011/February2011.pdf>. Accessed May 10, 2012.

Decker SL. Medicaid payment levels to dentists and access to dental care among children and adolescents. *Journal of the American Medical Association*. 2011;306(2):187-193. Available at: <http://jama.ama-assn.org/content/306/2/187.full.pdf+html>. Accessed January 26, 2012.

Delta Dental. Rational Health Care Reform: The Role of Dental Benefits. Oak Brook, IL: Delta Dental Plans Association, 2009. Available at: <http://www.deltadental.com/PubPolHeaCarRefBrochure09.pdf>. Accessed August 2, 2012.

Dental Lifeline Network. North Dakota. North Dakota Donated Dental Services (DDS) Program. Third Quarter Report for January 1, 2012 through March 31, 2012.

Dental Medicaid Fact Sheet 2009. Available at:

http://www.google.com/#hl=en&gs_nf=1&gs_mss=Dentist%20Participating%20Medicaid%20in%20North%20Dakota&pq=dental%20medicaid%20in%20north%20dakota&cp=25&gs_id=4p&xhr=t&q=Dentist%20Participating%20in%20Medicaid%20in%20North%20Dakota&pf=p&safe=active&rlz=1R2ADFA_enUS418&scient=psy-ab&oq=Dentist+Participating+in+Medicaid+in+North+Dakota&gs_l=&pbx=1&bav=on.2,or.r_gc.r_pw.r_qf.,cf.osb&fp=a0c5566a03d2eae0&biw=1280&bih=824. Accessed July 23, 2012.

Family HealthCare Center. Dental Services, 2012. Available at:

<http://www.famhealthcare.org/services/dental.html>. Accessed May 9, 2012.

Felix, Burdine and Associates, North Dakota Dental Summit. Oral Health Access: Shaping the Future, April 2000. Available at:

<http://www.ndhealth.gov/familyhealth/MCH/dental/summit2000/OralHealthAccess041400.pdf>
Accessed February 9, 2012.

Gehshan S, Hauck P, Scales J. Increasing Dentists' Participation in Medicaid and SCHIP.

National Conference of State Legislatures Promising Practices Issue Brief, Forum for State Health Policy Leadership. Available at:

<http://www.healthychild.ucla.edu/nohpc/National%20Oral%20Health%20Policy%20Center/Publications/Increasing%20Dentist%20Participation.pdf/>. Accessed July 23, 2012.

Glassman P. Oral Health Quality Improvement in the Era of Accountability. Prepared for the W.K. Kellogg Foundation. Available at:

http://dentaquestinstitute.org/sites/dentaquestinstitute.org/files/reports/2011/12/Pacific_Center_for_Special_Care_Report.pdf. Accessed February 10, 2012.

Haden NK, Catalanotto FA, Alexander CJ, Bailit H, Battrell A, Broussard J, et al. Improving the oral health status of all Americans: roles and responsibilities of academic dental institutions. May, 2003. The report of the ADEA president's commission. Available at:

<http://www.jdentaled.org/content/67/5/563.full.pdf+html>. Accessed August 12, 2012.

Health Action New Mexico. News. Available at:

http://www.healthactionnm.org/about_us/news.php?ID=721. Accessed August 14, 2012.

Jordan G. Maine urges water districts to cut fluoride now. *Sun Journal*. January 11, 2011.

Available at: <http://www.sunjournal.com/approved/story/969338>. Accessed October 11, 2011.

Kaiser State Health Facts. Dentist per 10,000 Civilian Population, 2007.

<http://www.statehealthfacts.org/comparemaptable.jsp?ind=966&cat=8>. Accessed July 13, 2012.

Kaiser State Health Facts. North Dakota: Health Insurance Coverage of the Total Population, States (2009-2010). Available at:

<http://www.statehealthfacts.org/profileind.jsp?cmprgn=1&cat=3&rgn=36&ind=125&sub=39>.
Accessed February 13, 2012.

- Kaiser State Health Facts. State Medicaid Fact Sheets. Available at:
<http://www.statehealthfacts.org/profileglance.jsp?rgn=36&rgn=1>. Accessed April 5, 2012.
- Martin A, Lassman D, Washington B, Catlin A. National Health Expenditure Accounts Team. Growth in U.S. health spending remained slow in 2010; health share of gross domestic product was unchanged from 2009. *Health Affairs*. 2012;31(1):208-219. Available at:
<http://content.healthaffairs.org/content/31/1/208.full.pdf+html>. Accessed April 2, 2012.
- Medicaid-CHIP State Dental Association. 2008 Medicaid Dental Reimbursement Chart. Available at: <http://www.medicaidental.org/resources/index.html#stateinfo>. Accessed April 5, 2012.
- Mentasti, L, Thibodeau E. Dental school applicants by state compared to population and dentist workforce distribution. *Journal of Dental Education*. 2008;72(11):1290-1295. Available at:
<http://www.jdentaled.org/cgi/reprint/72/11/1290.pdf>. Accessed July 13, 2012.
- Mouden L. North Dakota Children's Oral Health Conference: Mapping the Future for Access. November 2, 2007. Available at:
<http://www.ndhealth.gov/oralhealth/Publications/Childrens%20Oral%20Health%20Conference%20Summary.pdf>. Accessed May 4, 2012.
- Moulton P, Johnson S, Lang T. The University of North Dakota School of Medicine & Health Sciences, 2010 Snapshot of North Dakota's Health Care Workforce. November 2010. Available at: http://ruralhealth.und.edu/pdf/1010_workforce_moulton.pdf. Accessed May 16, 2012.
- National Association of Dental Plans (NADP). North Dakota Dental Benefits Fact Sheet, 2011. Purchased data.
- National Oral Health Policy Center. A Technical Issue Brief: EPSDT Periodicity Schedules and their Relation to Pediatric Oral Health Standards in Head Start and Early Head Start. June 2005. Available at: <http://www.aapd.org/policycenter/periodicity/pdf/PeriodicityBrief.pdf>. Accessed March 30, 2012.
- North Dakota Board of Dental Examiners. Licensure Lists. Purchased data.
- North Dakota Caring Foundation, Inc. Our History, 2012. Available at:
<http://www.ndcaring.org/about/history.html>. Accessed May 14, 2012.
- North Dakota Century Code, 43-28 and 43-20 and North Dakota Administrative Code, 20-01 through 20-05. Available at: <https://www.nddentalboard.org/>. Accessed July 24, 2012.
- North Dakota Department of Health (NDDoH). 2007-2009 Biennial Report, Working to Improve the Lives of North Dakotans. November 2009. Available at:
<http://www.nd.gov/dhs/info/pubs/docs/2007-2009-dhs-biennial-report.pdf>. Accessed April 3, 2012.

North Dakota Department of Health (NDDoH). Health Facilities. North Dakota Critical Access/Acute Hospitals, 2012. Available at:
http://www.ndhealth.gov/hf/North_Dakota_Hospitals_Critical_access.htm. Accessed May 16, 2012.

North Dakota Department of Health (NDDoH). Healthy People 2010, North Dakota Final Report. Available at:
<http://www.ndhealth.gov/healthypeople2010/HP2010%20Final%20Report/HP2010%20Final%20Report%20North%20Dakota%20v2.pdf>. Accessed March 8, 2012.

North Dakota Department of Health (NDDoH). Oral Health Program. Directory of Dental Access Programs, May 2010. Available at:
http://www.ndhealth.gov/oralhealth/Publications/Fact_Sheet_Dental%20Access.pdf. Accessed February 6, 2012.

North Dakota Department of Health (NDDoH). Oral Health Program. Focus on Oral Health Newsletter, November 2010. Available at:
<http://www.ndhealth.gov/oralHealth/Publications/November2010.pdf>. Accessed February 6, 2012.

North Dakota Department of Health (NDDoH). Oral Health Program. Focus on Oral Health Newsletter, Summer 2011 and March 2011. Both newsletters available at:
<http://www.ndhealth.gov/OralHealth/Publications.asp?ProgramID=101>. Accessed February 6, 2012.

North Dakota Department of Health (NDDoH). North Dakota Five Year Needs Assessment (2011-2015) for the Maternal and Child Health Services Title V Block Grant Program. Available at: http://www.ndsu.edu/sdc/publications/NDDoH/NDNeedsAssessment2011-2015_FINAL.pdf. Accessed July 24, 2012.

North Dakota Department of Health (NDDoH). North Dakota Oral Health Survey, 2004-2005 School Year. September 2005. Available at:
<http://www.ndhealth.gov/familyhealth/publications/NorthDakota2005Report.pdf>. Accessed February 7, 2012.

North Dakota Department of Health (NDDoH). Oral Health in North Dakota, Burden of Disease and Plan for the Future, September 2006. Available at:
http://www.ndhealth.gov/familyhealth/Publications/Oral_Health_State_Plan.pdf. Accessed February 8, 2012.

North Dakota Department of Human Services (NDDoHS). Medicaid Provider Information. Fee Schedules – North Dakota Medicaid. Available at:
<http://www.nd.gov/dhs/services/medicalserv/medicaid/provider-fee-schedules.html>. Accessed May 14, 2012.

North Dakota Department of Human Services (NDDoHS). Medical Services Division. Medicaid General Information, 2012. Available at:
<http://www.nd.gov/dhs/services/medicalserv/medicaid/covered.html>. Accessed April 2, 2012.

North Dakota Department of Human Services (NDDoHS). Milliman, Inc. Analysis of Medicaid Fee for Service Payment Rates. Available at: <http://www.nd.gov/dhs/info/testimony/2005-2006-interim/budget-human-services/20060913-med-serv-fee-for-serv-report-by-milliman.pdf>. Accessed August 3, 2012.

North Dakota Department of Human Services (NDDoHS). North Dakota Head Start State Collaboration Office Needs Assessment, 2011-2012 Survey Results.

North Dakota State Data Center. North Dakota PRAMS-2002 Survey Results. Available at: <http://www.ndsu.edu/sdc/ndprams.htm#2002surveyresults>. Accessed July 30, 2012.

Palmer C. Recession slows dental spending. First annual decline in 50 years. ADA News American Dental Association. February 21, 2011. Available at:
<http://www.ada.org/news/5418.aspx>. Accessed August 2, 2012.

Red River Valley Dental Access Project (RRV). Annual Report, July 2010 to June 2011. Available at:
http://www.rrdentalaccess.com/index.php?option=com_content&view=article&id=54:annual-report&catid=34:board&Itemid=56. Accessed May 10, 2012.

Red River Valley Dental Access Project (RRV). Overview of the Background and Current Situation of the Red River Region Community Dental Access Committee, November 1999. Available at:
http://www.rrdentalaccess.com/index.php?option=com_content&view=article&id=46&Itemid=53. Accessed May 10, 2012.

Ronald McDonald's House Charities, Bismarck. Care Mobile, Available at:
<http://www.rmhcbismarck.org/caremobile/>. Accessed July 11, 2012.

Ronald McDonald's House Charities, Bismarck. Care Mobile Preliminary Business Plan, March 2009. Needs Assessment. February 2011.

University of North Dakota (UND). Pre-Dentistry Program. Available at:
<http://www.und.edu/dept/hpadvize/predent.html>. Accessed February 10, 2012.

U.S. Census Bureau. American Community Survey (ACS). Available at:
<http://www.census.gov/acs/www/>. Accessed August 8, 2012.

U.S. Census Bureau. Population Estimates, Vintage 2008: State Tables. Available at:
http://www.census.gov/popest/data/historical/2000s/vintage_2008/state.html. Accessed February 1, 2012.

- U.S. Census Bureau. Small Area Health Insurance Estimates, 2009 Health Insurance Coverage Status (Uninsured and Insured) in North Dakota for Age (Under 65 years), Income (all Income levels), and Sex (both sexes). Available at: http://smpbff1.dsd.census.gov/TheDataWeb_HotReport/servlet/HotReportEngineServlet?reportid=b9dbb0d245aa0621835d366cd0d274e1&emailname=sueb@census.gov&filename=sahie09_county_print.html. Accessed February 13, 2012.
- U.S. Census Bureau. Small Area Income and Poverty Estimates Data, 2010. Available at: <http://www.census.gov/cgi-bin/saipe/saipe.cgi>. Accessed April 2, 2012.
- U.S. Census Bureau. State and County QuickFacts, North Dakota. Available at: <http://quickfacts.census.gov/qfd/states/38000.html>, Accessed January 31, 2012.
- U.S. Department of Health and Human Services. Head Start. Head Start Program Performance Standards and Other Regulations, §1304.20, Child Health and Developmental Services. Available at: <http://eclkc.ohs.acf.hhs.gov/hslc/standards/Head%20Start%20Requirements/1304/1304.20%20Child%20health%20and%20developmental%20services.htm>. Accessed March 30, 2012.
- U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. Designated Dental Care Health Professional Shortage Areas, North Dakota. 2011. Available at: <http://bhpr.hrsa.gov/shortage/hpsas/updates/09012011dentalhpsas.html>. Accessed February 3, 2012.
- U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA), Bureau of Health Professions. Shortage Designation: Health Professional Shortage Areas and Medically Underserved Populations. 2011. Available at: <http://bhpr.hrsa.gov/shortage/>. Accessed February 3, 2012.
- Wakefield M. North Dakota Legislative Council Budget Committee on Health Care. January 4, 2006. Available at: <http://ruralhealth.und.edu/presentations/pdf/ndlegislativecouncil.pdf>. Accessed February 13, 2012.
- Wendling W. The Private Practice of Dentistry. A Presentation to the Institute of Medicine Workshop: Sufficiency of the U.S. Oral Health Workforce in the Coming Decade. February 9, 2009. Available at: <http://www.iom.edu/~media/Files/Activity%20Files/Workforce/oralhealthworkforce/2009-Feb-09/1%20-%20Wendling.ashx>. Accessed July 17, 2012.
- Wendling W. Private sector approaches to workforce enhancement. *Journal of Public Health Dentistry*. 2010;70:S24-S31. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1752-7325.2010.00177.x/full>. Accessed April 27, 2011.

Western Interstate Commission for Higher Education (WICHE). North Dakota and WICHE. Working Together for Over 25 Years. Available at: <http://www.wiche.edu/info/states/North%20Dakota.pdf>. Accessed February 10, 2012.

Western Interstate Commission for Higher Education (WICHE). Student Exchange Program, Statistical Report, Academic Year 2011-2012. Available at: <http://www.wiche.edu/more/152>. Accessed February 1, 2012.

Western Interstate Commission for Higher Education (WICHE). Workforce, North Dakota, May 2006. Available at: <http://www.wiche.edu/info/publications/workforceBriefs06/NorthDakota.pdf>. Accessed February 10, 2012.

Wikipedia. North Dakota. Available at: http://en.wikipedia.org/wiki/North_Dakota. Accessed January 30, 2012.

World Atlas. Available at: <http://www.worldatlas.com/webimage/countrys/namerica/usstates/nd.htm>. Accessed January 30, 2012.