MINNESOTA MDH DEPARTMENT OF HEALTH Oral Health Program

Minnesota Oral Health Plan

Advancing Optimal Oral Health for All Minnesotans

2013-2018

January 2013

"The past half century has seen the meaning of oral health evolve from a narrow focus on teeth and gingiva to the recognition that the mouth is the center of vital tissues and functions that are critical to total health and well-being across the life span."

Former United States Surgeon General Dr. David Satcher
Oral Health in America: A Report of the Surgeon General (2000)

Minnesota Oral Health Plan 2013-2018
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MISSION: To promote, protect, maintain and improve oral health because it is integral to the health of all Minnesotans.

VISION: Advancing optimal oral health for all Minnesotans.

Dear Minnesotans,

It is a pleasure to present the state's first ever Minnesota Oral Health Plan. This strategic plan recognizes that oral health and overall health are inextricably linked. This plan also marks a turning point in how MDH will integrate oral health into its overall mission.

While Minnesotans enjoy good oral health when compared to the nation, still far too many residents needlessly suffer poor oral health because of the lack of routine oral health care, especially low-income children and adults, people of color, and the elderly. Oral health is fundamental to our quality of life; it impacts other chronic illnesses; affects children's growth and development and ability to learn; determines what foods we eat and whether we smile; and our very sense of self-worth. Untreated oral disease can even lead to death.

Fortunately, this plan identifies both the barriers to and solutions for improving the oral health of Minnesotans. Among the most effective solutions are school-based dental sealant programs and fluoridated water. Another promising solution includes increasing the public's access to affordable dental care through new workforce models like collaborative practice agreements between dentists and hygienists. These innovative approaches to improve oral health care are being rounded out by the cutting-edge work of establishing "health care homes" whereby a patient's total care is coordinated among dental, medical and behavioral health care providers across the health care system.

The Minnesota Oral Health Plan was developed through the hard work of MDH's Oral Health Program staff and our many partners and stakeholders who spent countless hours determining the state's burden of oral disease and the goals, objectives and strategies for reducing these diseases. One of our key collaborators in this endeavor has been the Minnesota Oral Health Coalition, which represents a cross-section of public health, oral health providers and payers, and educational and professional organizations. We thank all of these partners for making the Minnesota Oral Health Plan possible.

As we move forward to tackle the obstacles to oral health, these partnerships will be more critical than ever. We hope that as you review the strategies in this plan, you will identify areas that your organization will help support. By working together, we may indeed *achieve optimal oral health for all Minnesotans.*

Best of health,

Edward Ehlinger, MD, MSPH
Commissioner of Health

Acknowledgements

Thank you to our partner organizations and service providers:

3M
Apple Tree Dental
Century College
Children's Dental Services
Children's Dental Health Services
Community Dental Care
Delta Dental
Early Childhood Dental Network
HealthPartners
Just Kids Dental
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Minnesota Analysis and Development
Minnesota Dental Association
Minnesota Dental Hygienists' Association
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Behavioral Risk Factor Surveillance System
Center for Health Statistics, Minnesota Student Survey
Environmental Impacts Analysis Unit, Birth Defect Information System
Environmental Health Division, Water Fluoridation Reporting System
Minnesota Cancer Surveillance System
Minnesota Department of Health
Office of Rural Health and Primary Care, Health Workforce Database
Pregnancy Risk Assessment Monitoring System

Special thanks to the efforts of the:

Transition Task Force
Work Group Chairs:
- Access to Care Work Group
- Prevention and Education Work Group
- Workforce Work Group

Contents

Introduction

Over the past 50 years, the significant improvement in oral health of Americans is a public health success story, with community water fluoridation being one of the most effective public health initiatives of the twentieth century. Oral health is integral to overall health, as former United States Surgeon General Dr. David Satcher concluded in the groundbreaking report Oral Health in America: A Report of the Surgeon General (2000).

The report emphasizes that the mouth not only reveals signs of poor nutrition and diseases such as infections, immune disorders, injuries, and certain cancers, but research has shown associations between chronic oral infections and heart and lung diseases, stroke, low-birth-weight, premature births, as well as diabetes. Among the top risk factors for oral disease are high-sugar beverages and foods (which also contribute to obesity), along with tobacco and alcohol. Conversely, a healthy mouth can provide protection against chronic infection and disease.

Dr. Satcher also called for action to promote better access to oral health care for all Americans, especially vulnerable populations found to be at greatest risk for severe medical complications resulting from a lack of proper oral care and treatment.

There are several ways in which people suffer from pain and discomfort because of poor oral health: tooth decay; oral and craniofacial diseases; periodontal (gum) diseases; cleft lip and palate; oral and facial pain syndromes; traumatic injury; and oral and pharyngeal (mouth and throat) cancers. Many of these conditions and diseases are preventable.

Minnesotans in general enjoy a high level of oral health, ranking top in the nation for prevention and treatment of oral disease among third graders. In 2011, Minnesota also received a grade 'A' from The Pew Center on the States for achieving six of the eight oral health benchmarks, including enacting policies to improve access to dental care for children on Medicaid.

Despite these high ranks, there is room for improvement, especially among underserved populations who bear the brunt of oral diseases such as children and adults living in poverty, people of color, and the elderly. Through a Basic Screening Survey conducted in 2010, Minnesota children of color were found to be 12 percent more likely to experience caries (decay) and 7 percent more likely to have untreated caries when compared to their white peers.

The poorest adults, defined as making $15,000 or less yearly, were three times less likely to visit a dentist in the past year than adults making $50,000 or more. And among the elderly, a person without a high school degree was 10 times more likely to have all his or her teeth extracted than someone with a college degree.

Furthermore, the shortage of dental professionals serving high-risk populations combined with insufficient dental insurance is straining the health care system. With few means for affordable dental care, people seeking treatment for acute dental needs are forced to seek out the only option they have: hospital emergency department care. In Minnesota, the cost for hospital-treated "non-traumatic" conditions that could have been treated by a dentist was $148 million from 2008 to 2010.

To address these disparities and gaps in care, we must support the expansion of proven community-based disease prevention strategies across the state such as school-based dental sealant programs and ensuring optimal water fluoridation levels. Equally important is improving access to routine oral care through a more diverse dental workforce. Recruiting people from diverse backgrounds into the field of dentistry and providing incentives for working in rural areas will cultivate a workforce with the capacity to meet the needs of the underserved. In turn, providing more affordable dental care through new dental professional classifications such as dental therapists and advanced dental therapists and innovative workforce models like "collaborative agreements" between dentists and hygienists are increasing the public's options for better access to dental providers.

Additionally, transforming patient care through "health care homes" whereby dental and primary care providers work together to deliver integrated care to Minnesotans, and especially our most vulnerable populations, stands to significantly improve oral health while tamping down health care costs. The sooner oral health problems are diagnosed and treated, the less chance they will have to develop into more expensive chronic conditions that threaten people's lives and quality of life. While this health care model shows great promise, much work still needs to be done to raise the awareness among health care providers and policy makers about the social and environmental factors that are largely responsible for health inequities. Without full recognition for communities' economic and cultural needs, serious barriers to health will persist.

Minnesota's First Oral Health Plan

In 2009, the Minnesota Department of Health established a dedicated Oral Health Program to address disparities in oral health and to develop and implement the state's first Minnesota Oral Health Plan. The following plan is a result of a collaborative effort between the Minnesota Department of Health and many community partners. It is Minnesota's first comprehensive blueprint for improving oral health and reducing the prevalence of oral disease and provides a five-year strategic plan spanning from 2013 to 2018.

To establish a baseline to monitor the state's progress and focus resources, MDH carried out the first open-mouth screening of children in third grade through the Association of State & Territorial Dental Directors Basic Screening Survey in 2010. The Basic Screening Survey is based on a standardized set of data tools designed to collect:

- Information on the observed oral health of participants.
- Self-reported or observed information on age, gender, race and Hispanic ethnicity.
- Self-reported information on access to care for preschool, school-age and adult populations.

With these data in hand, Oral Health Program staff convened dentists, dental hygienists, educators, representatives from health plans and consumer groups, and other stakeholders to inform and prioritize efforts to improve Minnesotans' oral health. That teamwork produced the underpinnings of the Minnesota Oral Health Plan's top priority areas and goals as seen below, along with related objectives and strategies (see Appendix A for the full list).

Minnesota Oral Health Plan: Priority Areas and Goals

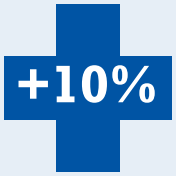
Priority Areas	Goals
1. Public Health Infrastructure	Goal 1: Minnesota's oral health infrastructure is stable and sustained.
2. Prevention and Education	Goal 2: Strategies are implemented that reduce oral disease and mitigate risks. Goal 3: Oral health literacy is increased across all ages and cultures.
3. Health Care Integration and Access to Oral Health Care	Goal 4: Professional integration is enhanced between oral health care providers and other providers in the broader health care system. Goal 5: Access is increased to preventive, restorative, and emergency oral health care services. Goal 6: The dental workforce is prepared for and addresses the oral health needs of all Minnesotans.
4. Surveillance	Goal 7: Access to population statistics, population-level oral health surveillance information, and aggregate data on oral health indicators is readily available to all.

Measuring Success: Leading Health Indicators

*Healthy People 2020**

Increase by 10% the proportion of children, adolescents, and adults who used the oral health care system in the past 12 months: **baseline 45%** (2007); **target 49%** (2020).

Minnesota Oral Health Program



Increase by 10% the number of Minnesotans who receive evidence-based preventive dental care, with emphasis on preventive dental services for all children birth to five years of age: **baseline 36%** (2010); **target 40%** (2020).

Minnesota Department of Health

Increase by 5% the number of adults age 18 and older who report visiting a dentist or dental clinic within the past year for any reason: **baseline 79%** (2010); **target 83%** (2020).

Minnesota Department of Human Services

Increase by 10% the total eligible number of children birth through 20 years of age who receive preventive dental services (by or under the supervision of a dentist): **baseline 36%** (FFY2011); **target 40%** (FFY2020).

*Healthy People 2020 provides public health organizations across the nation with an evidence- based framework to improve the nation's health by setting 10-year benchmarks and monitoring progress on various health indicators.

Measuring Success

Healthy People 2020 provides an evidence-based framework to improve the nation's health by setting 10-year benchmarks and monitoring progress on selected health indicators. Significantly, Healthy People 2020 was the first time the framework included oral health as one of its leading health indicators (LHI).

This recent shift among the top echelon of public health leadership in emphasizing oral health and recognizing its critical role in general health presents an exciting opportunity for Minnesotans: the opportunity to enjoy a higher quality of life, one without needless pain and suffering and filled with broad, confident smiles.

As the Minnesota Oral Health Program moves forward to implement strategies to reduce the prevalence of oral disease, it will measure its success against Healthy People 2020's LHI for the nation:

Increase by 10 percent the proportion of children, adolescents, and adults who used the oral health care system in the past 12 months: baseline 45 percent (2007); target 49 percent (2020).

Three complementary indicators have been identified by the Minnesota Oral Health Program to measure progress locally. These indicators are from the Minnesota Oral Health Plan, Minnesota Chronic Disease and Injury Plan, and Minnesota Department of Human Services. Aligning strategies around indicators that address oral health in different population groups can move us closer to the Healthy People 2020 target.

The Minnesota Oral Health Program's oral health indicator is:

Increase by 10 percent the number of Minnesotans who receive evidence-based preventive dental care, with emphasis on preventive dental services for all children birth to five years of age: baseline 36 percent (2010); target 40 percent (2020).

While this indicator is focused on young children, it complements MDH's statewide strategic health improvement framework, Healthy Minnesota 2020: Chronic Disease

and Injury, which also includes the following oral health indicator for the first time ever:

Increase by 5 percent the number of adults age 18 and older who report visiting a dentist or dental clinic within the past year for any reason: baseline 79 percent (2010); target 83 percent (2020).

MDH's and the Oral Health Program's work also correspond with the Minnesota Department of Human Services' initiative to increase access to oral health care for low-income children and young adults eligible for Medicaid. This initiative seeks to:

Increase by 10 percent the total eligible number of children birth through 20 years of age who receive preventive dental services (by or under the supervision of a dentist): baseline 36 percent (FFY2011); target 40 percent (FFY2020).

MDH's Oral Health Program has been charged with convening stakeholders to implement strategies and evaluate progress as outlined in the Minnesota Oral Health Plan. To ensure forward momentum, program staff are working closely with key organizations such as the Minnesota Oral Health Coalition, which is composed of a broad cross-section of professionals representing dental, health care, educational, business, public health and non-profit sectors. It is only through this broad collaborative effort that we will be able to truly *advance optimal oral health for all Minnesotans.*

Minnesota Oral Health Highlights

Children

- 55% of 3rd graders experienced dental decay (caries experience) (2010)
- 18% of 3rd graders had untreated cavities (2010)
- Children of color were 12% more likely to experience caries and 7% more likely to have untreated caries as compared to white children (2010)
- Minnesota's 64% school-based sealant rate far exceeds the national average of 32% (2010)
- 59% of children with Medicaid coverage did not receive any dental services by or under the supervision of a dentist during Federal Fiscal Year 2011.
- 403 cases out of 361,109 births or 1 in 1,000 births had an orofacial defect such as clefting (2005-2009)

Adults and the Elderly

- 79% of adults 18 years and older reported visiting a dentist or dental clinic within the past year (2010)
- The poorest adults (<$15K) were 3 times less likely than their most affluent peers ($50K+>) to visit a dentist in the past year (2010)
- Natural teeth extractions fell by 50% for older adults as compared to 36% drop in the national rate (1999-2010)
- An older adult without a high school diploma was 10 times more likely to have all his/her teeth extracted than one with a college degree (1999-2010)

Cancer of the Oral Cavity and Pharynx

- Minnesota incidence rate is 11.2/100,000 population for oral and pharyngeal cancers compared to 10.9/100,000 population nationally (2004-2008)
- Minnesota mortality rate for oral and pharyngeal cancers is 2.0/100,000 population compared to 2.5/100,000 nationally (2004-2008)
- Oral and pharyngeal cancer is highest (23%) among Minnesota's American Indian men living on or near Indian reservations (2004 and 2008)

Emergency Department Visits and Hospitalizations

- Hospital treated non-traumatic dental emergencies – which could have been treated by a dentist – cost nearly $148 million from 2008-2010

Community Water Fluoridation

- 78% of Minnesotans received community fluoridated water compared to 64% of people across the nation (2010)
- Nearly all (99%) Minnesotans who were connected to public water supplies received fluoridated drinking water (2010)

Dental Workforce

- 47% of dentists were 55 years or older (2009-2010)
- Of the 3,908 dentists who renewed their Minnesota license, only 26% were practicing in rural areas (2010)
- Just over half (53%) of practicing dentists submitted at least one dental claim for patients on public programs to the Minnesota Department of Human Services (2010)
- Only 7% of dentists and 6% of hygienists work with a "collaborative agreement" (2009-2010)
- Only 23% of dentists are female (2010)
- Only 6% of dentists are people of color (African American, Native American, Asian or multiracial); 2% are Hispanic (2010)
- In 2009, Minnesota signed into law two new types of "mid-level" dental providers: dental therapist and advanced dental therapist

The Burden of Oral Disease in Minnesota

Optimal oral health allows us to speak, smile, smell, touch, taste, chew, swallow, cry out and have facial expressions without pain or discomfort. Conversely, oral diseases seriously affect our quality of life, diminishing our health, ability to enjoy food, smile and speak confidently, and the ability of children to focus on school learning and adults on their workplace jobs. Oral disease and infection can also lead to death.

Over recent decades, tremendous advances have been made in developing effective treatment and prevention programs such as dental sealants and fluoridated water. Yet, far too many Minnesotans needlessly suffer from tooth decay and tooth loss, gum disease, injuries, cancer and birth defects. Both nationally and in Minnesota, those who bear the greatest burden are low-income children and adults, people of color, and people with disabilities.

Barriers to oral health care, while still poorly understood, may include economic factors such as inadequate insurance coverage and an insufficient number of dental providers accepting public program patients. Other factors include a possible shortage of dental providers, especially in rural locations; overly-restrictive supervision of dental professionals who could otherwise provide services for people in need; transportation issues; dental health literacy; and cultural and language barriers.

The Minnesota Oral Health Plan provides a multitude of strategies for addressing many of the barriers experienced by vulnerable populations. The following account provides an overview of where the greatest oral health needs are among Minnesotans.

Children

Even though dental caries (tooth decay) is preventable, it is the most common chronic childhood disease and is five times more common than asthma. If unchecked, caries can result in the destruction of tooth structure, inadequate tooth function, unsightly appearance, pain, infection, and can affect nutrition, growth and weight gain, and can result in death. Nationally, students ages five to 17 years miss more than 1.6 million school days due to acute dental problems. Children from low-incomes families are nearly 12 times more likely to have restricted-activity days (e.g., missing school) than children from families with higher incomes due to dental problems. To assess the status of oral health among Minnesota's children, in 2010 MDH conducted the state's first baseline "open mouth" Basic Screening Survey (BSS) on students in third grade, the time when most children would have had sealants placed on a first molar by a dental provider. The BSS was conducted at 40 randomly selected public schools with a third-grade classroom size of 10 or more students. A total of 1,766 third graders were observed for the presence of sealants (on at least one molar) on treated and untreated cavities. The 2010 BSS results, combined with Healthy People 2010 (HP2010) health status indicators, Healthy People 2020 (HP2020) targets, and other measures can be used to monitor the state's progress in reducing oral diseases.

Even though dental caries (tooth decay) is preventable, it is the most common chronic childhood disease and is five times more common than asthma.

Data on previous caries experience and the presence of untreated caries can be used to better target future prevention and treatment efforts. When compared to the nation, Minnesota children fared well with only 18 percent of children surveyed having untreated caries, exceeding both the national HP2010 status and the HP2020 target of 26 percent (Figure 1).

However, 55 percent of Minnesota third graders had experienced caries, which was slightly higher than the nation (53 percent) for children six to eight years years (Figure 2). To meet the target for HP2020, Minnesota has to reduce caries experience in children by 6 percent.

In general, lower-income populations bear a disproportionate burden of oral diseases and conditions. Using a school's Free or Reduced Price Lunch (FRL) eligibility statistics as an indication of socio-economic status, the 2010 BSS data confirms that low-income children were far more likely to have dental caries experience than their more affluent peers. As seen in Figure 3, caries experience and untreated caries rise as income declines: the poorest children (>75% FRL) were almost one and a half times more likely to experience tooth decay and almost three times more likely to have their tooth decay go untreated than students at more affluent schools.

Likewise, race and ethnicity can be risk factors for compromised oral health. Minnesota children of color (non-white, non-Hispanic) were 12 percent more likely to experience caries and 7 percent more likely to have untreated caries as compared to their white counterparts (white non-Hispanic) (Figure 4). Hispanic children were almost on par (1 percent higher) with white children for untreated caries.

A majority of Minnesota third graders (64 percent) showed evidence of dental sealants on at least one permanent molar, which is two times higher than the national rate (32 percent) and supersedes the HP2020 goal of 28 percent (Figure 5). Troubling though, is Minnesota's high sealant rate drops steadily by income to the low rate of 42 percent when we look at the poorest children (>75% FRL). The dental sealant prevalence rate is lowest among Hispanic children both nationally and locally, with the gap between Hispanic and white children being almost twice as big at the national level than in Minnesota.

FIGURE 1
Untreated Caries in Children, Comparison of HP2010, HP2020 with MN Data

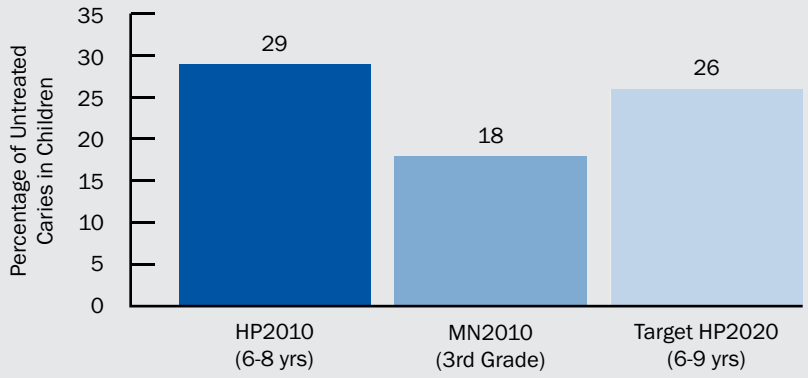


FIGURE 2
Dental Caries Experience in Children Comparison of HP2010, HP2020 with MN Data

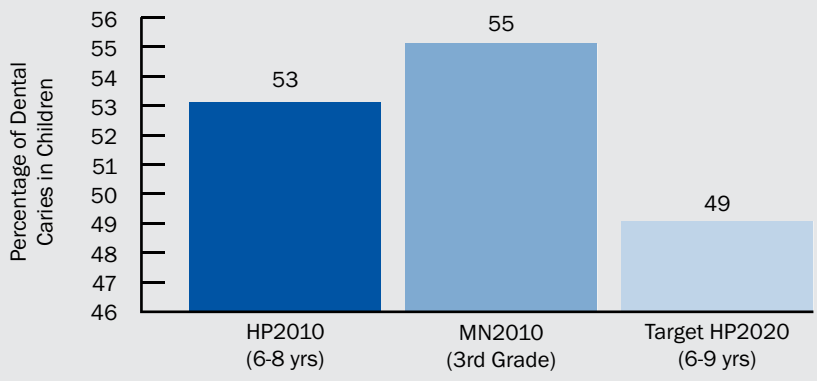
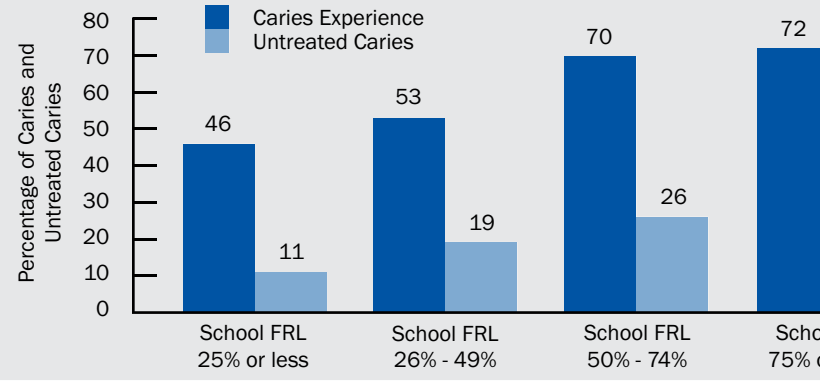


FIGURE 3
Caries Experience and Untreated Caries in Students in 3rd Grade by Free and Reduced Lunch Eligibility in Minnesota - BSS2010



When comparing rural versus urban areas, caries experience is 6 percent more prevalent among rural children (57 percent) than their urban counterparts (51 percent); untreated caries is 5 percent higher among rural children (20 percent) as compared to urban children (15 percent). Sealant rates, however, are nearly identical at 64 percent. This bright spot may point to the success of school-based sealant programs that focus on reaching children who do not have adequate access to dental care.

Adolescents

While Minnesota does not currently monitor the oral health status of adolescents, national data tell us that 56 percent of adolescents (15 year olds) had experienced caries, according to an HP2020 report. Data also show a higher prevalence of caries experience in females (60 percent) than males (53 percent). The national HP2020 target is to reduce the proportion of adolescents (13 to 15 years) with dental caries experience in their permanent teeth to 48 percent.

Adults

Most adults have suffered from tooth decay and gum disease, which are the most common oral diseases affecting both health and productivity. Nationally, 164 million hours of work are lost annually due to dental problems, with adults in lower paying jobs losing two to four times more work hours than higher-paid workers.

Nationwide, 28 percent of adults ages 35 to 44 years and 18 percent of adults age 65 years and older had untreated caries. In Minnesota, 79 percent of adults 18 years and older reported having visited a dentist or dental clinic within the past year. Despite this high rate, significant disparities exist across income levels. Minnesota's poorest adults (<$15K) were three times less likely than their most affluent counterparts ($50K+>) to visit a dentist in the past year (Figure 6). It is possible this disparity exists because public insurance programs provide limited dental benefits for low-income adults and eligible recipients may not be knowledgeable of, or seek out, these programs.

FIGURE 4
Caries Experience and Untreated Caries in Students in 3rd Grade by Race, Minnesota - BSS 2010

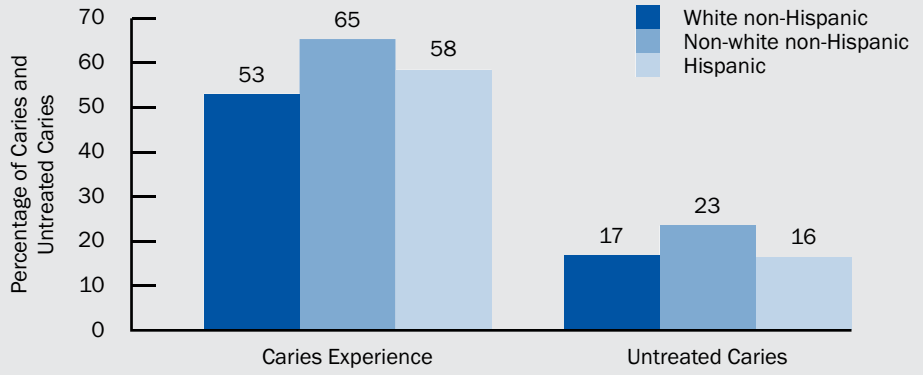


FIGURE 5
Minnesota and National Population Prevalence Estimates for Dental Sealant

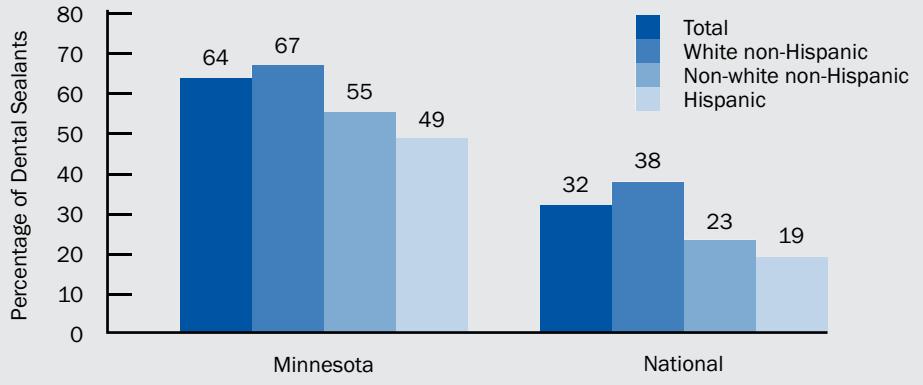
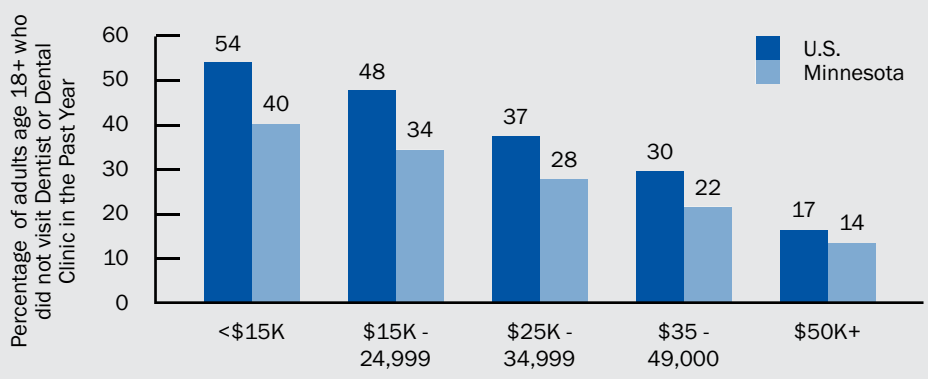


FIGURE 6
Adults 18+Who did not Visit a Dentist or a Dental Clinic in the Past Year by Income - BRFSS 2010



According to the Centers for Disease Control, almost half of all adults in the U.S. are affected by gum disease (periodontal disease). Periodontal disease is a bacterial infection that affects the gums and bone supporting

Through the benefits of water fluoridation and fluoride toothpastes, adults 60 years and older represent the first generation where the majority will keep their natural teeth over their lifetime.

the teeth. Gingivitis is the mildest form of periodontal disease and is often caused by inadequate oral hygiene. Gingivitis is reversible (health can be restored) with professional treatment and good oral home care. Gum disease can cause tooth loss if left untreated. Cigarette smoking is one of the leading risk factors of gum disease and inhibits the healing process; gum disease prevalence is three times higher in smokers than non-smokers.

Elderly

Historically, the elderly have been at higher risk for poor oral health due to their lack of preventive care when they were young and the lack of Medicare dental benefits for older adults. However, through the benefits of water fluoridation and fluoride toothpastes, adults 60 years and older represent the first generation where the majority will keep their natural teeth over their lifetime.

Both nationally and in Minnesota, the number of older adults (65+) missing all their natural teeth declined significantly in the past decade. From 1999 to 2010, natural teeth extractions fell by 50 percent for older Minnesotans, much higher than the national rate of a 36 percent drop (Figure 7). As of 2010, 17 percent of adults 65+ years across the nation had all their natural teeth extracted compared to 11 percent of Minnesotans.

FIGURE 7
Adults Aged 65+ Who Have Had All Their Natural Teeth Extracted BRFSS Data 1999 - 2010

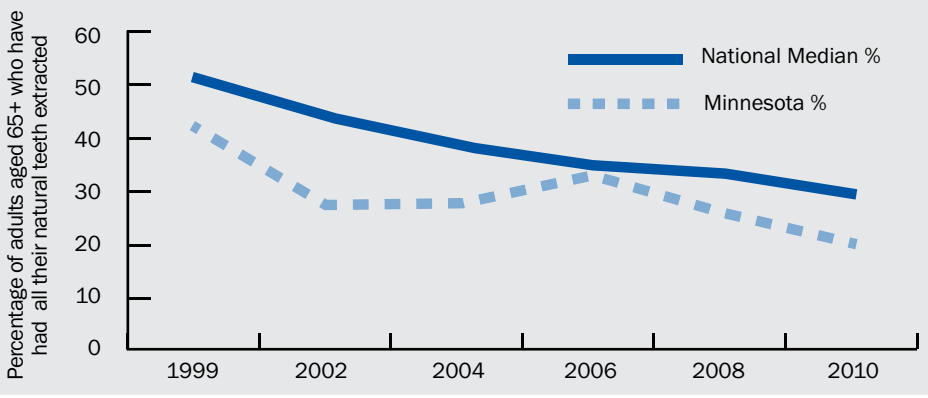
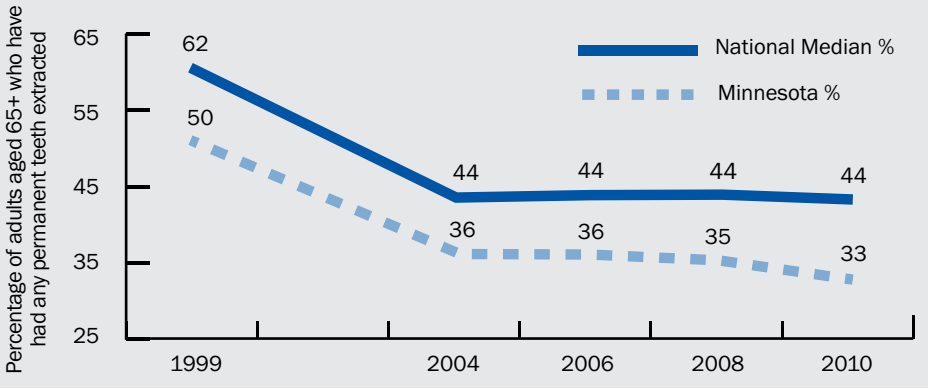
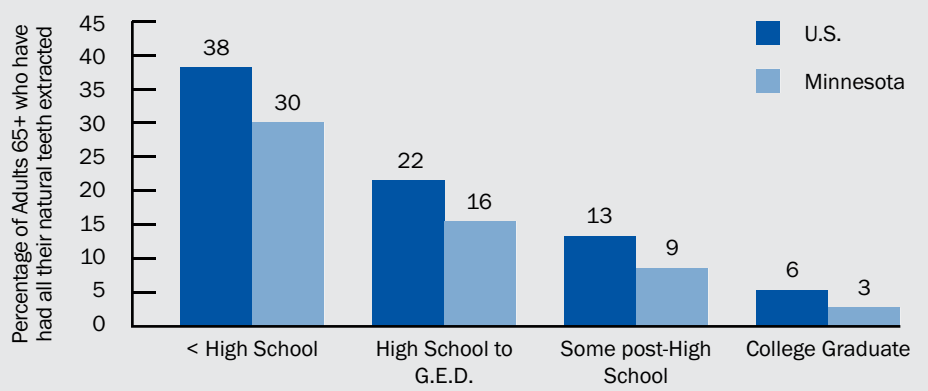


FIGURE 8
Adults Aged 65+ Who Have Had Any Permanent Teeth Extracted BRFSS Data 1999 - 2010



Note: Data between 1999-2004 is unavailable.

FIGURE 9
Adults Aged 65+ Who Have Had All Their Natural Teeth Extracted by Education Level, BRFSS Data 2010



Between 2004 and 2010, the rate of older Minnesotans who had any permanent teeth extracted declined slightly from 36 to 33 percent as national trends remained stagnant at 44 percent (Figure 8). While these downward trends are encouraging, with no Medicare dental benefits, older adults on fixed incomes are less likely to seek oral health care, compromising their quality of life and health.

Given persistent disparities, the lower a person's educational level the more likely his or her natural teeth will be extracted. In Minnesota, an older adult without a high school diploma was 10 times more likely to have all their teeth extracted than an older adult with a college degree. Minnesota's older adults without a high school degree did fare better than their national counterparts who were 8 percent more likely to have had all their natural teeth extracted (Figure 9).

Cleft Lip and Palate

Cleft lip and/or cleft palate is the fourth most common birth defect in the U.S., affecting about one child per 700 births. Cleft lip and cleft palate occur when a baby's lip or palate do not form properly. These conditions affect a child's ability to breastfeed, eat, talk, and can lead to ear infections, hearing loss, and jeopardize tooth health.

The exact cause of cleft lip and palate is not known; however, it is thought to be caused by a combination of genetic and risk factors such as environmental exposures, the mother's tobacco use and diet while pregnant, as well as certain medications. Women with diabetes have also been shown to be at higher risk of having a child with a cleft lip with or without cleft palate.

Cleft lip with and without cleft palate affects boys twice as much as girls whereas cleft palate without cleft lip affects girls twice as much as boys. In Minnesota, there were 403 cases of orofacial defects such as clefting recorded for births between 2005 and 2009; that is 403 cases out of 361,109 births or one case per 1,000 births. This number is likely higher as this figure is based on access to only 50 percent of birth records.

Women can take steps before and during pregnancy to reduce the risk of having a baby born with birth defects. Such steps include taking a daily multivitamin with

FIGURE 10
Incidence Rates for Cancer of Oral Cavity and Pharynx by Gender US and Minnesota Populations 1988-2008

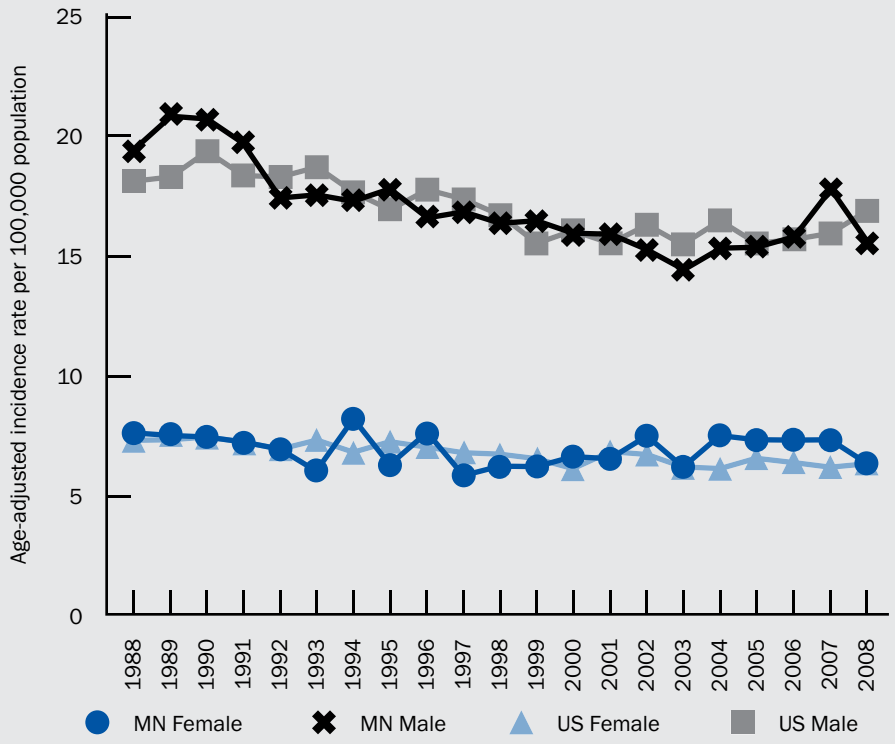
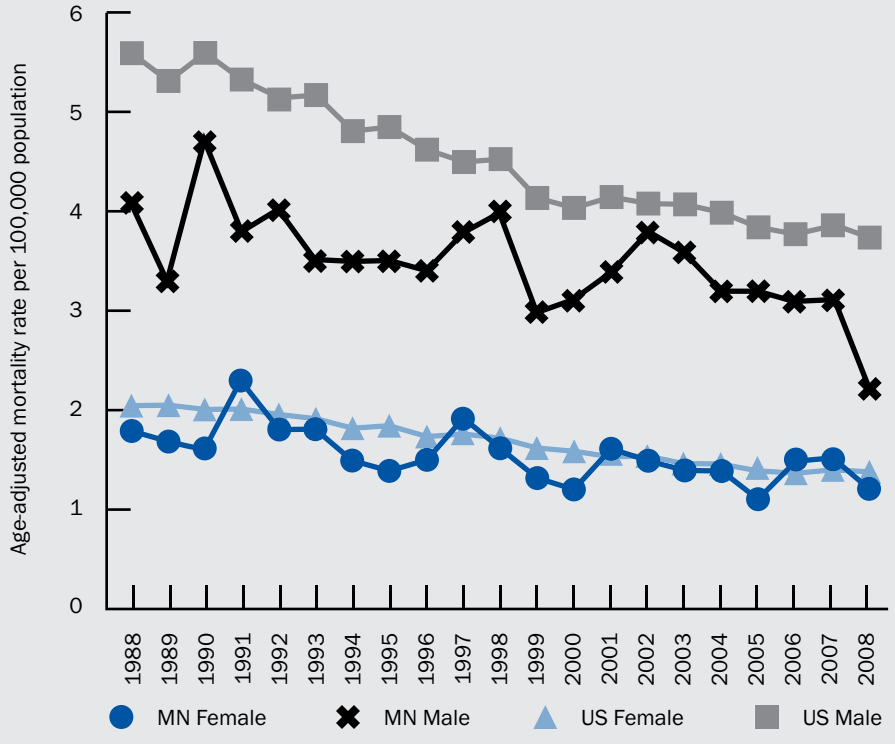


FIGURE 11
Mortality Rates for Cancer of Oral Cavity and Pharynx by Gender US and Minnesota Populations 1988-2008



folic acid (400 micrograms), not smoking, and not drinking alcohol during pregnancy.

Treatments and rehabilitation begins within the first few months of life. As the process involves multiple specialists and procedures, the average treatment costs for treating cleft lip or cleft palate per patient over their lifetime is estimated at $250,000.

Cancers of The Oral Cavity and Pharynx

The American Cancer Society estimates that 35,000 people get oral cavity and pharyngeal cancers each year and that 6,800 people will die from these cancers. These cancers affect males twice as much as females and most often occur in people ages 62 and older. Oral and pharyngeal cancer occur most often on the tongue, tonsils, and minor salivary glands while the remainder are found on the lips, gums, the floor of the mouth, and other sites.

Use of tobacco and heavy consumption of alcohol are widely considered major risk factors for oral and pharyngeal cancer. Recently, exposure to the human papillomavirus (HPV) and infection have been documented as strong risk factors for certain types of oral and pharyngeal cancer, particularly in men. Reducing exposure to tobacco and alcohol is the most effective strategy to lower the risk of developing these types of cancer.

FIGURE 12
Incidence of Cancer of Oral Cavity and Pharynx by Age and Gender, 2004-2008 (Source: MCSS)

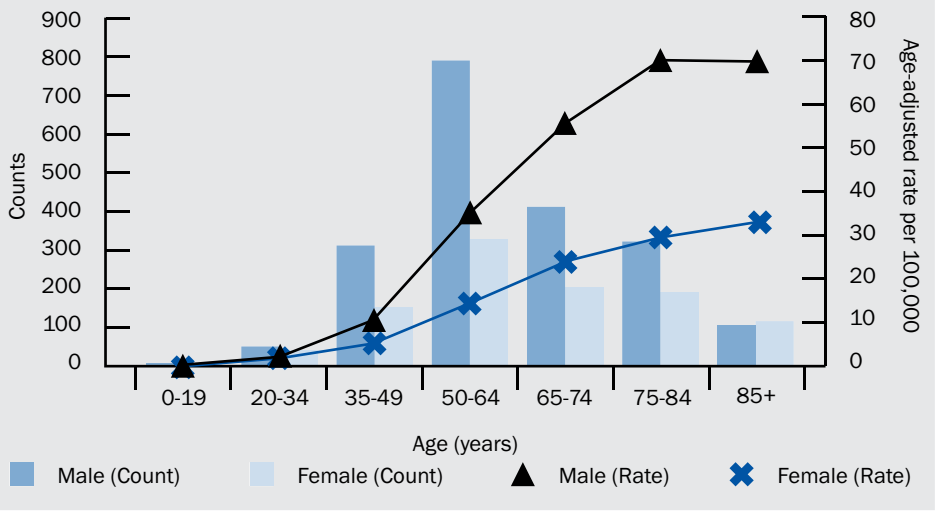
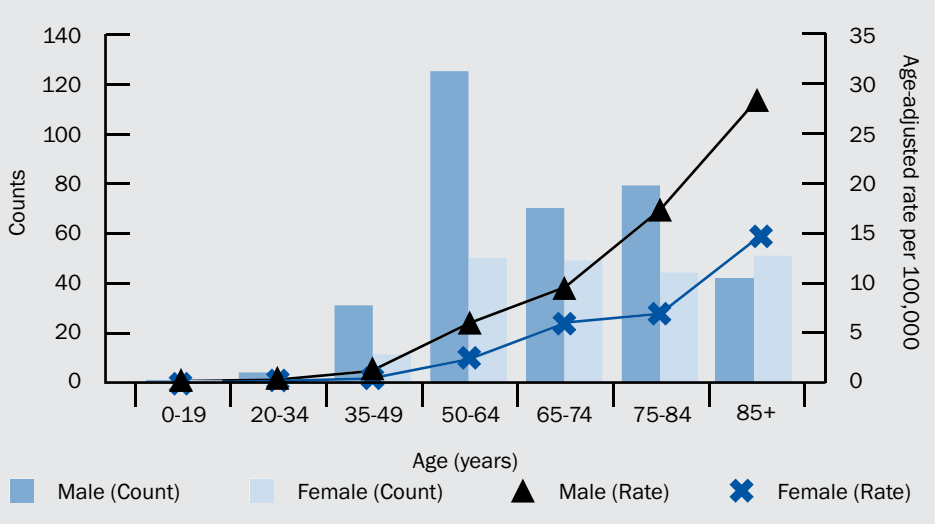


FIGURE 13
Incidence of Cancer of Oral Cavity and Pharynx By Age and Gender, 2004-2008, (Source: MCSS)



In Minnesota, from 2004 to 2008 an average of 603 cases of oral and pharyngeal cancer were diagnosed – 2.4 percent of all new cancer cases – resulting in 111 deaths and representing 1.2 percent of all cancer-related mortality. The average annual incidence for oral and pharyngeal cancer was 11.2 per 100,000 Minnesotans compared to 10.9 per 100,000 nationally; the mortality rate was 2.0 per 100,000 population, slightly lower than the average for the nation at 2.5. Oral cancer is devastating: although incidence rates are low compared to other cancers, one out of every six cases results in death.

Following national trends, the incidence rate was two times higher (15.9 per 100,000 males) among Minnesota males than females (7.1 per 100,000) (Figure 10). While the Minnesota incidence rate for oral and pharyngeal cancer in women has been stable, the rate among males fell by 20 percent from 1988 (19.6 per 100,000) to 2006 (15.7 per 100,000), with a slight increase in 2007 (17.8 per 100,000).

Oral and pharyngeal cancer mortality rates for the state decreased significantly among males since 1988. Through 2008, rates declined by 27.2 percent in the state for males as compared to national mortality rates. Mortality rates were consistently lower in the state for males (41.5 percent) and females (13.0 percent) as compared to national rates; Minnesota mortality rates for females were steady and closer to the national figures (Figure 11).

Incidence, Mortality and Lifetime Risk by Age, Gender and Race

In Minnesota, the median age for oral and pharyngeal cancer diagnosis for males is 61 years and 65 years for females. The incidence rate in both males and females increases with age and more than two-thirds of the new oral and pharyngeal cancer cases are identified after the age of 74 years (Figure 12). Incidence rates are two times higher in males than females. Starting in the 20 to 34 year range, both the number of cases and rate of oral and pharyngeal cancer between men and women begins to diverge with the biggest spread occurring between the ages of 50 and 64 years.

Mortality rates for oral and pharyngeal cancer increase sharply after age 64 years in both males and females (Figure 13). As with incidence rates, males have higher oral and pharyngeal cancer mortality rates than females.

Between 2004 and 2008, the occurrence of oral and pharyngeal cancer in Minnesota males was highest (23 percent) among American Indian men living on or near Indian reservations, followed by blacks (21 percent). Among females, American Indian females (12 percent) had the highest incidence rate. Interestingly, mortality rates were higher in Asian/Pacific Islander populations.

The average, annual incidence rate among Minnesota populations living on or near Indian reservations was 17 percent higher (23 new cases/100,000 population) than among American Indians (19 new cases/100,000 population) living outside these areas (Table 1).

Oral Diseases and Other Health Conditions

Over the past few decades, the rise in chronic disease has emerged as a major threat to the well-being of Americans, while costing the health care system billions of dollars. These factors reinforce the need for better integration between oral health care and general health care systems and for professionals to raise awareness, maximize resources and streamline efforts in the interest of achieving a common goal: improving the health of Minnesotans.

There is an inextricable relationship between oral and chronic diseases such as diabetes, cardiovascular diseases, stroke, and adverse pregnancy outcomes. Studies have shown that the mouth can signal the presence of diseases in other parts of the body as well as be a gateway for infections that can spread throughout the body. In addition, people with certain chronic diseases are at an increased risk for developing periodontal (gum) disease, further compromising their health and recovery.

Periodontal disease is often considered the "sixth complication of diabetes." Since people with diabetes are more susceptible to contracting infections, they are more likely to have periodontal disease than people without diabetes. Children with diabetes often develop gum diseases earlier in life than those without diabetes and show more plaque and gingival inflammation than non-diabetic children. Research also suggests the relationship goes both ways, as periodontal disease may make it more difficult for diabetic patients to control their blood sugar, increasing the risk for diabetic complications.

Additionally, while periodontal disease may not be conclusively linked as a causal agent for heart disease and stroke, a strong case can be made that risk factors for periodontal disease are shared with heart disease and stroke.

Another startling fact is that only 22 to 34 percent of women in the U.S. consult a dentist during pregnancy. According

TABLE 1

Oral Cavity and Pharyngeal Cancer Average Annual Rates in Minnesotans by Race and Ethnicity, 2004-2008

Race	Average Annual Incidence Rate		Mortality Rate	
	Male	Female	Male	Female
Contract Health Services Delivery Area*	23%	~	~	~
Blacks	21%	8%	~	~
American Indians	19%	12%	~	~
Non-Hispanic whites	16%	7%	2.8%	1.3%
Asian/Pacific Islanders	15%	8%	7.8%	~
Hispanic all races	6%	7%	~	~
All Races combined	16%	7%	2.9%	1.3%

* Contract Health Services Delivery Area: American Indians living on or near reservation

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

TABLE 2

Minnesota Indicators for Medicaid Recipients birth through the age of 20 years

	FFY2010		FFY2011	
	Number	Percent	Number	Percent
Total individuals eligible for EPSDT for 90 continuous days*	436,388	---	453,502	---
Total eligible receiving any dental services [any service by or under the supervision of a dentist]	181,137	42%	183,929	41%
Total who did not receive dental services	255,251	58%	269,573	59%
Total eligible receiving preventive dental services [by or under the supervision of a dentist]	162,986	33%	164,432	36%
Total eligible receiving dental treatment services [by or under the supervision of a dentist]	81,942	19%	79,335	17%
Total eligible (only children 6-9 years) receiving a sealant on a permanent molar tooth	14,273	17%	13,590	15%

TABLE 3

Charges for Minnesota Hospital-treated Oral Trauma and Non-Traumatic Conditions, 2008-2010

	Hospital-treated Oral Trauma			Hospital-treated		
	2008	2009-2010	Percent of Increase	Number	2009-2010	Percent of Increase
Mean	$453.16	$483	7%	$1,053.75	$1,148	9%
Median	$187	$208	11%	$242	$291	20%
Total	$11,720,194	$12,755,259	9%	$67,378,817	$80,356,318	19%

to the National Maternal and Child Oral Health Resource Center, most infants and young children acquire caries-causing bacteria from their mothers. Therefore it is essential for health professionals to provide pregnant women and new mothers with appropriate and timely oral education and health care. While the research is not conclusive, many studies have found periodontitis (inflammation of gums) to be associated with poor pregnancy outcomes including preterm birth, low birth weight, or both. What is clear is that oral health programs need to focus more on educating and improving prenatal education and oral health care for pregnant women. These conditions drive home the fact that to maximize a patient's health outcomes, a more coordinated approach is needed among dental and medical providers to use a shared risk factor approach to treat patients.

Oral Health Financing

Increasing Use Rates of Public Insurance Programs for Children

Medicaid is a government-sponsored program that provides health and dental coverage for low-income children and vulnerable adults such as those with disabilities and refugees. The Early Periodic Screening, Diagnosis, and Treatment (EPSDT) Program is the child health component of Medicaid. It is required in every state and is designed to improve the health of low-income children by financing appropriate and necessary pediatric services. Child and Teen Checkups (C&TC) is the name for Minnesota's EPSDT Program.

C&TC is a comprehensive child health program provided to children and teens from birth through the age of 20 who are enrolled in Medicaid or MinnesotaCare. Comprehensive and periodic screenings are the foundation of the C&TC program and delivered according to a set schedule, ensuring that health problems are diagnosed and treated early before they become more complex and treatment more costly.

Despite these resources, dental services continue to be under used by low-income children. In Federal Fiscal Year 2011 (FFY2011), of the 453,502 eligible EPSDT children in Minnesota, the vast majority (59 percent) did not receive dental services (Table 2). In Minnesota, there was a 4 percent increase in those under 21 years of age eligible for Medicaid from FFY2010 to FFY2011.

Hospital treated non-traumatic dental emergencies — which could have been treated by a dentist — cost nearly $148 million from 2008-2010.

According to the Pew Charitable Trusts, by 2014 an estimated 5.6 million more children will be eligible to receive Medicaid dental benefits under the Affordable Care Act.

The Centers for Medicare & Medicaid Services (CMS) reviewed the causes of low dental use rates among children on Medicaid and identified the following key barriers:

- Limited availability of dental providers
- Low insurance reimbursement rates to dental providers
- Lack of clear information for beneficiaries about dental health benefits
- Missed dental appointments
- Transportation
- Cultural and language barriers
- Need for consumer education about the benefits of dental care

To address these barriers, CMS developed national objectives in April of 2011 that are in line with the HP2020 oral health goals:

- To increase the rate of children ages one to 20 enrolled in Medicaid or Children's Health Insurance Program (CHIP) who receive any preventive dental service by 10 percentage points over a five-year period; and
- To increase the rate of children ages six to nine enrolled in Medicaid or CHIP who receive a dental sealant on a permanent molar tooth by 10 percentage points over a five-year period (this goal will be phased in during year two or three of the initiative).

Through its school-based sealant program, MDH's Oral Health Program and the Minnesota Department of Human Services are working together to ensure the CMS objectives are implemented. Currently, the Oral Health Program coordinates five school-based sealant programs and three sealant demonstration sites in at-risk schools (targeting second grade children) throughout the state.

TABLE 4

Profile of Minnesota Hospital Treated Patients with Oral and Dental Conditions, 2000-2010

	Traumatic (2000-2010)		Non-traumatic (2007-2010)	
	Number	Percent	Number	Percent
Total number of cases	32,553	---	136,982	---
Male	18,816	58%	65,340	48%
Female	13,737	42%	71,642	52%
Urban Residents	20,443	63%	74,655	55%
Rural Residents	12,110	37%	62,327	46%
Patients treated in Emergency Dept.	32,293	99%	131,914	96%
Patients hospitalized	260	1%	5,068	4%

Dental Care for the Uninsured and Under-insured

While Medicaid and CHIP provide dental coverage for low-income children, 30 percent of children across the nation with private health insurance do not have dental insurance. Across the nation, disparities between the insured and uninsured are significant: more than 80 percent of low-income children with health insurance (Medicaid and/or private insurance) in 2010 had a dental visit within the past 12 months compared to only half of low-income children without insurance.

In Minnesota, low-income children are eligible to receive dental benefits under Medicaid and low-income adults are eligible for limited dental benefits. According to CMS, in 2009 the national dental services expenditure was $102.2 billion with 42 percent of that amount spent on out-of-pocket payments. This gap in dental benefits coverage often discourages low-income adults and families from seeking dental care in the first place, which points to the need for more affordable treatment options.

The lack of adequate access to dental care has flooded hospital emergency departments (EDs) with patients suffering from dental problems. The main factors contributing to this situation are insufficient insurance benefits; lack of enough providers accepting uninsured or under-insured individuals; and a shortage of dental care providers. These gaps force children without insurance and uninsured or under-insured adults to seek treatment in EDs. Often, the care offered may result in additional visits and corrective procedures as ED staff are not generally trained in handling oral health problems.

Hospitals diagnose oral conditions as either “oral trauma” or “non-trauma." Hospital-treated oral trauma often occurs through injuries and includes broken teeth and open wounds in the mouth.

FIGURE 14

Hospital-treated Oral Non-trauma by Age, Minnesota 2000-2010 Rate/100,000 cases

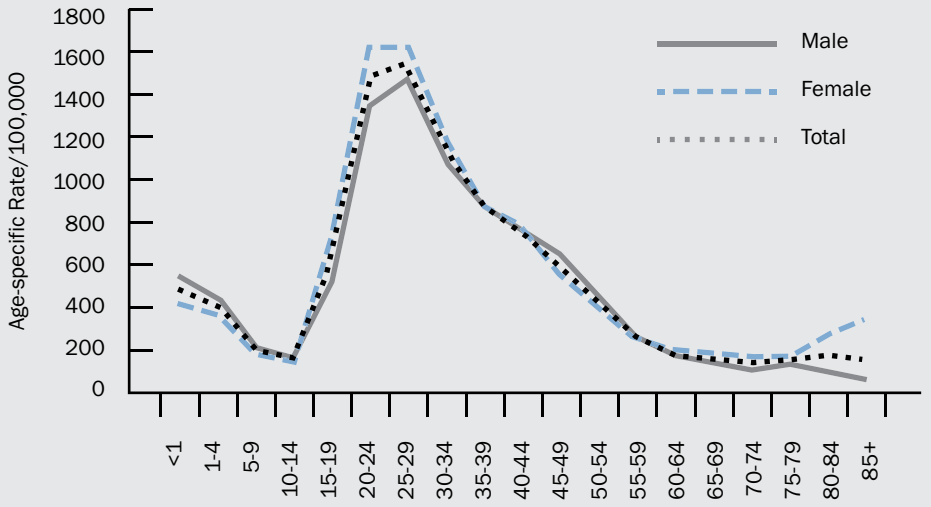


TABLE 5

Minnesota Hospital-treated Oral Non-trauma Rates by Age (2000-2010)

Age group	Rates in Males/100,000	Rates in Females/100,000	Rate differential
20-24	1,345	1,616	20% higher
25-29	1,468	1,610	10 % higher

Non-trauma conditions include tooth development and eruption disorders, abscesses, periodontal disease, gingivitis, dentofacial anomalies, malocclusion and other diseases of the internal structures of the mouth. Non-trauma conditions can best be treated by a dental provider, rather than in a hospital emergency room.

The increased use of EDs for preventive and less severe oral health problems (non-trauma) has serious financial implication to the overall health care system: hospital treatment of non-traumatic conditions cost nearly $148 million from 2008 to 2010 (Table 3). Within a two-year span in Minnesota, the average hospital charges increased significantly for both traumatic (7 percent) and non-traumatic (9 percent) conditions.

In Minnesota, the rate of hospital treatment is much higher for non-traumatic versus traumatic oral emergencies, which may be attributable to the under-insured/uninsured using hospital services for more regular dental care needs. Four times more people sought treatment for non-traumatic oral emergencies at hospitals as compared to those seeking treatment for traumatic conditions (Table 4). From 2000 to 2010, just over a third (37 percent) of patients visiting EDs with traumatic conditions were from rural communities – even though these areas are more sparsely populated – which may be due to the lack of enough dentists in rural locations.

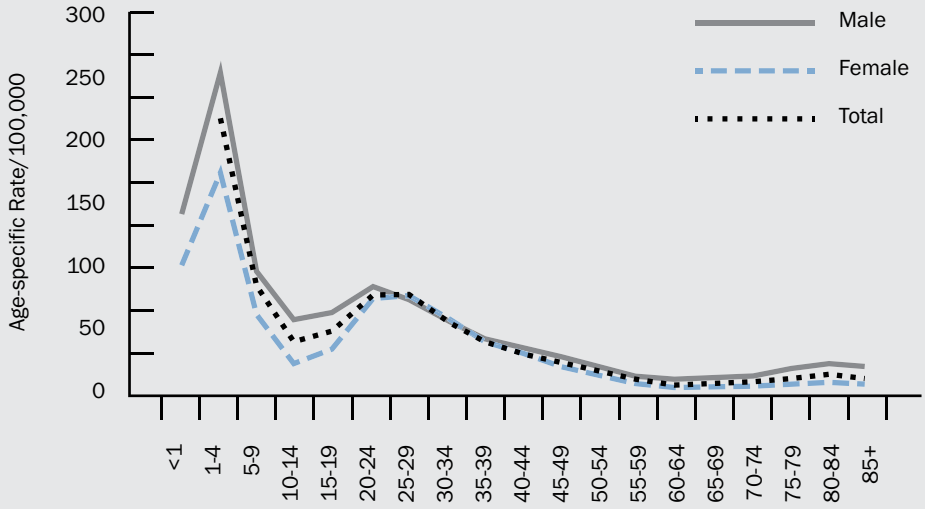
Significantly, people who sought treatment from a hospital for non-traumatic oral emergencies were four times more likely to be admitted to the hospital than those seeking treatment for oral trauma (Table 4). This may be due to preventable dental conditions having evolved into more complicated and costly ailments that needed hospitalization. When charges like this are not paid by uninsured or under-insured patients, the burden falls to the hospital or health care organization which in turn may pass the cost on to insured patients through higher health care charges.

The incidence of non-traumatic hospital-treated oral emergencies is higher among 20 to 29 year olds and is 20 percent higher in females 20 to 24 years old as compared to males in the same age group (Figure 14 and Table 5). The higher rate among this age group may be due to young adults no longer being eligible for coverage through their parents' insurance plans; still being in college without dental benefits; or employed in jobs without dental benefits. The rate in this age group may decline as the Affordable Care Act is implemented and provides coverage for young adults through age 26 on their parents' health care plan.

Minnesota hospital-treatment rates for dental conditions vary significantly by age, with oral trauma being highest in children ages one to four followed by adults ages 20 to 29 years; males and females show the same pattern (Figure 15).

FIGURE 15

Hospital-treated Oral Trauma by Age, Minnesota 2000-2010
Rate/100,000 cases



Public Health Infrastructure

Goal 1: Minnesota's oral health infrastructure is stable and sustained.

Prevention and Education

Goal 2: Strategies are implemented that reduce oral disease and mitigate risks.

Goal 3: Oral health literacy is increased across all ages and cultures.

Health Care Integration and Access to Oral Health Care

Goal 4: Professional integration is enhanced between oral health care providers and other providers in the broader healthcare system.

Goal 5: Access is increased to preventive, restorative, and emergency oral health care services.

Goal 6: The dental workforce is prepared for and addresses the oral health needs of all Minnesotans.

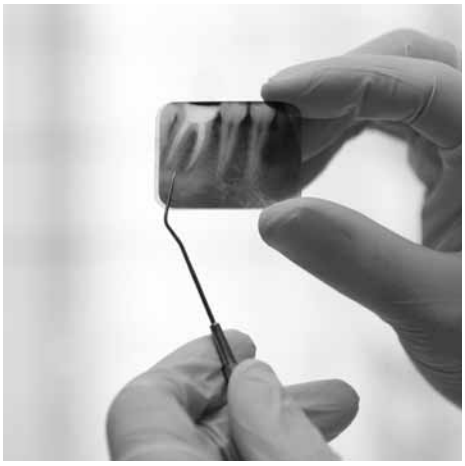
Surveillance

Goal 7: Access to population statistics, population-level oral health surveillance information, and aggregate data on oral health indicators is readily available to all.

Priority Areas: Oral Health Goals, Objectives and Strategies

The Minnesota Oral Health Plan defines specific goals, objectives and strategies for advancing oral health for all Minnesotans. These priority areas were identified by a cross-section of public health and oral health professionals and recognize that oral health is dependent on a complex, interrelated set of factors that range from good oral hygiene and optimal water fluoridation to providing more equitable access to oral health care services.

This overview of priority areas and goals below is followed by a more in-depth analysis of the factors impacting oral health and suggested strategies for dismantling barriers and bolstering health care integration in order to improve oral health for all Minnesotans.



Priority: Oral Health Infrastructure

To sustain continued progress in reducing the burden of oral diseases across Minnesota, it is imperative to devote attention to the status of oral health and amplify the prevention strategies that address them. Further embedding the Oral Health Program's mission with the Minnesota Department of Health's goals and objectives is a first step in that direction. The Minnesota Oral Health Plan also supports Minnesota's statewide health improvement framework: Healthy Minnesota 2020 which emphasizes common themes:

- A Healthy Start for All: capitalize on the opportunity to influence health in early childhood.
- An Equal Opportunity for Health: Assure that the opportunity to be healthy is available everywhere and for everyone.
- Communities Creating Health: Strengthen communities to create their own healthy futures.

Equally critical to this state-level integration is the continued development of collaborative partnerships with other public health and social welfare sectors, educational and health care organizations, and private organizations concerned with oral care. The establishment and continued support of the Minnesota Oral Health Coalition as an independent entity will provide the groundswell of action needed to prioritize and address the complexities of oral diseases.

Through this combined stable leadership, it will be possible to leverage and maximize resources, augment data collection, streamline interventions and address policy barriers while expanding oral health literacy among both professional sectors and the public at large. Working together, we may indeed achieve optimal oral health for all Minnesotans while reducing health care costs.

Goal 1: Minnesota's oral health infrastructure is stable and sustained.

Objective 1.1: Fully integrate the Oral Health Program into the Minnesota Department of Health infrastructure.

Suggested strategies

A. Increase the sustainability of the state oral health program and support the state oral health program as the central agency for oral health promotion.

B. Continue to apply for grants and increase the amount of grant money obtained.

C. Promote integration opportunities with other funded programs.

Objective 1.2: Support development of a strong Minnesota Oral Health Coalition that works closely with the Minnesota Department of Health.

Suggested strategies

A. Support the coalition in determining leadership structure and other administrative and organizational issues related to its development into a self-supporting organization.

   i. Obtain best practices guidance from more mature organizations, access assistance available from National Association of Oral Coalitions and coalition experts e.g. "Coalitions Work", etc.).

   ii. Sustainability of Oral Health Coalition; establish development fund.

   iii. Inform membership.

   iv. Summarize in-kind support from MDH.

B. Complete a vision, mission, goals (identity) process.

C. Work with the coalition leadership to explore pros and cons of establishing the Minnesota Oral Health Coalition as a non-profit organization (501 (C)3 status).

D. Utilize the CDC framework and other recognized coalition resources to increase diversity of the membership in the coalition.

E. Develop an independent, interactive web presence for the Minnesota Oral Health Coalition.

Objective 1.3: Develop and sustain collaborative partnerships to implement the Minnesota Oral Health Plan.

Suggested strategies

A. Create new partnerships that ensure diversified funding is available to implement the Minnesota Oral Health Plan.

B. Identify innovative action plans that are easily adopted by stakeholders.

Objective 1.4: Seek commitment for long-term data collection and surveillance on Minnesota's oral health indicators.

Suggested strategies

A. Investigate the cost (along with data and information technology experts and programmers) to create an interactive web-based data source known as the Minnesota Oral Health Surveillance System (MNOHSS).

B. Prepare planning and implementation process including data documentation to Minnesota Technology Services.

C. Approach potential funders or add to grant proposals to launch a full-scale sustainable interactive data portal.

Objective 1.5: Seek funding sources that support the review, professional evaluation, and updates to the current Minnesota Oral Health Plan.

Suggested strategies

A. Oral health leaders and stakeholders seek sustainable funding and program changes to implement the plan.

Objective 1.6: Assess opportunities for policy change through environmental analysis tools such as the environmental and policy scan and share results with decision makers.

Suggested strategies

A. Utilize resources available through the CDC to support a facilitated process for oral health stakeholders to join together to make decisions about priorities based on suggested criteria.

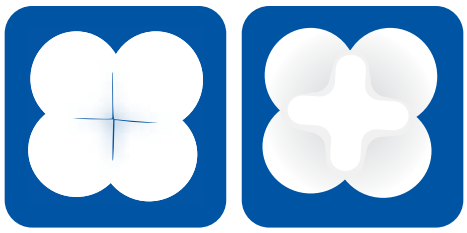
Priority: Prevention and Education

Prevention and education strategies work hand-in-hand to mitigate the risk of oral diseases. Protecting children and adults from developing caries is the first line of defense for related health complications such as tooth loss, infection and compromised immunity. Informing the public about the risk factors associated with oral cavity and pharynx cancers is also critical.

Two of the most effective and proven strategies for preventing the development of caries are dental sealants and fluoridated drinking water. These interventions, mixed with efforts to increase oral health literacy among the public through education campaigns and those working directly with vulnerable populations such as school nurses, prenatal and primary care providers, and public health workers are proven strategies to preventing most oral diseases.

Dental Sealant Programs

The risk of developing tooth decay can begin as early as when teeth first erupt in an infant's mouth. Tooth decay is caused by bacteria on teeth that break down foods and produce acid that destroys tooth enamel resulting in tooth decay. The best defenses against cavities are good oral hygiene, regular dental visits, a healthy diet low in sugary foods and beverages, fluoride, and dental sealants. Dental sealants are highly effective—nearly 100 percent – in preventing decay among vulnerable children and adults. Dental sealants are a thin coating bonded to the chewing surfaces of back teeth (molars) to protect them from decay.



Chewing surface before sealant

Tooth protected by sealant

Providing children with sealants through school-based sealant programs has been shown to be an efficient and cost-effective strategy for providing children in need with preventive oral health care. The State of Colorado estimated a $1.2 million per year saving if a statewide school sealant program were implemented.

The 2009 to 2010 Minnesota Basic Screening Survey (BSS) revealed that of those surveyed, 64 percent of third graders had sealants on at least one of their permanent molars, though that rate falls steadily with income levels to the low rate of 42 percent for Minnesota's poorest children (>75% FRL).

MDH is working closely with the Minnesota Department of Human Services and other partners to reach the goal set by the Centers for Medicare and Medicaid Services (CMS) of increasing the rate of dental sealants by 10 percent over a five-year period in children ages six to nine enrolled in Medicaid or or Child and Teen Checkups (Minnesota's Early and Periodic Screening, Diagnosis and Treatment Program). To this end, in 2011, MDH's Oral Health Program, in cooperation with federal agencies, 3M and Delta Dental, funded school-based sealant programs to reach children who did not have easy access to sealants.

Minnesota's coordinated sealant program targets second grade students at schools where more than 50 percent of students are eligible for the Free or Reduced Price Lunch Program (FRL). As seen in Table 6, in 2009 less than 25 percent of "high-risk schools" (>50% FRL) had sealant programs, but within a year's time that number climbed to 29 percent for the 2010 to 2011 school year as a result of the MDH-sponsored dental sealant program. Data from the program show that one-third (34 percent; n=6,356) of the children in second grade participated

Community water fluoridation has been recognized by the CDC as one of the 10 greatest public health achievements of the twentieth century.

and that, on average, three dental sealants were applied per student.

As part of MDH's sealant program, oral health education is also provided to parents, children and school staff through presentations, conferences, classroom activities, informational meetings, and other promotional methods. This approach to oral health care also resulted in referrals to partner clinics for continued care.

Fluoride Varnish

Fluoride varnish has also been found to be another cost-effective preventive treatment, reducing decay on tooth surfaces by 50 percent to 70 percent. Fluoride varnish is applied on high-risk teeth through a resin-based solution and must be reapplied at regular intervals to be effective.

Water Fluoridation

Fluoride is a naturally occurring mineral found in water, air and soil. At proper levels, fluoride provides significant health benefits by preventing tooth decay. Minnesota Statute 144.145 requires the fluoridation of water in all municipal water supplies except where natural levels are sufficient. By law, Minnesota is required to monitor drinking water fluoride concentrations to ensure optimal levels are maintained. Municipal water supplies monitor system performance, collect daily samples, and submit reports and results to MDH on a monthly basis, making adjustments to fluoride levels accordingly.

Community water fluoridation has been recognized by the CDC as one of the 10 greatest public health achievements of the twentieth century, providing one of the most cost-effective and equitable means to prevent tooth decay. Economic analysis conducted by the CDC found that in communities with more than 20,000 people, every dollar invested in water fluoridation yields $38 in savings for dental treatment costs. In states where more than half of the communities have fluoridated water, there is 26 percent less tooth decay among 12 year olds when compared to states with less than one-quarter of the communities with fluoridated water.

In 2010, approximately 78 percent of Minnesotans benefited from community water fluoridation compared to 64 percent of the population nationally, ranking Minnesota fourth in the nation after Kentucky, Maryland and Illinois. Nearly all (99 percent) Minnesotans who are connected to public water supplies receive fluoridated drinking water. While this is a great success, we must be vigilant in maintaining this high ranking while also addressing fluoridation needs for rural communities that rely on private wells that may not have the optimal amount of fluoride.

TABLE 6

Minnesota Elementary High-risk Schools, 2010-2011 School Year

	Number of Schools	Percent of Schools
Elementary schools	946	---
High-risk schools*	392	41%
High-risk schools with school-based dental sealant program	115	29%

* >50 percent rate of students on Free or Reduced Price Lunch Program

Goal 2: Strategies are implemented that reduce oral disease and mitigate risks.

Objective 2.1: Determine the baseline for the number of providers who use standardized, evidence-based oral disease risk assessment tools.

Suggested strategies

A. Implement an educational campaign that raises understanding of risk assessment, benefits of using risk assessment, and introduces tools used to assess risk.

B. Promote use of risk assessment (periodontal disease, diabetes, tobacco use, etc.) among medical and dental providers.

C. Collect data that is valid and reliable on current usage of tools for caries risk assessment in practice.

D. Choose a tested caries and periodontal disease risk assessment tool to use in Minnesota that is valid and reliable.

E. Use the Minnesota Oral Health Surveillance System (MNOHSS) as a clearinghouse for sharing standardized information on caries and periodontal disease risk in Minnesota.

Objective 2.2: Reduce caries experience in Minnesota children.

Suggested strategies

A. Partner with Maternal and Child Health, pre-school, Early Head Start and Head Start oral health programs, early care and education settings on tooth brushing promotion programs targeted toward pregnant women and children under the age of five (review National Association for the Education of Young Children accreditation standards for oral health).

B. Partner with Early Head Start and Head Start on oral health programs that help meet Head Start and Child and Teen Checkups (the Minnesota version of Early Periodic Screening, Diagnosis, and Treatment) requirements.

C. Develop and offer trainings for preschool staff, Head Start coordinators and home visitors to recognize signs of and identify risk factors for early childhood caries.

D. Promote fluoride varnish programs as part of immunization and well child visits.

E. Increase programmatic coordination between risk-reduction programs, e.g., preschool and Women, Infants and Children (WIC) programs.

F. Include oral health screening requirements in childhood screenings.

G. Educate caregivers of infants/toddlers about appropriate amounts of topical fluoride or fluoride toothpaste.

H. Increase availability and ease of access to oral health supplies.

School-based Dental Sealant Programs

Objective 2.3: Develop and coordinate comprehensive, statewide school-based prevention programs that target high-risk children.

Suggested strategies

A. Conduct the statewide third grade Basic Screening Survey at least once every five years.

B. Convene a school-based sealant work group that includes providers, school representatives, school nurses, public health professionals, health plans, Minnesota public programs representatives, Board of Dentistry, researchers, community representatives, parent representatives, and parent-teacher associations.

   i. Conduct a needs assessment and compile information on existing sealant activities in the state.

   ii. Seek and acquire sustainable financial support, i.e., foundations, Title V funding, industry (3M, dental supply companies), Smiles Across Minnesota, Oral Health America, etc.

   iii. Create and publish a comprehensive state sealant plan.

   iv. Create a variety of easily understood messages targeted to parents/caregivers about efficacy and safety of pit and fissure sealants, why they are needed and the importance of sealants in caries prevention.

C. Develop parameters for and post a request for proposal (RFP) for at least five school-based sealant mini-grant projects.

   i. Plan and conduct projects that provide documentation of components of successful sealant programs and identify barriers to sustainability.

   ii. Promote limited authorization/collaborative practice as a model for school-based programs.

D. Convene a transdisciplinary panel for review and development of a comprehensive coordinated plan for fluoride varnish programs and to develop quality improvement initiatives, i.e., through learning collaboratives and health care home initiatives.

E. Create an education campaign about how fluoride works and the importance of the appropriate use of fluoride varnish in caries prevention.

Water Fluoridation

Objective 2.4: Ensure that the percentage of public water supply systems providing fluoridated water are within the optimal range and meet the CDC optimal monitoring and surveillance requirements of meeting or exceeding 90 percent.

Suggested strategies

A. Collect community water fluoridation information and submit data to the CDC on 510 reports.

B. Identify ways to provide support to communities to maintain or update aging fluoridation equipment.

C. Support statewide educational campaigns that promote drinking tap water.

D. Educate water works operators about the importance of the water fluoridation process and its link to oral health.

E. Recognize water workers and engineers as oral health leaders on a consistent basis.

Objective 2.5: Ensure that at least 50 percent of Minnesota's schools have achieved oral health targets.

Suggested strategies

A. Remove cariogenic foods and beverages from vending machines.

B. Increase the number of non–cariogenic food items accessible outside the lunch program (vending machines, fund raisers, concessions, classroom celebrations and a la carte) in Head Start and school menus.

C. Increase tobacco use prevention/cessation and nutrition information in health education programs.

D. Provide resources to strengthen curricula that emphasize how healthy eating can improve and maintain oral health.

E. Reduce the impact of soda/beverage marketing by educating schools to resist marketing strategies.

F. Promote the understanding of the preventive properties of xylitol gum and xylitol products and their proper use.

G. Partner with the Minnesota School Nutrition Association and the Minnesota Department of Education to collect data on candy and pop available in schools in order to tailor oral health campaigns to school needs.

Objective 2.6: Promote awareness of the effect of diet and nutrition on oral health among hospital food service directors, older adult service establishments, and nutrition staff.

Suggested strategies

A. Partner with the Minnesota Hospital Association (MHA), hospital food service directors, and registered hospital dieticians to provide information about creating tooth-healthy menus and increasing health snack choices for patients, visitors, staff, and in vending machines.

B. Provide educational sessions at MHA conferences about the relationship of diet to dental disease.

C. Promote partnerships with assisted living and nursing home providers and organizations to increase understanding about the impact of diet on the oral health of older adults.

Public Education

Good oral hygiene combined with good nutrition are the building blocks to personal oral health. Bolstering oral health literacy as early as possible among both vulnerable populations and the general public can be done most effectively through those who work directly with children and their caregivers, especially pregnant women receiving prenatal and maternal health care. Through broad and consistent public education efforts to raise awareness, the risk factors associated with poor oral health can be decreased, leading to better health outcomes and significant health care cost savings.

Among the most significant risk factors jeopardizing oral health are tobacco use, along with the consumption of alcohol and sugared beverages. Tobacco use is a major risk factor in oral cavity and pharyngeal cancers. According to the American Academy of Periodontology, tobacco use may be one of the most significant risk factors in the development and progression of periodontal disease; smokers are four times more likely to develop gum diseases compared to non-smokers.

Over the past decade, smoking rates have been steadily decreasing for both teens and adults in Minnesota. In 2011, 26 percent of Minnesota high school students reported smoking cigarettes in the past 30 days, compared to 39 percent in 2000. Adult tobacco use rates have decreased from 22 percent in 1999 to 16 percent in 2000. No doubt this decline is due to the Minnesota's strong tobacco laws and prevention strategies implemented as a result of the landmark tobacco settlement won by the state of Minnesota and Blue Cross and Blue Shield of Minnesota against tobacco companies in 1998.

Alcohol use also shows an overall declining pattern among 12th graders, both nationally and in Minnesota. Since 1995, Minnesota alcohol use for this age group fell below the national level to 69 percent and has remained lower, declining steadily to 55 percent in 2010 compared to the national rate of 62 percent. Conversely, alcohol consumption among Minnesota adults is higher when compared to the nation, though rates have decreased fairly steadily in Minnesota from 67 percent in 2001 down to 60 percent in 2010 as compared to national rates in 2001 at 56 percent and 55 percent in 2010.

Excessive consumption of sugar sweetened beverages increases the risk of caries. In certain brands of soda, there is the equivalent of 10 teaspoons of sugar in a 12-ounce can. The combination of high sugar content and high level of acidity in soda significantly increases the risk of dental caries. Encouraging Minnesotans to drink tap water and milk instead of soda and other sugary drinks is another important way to decrease caries.

Goal 3: Oral health literacy is increased across all ages and cultures.

Objective 3.1: Increase oral health evaluation and caregiver education in early childhood screenings, vaccination visits, episodic care visits, prenatal, and Child and Teen Checkups.

Suggested strategies

A. Support health literacy and cultural competency training for health professionals in the community, including health care providers and public health officials.

B. Provide technical assistance to those interested in becoming proficient in patient-centered literacy skills.

C. Educate prenatal and maternal health care providers about the importance of increasing oral health literacy among pregnant women so they are well informed about caries etiology, caries prevention, and infant oral health care.

D. Create a campaign to increase understanding regarding the importance of tooth brushing and sponsor distribution of oral health information and materials in prenatal and maternal care programs.

Objective 3.2: Build awareness of oral disease prevention strategies and increase oral health knowledge in school-based health systems.

Suggested strategies

A. Strengthen partnerships with and provide resources to the Minnesota Department of Education and Minnesota school nurses to evaluate oral health curricula (including early childhood and after school programs) on evidence-based strategies.

B. Develop and disseminate information about the efficacy of pit and fissure sealants, water fluoridation, topical fluoride therapy and other strategies that prevent and control oral disease.

C. Investigate programs to introduce evidence-based xylitol therapy in early childhood programs and schools.

D. Partner with the Minnesota Department of Health Injury and

Violence Prevention Unit to develop promotional programs that focus on preventing and reducing oral injury.

E. Develop and disseminate information to parents and schools about fluoride varnish, sealants and the health care home.

Objective 3.3: Increase exposure to oral health knowledge through targeted and culturally sensitive campaigns that focus on prevention strategies.

Suggested strategies

A. Develop and disseminate fluoridation messages that provide culturally and age appropriate information to population groups, adults, and children. e.g. "safe to drink fluoridated tap water" messages.

B. Increase oral health literacy among young adults emphasizing smoking, diet, smokeless tobacco, alcohol and tobacco, periodontal disease and importance of oral care.

C. Increase oral health literacy among the elderly and their caregivers; emphasize medications that increase xerostomia (dry mouth), root caries etiology, periodontal disease and oral cancer.

D. Ensure educational materials are available in multiple languages, including visuals for the non-reading population.

E. Create electronic media and monitor hits/visits to web pages and internet sites.

Objective 3.4: Increase awareness of oral health among policy and decision makers about the benefits of oral disease prevention.

Suggested strategies

A. Engage legislators in an annual oral health initiatives forum.

B. Partner with the Minnesota Oral Health Coalition to support oral health promotion policies, tobacco control policies, and to promote policy change.

C. Identify and utilize oral health resources in the state to target areas of greatest need.

In Illinois, the state saved $140 million in 2009 through its health care home initiative.

D. Increase understanding of federal mandates and funding, or lack of funding.

Priority: Health Care Integration and Access to Oral Health Care

To truly prevent oral diseases, it is critical that changes are made upstream within the health care system and provider education programs to achieve a broader understanding among health care providers of the relationship oral health has to overall health. Building partnerships across care sectors — dental, primary care, dietary, public health, health plans, community health — to achieve a more patient-centered approach to health care will have the triple advantage of decreasing oral and other diseases, while slashing health care costs.

This holistic approach to health care, combined with efforts to provide more affordable dental care through new dental provider types and workforce models, will help reach more people who often lack adequate or any access to oral health care and treatment.

Health Care Home Model

The "health care home" is one of the most promising solutions to improving the health of Americans while significantly reducing health care costs. The development of health care homes in Minnesota is part of the ground-breaking 2008 Minnesota Health Care Reform Act to provide a patient-centered model focused on primary care and prevention that is culturally appropriate. Ideally, a health care home also connects a patient's dental and primary care records so that treatment and care is fully integrated. In turn, health care homes keep health care costs down by addressing adverse health conditions early so that expensive emergency department visits and hospital stays can be avoided. In Illinois, the state saved $140 million in 2009 through its health care home initiative.

To ensure oral health care is considered an essential component of a patient's overall health and is embedded in the health care home model, the concept that "the mouth is a part of the body" must be elevated in health education. A better understanding of the interrelatedness of oral and systemic health stands to improve a patient's overall health. Both dental and non-dental professionals must be educated in this concept: obstetrics, family practice, pediatrics, internal medicine, nurses, dietitians, health plan case managers, community health workers, social workers, and others. In time, this health care integration will give rise to a team of people working together to better meet the health needs of all Minnesotans, especially the underserved.

This increased appreciation for oral health across sectors should also extend to medical providers in private practice and hospital settings, along with long-term care facilities. Integrating oral disease assessment into medical protocols will also ensure that everyone is receiving the best care possible.

Public Health and Health Integration

The environmental strategies employed by the public health sector present numerous partnership opportunities with oral health agencies. The links between oral disease and chronic disease have been well documented; they also share common risk factors such as poor nutrition, tobacco and alcohol use.

Increasing awareness among local public health agencies of the interrelatedness of oral health to other preventable diseases widens the field for greater collaboration to meet common health goals. Including oral health in public health agencies' missions is an important step in integrating proven oral health prevention strategies that lead to total health.

Banding together, public health and oral health agencies can speak with one voice to address policies that create barriers to health. Together, they can also more effectively heighten awareness among health care providers and policy makers of the social and environmental factors that are largely responsible for health inequities.

Goal 4: Professional integration is enhanced between oral health care providers and other providers in the broader health care system.

Objective 4.1: Promote the understanding and development of the health care home concept.

Suggested strategies

A. Create and nurture non-traditional partnerships in oral health to establish a coordinated strategic direction.

B. Gather information and evaluate the effect of reimbursements/incentives for improving care.

C. Increase training opportunities in oral health for non-dental professionals (public health nurses, dietitians, health plan case managers, community health workers, and interpreters) that build patient-centered skills (preventive, therapeutic, and remedial) and provide technical assistance for working with patients, clients and the public.

D. Increase the number of local public health agencies that address oral health.

E. Increase integration activities and partnerships with nutrition, obesity, tobacco, alcohol, etc. (i.e., American Dietetic Association, American Lung Association, American Heart Association).

F. Plan demonstration projects that create innovative health care home models.

G. Work with educators to investigate the potential role of teledentistry and policy makers to address payment issues.

Objective 4.2: Increase the number of non-dental provider education programs (physician's assistant, nurse practitioner, dietitians, medical schools, and nursing schools) that incorporate oral health into their curriculum.

Suggested strategies

A. Partner with the Minnesota and American Pediatric Association and work to determine current continuing medical education curriculum that encompasses an oral health component.

B. Work with the University of Minnesota College of Continuing Education to create continuing medical education curriculum focused on oral health.

C. Use evidence-based strategies to develop core competencies in oral health within educational settings.

D. Provide one conference in each of the next two years for oral health and medical providers that focuses on:

   i. Oral and systemic health interrelatedness.

   ii. Understanding and promoting risk assessment of oral and systemic health.

   iii. Participate in "Many Faces Conference" and Accountable Care Conference with medical and dental professionals.

Objective 4.3: Develop collaborative opportunities throughout the health care community by educating and training physicians, dentists, nurses, hygienists, nurse practitioners, dental assistants, dental therapists, and social workers to work as a single team addressing oral health disparities and unmet dental needs of the underserved.

Suggested strategies

A. Promote research on the impact of oral health on overall health.

B. Support the development and evaluation of programs that promote disease prevention and increase collaborative health care.

C. Provide incentives for allied dental personnel to work in medical settings under collaborative supervision by a licensed dentist.

D. Reduce barriers to dental hygienists working in public health agencies and other settings.

E. Move primary oral health care into every obstetrics, primary care, family practice, pediatrics, and internal medicine practice in Minnesota by incorporating "The mouth is a part of the body" concept.

F. Investigate further development of innovative collaborative strategies for serving elderly and youth populations with different provider types.

G. Explore the development of a centralized network for identifying excess capacity, sharing resources, and communicating needs that utilizes the public health infrastructure.

Objective 4.4: Promote collaboration among dental providers and medical care providers that increase information sharing, understanding of eligibility requirements, and access to and utilization of oral health care benefits.

Suggested strategies

A. Create demonstration projects that gather and analyze preventive services utilization data and propose new models that coordinate collaboration between dental and medical providers and eliminate disparities.

Objective 4.5: Promote the adoption and meaningful use of the electronic dental record.

Suggested strategies

A. Disseminate information about the Office of the National Coordinator efforts to create standardized guidelines for the utilization of Health Information Technology and reporting.

B. Improve collaboration and follow up by aligning with at least two objectives of the local and national Office of the National Coordinator for Health Information Technology.

C. Seek funding to create incentives for private and public health dental and medical systems to create and adopt centralized network tools.

Objective 4.6: Call for the development and promotion of clinical preventive oral health guidelines for use in settings outside the dental office: medical and long-term care, prison, juvenile, and hospital settings.

Suggested strategies

A. Support and promote the development and use of dental diagnostic codes.

B. Develop partnerships that integrate oral health into the current case management system.

C. Promote public health research, standardized protocols for care, and use of evidence-based practices.

D. Promote inclusion of oral evaluation in care guidelines for the aging and persons with diabetes and special health care needs.

E. Create a web-based tracking and referral mechanism for oral health information and treatment.

F. Promote Health Insurance Portability and Accountability Act compliant communications between dental providers and primary care providers (family medicine, obstetrics, pediatrics, internal medicine, etc.) and allied health professionals, (dieticians, pharmacists, etc.) when assessing and referring for medical conditions and non-dental issues.

Objective 4.7: Increase the number of primary care medical providers who integrate prevention of oral disease as part of overall health care by 10 percent for patients of all ages.

Suggested strategies

A. Create a recognizable symbol and/or standardized message that captures the concept of the interrelatedness of oral health and overall health.

B. Develop a marketing campaign targeted to medical providers that promotes oral health as integral to overall health.

C. Determine a baseline number (early adopters) and evaluate barriers to the utilization of oral disease prevention strategies by medical practitioners.

D. Develop an integrated approach among medical and dental providers that promotes oral exams/evaluation, referral, and access to oral health care by age one.

E. Promote treatment and diagnostic information sharing between pediatricians, physicians and dentists.

Access to Oral Health Care

Inadequate access to oral health care is due to a variety of complex factors including a shortage of dental providers, especially in rural areas; not enough providers willing to accept people on medical assistance due to low reimbursement rates; and a gap in affordable insurance options. The need for more accessible and affordable dental care has led people to seek oral health care in emergency departments and hospitals, resulting in exorbitant health care costs that could be prevented.

Health Professional Shortage Area (HPSA) is a designation given by the Department of Health and Human Services (DHHS) to identify shortages of primary medical, dental or mental health providers within a geographic area, population group or facility. The designation uses a provider-to-population ratio based on the available primary care provider FTE (full-time equivalent) serving the specified area, population or facility, as well as the availability of health care resources in contiguous areas. For instance, a dental HPSA for a geographic area requires a ratio of dentist FTE-to-population ratio of 1:5000 or greater in addition to lack of contiguous services available to the area.

A population HPSA, based on a specific population subset within a geographic area, uses only dentist FTE serving the specified population subset. For example, the ratio for a low-income population designation would be based on the

dentist FTE serving Medicaid and/or low-income patients to the population with income status at or below 200 percent of the Federal Poverty Level. The ratio threshold for a population HPSA is 1:4000 or greater. Additionally, the designation requires that the percentage of the population with incomes at or below 200 percent of the Federal Poverty Level be at 30 percent or higher and that contiguous services are unavailable. An exception is that Native American and Alaskan Native Tribal populations have been afforded automatic population HPSA designations by Congress.

As of September 2012, there were 112 dental HPSAs in Minnesota. The majority of these HPSAs are located in rural parts of the state. There are 13 HPSAs designated in Hennepin County (four population and nine facilities) and five in Ramsey County (two population and three facilities). In five other metropolitan counties (Anoka, Washington, Carver, Dakota and Scott), there are two correctional facilities and one Native American tribal population designations.

More than half (66 out of 112) of the dental HPSAs in Minnesota are low-income population designations. Based on the dentist FTE data serving Medicaid and/or low-income populations in these areas, DHHS estimates that 166,200 people have access to dental services and 362,569 experience barriers to accessing dental care. (See Appendix C for the map of Minnesota Health Professional Shortage Areas - Population/ Low-Income Dental Care Designation).

To meet the increasing oral health needs of Minnesotans, the workforce capacity must be bolstered through more innovative strategies to recruit, prepare, retain and equitably distribute oral health care providers. According to the Pew Charitable Trusts, by 2014 an estimated 5.6 million more children will be eligible to receive Medicaid dental benefits under the Affordable Care Act. This, coupled with the looming tidal wave of retiring baby boomers will further strain the capacity of the dental care system to serve Minnesotans, especially low-income people and residents in rural areas.

Health Professional Shortage Area (HPSA) is a designation given by the Department of Health and Human Services (DHHS) to identify shortages of primary medical, dental or mental health providers within a geographic area, population group or facility.

Minnesota has been a trailblazer in sanctioning mid-level dental professionals such as dental therapists and advanced dental therapists and collaborative practice agreements between dentists and hygienists.[1] Yet, to truly maximize the potential in these workforce models, a concerted effort needs to be made to better promote these professional opportunities and encourage more dentist to negotiate collaborative/ management agreements with hygienists and therapists.

Better preparing the next generations of oral health professionals is essential to retaining qualified providers willing to work with underserved communities. Strategies such as mentorship programs and teledentistry, whereby patients receive diagnostic and basic primary care through video teleconferencing and health professionals receive continued educational opportunities, can offer needed support to professionals who might feel isolated in more rural settings.

The dental workforce must also become more versed in meeting the needs of a more diverse population by incorporating cultural competency into the curriculum of oral health provider education programs. There is also a dire need to recruit more people of color and women into the field of dentistry, especially as dentists.

A more diverse workforce enriches oral health care delivery as people tend to be more comfortable seeking treatment from people of their own ethnic or racial background. Caregivers from diverse backgrounds are also more likely to serve underserved populations. In a 2010 survey of Minnesota dentists (1,867 out of 3,908 responders), the following dental provider demographics were gathered:

- 23% are female; 77% are male
- 47% of dentists are 55 years or older
- 50% of dentists under age 35 are female
- 94% of dentists are white; the remaining 6% of dentists identified themselves as African American, Native American, Asian or multiracial; 2% identified their ethnicity as Hispanic.

Taken together, strategies to increase access can do much toward reinforcing the Minnesota oral health workforce and improving care across the state.

1. Alaska was the first state to use dental therapists in 2005, but was established under federal law and is limited to native villages through the Alaska Native Tribal Health Consortium. Minnesota is the first and only state to license dental therapists under a 2009 law; see statutes 150A.105 (law on dental therapists) and 150A.106 (law on certification for advanced dental therapist).

Dental Workforce Capacity

As of 2010, there were 3,908 Minnesota dentists who renewed their licenses with 3,244 practicing in the state providing 61 dentists per 100,000 population (Table 7). Most of the dentists (57 percent) planned to practice in Minnesota for more than 10 years. Based on a 2010 MDH licensee survey, 47 percent of dentists were 55 years or older indicating that the gap in services will increase over the next decade as dentists begin to retire.

One-third (74 percent) of dentists were practicing in urban areas, whereas only 7 percent worked in small rural areas. Solo practice is the most common type of dental practice especially in rural areas (44 percent) followed by small group practice (37 percent), leaving rural populations with fewer options when solo practitioners are unavailable or retire.

According to the Minnesota Department of Human Services, in 2011 just over half (53 percent) of practicing dentists had submitted at least one dental claim for patients on public programs. This figure may serve as a proxy indictor for the number of Minnesota dentists seeing Medicaid patients.

In 2011, Minnesota had only 77 certified pediatric dental specialists; approximately 6 pediatric dentists per 100,000 children (Table 7). Pediatric dental services are available in fewer than 20 of Minnesota's 87 counties, which are clustered in and around the seven-county Minneapolis/St. Paul metropolitan area and in larger cities such as Duluth, Rochester, St. Cloud, and Mankato. Very few pediatric dentists, if any, are located in rural Minnesota.

Dental hygienists are licensed dental professionals who specialize in preventive dental and periodontal care. As of 2009, a total of 3,594 practicing dental hygienists provided approximately 68 dental hygienists per 100,000 people in the state (Table 7). In 2012, the Minnesota Office of Rural Health and Primary Care reported that there is an excess capacity in the dental hygienist workforce with more than three times as many dental hygiene graduates than available jobs. Based on preliminary findings, 18 percent of the dental hygienists working in Minnesota are seeking different or additional employment.

Dental assistants are licensed dental practitioners who work with supervision by a licensed dentist. A total of 7,146 dental assistants renewed their licenses from 2008 to 2009, according to the Minnesota Board of Dentistry licensing data; 6,288 (88 percent) were practicing in Minnesota (Table 7). The vast majority (73 percent) were working in urban areas with only 8 percent located in rural areas.

Enhancing Workforce Models and Creating New Providers

Minnesota is leading the nation in providing one of the best solutions to the dental workforce shortage and bridging gaps in dental care by creating new licensed "mid-level" dental providers such as advanced dental therapists and dental therapists, and supporting new workforce models such as hygienists working under "collaborative agreements" with dentists. These leading-edge workforce solutions have been hailed nationally by leaders in public health as a viable means to close the gap in affordable dental care.

In 2009, Minnesota became the first and only state to establish licensed dental therapists and dually licensed advanced dental therapists (ADTs) (licensed as both a dental hygienist and a dental therapist) to better serve underserved populations. These new dental professionals offer evaluative (ADTs only), preventive,

TABLE 7

Ratio of Dental Provider Types per 100,000 Population

Dental Professionals	*Minnesota: Number per 100,000 population	**National: Number per 100,000 population
Dentists (practicing)	3,244 (61 dentists per 100,000)	195,628 (63 dentists per 100,000)
Collaborative Agreement Dentists	274 (5 dentist per 100,000)	~
Pediatric Dental Specialists	77 (6 dentists per 100,000 children <18 years)	6,181 (8 dentists per 100,000 children <18 years)
Advanced Dental Therapists	~	~
Dental Therapists	16 (3 per 1,000,000)	~
Hygienists (practicing)	3,594 (68 per 100,000)	152, 000 (49 per 100,000)
Collaborative Agreement Hygienists	276 (5 per 100,000)	~
Dental Assistants (practicing)	6,288 (119 per 100,000 pop)	297,200 (96 per 100,000)

*Total Minnesota population: 5,303,925; children under 18 years (24%): 1,267,638
**U.S. Population: 308,745,538; children under 18 years (24%): 73,172,69

In 2009, Minnesota became the first and only state to establish licensed dental therapists and dually licensed advanced dental therapists (ADTs) (licensed as both a dental hygienist and a dental therapist) to better serve underserved populations.

restorative, and minor surgical dental care with dentist supervision and a collaborative management agreement. The first wave of dental therapy students graduated in 2011 and it is anticipated there will be between 70 to 75 graduates in the next five years.

While dental hygienists must work under the general supervision of a dentist, the Minnesota dental law also provides the opportunity for hygienists with a collaborative agreement with a dentist to work without the dentist first seeing the patient, in turn expanding the reach of dental care into more settings, e.g., elementary schools. Despite this opportunity for workforce expansion, when surveyed only 6 percent of hygienists were actively practicing under a collaborative agreement; 20 percent did not know if they were practicing under a collaborative agreement or not.

Increased awareness about these new dental providers and the opportunity for collaborative agreements is needed. While these new job classifications and dental workforce models offer promise for providing more people with better access to more affordable disease prevention and treatment care, not enough dentists have entered into these collaborative opportunities: only 7 percent of Minnesota dentists had a collaborative agreement with a dental hygienist.

Goal 5: Access is increased to preventive, restorative, and emergency oral health care services.

Objective 5.1: The legislative intent to increase the supply and distribution of dental services through creation of new dental providers and appropriate utilization of the entire dental team is achieved.

Suggested strategies

(See Minnesota statutes 150A.10 Subd.1a., 150A.105 and 150A.106)

A. Maximize the opportunity that Minnesota has to provide positive leadership in creating new oral health care providers and innovative workforce models.

B. Support and engage with other agencies to research the impact of new and existing oral health care providers on improved access to services by collecting and analyzing outcomes data.

C. Increase the number of dentists, health care facilities, programs, or nonprofit organizations that employ dental hygienists with collaborative agreements.

D. Develop relationships with providers in older adult services settings (e.g., nursing homes, assisted living) to connect providers with elderly populations.

Objective 5.2: Increase by 10 percent the number of underserved Minnesotans who receive evidence-based preventive dental care, with emphasis on children under age one, low-income uninsured adults, people with developmental disabilities, pregnant women, children with special health care needs, low income and immigrant populations, those with chronic diseases, and individuals in long-term care facilities.

Suggested strategies

A. Educate general dentists to be more comfortable caring for infants and toddlers (birth to three years old), making appropriate referrals, and using best practices.

B. Work with state agencies and commissions to analyze issues (including funding) regarding care for children, adults, the aging, developmentally disabled, and special health care needs populations, low income and under insured, and participate in developing policy recommendations.

C. Use Basic Screening Survey results to determine preventive service initiatives.

D. Encourage local and county public health agencies to utilize dental hygienists in prevention programs.

E. Identify and work with agencies engaged in dental programs to explore alternative delivery systems that improve communication with local dentists, improve sustainability, and increase continuity of care.

F. Partner with agencies on a centralized website or helpline for the public to increase access to referral information and information on current systems in place for Minnesota health care programs and the uninsured.

G. Develop compliance initiatives that increase comprehensiveness of oral health programs for children under age one, uninsured adults, people with developmental disabilities, children with special health care needs, and individuals in long-term care facilities.

Objective 5.3: Reduce the proportion of Minnesotans who experience difficulties, delays, or barriers to restorative oral health care service by 20 percent.

Suggested strategies

A. Partner with state agencies that have been mandated to document the impact of existing and new Minnesota oral health care workforce models on improved access to restorative services using outcome data.

B. Establish baseline information on barriers to oral health care involving target populations by conducting a statewide survey and adding questions to both the Basic Screening Survey and Behavioral Risk Factor Surveillance System regarding Minnesota's accessibility to dental care.

C. Investigate best practices for sustainability of public health and safety net clinics.

Objective 5.4: Reduce the number of emergency room visits for dental related reasons by 15 percent.

Suggested strategies

A. Develop and disseminate materials that educate caregivers about dental injuries and the appropriate response.

B. Collaborate with hospitals and providers in older adult service settings to provide information on local public health dental programs so that patients presenting in emergency departments are provided with appropriate referral and preventive education information.

C. Develop a campaign to educate the public about seeking professional dental care and guidance after an oral injury has occurred.

D. Develop a campaign focused on oral injury prevention and promoting the appropriate use of mouth-protecting equipment in sports, e.g., mouth guards.

E. Collaborate with hospital medical staff to ensure diagnostic codes are utilized for non-traumatic dental related emergency department visits and are coded correctly in order to establish baseline data.

Objective 5.5: Increase the number of individuals who receive oral and pharyngeal cancer screenings by 10 percent.

Suggested strategies

A. Determine a baseline number of dental and medical professionals that currently integrate oral and pharyngeal cancer screenings into comprehensive exams.

B. Emphasize the importance of screening for oral and pharyngeal cancer and how it can affect critical functions, such as speaking, swallowing and eating.

C. Increase the number of health care providers who deliver consistent and appropriate messages to help people quit smoking.

D. Partner with the National Cancer Institute on developing health care provider competencies in prevention, diagnosis, and management of oral and pharyngeal cancers.

E. Aid the American Cancer Society in incorporating oral and pharyngeal cancer screenings in the "Welcome to Medicare" physical examination.

F. Promote the development of a community-based oral cancer prevention and early detection program.

Objective 5.6: Increase the proportion of local health departments that have an oral health program focused on prevention.

Suggested strategies

A. Build capacity in local health departments by providing technical expertise and evidence-based oral health information.

B. Determine a baseline number of local health departments that currently have an oral health care program.

C. In collaboration with existing local oral health care program personnel, identify local health departments that do not have an oral health program and offer resources and guidance in creating and structuring their own oral health component.

D. Partner with the Local Public Health Association of Minnesota to convene a conference on integrating oral health into local public health systems.

Objective 5.7: Promote policies and programs that ensure that 95 percent of Minnesotans have access to a dental care provider within a 90-minute drive or by public transportation from their place of residence.

Suggested strategies

A. Conduct at least one public health/nonprofit clinic pilot project to investigate and gather data on current equitable distribution of services.

B. Promote school-based programs and older adult service settings.

C. Determine existing excess provider capacity and transportation services available to patients, including the uninsured and public programs patients.

D. Work with local safety net programs in supporting existing and creating new volunteer programs that provide patients transportation to and from dental and health appointments.

E. Convene a conference focused on policy tools that will help achieve equity in population health, featuring best practices and expert panel presentations, moderated discussions, as well as working groups.

F. Reduce supervision barriers and increase utilization of collaborative agreements.

Objective 5.8: Increase partnerships that explore effective policy initiatives to stabilize the availability of oral health care services to the most vulnerable populations.

Suggested strategies

A. Develop a planning checklist to move forward strategically once consensus about priorities is achieved.

B. Increase data and information gathering efforts that support policy decisions among stakeholders, oral health care providers and primary care providers.

C. Promote philanthropic programs among specialty dental organizations.

Goal 6: The dental workforce is prepared for and addresses the oral health needs of all Minnesotans.

Objective 6.1: Promote innovative and effective oral health care delivery practice models for rural populations.

Suggested strategies

A. Continue to work with Area Health Education Centers to explore and strengthen strategies that will achieve better retention and distribution of oral health care providers graduating from state supported institutions.

B. Develop mentoring programs for the dental workforce.

C. Investigate the role of teledentistry.

Objective 6.2: Promote broader discussion of ways the social compact between dentistry and society can be reinforced.

A. Develop a Patient Centered Principles document.

   i. Create a document that states principles and objectives that are patient centered.

   ii. Develop bullet points about what patients need for oral care as part of general health care.

   iii. Create a list of evidence-based studies that support oral health effects on general health.

B. Convene workshops with medical providers.

C. Promote continuing education programs.

D. Encourage the creation of at least one internship opportunity for students and one work experience for professionals.

Objective 6.3: Collaborate with agencies and educational institutions to gather and disseminate information on practice models, collaborative agreement dental hygiene practice, and the dental therapist/advanced dental therapist management agreement.

Suggested strategies

A. Maximize utilization of tools available: support infrastructure for collaborative agreement hygienists and restorative function allied personnel, dental therapist and advanced dental therapist.

   i. Develop a checklist on payment protocols and credentialing.

   ii. Develop a fact sheet/resource sheet describing definition of, roles of, and scope of practice levels of all oral health professionals to be used by the profession, payers, and the public to understand the current state of oral health care delivery.

B. Convene an educational forum or summit of collaborative practice hygienists and dentists to promote collaborative practice.

C. Develop a conference on advancing the implementation of workforce models.

D. Identify and develop a method for tracking current collaborative practice agreements and collaborative management agreements in order to increase networking and information sharing among collaborative providers.

Objective 6.4: Ensure that at least 90 percent of oral health provider education programs incorporate health literacy concepts and cultural competency training into curriculum.

Suggested strategies

A. Promote the CDC health literacy certification program.

B. Disseminate information about health literacy and promote the use of a usability checklist that ensures that oral health information meets health literacy principles.

C. Partner with professional associations to create continuing education courses for oral health professionals focused on health literacy and cultural competency concepts.

D. Seek ways to enhance or support opportunities for community health workers to promote culturally sensitive oral disease prevention strategies in their communities.

Objective 6.5: Increase cultural competency training related to oral health in health professional education programs.

Suggested strategies

A. In collaboration with existing local cultural organizations, develop and disseminate cultural competency educational materials for health professionals.

B. Encourage the Board of Dentistry to focus a self-assessment on the subject of cultural competency.

C. Partner with Minnesota state-supported higher education institutions to provide community outreach and cultural center personnel with a basic oral health education course.

Objective 6.6: Encourage all oral health provider education programs to focus on recruiting classes that reflect the state's population diversity.

Suggested strategies

A. Strengthen existing and develop new outreach programs that recruit future dental professionals from diverse backgrounds.

B. Seek funding for the expansion of dental education scholarships and loan repayment efforts.

Priority: Surveillance

Monitoring the status of oral diseases among Minnesotans is the underpinning to improving oral health. Public health surveillance is the ongoing, systematic collection, analysis, interpretation and dissemination of data regarding a health related event. In turn, data inform policy development and target public health initiatives to improve the health of all Minnesotans.

While baseline data for third graders is now available through the 2010 Basic Screening Survey, the state must continue to monitor the status of oral health to continually evaluate and refine prevention programs. In addition, there are large data gaps that hamstring efforts to better target resources. The most significant lack of data is on caries incidence, service coverage, and disease estimates in certain pockets of the population. Better data is needed on dental caries prevalence and untreated caries among very young children and adolescents, along with the adult population, particularly the older adults living in elder care facilities. Data is limited on the burden of disease among migrant and native populations, school-based sealant coverage, oral birth defects, and pregnant women.

Despite these gaps, several indicators related to the objectives outlined in this plan are collected through existing surveillance systems. The Minnesota Oral Health Surveillance System (MNOHSS) is the state's main mechanism for monitoring trends in morbidity in early childhood caries, edentulism (being toothless), and oral and pharyngeal cancer. In addition, MNOHSS data informs the efficacy of preventive services such as dental sealants, community water fluoridation and the use of dental services. MNOHSS uses the following secondary sources to generate oral health indicators:

- Behavioral Risk Factor Surveillance System (BRFSS)
- Dental workforce data from Office of Rural Health and Primary Care (Minnesota Department of Health)
- Hospital discharge records from Minnesota Hospital Association
- Medicaid data from Department of Human Service (DHS)
- Medical and Expenditure Panel Survey (MEPS)
- Minnesota Birth Defects Information System (BDIS)
- Minnesota Cancer Surveillance System (MCSS)
- Minnesota Student Survey (equivalent of National Youth Risk Behavior Surveillance System (YRBSS)
- Pregnancy Risk Assessment and Monitoring System (PRAMS)
- U.S. Census Bureau (demographic data)
- Water Fluoridation Reporting System (WFRS)

To assist public health efforts across the state, the Oral Health Program has been developing a public, web-based data system to assess and monitor the status of oral disease in Minnesota based on the following set of oral health indicators:

- Demographic data including state population by age
- Percentage of population below 100% and 200% of poverty level; total number of schools
- Percentage of schools with 50% or more of students eligible for the free and reduced price meal program
- Percentage of total county population enrolled in a Minnesota Health Care Program
- Number and percentage of Minnesota Health Care Programs enrolled-population with a dental visit
- Percentage of population served by optimally fluoridated water
- Number of licensed dental professionals
- Ratio of Minnesota Health Care Program enrollees to dentists who treat them
- Number of Dental Health Professional Shortage Areas based on "facility"

To address the data gaps in the current system, efforts are being made to convene partners and stakeholders to identify and prioritize data needs and mapping out ways to disseminate this information to policy makers and public health officials.

Goal 7: Access to population statistics, population-level oral health surveillance information, and aggregate data on oral health indicators is readily available to all.

Objective 7.1: Collaborate with data partners and key stakeholders to identify key oral health indicators and to increase the visibility and effectiveness of the Minnesota Oral Health Surveillance Advisory Group.

Suggested strategies

A. Convene the Advisory Group annually.

B. Develop and maintain data sharing agreements with partners.

C. Acquire and analyze data, and interpret findings.

D. Prepare and publish the Minnesota Surveillance Plan and the Burden of Oral Disease in Minnesota documents.

E. Review, update and publish the Burden of Oral Disease document regularly.

F. Evaluate progress, trends and direction.

Objective 7.2: Develop a secure data system that identifies and tracks key oral health indicators and has the capability to provide specific data affecting policy and existing programs upon request.

Suggested strategies

A. Develop quality assurance measures to ensure accuracy.

B. Continue to develop and implement the Minnesota Oral Health Surveillance System (MNOHSS).

C. Share summarized surveillance information with local public health, educational institutions, insurers, social services, policy makers, community-based organizations, community health clinics, and other partners as appropriate.

D. Increase the capacity of the MDH Oral Health Program to serve as a primary resource for oral health information by providing links to educational materials, oral health initiative information, and oral health curriculum.

E. Monitor and respond to data requests.

F. Ensure data security/confidentiality.

G. Explore use of (or develop) a secure web-based data entry portal (i.e., a web page for sealant grantees to enter data).

Objective 7.3: Increase capacity of the Minnesota Oral Health Program to collect data and conduct surveillance activities.

Suggested strategies

A. Investigate ways to sustain the surveillance activities of the oral health program.

B. Provide staff and stakeholder training opportunities that increase the ability of the program to manage large data projects.

C. Evaluate surveillance and outcome data.

D. Increase support for acquiring data and increase demand for oral health data.

Future Action: Next Steps

Minnesota is well poised to meet the oral health needs of its residents. As this report has shown, oral health is dependent on multifaceted, interrelated factors that range from personal care and awareness to the changing role of dental and health providers, and from the complexities of the health care system to a more integrated approach to total health. As we move forward to reduce both the prevalence and disparities of oral diseases, a full deployment of a varied dental workforce combined with proven prevention strategies and integration with other health organizations will be critical.

To implement the Minnesota Oral Health Plan, MDH's Oral Health Program is working closely with the Minnesota Oral Health Coalition and other key partners. Working groups have been organized to advance the strategies outlined in this plan while creating a process for the continuous review and revision of the plan. Pressing issues are being addressed to move the work forward in the following key areas.

Dental Sealants

The Minnesota school-based sealant program is a proven strategy that prevents caries among young children. The program targets high-risk, second grade students at schools where more than 50 percent of students are eligible for the Free or Reduced Price Lunch Program (FRL), a proxy for identifying low-income children. The Oral Health Program is working to expand and improve the program by:

- Identifying schools that need sealant programs and have the greatest need (>50% FRL) so school-based dental sealant providers can target their services to those schools.

- Fostering relationships with school-based dental sealant service providers to help families navigate both the dental insurance and dental care systems so children receive their dental benefits and are connected to a "dental home" for ongoing care and treatment.

- Communicating with school boards, district superintendents and school nurses to smooth the way for establishing sealant programs at their schools.

- Establishing a strong relationship with the local dental community to facilitate the ongoing dental care needs of children.

- Securing additional funding to reach more high-needs children across the state.

Water Fluoridation

In collaboration with stakeholders and other MDH programs, the Oral Health Program is working to maintain the state's high community water fluoridation status. Grant programs are increasing the number of Minnesotans who receive the oral health benefits of optimally fluoridated drinking water. The grants enable community public water systems to: improve aging fluoride treatment

infrastructures; improve or replace aging analytical equipment; and assist with fluoridation implementation. Efforts include:

- Ensuring Minnesota communities are receiving proper levels of fluoridated water by securing and providing funding to municipalities to upgrade or replace water fluoridation equipment. More than 50,000 people are being better served in Bayport, Centerville, Murdock, North Mankato, and Victoria as a result of MDH funding and technical assistance. MDH is continuing to seek sustainable funding sources to provide additional communities with equipment updates on an ongoing basis.
- Supporting quality assurance by providing technical training to community water operators and engineers statewide so they can keep pace with the latest engineering, operation, and management practices for maintaining new fluoridation water systems.
- Highlighting the critical role water fluoridation has in public health by convening a panel of fluoridation experts (educators, scientists, water workers, providers, communications) to develop a plan to raise awareness among dental and public health professionals, policy makers, the public, and even water fluoridation operators themselves about the importance of water fluoridation to oral and overall health.

Increasing Public Insurance Programs Use Rates

To ensure low-income children are getting the dental care they need, the Oral Health Program is working with the Minnesota Department of Human Services and the Centers for Medicare & Medicaid Services to develop training materials and provide technical assistance to health care providers. These programs focus on improving diagnostic dental services, early referral, primary care integration, and guidance on prevention strategies during well child visits. These efforts will help the state meet the national and local leading health indicators for increasing dental visits and use of the oral health care system by low-income children. Specific strategies include:

- Advocating for Child and Teen Checkups' protocols that assess children's dental health status and needs by age one and establishing a "dental home" for them through immediate referrals to a dentist.
- Providing technical support to child health consultants and training materials for Child and Teen Checkups to enable primary care and dental providers to increase the rates of fluoride varnish applications among at-risk children.
- Working with dental providers to become more comfortable in pediatric dentistry and proficient with working with very young patients (aged one to three years).

Health Care Integration

The advent of the "health care home" concept is a promising model for providing more integrated and effective health care for underserved populations. Health care homes are focused on early detection and addressing the spectrum of patients' health needs (physical, dental, mental), while lowering health care costs. Health integration is also accomplished through other strategies that work to change policies to reduce risk factors to oral disease. To ensure that oral health is considered a high-priority, work is focused on:

- Raising awareness of the importance of oral health to overall health among health care and public health leaders by meeting with stakeholders and finding opportunities to integrate oral health into their strategic plans, policies and protocols.
- Collaborating with state-level, obesity initiatives to decrease access to sugar-sweetened beverages through policies that would increase taxes and pricing on these beverages and encourage drinking tap water.
- Working with the Minnesota Physical Activity and Nutrition Program to include height and weight measurements of third graders in the Minnesota Basic Screening Survey to investigate and analyze data on the relationship of healthy weight to oral health.
- Funding a pilot project with Head Start, an early childhood education program for low-income children, to embed on-site dental prevention services and referral system to a "dental home" for ongoing care.

New Dental Providers and Workforce Models

Minnesota has developed innovative solutions to improving access to dental care through the creation of new dental provider types and expanding how and where dental treatment and preventive services can be delivered. However, many barriers still exist in maximizing these dental care options so that low-income children, adults and the elderly get the care they need. To this end, the Oral Health Program is:

- Increasing awareness and addressing misperceptions among dentists, hygienists, dental therapists (DTs), and advanced dental therapists (ADTs) about how collaborative agreements and new service models can be integrated into their practice; resources include free, online courses addressing these issues.
- Promoting to dental professionals and policy makers the Oral Health Program's "Collaborative Agreement Dental Hygiene Assessment" report which includes findings and recommendations for increasing the use of this dental service model to improve access to preventive dental services.
- Ensuring that advanced dental therapist (ADT) services are widely available to those in greatest need by funding the development of a refresher course for ADT graduates to attain their advanced dental therapy certification so they can deliver dental care.
- Seeking funding to create incentives for dentists to partner in innovative employment models for DTs and ADTs.
- Assessing whether the penetration of DTs and ADTs into the workforce will indeed improve Minnesotans' access to more affordable dental care or if barriers persist that need to be addressed.

- Funding outreach programs through the University of Minnesota School of Dentistry to recruit more people from diverse backgrounds into dental careers by working with Area Health Education Centers, Minneapolis Public Schools, rural communities, and providing dental students with rotation experiences through Community Health Centers and underserved rural dentistry clinics.

Surveillance

Identifying and addressing the barriers to oral health is a complex process requiring a variety of integrated solutions involving private-public partnerships and a commitment to prevention. To assist state and local health agencies to work more efficiently and effectively, the Oral Health Program has been developing the state-wide Minnesota Oral Health Surveillance System (MNOHSS). MNOHSS provides easily accessible county-level data on more than a dozen oral health indicators with mapping functionality that uses Health Professional Shortage Area (HPSA) data. To ensure this dynamic tool is employed to its full capacity, the Oral Health Program is:

- Working to widely promote MNOHSS to public health professionals, health care providers and other stakeholders.
- Providing technical assistance and learning opportunities to organizations on how to use MNOHSS to inform policy and practice, set benchmarks, implement evidence-based interventions, and measure impact.
- Leveraging funding to fill in data gaps and to continually refine intervention strategies to better meet the needs of underserved populations. The most pressing data gaps are dental caries incidence and prevalence among toddlers and adolescents; older adults living in elder care facilities; migrant and native populations; school-based sealant coverage; and pregnant women.

To stay the course on these initiatives, the Minnesota Oral Health Program is committed to regularly reporting on the progress of these efforts and will convene stakeholders to address the changing oral health needs of Minnesotans across the state. The Minnesota Oral Health Program looks forward to partnering with even more organizations in *advancing optimal oral health for all Minnesotans.*

Appendices

Appendix A: Minnesota Oral Health Plan Goals, Objectives and Strategies

Goal 1: Minnesota's oral health infrastructure is stable and sustained.

Objective 1.1: Fully integrate the Oral Health Program into the Minnesota Department of Health infrastructure.

Suggested strategies

A. Increase the sustainability of the state oral health program and support the state oral health program as the central agency for oral health promotion.

B. Continue to apply for grants and increase the amount of grant money obtained.

C. Promote integration opportunities with other funded programs.

Objective 1.2: Support development of a strong Minnesota Oral Health Coalition that works closely with the Minnesota Department of Health.

Suggested strategies

A. Support the coalition in determining leadership structure and other administrative and organizational issues related to its development into a self supporting organization.

   i. Obtain best practices guidance from more mature organizations, access assistance available from National Association of Oral Coalitions and coalition experts e.g. "Coalitions Work", etc.).

   ii. Sustainability of Oral Health Coalition; establish development fund.

   iii. Inform membership.

   iv. Summarize in kind support from MDH.

B. Complete a vision, mission, goals (identity) process.

C. Work with the coalition leadership to explore pros and cons of establishing the Minnesota Oral Health Coalition as a non-profit organization (501 (C)3 status).

D. Utilize the CDC framework and other recognized coalition resources to increase diversity of the membership in the coalition.

E. Develop an independent, interactive web presence for the Minnesota Oral Health Coalition.

Objective 1.3: Develop and sustain collaborative partnerships to implement the Minnesota Oral Health Plan.

Suggested strategies

A. Create new partnerships that ensure diversified funding is available to implement the Minnesota Oral Health Plan.

B. Identify innovative action plans that are easily adopted by stakeholders.

Objective 1.4: Seek commitment for long-term data collection and surveillance on Minnesota's oral health indicators.

A. Investigate the cost (along with data and information technology experts and programmers) to create an interactive web-based data source known as Minnesota Oral Health Surveillance System (MNOHSS).

B. Prepare planning and implementation process including data documentation to Minnesota Technology Services.

C. Approach potential funders or add to grant proposals to launch a full-scale sustainable interactive data portal.

Objective 1.5: Seek funding sources that the support review, professional evaluation, and updates to the current Minnesota Oral Health Plan.

Suggested strategies

A. Oral health leaders and stakeholders seek sustainable funding and program changes to implement the plan.

Objective 1.6: Assess opportunities for policy change through environmental analysis tools such as the environmental and policy scan and share results with decision makers.

Suggested strategies

A. Utilize resources available through the CDC to support a facilitated process for oral health stakeholders to join together to make decisions about priorities based on suggested criteria.

Goal 2: Strategies are

implemented that reduce oral disease and mitigate risks.

Objective 2.1: Determine the baseline for the number of providers who use standardized, evidence-based oral disease risk assessment tools.

Suggested strategies

A. Implement an educational campaign that raises understanding of risk assessment, benefits of using risk assessment, and introduces tools used to assess risk.

B. Promote use of risk assessment (periodontal disease, diabetes, tobacco use, etc.) among medical and dental providers.

C. Collect data that is valid and reliable on current usage of tools for caries risk assessment in practice.

D. Choose a tested caries and periodontal disease risk assessment tool to use in Minnesota that is valid and reliable.

E. Use the Minnesota Oral Health Surveillance System (MNOHSS) as a clearinghouse for sharing standardized information on caries and periodontal disease risk in Minnesota.

Objective 2.2: Reduce caries experience in Minnesota children.

Suggested strategies

A. Partner with Maternal and Child Health, pre-school, Early Head Start and Head Start oral health programs, early care and education settings on tooth brushing promotion programs targeted toward pregnant women and children under the age of five (review National Association for the Education of Young Children accreditation standards for oral health).

B. Partner with Early Head Start and Head Start on oral health programs that help meet Head Start and Child and Teen Checkups (the Minnesota version of Early Periodic Screening, Diagnosis, and Treatment) requirements.

C. Develop and offer trainings for preschool staff, Head Start coordinators and home visitors to recognize signs of and identify risk factors for childhood caries.

D. Promote fluoride varnish programs as part of immunization and well child visits.

E. Increase programmatic coordination between risk-reduction programs, e.g., preschool and Women, Infants and Children (WIC) programs.

F. Include oral health screening requirements in childhood screenings.

G. Educate caregivers of infants/toddlers about appropriate amounts of topical fluoride or fluoride toothpaste.

H. Increase availability and ease of access to oral health supplies.

School-based Dental Sealant Programs

Objective 2.3: Develop and coordinate comprehensive, statewide school-based prevention programs that target high-risk children.

Suggested strategies

A. Conduct the statewide third grade Basic Screening Survey at least once every five years.

B. Convene a school-based sealant work group that includes providers, school representatives, school nurses, public health professionals, health plans, Minnesota public programs representatives, board of dentistry, researchers, community representatives, parent representatives, and parent-teacher associations.

   i. Conduct a needs assessment and compile information on existing sealant activities in the state.

   ii. Seek and acquire sustainable financial support, i.e., foundations, Title V funding, industry (3M, dental supply companies), Smiles Across Minnesota, Oral Health America, etc.

   iii. Create and publish a comprehensive state sealant plan.

   iv. Create a variety of easily understood messages targeted to parents/caregivers about efficacy and safety of pit and fissure sealants, why they are needed and the importance of sealants in caries prevention.

C. Develop parameters for and post a request for proposal (RFP) for at least five school-based sealant mini-grant projects.

   i. Plan and conduct projects that provide documentation of components of successful sealant programs and identify barriers to sustainability.

   ii. Promote limited authorization/ collaborative practice as a model for school-based programs.

D. Convene a transdisciplinary panel for review and development of a comprehensive coordinated plan for fluoride varnish programs and to develop quality improvement initiatives, i.e., through learning collaboratives and health care home initiatives.

E. Create an education campaign about how fluoride works and the importance of the appropriate use of fluoride varnish in caries prevention.

Water Fluoridation

Objective 2.4: Ensure that the percentage of public water supply systems providing fluoridated water are within the optimal range and meet the CDC optimal monitoring and surveillance requirements of meeting or exceeding 90 percent.

Suggested strategies

A. Collect community water fluoridation information and submit data to the CDC on 510 reports.

B. Identify ways to provide support to communities to maintain or update aging fluoridation equipment.

C. Support statewide educational campaigns that promote drinking tap water.

D. Educate water works operators about the importance of the water fluoridation process and its link to oral health.

E. Recognize water workers and engineers as oral health leaders on a consistent basis.

Objective 2.5: Ensure that at least 50 percent of Minnesota's schools have achieved oral health targets.

Suggested strategies

A. Remove cariogenic foods and beverages from vending machines.

B. Increase the number of non–cariogenic food items accessible outside the lunch program (vending machines, fund raisers, concessions, classroom celebrations and a la carte) in Head Start and school menus.

C. Increase tobacco use prevention/cessation and nutrition information in health education programs.

D. Provide resources to strengthen curricula that emphasize how healthy eating can improve and maintain oral health.

E. Reduce the impact of soda/beverage marketing by educating schools to resist marketing strategies.

F. Promote the understanding of the preventive properties of xylitol gum and xylitol products and their proper use.

G. Partner with the Minnesota School Nutrition Association and the Minnesota Department of Education to collect data on candy and pop available in schools in order to tailor oral health campaigns to school needs.

Objective 2.6: Promote awareness of the effect of diet and nutrition on oral health among hospital food service directors, older adult service establishments, and nutrition staff.

Suggested strategies

A. Partner with the Minnesota Hospital Association (MHA), hospital Food Service Directors, and Registered Hospital Dieticians to provide information about creating tooth-healthy menus and increasing health snack choices for patients, visitors, staff, and in vending machines.

B. Provide educational sessions at MHA conferences about the relationship of diet to dental disease.

C. Promote partnerships with assisted living and nursing home providers and organizations to increase understanding about the impact of diet on the oral health of older adults.

Goal 3: Oral health literacy is increased across all ages and cultures.

Objective 3.1: Increase oral health evaluation and caregiver education in early childhood screenings, vaccination visits, episodic care visits, prenatal, and Child and Teen Checkups.

Suggested strategies

A. Support health literacy and cultural competency training for health professionals in the community, including health care providers and public health officials.

B. Provide technical assistance to those interested in becoming proficient in patient-centered literacy skills.

C. Educate prenatal and maternal health care providers about the importance of increasing oral health literacy among pregnant women so they are well informed about caries etiology, caries prevention, and infant oral health care.

D. Create a campaign to increase understanding regarding the importance of tooth brushing and sponsor distribution of oral health information and materials in prenatal and maternal care programs.

Objective 3.2: Build awareness of oral disease prevention strategies and increase oral health knowledge in school-based health systems.

Suggested strategies

A. Strengthen partnerships with and provide resources to the Minnesota Department of Education and Minnesota school nurses to evaluate oral health curricula (including early childhood and after school programs) on evidence-based strategies.

B. Develop and disseminate information about the efficacy of pit and fissure sealants, water fluoridation, topical fluoride therapy and other strategies that prevent and control oral disease.

C. Investigate programs to introduce evidence-based xylitol therapy in early childhood programs and schools.

D. Partner with the Minnesota Department of Health Injury and Violence Prevention Unit to develop promotional programs that focus on preventing and reducing oral injury.

E. Develop and disseminate information to parents and schools about fluoride varnish, sealants and the health care home.

Objective 3.3: Increase exposure to oral health knowledge through targeted and culturally sensitive campaigns that focus on prevention strategies.

Suggested strategies

A. Develop and disseminate fluoridation messages that provide culturally and age appropriate information to population groups, adults, and children. e.g. "safe to drink fluoridated tap water" messages.

B. Increase oral health literacy among young adults emphasizing smoking, diet, smokeless tobacco, alcohol and tobacco, periodontal disease and importance of oral care.

C. Increase oral health literacy among the elderly and their caregivers; emphasize medications that increase xerostomia (dry mouth), root caries etiology, periodontal disease and oral cancer.

D. Ensure educational materials are available in multiple languages, including visuals for the non-reading population.

E. Create electronic media and monitor hits/visits to web pages and internet sites.

Objective 3.4: Increase awareness of oral health among policy and decision makers about the benefits of oral disease prevention.

Suggested strategies

A. Engage legislators in an annual oral health initiatives forum.

B. Partner with the Minnesota Oral Health Coalition to support oral health promotion policies, tobacco control policies, and to promote policy change.

C. Identify and utilize oral health resources in the state to target areas of greatest need.

D. Increase understanding of federal mandates and funding, or lack of funding.

Goal 4: Professional integration is enhanced between oral health care providers and other providers in the broader health care system.

Objective 4.1: Promote the understanding and development of the health care home concept.

Suggested strategies

A. Create and nurture non-traditional partnerships in oral health to establish a coordinated strategic direction.

B. Gather information and evaluate the effect of reimbursements/incentives for improving care.

C. Increase training opportunities in oral health for non-dental professionals (public health nurses, dietitians, health plan case managers, community health workers, and interpreters) that build patient-centered skills (preventive, therapeutic, and remedial) and provide technical assistance for working with patients, clients and the public.

D. Increase the number of local public health agencies that address oral health.

E. Increase integration activities and partnerships with nutrition, obesity, tobacco, alcohol, etc. (i.e., American Dietetic Association, American Lung Association, American Heart Association).

F. Plan demonstration projects that create innovative health care home models.

G. Work with educators to investigate the potential role of teledentistry and policy makers to address payment issues.

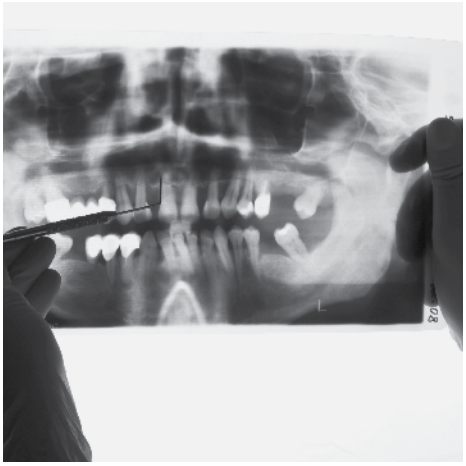
Objective 4.2: Increase the number of non-dental provider education programs (physician's assistant, nurse practitioner, dietitians, medical schools, and nursing schools) that incorporate oral health into their curriculum.

Suggested strategies

A. Partner with the Minnesota and American Pediatric Association and work to determine current continuing medical education curriculum that encompasses an oral health component.

B. Work with the University of Minnesota Continuing Education Division to create continuing medical education curriculum focused on oral health.

C. Use evidence-based strategies to develop core competencies in oral health within educational settings.



D. Provide one conference in each of the next two years for oral health and medical providers that focuses on:

   i. Oral and systemic health interrelatedness.

   ii. Understanding and promoting risk assessment of oral and systemic health.

   iii. Participate in "Many Faces Conference" and Accountable Care Conference with medical and dental professionals.

Objective 4.3: Develop collaborative opportunities throughout the health care community by educating and training physicians, dentists, nurses, hygienists, nurse practitioners, dental assistants, dental therapists, and social workers to work as a single team addressing oral health disparities and unmet dental needs of the underserved.

Suggested strategies

A. Promote research on the impact of oral health on overall health.

B. Support the development and evaluation of programs that promote disease prevention and increase collaborative health care.

C. Provide incentives for allied dental personnel to work in medical settings under collaborative supervision by a licensed dentist.

D. Reduce barriers to dental hygienists working in public health agencies and other settings.

E. Move primary oral health care into every obstetrics, primary care, family practice, pediatrics, and internal medicine practice in Minnesota by incorporating "The mouth is a part of the body" concept.

F. Investigate further development of innovative collaborative strategies for serving elderly and youth populations with different provider types.

G. Explore the development of a centralized network for identifying excess capacity, sharing resources, and communicating needs that utilizes the public health infrastructure.

Objective 4.4: Promote collaboration among dental providers and medical care providers that increase information sharing, understanding of eligibility requirements, and access to and utilization of oral health care benefits.

Suggested strategies

A. Create demonstration projects that gather and analyze preventive services utilization data and propose new models that coordinate collaboration between dental and medical providers and eliminate disparities.

Objective 4.5: Promote the adoption and meaningful use of the electronic dental record.

Suggested strategies

A. Disseminate information about the Office of the National Coordinator efforts to create standardized guidelines for the utilization of Health Information Technology and reporting.

B. Improve collaboration and follow up by aligning with at least two objectives of the local and national Office of the National Coordinator for Health Information Technology.

C. Seek funding to create incentives for private and public health dental and medical systems to create and adopt centralized network tools.

Objective 4.6: Call for the development and promotion of clinical preventive oral health guidelines for use in settings outside the dental office: medical and long-term care, prison, juvenile, and hospital settings.

Suggested strategies

A. Support and promote the development and use of dental diagnostic codes.

B. Develop partnerships that integrate oral health into the current case management system.

C. Promote public health research, standardized protocols for care, and use of evidence-based practices.

D. Promote inclusion of oral evaluation in care guidelines for the aging and persons with diabetes and special health care needs.

E. Create a web-based tracking and referral mechanism for oral health information and treatment.

F. Promote Health Insurance Portability and Accountability Act compliant communications between dental providers and primary care providers (family medicine, obstetrics, pediatrics, internal medicine, etc.) and allied health professionals, (dieticians, pharmacists, etc.) when assessing and referring for medical conditions and non-dental issues.

Objective 4.7: Increase the number of primary care medical providers who integrate prevention of oral disease as part of overall health care by 10 percent for patients of all ages.

Suggested strategies

A. Create a recognizable symbol and/or standardized message that captures the concept of the interrelatedness of oral health and overall health.

B. Develop a marketing campaign targeted to medical providers that promotes oral health as integral to overall health.

C. Determine a baseline number (early adopters) and evaluate barriers to the utilization of oral disease prevention strategies by medical practitioners.

D. Develop an integrated approach among medical and dental providers that promotes oral exams/evaluation, referral, and access to oral health care by age one.

E. Promote treatment and diagnostic information sharing between pediatricians, physicians and dentists.

Goal 5: Access is increased to preventive, restorative, and emergency oral health care services.

Objective 5.1: The legislative intent to increase the supply and distribution of dental services through creation of new dental providers and appropriate utilization of the entire dental team is achieved. (See Minnesota statutes 150A.10 Subd.1a., 150A.105 and 150A.106)

Suggested strategies

A. Maximize the opportunity that Minnesota has to provide positive leadership in creating new oral health care providers and innovative workforce models.

B. Support and engage with other agencies to research the impact of new and existing oral health care providers on improved access to services by collecting and analyzing outcomes data.

C. Increase the number of dentists, health care facilities, programs, or nonprofit organizations that employ dental hygienists with collaborative agreements.

D. Develop relationships with providers in older adult services settings (e.g., nursing homes, assisted living) to connect providers with elderly populations.

Objective 5.2: Increase by 10 percent the number of underserved Minnesotans who receive evidence-based preventive dental care, with emphasis on children under age one, low-income uninsured adults, people with developmental disabilities, pregnant women, children with special health care needs, low income and immigrant populations, those with chronic diseases, and individuals in long-term care facilities.

Suggested strategies

A. Educate general dentists to be more comfortable caring for infants and toddlers (birth to three years old), making appropriate referrals, and using best practices.

B. Work with state agencies and commissions to analyze issues (including funding) regarding care for children, adults, the aging, developmentally disabled, and special health care needs populations, low income and under insured, and participate in developing policy recommendations.

C. Use Basic Screening Survey results to determine preventive service initiatives.

D. Encourage local and county public health agencies to utilize dental hygienists in prevention programs.

E. Identify and work with agencies engaged in dental programs to explore alternative delivery systems that improve communication with local dentists, improve sustainability, and increase continuity of care.

F. Partner with agencies on a centralized website or helpline for the public to increase access to referral information and information on current systems in place for Minnesota health care programs and the uninsured.

G. Develop compliance initiatives that increase comprehensiveness of oral health programs for children under age one, uninsured adults, people with developmental disabilities, children with special health care needs, and individuals in long-term care facilities.

Objective 5.3: Reduce the proportion of Minnesotans who experience difficulties, delays, or barriers to restorative oral health care service by 20 percent.

Suggested strategies

A. Partner with state agencies that have been mandated to document the impact of existing and new Minnesota oral health care workforce models on improved access to restorative services using outcome data.

B. Establish baseline information on barriers to oral health care involving target populations by conducting a statewide survey and adding questions to both the Basic Screening Survey and Behavioral Risk Factor Surveillance System regarding Minnesota's accessibility to dental care.

C. Investigate best practices for sustainability of public health and safety net clinics.

Objective 5.4: Reduce the number of emergency room visits for dental related reasons by 15 percent.

Suggested strategies

A. Develop and disseminate materials that educate caregivers about dental injuries and the appropriate response.

B. Collaborate with hospitals and providers in older adult service settings to provide information on local public health dental programs so that patients presenting in emergency departments are provided with appropriate referral and preventive education information.

C. Develop a campaign to educate the public about seeking professional dental care and guidance after an oral injury has occurred.

D. Develop a campaign focused on oral injury prevention and promoting the appropriate use of mouth-protecting equipment in sports, e.g., mouth guards.

E. Collaborate with hospital medical staff to ensure diagnostic codes are utilized for non-traumatic dental related emergency department visits and are coded correctly in order to establish baseline data.

Objective 5.5: Increase the number of individuals who receive oral and pharyngeal cancer screenings by 10 percent.

Suggested strategies

A. Determine a baseline number of dental and medical professionals that currently integrate oral and pharyngeal cancer screenings into comprehensive exams.

B. Emphasize the importance of screening for oral and pharyngeal cancer and how it can affect critical functions, such as speaking, swallowing and eating.

C. Increase the number of health care providers who deliver consistent and

appropriate messages to help people quit smoking.

D. Partner with the National Cancer Institute on developing health care provider competencies in prevention, diagnosis, and management of oral and pharyngeal cancers.

E. Aid the American Cancer Society in incorporating oral and pharyngeal cancer screenings in the "Welcome to Medicare" physical examination.

F. Promote the development of a community-based oral cancer prevention and early detection program.

Objective 5.6: Increase the proportion of local health departments that have an oral health program focused on prevention.

Suggested strategies

A. Build capacity in local health departments by providing technical expertise and evidence-based oral health information.

B. Determine a baseline number of local health departments that currently have an oral health care program.

C. In collaboration with existing local oral health care program personnel, identify local health departments that do not have an oral health program and offer resources and guidance in creating and structuring their own oral health component.

D. Partner with Local Public Health Association of Minnesotato convene a conference on integrating oral health into local public health systems.

Objective 5.7: Promote policies and programs that ensure that 95 percent of Minnesotans have access to a dental care provider within a 90-minute drive or by public transportation from their place of residence.

Suggested strategies

A. Conduct at least one public health/ nonprofit clinic pilot project to investigate and gather data on current equitable distribution of services.

B. Promote school-based-programs and older adult service settings.

C. Determine existing excess provider capacity and transportation services available to patients, including the uninsured and public programs patients.

D. Work with local safety net programs in supporting existing and creating new volunteer programs that provide patients transportation to and from dental and health appointments.

E. Convene a conference focused on policy tools that will help achieve equity in population health, featuring best practices and expert panel presentations, moderated discussions, as well as working groups.

F. Reduce supervision barriers and increase utilization of collaborative agreements.

Objective 5.8: Increase partnerships that explore effective policy initiatives to stabilize the availability of oral health care services to the most vulnerable populations.

Suggested strategies

A. Develop a planning checklist to move forward strategically once consensus about priorities is achieved.

B. Increase data and information gathering efforts that support policy decisions among stakeholders, oral health care providers and primary care providers.

C. Promote philanthropic programs among specialty dental organizations.

Goal 6: The dental workforce is prepared for and addresses the oral health needs of all Minnesotans.

Objective 6.1: Promote innovative and effective oral health care delivery practice models for rural populations.

Suggested strategies

A. Continue to work with Area Health Education Centers to explore and strengthen strategies that will achieve better retention and distribution of oral health care providers graduating from state supported institutions.

B. Develop mentoring programs for the dental workforce.

C. Investigate the role of teledentistry.

Objective 6.2: Promote broader discussion of ways the social compact between dentistry and society can be reinforced.

Suggested strategies

A. Develop a Patient Centered Principles document.

   i. Create a document that states principles and objectives that are patient centered.

   ii. Develop bullet points about what patients need for oral care as part of general health care.

   iii. Create a list of evidence-based studies that support oral health effects on general health.

B. Convene workshops with medical providers.

C. Promote continuing education programs.

D. Encourage the creation of at least one internship opportunity for students and one work experience for professionals.

Objective 6.3: Collaborate with agencies and educational institutions to gather and disseminate information on practice models, collaborative agreement dental hygiene practice, and the dental therapist/advanced dental therapist management agreement.

Suggested strategies

A. Maximize utilization of tools available: support infrastructure for collaborative agreement hygienists and restorative function allied personnel, dental therapist and advanced dental therapist.
   i. Develop a checklist on payment protocols and credentialing.
   ii. Develop a fact sheet/resource sheet describing definition of, roles of, and scope of practice levels of all oral health professionals to be used by the profession, payers, and the public to understand the current state of oral health care delivery.
B. Convene an educational forum or summit of collaborative practice hygienists and dentists to promote collaborative practice.
C. Develop a conference on advancing the implementation of workforce models.
D. Identify and develop a method for tracking current collaborative practice agreements and collaborative management agreements in order to increase networking and information sharing among collaborative providers.

Objective 6.4: Ensure that at least 90 percent of oral health provider education programs incorporate health literacy concepts and cultural competency training into curriculum.

Suggested strategies

A. Promote the CDC health literacy certification program.
B. Disseminate information about health literacy and promote the use of a usability checklist that ensures that oral health information meets health literacy principles.
C. Partner with professional associations to create continuing education courses for oral health professionals focused on health literacy and cultural competency concepts.
D. Seek ways to enhance or support opportunities for community health workers to promote culturally sensitive oral disease prevention strategies in their communities.

Objective 6.5: Increase cultural competency training related to oral health in health professional education programs.

A. In collaboration with existing local cultural organizations, develop and disseminate cultural competency educational materials for health professionals.
B. Encourage the Board of Dentistry to focus a self-assessment on the subject of cultural competency.
C. Partner with Minnesota state-supported higher education institutions to provide community outreach and cultural center personnel with a basic oral health education course.

Objective 6.6: Encourage all oral health provider education programs to focus on recruiting classes that reflect the state's population diversity.

Suggested strategies

A. Strengthen existing and develop new outreach programs that recruit future dental professionals from diverse backgrounds.
B. Seek funding for the expansion of dental education scholarships and loan repayment efforts.

Goal 7: Access to population statistics, population-level oral health surveillance information, and aggregate data on oral health indicators is readily available to all.

Objective 7.1: Collaborate with data partners and key stakeholders to identify key oral health indicators and to increase the visibility and effectiveness of the Minnesota Oral Health Surveillance Advisory Group.

Suggested strategies

A. Convene the Advisory Group annually.
B. Develop and maintain data sharing agreements with partners.
C. Acquire and analyze data, and interpret findings.
D. Prepare and publish the Minnesota Surveillance Plan and the Burden of Oral Disease in Minnesota documents.
E. Review, update and publish the Burden of Oral Disease document regularly.
F. Evaluate progress, trends and direction.

Objective 7.2: Develop a secure data system that identifies and tracks key oral health indicators and has the capability to provide specific data affecting policy and existing programs upon request.

Suggested strategies

A. Develop quality assurance measures to ensure accuracy.
B. Continue to develop and implement the Minnesota Oral Health Surveillance System (MNOHSS).
C. Share summarized surveillance information with local public health, educational institutions, insurers,

social services, policy makers, community-based organizations, community health clinics, and other partners as appropriate.

D. Increase the capacity of the MDH Oral Health Program to serve as a primary resource for oral health information by providing links to educational materials, oral health initiative information, and oral health curriculum.

E. Monitor and respond to data requests.

F. Ensure data security/confidentiality.

G. Explore use of (or develop) a secure web-based data entry portal (i.e., a web page for sealant grantees to enter data).

Objective 7.3: Increase capacity of the Minnesota Oral Health Program to collect data and conduct surveillance activities.

Suggested strategies

A. Investigate ways to sustain the surveillance activities of the oral health program.

B. Provide staff and stakeholder training opportunities that increase ability of the program to manage large data projects.

C. Evaluate surveillance and outcome data.

D. Increase support for acquiring data and increase demand for oral health data.

Appendix B: Minnesota Populations by Race and Hispanic Ethnicity

Racial Groupings	2010 Census	Percentage of population	Change 2000-2010
White	4,524,062	85.3%	+2.8
Blacks, African American	274,412	5.2%	+58.9
American Indian Alaskan Native	60,916	1.1%	+10.8
Asian	214,234	4.0%	+50.9
Native Hawaiian/Other Pacific Islander	2,156	0.04%	+8.9
Other race	103,000	1.9%	+56.5
Two or more races	125,145	2.4%	+51.2
Ethnic Origin			
Hispanic or Latino origin*	250,258	4.7%	+74.5
Non-Hispanic or Latino	5,053,667	95.3%	+5.8
Total	5,303,925	100%	+ 7.8

*People of Hispanic ethnicity may be of any race

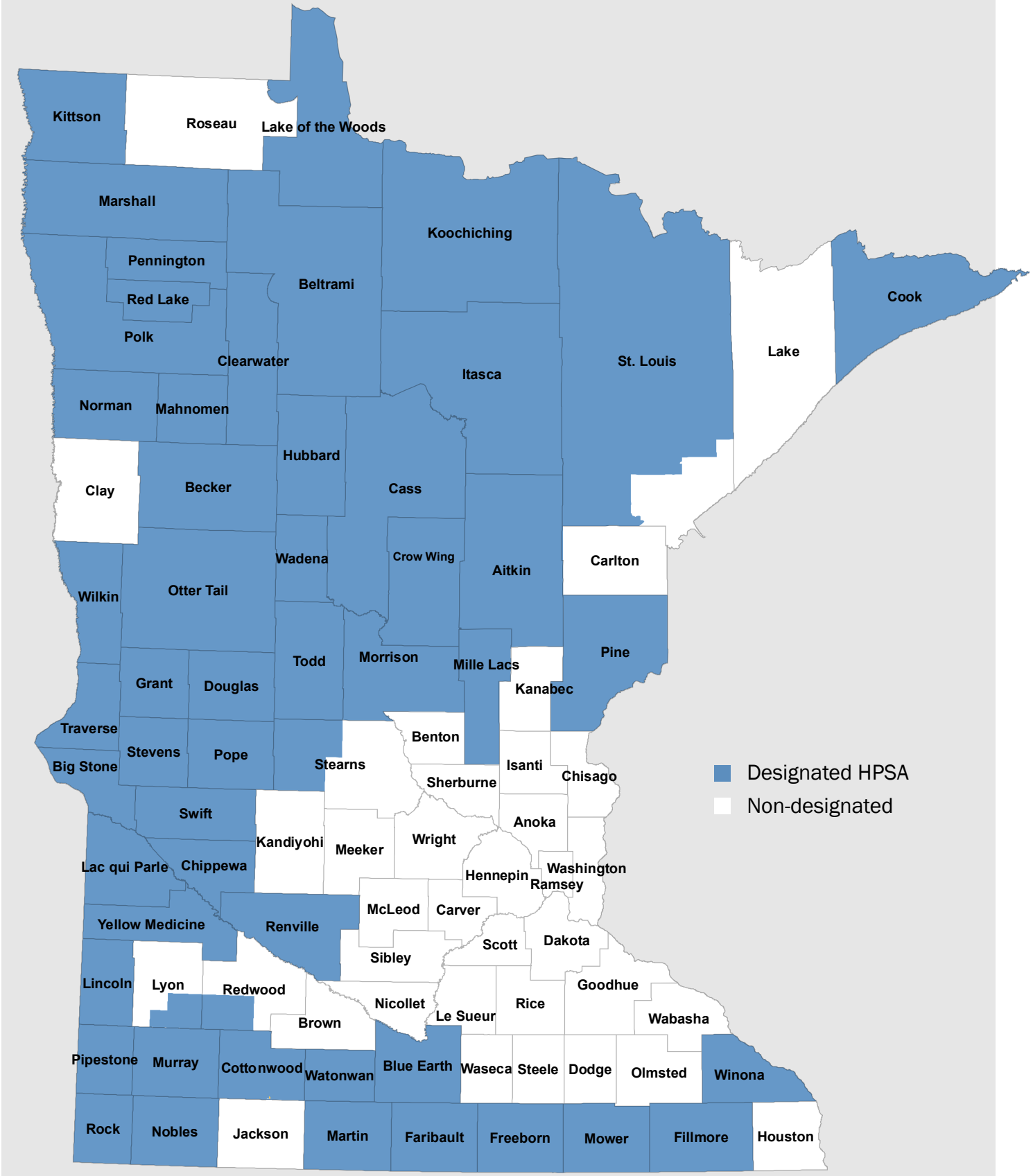
Source: Minnesota Department of Administration. Office of Geographic and Demographic Analysis. Office of the State Demographer / U.S Census; 2010

Appendix C: Minnesota Health Professional Shortage Areas – Population/Low-Income Dental Care Designation

Note: HPSA designations reflected in the following map only include those based on a geographic area and low-income population designations which are still bound by a geographic service area.

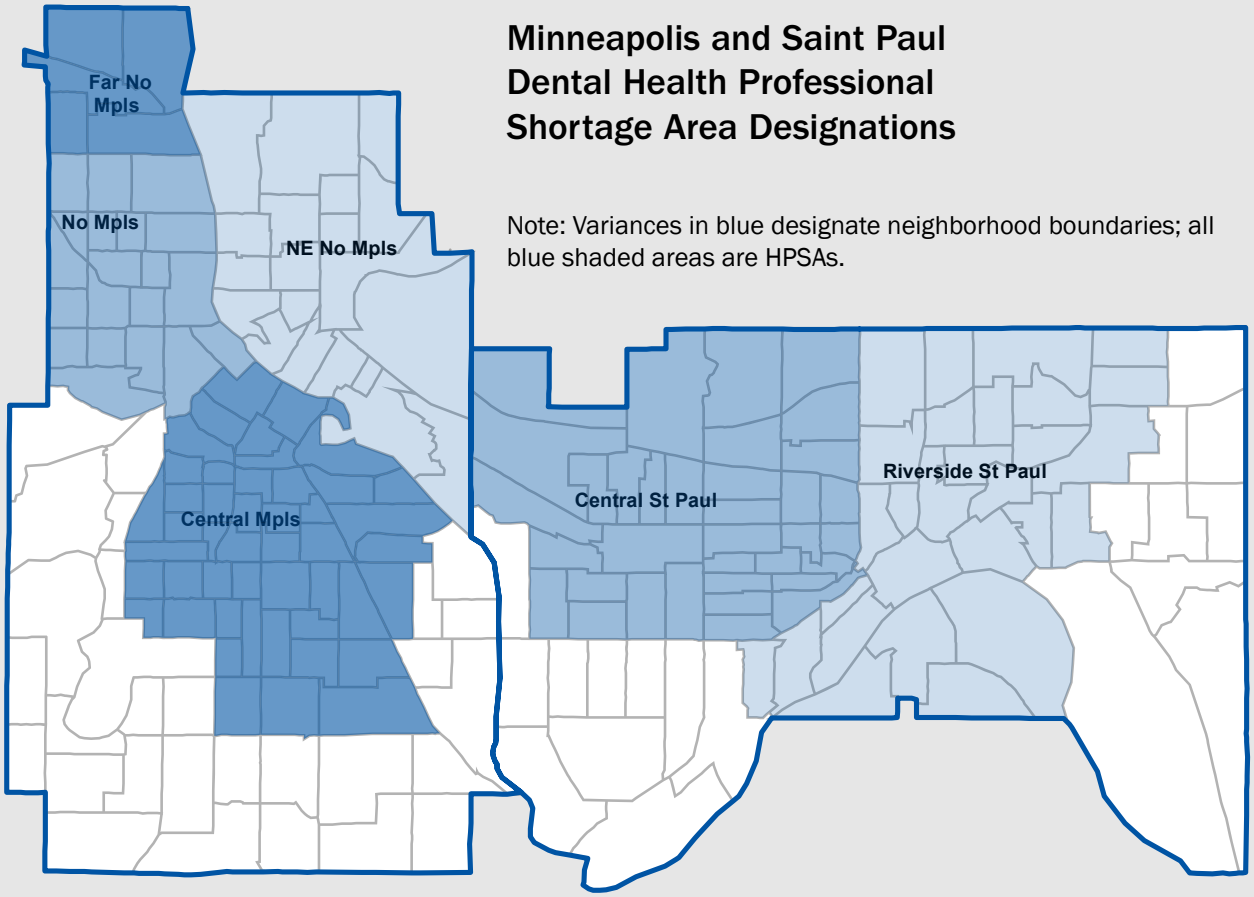
Designations not reflected in the map include any facility (e.g. comprehensive health center, correctional facility, rural health clinic) and tribal designations. For further information about Minnesota HPSA, please visit the Minnesota Department of Health Office of Rural Health and Primary Care website: www.health.state.mn.us/divs/orhpc

Map 1: Minnesota Health Professional Shortage Areas (by county) – Population/Low-income Group Dental Care Designation (identified in blue)



Data Source: Minnesota Department of Health, Office of Rural Health and Primary Care, State DD HPSA May 2012.

Map 2: Minneapolis-St. Paul Health Professional Shortage Areas – Population/Low-income Group Dental Care Designation (identified in blue)



Data Source: Minnesota Department of Health, Office of Rural Health and Primary Care, September 2010

Minneapolis Neighborhoods:

- Far North
- North
- Northeast-North
- Central

St. Paul Neighborhoods:

- Central
- Riverside

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TABLE 7: Ratio of Dental Provider Types per 100,000 Population. SOURCES: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2012-13 Edition, Dental Hygienists. Accessed September 25, 2012. http://www.bls.gov/ooh/healthcare/dental-hygienists.htm

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