Burden of Oral Disease in Michigan 2013

ACKNOWLEDGEMENTS

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Michigan Department of Community Health - ***Director James K. Haveman***

Public Health Administration - ***Chief Administrative Officer Melanie Brim***

Bureau of Family, Maternal, and Child Health - ***Director Alethia Carr***

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March 2013

The development of this report was funded from the Centers for Disease Control and Prevention (CDC) by cooperative agreement (CDC DP08-802) between the Michigan Department of Community Health and the Centers for Disease Control and Prevention.

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INTRODUCTION

The mouth is vital to our everyday life. It serves to nourish our bodies as we take in water and nutrients, to communicate our thoughts, our mood, and our dreams, and to distinguish our appearance from others. The key idea of this report is that good oral health means much more than healthy teeth. It means being free of oral-facial pain, oral and throat cancers, oral soft tissue lesions, birth defects such as cleft lip and palate, and scores of other diseases and disorders that affect the dental and craniofacial tissues, collectively known as the *craniofacial complex*. These are the tissues whose dysfunctions we often neglect and yet these tissues represent the very meaning of our humankind. They allows us to speak and smile; sigh and kiss; smell, taste, touch, chew, and swallow; cry out in pain; and convey a world of feelings and emotions through facial expressions. They also provide protection against microbial infections and environmental insults.

Because the mouth is an integral part of human anatomy, oral health is intimately related to the health of the rest of the body. For example, mounting evidence suggests that infections in the mouth such as periodontal (gum) diseases can increase the risk for heart disease, can put pregnant women at greater risk for premature delivery, and can complicate control of blood sugar for people living with diabetes. Conversely, changes in the mouth often are the first signs of problems elsewhere in the body such as infectious diseases, immune disorders, nutritional deficiencies, stroke and cancer. Current research also suggests an association between Alzheimer's disease and periodontal disease.

This report summarizes the current status of oral health in Michigan and establishes a documented burden of disease, disparities in disease and access, and comparisons between Michigan and national data. Where state data deficiencies exist national information is used instead, with each data source having its own limitations. This summary of the oral health disease burden should provide a valuable resource for the public, clinicians, researchers, public health professionals, and policy makers to increase awareness, to guide prevention and treatment efforts, and to enhance the quality of life for Michigan residents.

NATIONAL AND STATE OBJECTIVES ON ORAL HEALTH

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

One component of a national oral health plan is a set of measurable and achievable objectives on key indicators of oral disease burden, oral health promotion, and oral disease prevention. A similar set of indicators was developed in November 2000 as part of *Healthy People 2010,* a document that presents a comprehensive, nationwide health promotion and disease prevention agenda (USDHHS, 2000). It is designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. Included in *Healthy People 2010* are objectives for improving oral health. These objectives represent the ideas and expertise of a diverse range of individuals and organizations concerned about the Nation's oral health. *Healthy People 2020* objectives have been released along with guidance for achieving the new 10-year targets.

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

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

National objectives on oral health such as those in *Healthy People 2020* provide measurable targets for the nation, but most core public health functions of assessment, assurance, and policy development occur at the State level. The tables below summarize the *Healthy People 2010* and *2020* Oral Health Objectives for the Nation and the current status of each indicator for the United States and Michigan.

Healthy People 2010 Oral Health Indicators, Target Levels, and Current Status in the United States and Michigan

	Healthy People 2010 Objective	Target	U.S. Status	Michigan Status
21-1	**Dental caries experience**			
	Young children, ages 2-4	11%	24%	DNA
	Children, ages 6-8	42%	53%	58%
	Adolescents, age 15	51%	56%	DNA
21-2	**Untreated caries**			
	Young children, ages 2-4	9%	19%	DNA
	Children, ages 6-8	21%	29%	25%
	Adolescents, age 15	15%	18%	DNA
	Adults, age 35-44	15%	28%	DNA
21-3	**Adults with no tooth loss, ages 35-44**	42%	38%	66%
21-4	**Edentulous (toothless) older adults, ages 65-74**	20%	24%	17%
21-5	**Periodontal diseases, adults ages 35-44**			
	Gingivitis	41%	48%	DNA
	Destructive periodontal diseases	14%	16%	DNA
3-6	**Oral cancer mortality rates (per 100,000 persons)**	2.7	3.0	2.6
21-6	**Oral cancer detected at earliest stages**	50%	35%	40%
21-7	**Oral cancer exam in past 12 months, age 40+**	20%	13%	DNA
21-8	**Dental sealants**			
	Children, age 8 (1st molars	50%	32%	23%
	Adolescents, age 14 (1st & 2nd molars)	50%	21%	DNA
21-9	**Population served by fluoridated water systems**	75%	69%	91%
21-10	**Dental visit within the past 12 months**			
	Children, age 2+	56%	45%	81%
	Adults, ages 18+	56%	42%	77%
21-11	**Dental visit in past 12 months, adults in long-term care**	25%	31%	DNA
21-12	**Preventive dental care in past 12 months, low-income children and adolescents, age 0-18**	57%	20%	32.9%
21-13	**School-based health centers with oral health component**		DNA	DNA
	Dental sealants (NEW)	15%		
	Dental care (NEW)	11%		
21-14	**Community based health centers and local health departments with oral health component**	75%	70%	38%
21-15	**States with system for recording and referring infants with cleft lip and palate**	100%	32%	No Referral System
21-16	**States with an oral health surveillance system**	100%	DNA	100%
21-17	**State and local dental programs directed by public health professionals (NEW)**	41	51	DNA
	Indian Health Service and Tribal dental programs directed by public health professionals (NEW)	9	10	DNA

NEW indicates revision to the objective from the 2010 Midcourse Review
DNA indicated data not available

Healthy People 2020 Oral Health Indicators, Target Levels, and Current Status in the United States and Michigan

Healthy People 2020 Objective	Target	U.S. Status	MI Status (Yr)
OH-1 **Dental caries experience in primary teeth**			
Young children, ages 3-5	30%	33.3%	DNA
Children, ages 6-9	49%	54.4%	55.9% (2010)
Adolescents, age 13-15	48.3%	53.7%	DNA
OH-2 **Untreated dental decay**			
Young children, ages 3-5 (primary teeth)	21.4%	23.8%	DNA
Children, ages 6-9 (primary and permanent teeth)	25.9%	28.8%	27.1% (2010)
Adolescents, age 13-15 (permanent teeth)	15.3%	17%	DNA
OH-3 **Untreated dental decay**			
Adults, ages 35-44 (overall dental decay)	25%	27.8%	DNA
Adults ages 65-74 (coronal caries)	15.4%	17.1%	DNA
Older adults aged 75 and older (root surface)	34.1%	37.9%	DNA
OH-4 **Permanent tooth extracted because of caries or periodontal disease**			
Adults, ages 45-64	68.8%	76.4%	DNA
Older adults, ages 65-74 (lost all natural teeth)	21.6%	16.9%	13.1% (2010)
OH-5 **Moderate to severe periodontitis, adults ages 45-74**	11.4%	12.7%	DNA
OH-6 **Oral and pharyngeal cancers detected at earliest stage**	35.8%	32.2%	33.2% (2007)
OH-7 **Oral health care system use in the past year by children, adolescents and adults**	49.0%	44.5%	DNA
OH-8 **Low-income children and adolescents who received any preventive dental service during past year**	29.4%	26.7%	32.5% (2008)
OH-9 **School-based health centers (SBHC) with an oral health component**			
Includes dental sealants	26.5%	24.1%	DNA
Oral health component that includes dental care	11.1%	10.1%	DNA
Includes topical fluoride	32.1%	29.2%	DNA
OH-10 **Local Health Departments (LHDs) and Federally Qualified Health Centers (FQHCs) that have an oral health component**			
FQHCs with an oral health component	83%	75%	82.8% (2011)
LHDs with oral health prevention or care programs	28.4%	25.8%	40% (2011)
OH-11 **Patients who receive oral health services at FQHCs each year**	33.3%	17.5%	28.8% (2009)
OH-12 **Dental sealants**			
Children, age 3-5 (primary molars)	1.5%	1.4%	DNA
Children, ages 6-9 (permanent 1st molars)	28.1%	25.5%	26.4 (2010)
Adolescents, ages 13-15 (permanent molars)	21.9%	19.9%	DNA
OH-13 **Population served by optimally fluoridated water systems**	79.6%	72.4%	91% (2011)
OH-14 **Adults who receive preventive interventions in dental offices (*developmental*)**			
Tobacco and smoking cessation information in past year	N/A	N/A	DNA
Oral and pharyngeal cancer screening in past year	N/A	N/A	DNA
OH-15 **States with system for recording and referring infants with cleft lip and palate (*developmental*)**	N/A	N/A	No referral system
OH-16 **Oral and craniofacial health surveillance system**	100%	62.7%	100% (2012)
OH-17 **State and local dental programs directed by public health professionals (PHP)**	25.7%	23.4%	DNA
Indian Health Service and Tribal dental programs directed by PHP	12 Programs	11 Programs	DNA

EXECUTIVE SUMMARY

Reliable and relative information concerning the burden of diseases and risk factors that cause them is a vital contribution to health management and development process. Information that is available on poor oral health and death due to oral cancer within populations in all regions of the world is incomplete and sometimes conflicting. Thus, an agenda for combining, confirming, evaluating and distributing such information in every state is needed to review the significance of diseases and spread of infections due to poor oral health resulting in pre-term low birth weight and loss of health in diverse populations.

In 1948 the World Health Organization defined health as "a complete state of physical, mental, and social well-being, and not just the absence of infirmity." It states that oral health is also an integral component of the general health and needs to be maintained well to lead a healthy life. Oral health and general health are inseparable and should not be interpreted as separate entities. Oral health must be included in the provision of health care and the planning of community programs.

The idiom "the mouth is a mirror of our body" has been used to illustrate the abundance of information that can be derived from examining oral tissues. A careful oral examination can detect signs of nutritional deficiencies as well as a number of systemic diseases including microbial infections, immune disorders, injuries, and some cancers.

This summary is intended to highlight the current oral disease burden in Michigan. The disease burden does not simply include the individuals with disease, but also describes the state's capacity to prevent oral disease and provide care for those affected by oral disease.

FACTS

Epidemiology of Oral Disease

- Early childhood caries (ECC) result when caries (cavities) form in early childhood, resulting in pain, nutrient deficiency, and potential oral surgery. The American Dental Association reported the direct link between cavity-causing bacteria being passed from the primary caregiver who has these bacteria in their mouth to the infant resulting in tooth decay.

- Third grade children who were uninsured, Free and Reduced Lunch Program (FRLP) participants were nearly three times more likely to have immediate dental needs with signs or symptoms of pain, swelling, or infection than privately insured children that did not participate in the FRLP program in 2010. Barriers to dental care were strongly associated with immediate dental needs.

- Most children in Michigan have some form of dental insurance, whether through private insurance (56.5%) or government-based coverage (28.8%). Despite the provision of private dental insurance and government safety net programs, 14.7% of children still lacked dental coverage in Michigan in 2003.

- Tooth loss can impair a person's nutrition, employability, and social functioning. According to the 2008 BRFSS about 68% of Michigan adults aged 35-44 reported they never had a permanent tooth extracted due to decay or gum disease. Not surprisingly, individuals with lower levels of income and education, who were less likely to visit the dentist, were much more likely to report missing permanent teeth. Racial minorities, particularly African Americans were also more likely than Caucasian and Hispanic adults to report having had any permanent teeth extracted.

- Periodontitis is the leading cause of bleeding, pain, infection, and tooth loss among adults, and may increase the risk of cardiovascular disease and premature labor. Gingivitis and periodontitis are most prevalent in American Indians, Mexican Americans, and persons with less education.

- Persons with diabetes are at increased risk for periodontal disease, tooth loss and less likely to visit a dentist. However, in Michigan, the number of adults with diabetes having lost six or more teeth has declined (52% in 1996 to 37% in 2004 to 34.7% in 2008) and the proportion visiting the dentist has increased from 57% in 1996 to 68% in 2004, dropping slightly to 66.8% in 2008.

- There were 11.1 new cases of oral cancer per 100,000 persons from 2002 to 2006 in Michigan, slightly higher than the national rate of 10.6 new cases per 100,000 persons. The mortality rate for oral cancer in Michigan was 2.6 per 100,000 populations for 2004-2008 (MDCH DVRHS 2009).

- Early detection of oral cancer is critical to survival. In Michigan, the 5-year relative survival rate for persons with oral cancer diagnosed at a localized stage is 82.7%. In contrast, the 5-year survival rate is only 54.3% once the cancer has spread to regional lymph nodes at the time of diagnosis. Adults who smoke and drink alcohol excessively are most at risk, but less likely to be seen by a dentist.

Prevention of Oral Disease

- Community water fluoridation, as a public health measure, is very cost effective regardless of socio-economic status (MMWR, 2001). Maintaining optimal levels of fluoride in community water supply systems greatly reduces decay. In Michigan, approximately 7.4 million people received optimally fluoridated water in 2011, representing 89.6% of the population served by public water systems. About every $1 invested in community water fluoridation saves $38 in averted costs. The cost per person of institution and maintaining a water fluoridation program in a community decreases with increasing population size. Water fluoridation is a safe and effective way to reduce dental decay.

- Dental sealants are effective in preventing tooth decay. In Michigan, 26.4% of 3rd grade children had sealants present on first molar teeth (MDCH CYS, 2010), which is close to the Healthy People 2020 goal of 28.1%.

- In 2010, about 72.5% of adults in Michigan reported that they had visited a dentist or dental clinic during the previous year, a much greater percentage than the Healthy People 2010 target of 56%. Adults with less than a high school education or an annual household income less than $20,000 were less frequently visiting the dentist (49.9% and 44.5%, respectively).

- In 2010, only 32.4% of Medicaid eligible children in Michigan received a dental service, less than the 39.7% of children nationally. Children under the age of 5, regardless of insurance, were least likely to have visited the dentist compared to children of older ages. Lack of insurance, affordability, and availability of dentists all contribute to failure to receive needed dental care (MDA, 2010).

Oral Health Workforce

- An adequately trained oral health workforce is critical to the delivery of quality dental care in Michigan. Of Michigan's 83 counties, 11 are not currently designated as a dental HPSA.

- There are 7,538 dentists and 10,174 dental hygienists currently licensed in the Michigan. However, they are distributed disproportionately resulting in a deficiency of providers in primarily rural areas. (Figure 12 & 13).

- 1,659 (22%) of the 7,538 dentists in 2008 had at least one claim for Medicaid, and just 754 (10%) could be considered critical access providers, or having Medicaid claims totaling $10,000 or greater (The equivalent of three to four Medicaid child visits per week).

Access to Oral Health Services

- Adult dental Medicaid was reduced to emergency extractions only in 2003 and reinstated in 2005 to the 2003 fee structure. A budget crises in Michigan in 2009 again limited adult dental Medicaid to emergency services. In October 2010 dental coverage was reinstated to the previous fee structure, no longer limited to only emergency services only.

- In FY2009, 4.9% ($102.2 billion) of health care dollars nationally were spent for dental services. By comparison, in FY2009, Michigan spent 5.3% (3.5 billion) of health care dollars on dental services but just 2.5% of its Medicaid dollars on dental services.

- Persons with developmental and physical disabilities face additional challenges when seeking dental care. The 2007 National Survey of Children's Health reported that 21.7% of children in Michigan had

special health care needs; 64.9% of parents of CSHCN reported that their child had two or more preventive dental visits in the past year. Nationally, only 57.1% of CSHCN had two or more preventive visits in the past year. Adults with disabilities were less likely to visit the dentist and more likely to have lost their teeth (Table 5)

- Michigan's Healthy Kids Dental program has improved access to dental care for Medicaid eligible children. Utilization has continued to increase each year. The program has also increased provider participation in addressing dental needs of low-income children.

THE BURDEN OF ORAL DISEASES

Dental Caries

Dental caries (tooth decay) is a common chronic disease among the general population. Dental caries is a disease in which acids produced by bacteria on the teeth lead to loss of minerals from the enamel and dentin, the hard substances of teeth. If the infection goes untreated, the infection can lead to severe pain, dental abscesses, loss of tooth structure, increased emergency room visits, mouth odor (halitosis), missed days at school and work, have negative effects on an individuals' self-esteem, and low employability.

Early Childhood

The prevalence of decay in children is measured through the assessment of caries experience (if they have ever had decay and now have fillings), untreated decay (active unfilled cavities), the loss of first permanent molars due to caries, and urgent care (reported pain or a significant dental infection that requires immediate care).

Early Childhood Caries (ECC) occurs in young children between birth and 71 months of age (typically infants, toddlers and preschool aged) when cavities develop in the primary (baby) teeth. The very first sign of ECC are "white spot lesions," which normally occur along the gum line of the primary teeth. This can occur on the insides as well as the outsides of the teeth. A parent or caregiver should be "lifting the lip" to look for this early sign of demineralization of the enamel.

Typical culprits in the development of ECC include passing harmful bacteria from the mother or caregiver with dental infection to the infant, a lack of parental education about the oral needs of the child, and inappropriate use of baby bottles and/or training (sippy) cups. Inappropriate use is characterized by bottle feeding with juice or soda, or providing a bottle for overnight use that contains any liquid other than water, including formula, milk and sugary beverages. Around the age of 6 months the baby's first tooth will appear making the child susceptible to decay.

Repeated inappropriate bottle and sippy cup use can eventually lead to an early onset of rampant caries. Severe ECC requires extensive dental work, including hospital inpatient stays, multiple tooth extractions, and anesthesia. The best way to avoid ECC is by cleaning the child's gums immediately after bottle feeding. As soon as teeth begin to appear start brushing in addition to the gums twice daily using an age-appropriate sized toothbrush. ECC not only cause pain and infection; they can affect several necessary human functions such as eating, speaking, sleeping, and learning. In addition, ECC can be costly, often resulting in restorative treatment in an operating room under general anesthesia. ECC disproportionately affects children and occurs more often among those who qualify for Medicaid. Muskegon County Health Department reported their county spends on average $3,605 per case on ECC (Balcom, 2009).

While the immediate effects of ECC can be devastating, long-term effects can be equally damaging. If these primary teeth, which help guide permanent teeth into place, have been lost due to decay, then it can impact how the permanent teeth establish themselves within the mouth. Other factors like, thumb sucking and early loss of primary teeth can result in improper alignment of permanent teeth resulting in caries, inappropriate speech, poor nutrition and poor self-esteem.

Children and Adolescents

The 2007 National Survey of Children's Health indicated that nearly 1 in 5 US children (17.5%) ages 1-17 years had an oral health problem in the last 6 months. Nationally, dental caries is the most common chronic disease among children age 6-11 years (25%) and adolescents aged 12-19 years (59%). It is four times more common than asthma among adolescents aged 14-17 years (15%) (CDC, 2009). The longer a child goes with an untreated cavity, the larger the cavity will grow, resulting in damage to permanent teeth, higher dental costs, loss of teeth and often pain.

The percent of children with excellent or very good oral health in Michigan was at 73.3% compared to nationally 70.7%. Over half of third grade children in Michigan (55.9%) had experienced tooth decay according to Count Your Smiles (CYS) 2010, a basic screening survey of third grade children. Prevalence of caries experience and untreated decay was high in the Upper Peninsula and Northern Lower Peninsula. Hispanic and Native American children, children not covered by private dental insurance, and Free and Reduced Lunch Program participants all experienced caries more often. Children who participated in Free and Reduced Lunch Programs experienced higher caries prevalence in each geographic region. The resulting disparity varied in magnitude between the different regions (Figure 1).

Figure 1: Proportion of Michigan Third Grade Children with Caries Experience, by Free and Reduced Lunch Program Participation and Geographic Region, Count Your Smiles 2009-10

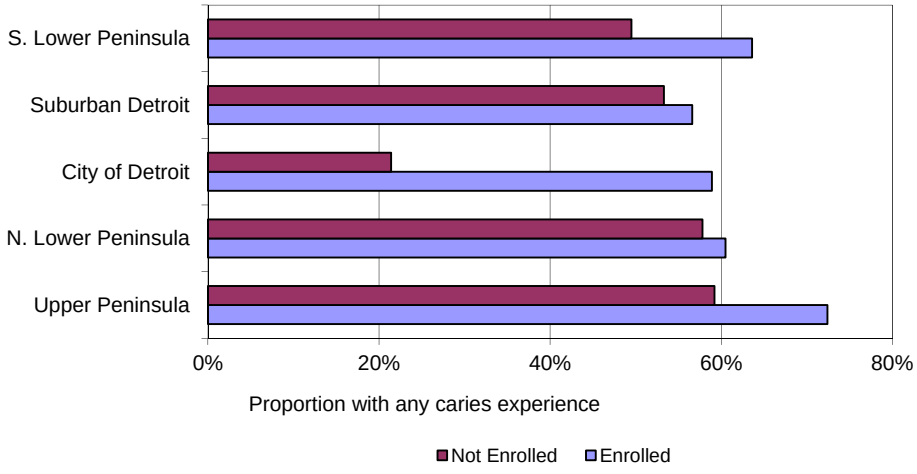
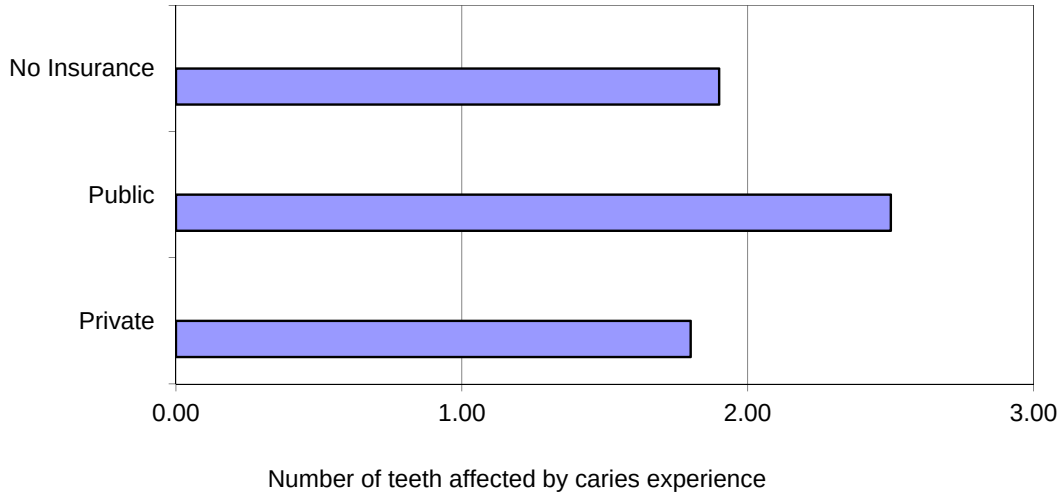


Figure 2: Average Number of Teeth Affected by Caries Experience among Michigan Third Grade Children with any Caries Experience, by Type of Dental Insurance, 2009-10

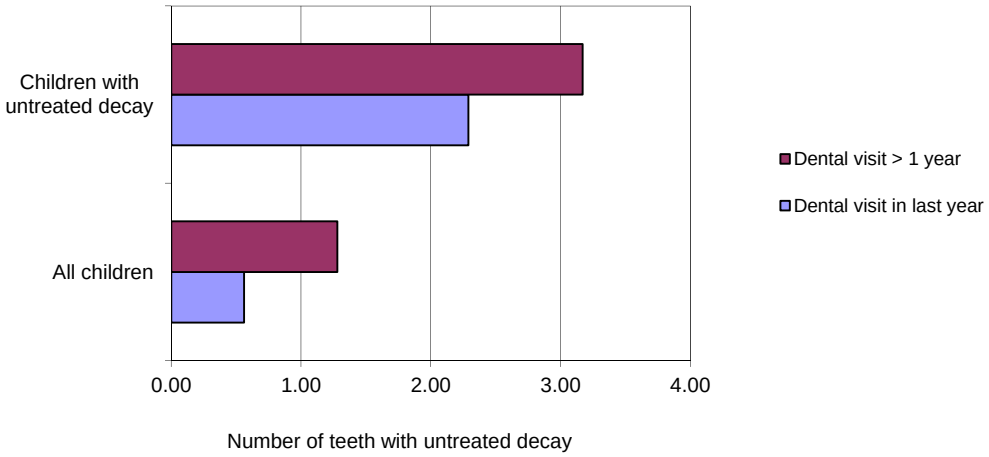


Approximately one in four third grade children in Michigan (27.1%) had untreated dental disease (CYS, 2010). Untreated dental disease refers to caries experience (a cavity) that is visible, but has not been filled or treated. Prevalence of untreated dental disease was highest in the Detroit area (41.9%). A higher prevalence of African American, Arab, and Hispanic school children had untreated dental disease compared to white children. One in three children who lacked private dental insurance had untreated dental disease compared to one in six children with private insurance. Children with untreated dental decay averaged 2.5 untreated teeth. Among children with untreated primary tooth decay, 2.3 primary teeth were untreated on average. Among children with untreated permanent tooth decay, 1.5 permanent teeth were untreated on average. Children who had visited the dentist in the past year had substantially less untreated decay than children who had not (Figure 3).

"For the numerous children in Michigan who count on MIChild as their health lifeline and for the 142,000 uninsured children in the state, support for continuing and expanding CHIP (Children's Health Insurance Program) is critically important," said Ron Pollack, Executive Director of Families USA. "It will determine whether children get the preventive care they need so that they can remain healthy, learn in school, and become productive citizens" (Families USA, 2008).

Count Your Smiles 2010 revealed that nearly one in fourteen (7.0%) Michigan children were in need of immediate dental care for signs or symptoms of pain, infection, or swelling. The need for routine dental care was found in 28.1% of children while 64.9% of children had no obvious dental problems.

Figure 3: Average Number of Teeth with Untreated Decay among Michigan 3rd Grade Children with Untreated Decay and All Michigan Third Grade Children, by Occurrence of a Dental Visit in the Past Year, 2009-10



Recent observations suggest that severe dental conditions similar to ECC occur in teenagers, which is known as rampant caries. However, due to the severe deterioration of the permanent teeth, this condition has more extreme consequences over a lifetime. Rampant caries is often the result of frequent consumption of sugar-laden beverages such as fruit juices, sodas, sports drinks, and high energy drinks. Resulting decay can present immediately, but the full impact may not be evident until early adulthood. Thus, limiting availability and exposure to sugar-laden beverages during adolescence will assist with the prevention of rampant caries, in adolescence and adulthood.

Patients with body piercing in the oral cavity may be at increased risk of developing considerable periodontal attachment loss involving their teeth. Damage from oral jewelry is seen with chipping of the enamel, cuspal fractures and deep-seated cracks extending to the pulp. DeMoor and colleagues stated that 80% of patients with tongue piercing had some structure loss (Brooks et al., 2003).

Adults

People are susceptible to dental caries (decay) throughout their lifetime. Like children and adolescents, adults also experience decay on the crown (enamel covered) portion of the tooth. However, adults may also develop caries on the root surfaces of teeth as those surfaces become exposed to bacteria and carbohydrates as a result of gum recession. 85% of U.S. adults had at least one tooth with decay or a filling on the crown (CDC, 2009). It is important to develop strategies for preventing and controlling dental caries in older adults as the population continues to live longer and retain more teeth. The natural aging process can lead to root surfaces becoming more exposed and an increased risk for tooth decay.

The Elderly

Oral diseases in the elderly have been shown to affect quality of life. Research has noted links between oral health, general health and wellbeing. However, oral health is often neglected among older adults. A 1987 Michigan study noted that 51% of adults had not seen a dentist in more than a year which has since then decreased to 27.5% in 2010, however barriers remain existent. Barriers preventing care include affordability, lack of dental insurance, and fear of visiting a dentist. Barriers to care in long-term care facilities include shortage of dentists who will provide services to clients in the facility, lack of dental insurance, and the high cost of dentistry. According to the 2009 Geriatric Survey from the Michigan Department of Community Health Oral Health Program and the Coalition for Oral Health for the Aging (COHA), transportation is the biggest barrier for access to care. Over half of vulnerable elderly patients (56.6%) were not covered by insurance that

paid or partially paid for dental services, 31.2% were covered by private insurance and 12.2% were covered by public assistance.

Nationally, only 8.0% of dentists accept Medicaid. Root canals and intravenous anesthesia are not routinely covered forcing the dentist to treat the patient with a less desirable treatment plan (extracting the tooth rather than restorative treatment) (Area Agency on Aging 1-B, 2000).

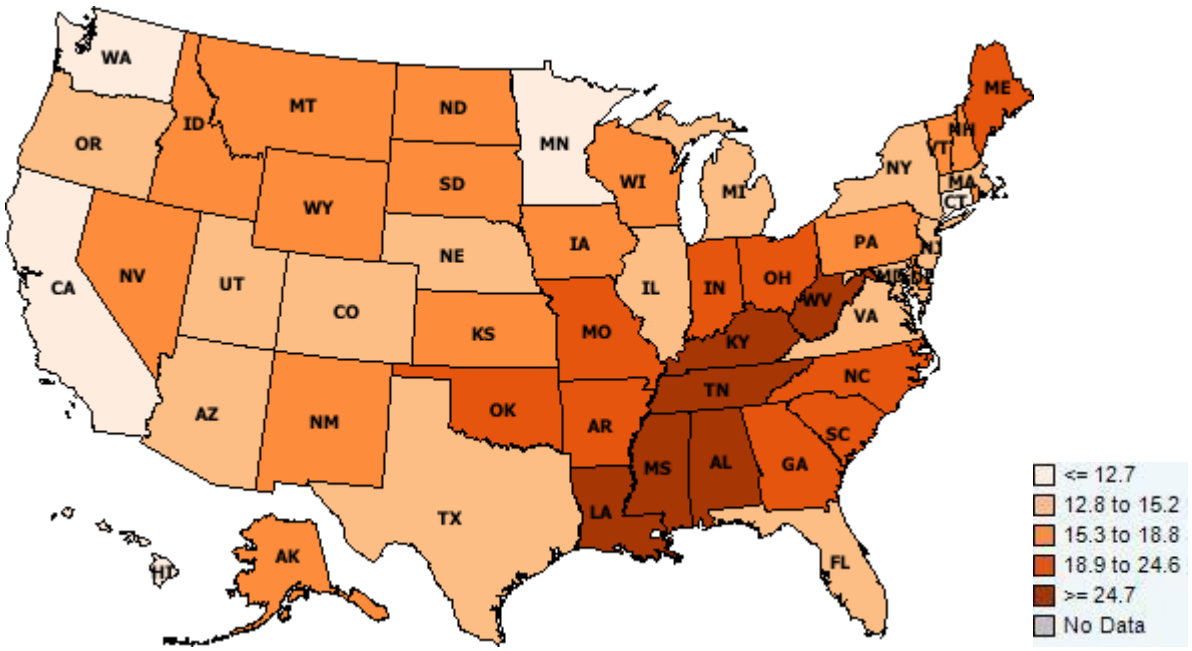
Tooth Loss

A full dentition is defined as having 28 natural teeth; this is excluding the third molars (wisdom teeth). Most persons can keep their teeth for life with adequate personal, professional, and population-based preventive practices.

As teeth are lost, a person's ability to chew and speak decreases and interference with social functioning can occur. The most common reasons for tooth loss in adults are tooth decay and periodontal (gum) disease. Tooth loss can also result from infection, unintentional injury, and head and neck cancer treatment. In addition, certain orthodontic and prosthetic services sometimes require the removal of teeth.

As of 2010, over 13% of Michigan adults, 65 years of age and older, reported having all of their natural teeth extracted. As can be seen in Figure 4, the prevalence is higher in other states across the United States.

Figure 4: Percent who have had all of their Natural Teeth Extracted, United States, CDC BRFSS 2010



Despite an overall trend toward a reduction in tooth loss in the U.S. population, not all groups have benefited to the same extent. African Americans are more likely than whites to have tooth loss. Among all predisposing and enabling factors, low educational level often has been found to have the strongest and most consistent association with tooth loss (Table 1).

Table 1: Age 65+ Lost All Natural Teeth, 2010 BRFS		
	Michigan (%)	**United States (%)**
Healthy People 2010 Target	21.6%	21.6%
Total	13.1	16.9
By Race/Ethnicity		
White	12.0	16.2
Black	21.0	24.5
Hispanic	DNA	14.3
Other	DNA	13.2
Multi-Racial	DNA	20.7
By Sex		
Female	14.2	18.1
Male	11.7	15.4
By Education Level		
Less than high school	31.4	38.4
H.S. or G.E.D.	15.7	21.5
Some post H.S.	12.3	13.3
College graduate	3.4	5.5

DNA = Data Not Available

According to the 2010 MI BRFSS, 31.7% of Michigan adults age 35-44 years have lost at least one tooth due to caries, infection, or periodontal disease and 13.1% of Michigan adults age 65-74 years have lost all their teeth, or are edentulous. The individuals at most risk are those of lower educational levels and those of racial minorities, particularly African Americans.

As shown in Figure 4, Michigan compares favorably to the nation as a whole with only 13.1% of residents having all natural teeth extracted. However, residents in the city of Detroit suffer a greater burden of adult tooth loss (Tables 2 and 3). Detroit adults were more likely to have lost teeth, and those at older ages were more likely to be edentulous. Detroit adults were also less likely to have visited a dentist in the past year compared to other adults in Michigan.

Table 2: Detroit vs. State of Michigan 2010 Michigan BRFS		
	Detroit % (95%CI)	**Michigan % (95%CI)**
Adults age 65+ who have lost all their natural teeth	22.0% (17.6-27.2)	13.1% (11.9-14.5)
Adults that have had any permanent teeth extracted	46.8% (41.2-52.4)	29.2% (27.7-30.7)
Visited the dentist or dental clinic within the past year	56.4% (51.0-61.6)	72.5% (71.1-73.8)

Table 3: Proportion of Adults, 18-74, who have Lost Less than 6 Teeth and Proportion of Adults that have 6+ Teeth, by Selected Demographic Characteristics, Michigan Vs. Detroit, MIBRFSS 2006, 2008, and 2010 Combined				
	<6 Teeth Missing		6+ Teeth Missing	
	Michigan % (95%CI)	Detroit % (95%CI)	Michigan % (95%CI)	Detroit % (95%CI)
Total	88.3% (87.8-88.8)	80.3% (78.0-82.4)	11.7% (11.2-12.2)	19.7% (17.6-22.0)
By Race/Ethnicity				
White non-Hispanic	89.3% (88.8-89.8)	80.5% (71.8-87.0)	10.7% (10.2-11.2)	19.5% (13.0-28.2)
Black non-Hispanic	82.5% (80.7-84.2)	79.4% (76.7-81.8)	17.5% (15.8-19.3)	20.6% (18.2-23.3)
By Gender				
Female	87.7% (87.1-88.3)	76.2% (73.2-79.0)	12.3% (11.7-12.9)	23.8% (21.0-26.8)
Male	89.0% (88.2-89.7)	85.0% (81.2-88.1)	11.0% (10.3-11.8)	15.0% (11.9-18.8)
By Age Group				
18-24	99.5% (98.8-99.8)	99.3% (95.2-99.9)	0.5% (0.2-1.2)	0.7% (0.1-4.8)
25-34	98.2% (97.4-98.7)	98.6% (95.7-99.6)	1.8% (1.3-2.6)	1.4% (0.4-4.3)
35-44	94.2% (93.1-95.2)	93.2% (89.2-95.7)	5.8% (4.8-6.9)	6.8% (4.3-10.8)
45-54	87.0% (85.9-88.1)	71.2% (65.0-76.7)	13.0% (11.9-14.1)	28.8% (23.3-35.0)
55-64	76.5% (75.2-77.8)	53.5% (47.8-59.1)	23.5% (22.2-24.8)	46.5% (40.9-52.2)
65-74	64.3% (62.6-66.1)	41.5% (34.4-49.0)	35.7% (33.9-37.4)	58.5% (51.0-65.6)
By Education Level				
Less than high school	71.1% (67.8-74.2)	72.6% (64.7-79.3)	28.9% (25.8-32.2)	27.4% (20.7-35.3)
High school graduate	82.9% (81.8-83.9)	79.6% (75.2-83.3)	17.1% (16.1-18.2)	20.4% (16.7-24.8)
Some college	89.2% (88.3-90.1)	80.7% (76.4-84.5)	10.8% (9.9-11.7)	19.3% (15.5-23.6)
College graduate	95.5% (95.0-96.0)	85.0% (80.8-88.4)	4.5% (4.0-5.0)	15.0% (11.6-19.2)

Periodontal (Gum) Disease

Gum disease in its earliest stages is known as gingivitis. Gingivitis is characterized by localized inflammation, swollen, and bleeding gums without loss of the bone that supports the teeth and is often caused by inadequate oral hygiene. The longer plaque and calculus (tarter) are on the teeth, the more harmful they become. Gingivitis can be reversed with professional dental treatment and good oral home care. Without removal of dental plaque from the teeth on a daily basis, gingivitis can advance to destructive periodontal disease.

Periodontitis (destructive periodontal disease) is an advanced form of gum disease in which the tissues and bone that support the teeth are damaged by extensive plaque buildup. If left untreated, this condition may lead to gradual tooth loss. About 80% of American adults currently have some form of the disease. Among adults, periodontitis is a leading cause of gingival bleeding, halitosis (bad breath), pain, infection, loose teeth, and tooth loss.

Cases of gingivitis likely will remain a substantial problem and may increase as tooth loss from dental caries declines or as a result of other illnesses and the use of some systemic medications. Smoking, hormonal changes in women, diabetes, stress, medications, illnesses, and genetic susceptibility can make periodontal disease worse. Men are more likely to have periodontal disease than women. Although not all cases of gingivitis progress to periodontal disease, all periodontal disease starts as gingivitis. The major method available to prevent destructive periodontitis, therefore, is to prevent the precursor condition of gingivitis and its progression to periodontitis.

Evidence shows that oral health is essential to overall health, particularly in gum disease within pregnant women. Women considering pregnancy or who are pregnant should have access to routine dental care. According to the American Academy of Periodontology, pregnant women with periodontal disease may be seven times more likely to deliver a pre-mature baby with low birth weight. Periodontal disease has also been implicated as a risk factor for heart attack or stroke. Preeclampsia is a hypertensive disorder that affects between five and eight percent of all pregnancies, and usually occurs during the late part of the second or early part of the third trimester. A study published in the February 2010 issue of the Journal of Periodontology verified a positive association between periodontitis and an increased risk of developing preeclampsia (pregnancy complication) (Horton et al., 2010).

Oral Cancer

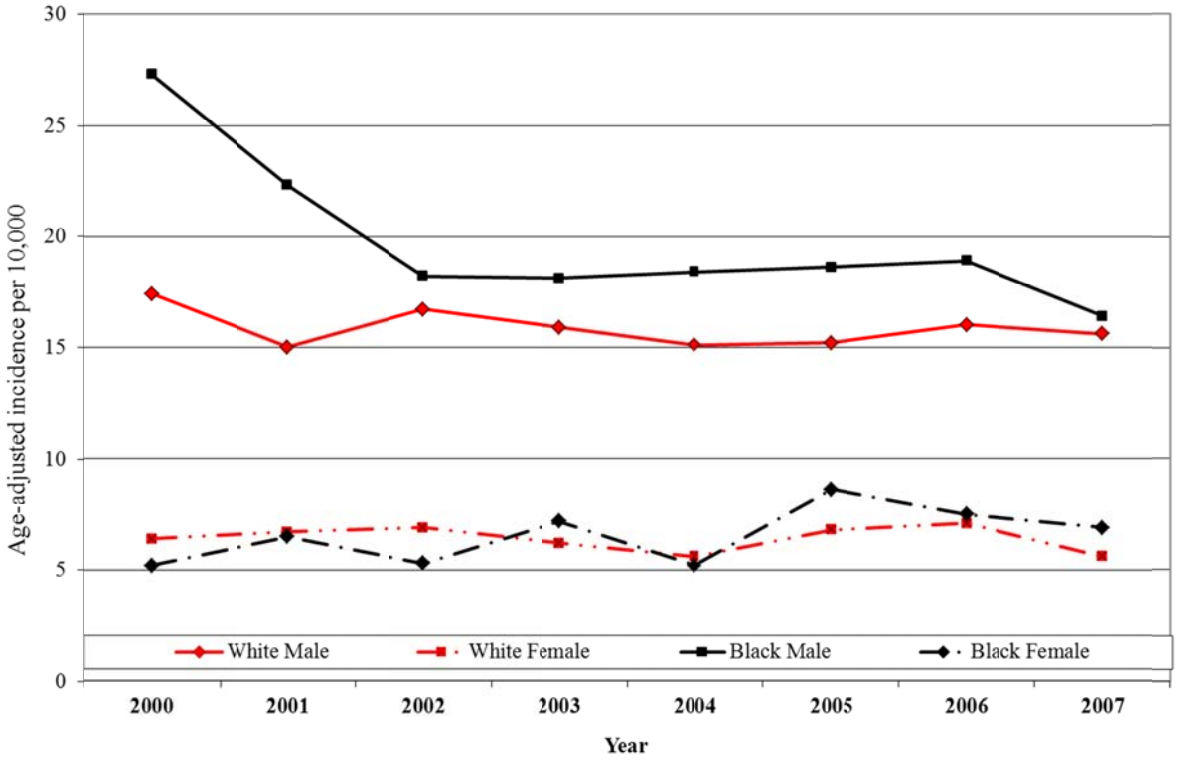
Cancer of the oral cavity or pharynx (oral cancer) is the fourth most common cancer among black/African American males and the seventh most common cancer among white males in the United States. The incidence rate of oral cancer is comparable to those for cervical, stomach, and uterine cancer. An estimated 23,110 new cases of oral cancer and 5,370 deaths from these cancers occurred in the United States in 2009. From 2002-2006, the national age-adjusted incidence rate was 10.4 per 100,000 people. Nearly 96% of cases of oral cancer in the United States occur among persons aged 45 years and older with the median age at death being 68 years old (Horner et al., 2009).

Cigarette smoking and alcohol are the major known risk factors for oral cancer in the United States. Using other forms of tobacco, including smokeless tobacco (USDHHS, 1986; IARC, 2005) and cigars (NCI, 1998) also increases the risk for oral cancer. Dietary factors, particularly low consumption of fruit, and some types of viral infections also have also been implicated as risk factors (McLaughlin et al., 1988; De Stefani et al., 1999; Levi, 1999; Morse et al., 2000; Phelan, 2003; Herrero, 2003). In addition, radiation from sun exposure is a risk factor for lip cancer (Silverman et al., 1998).

A recent study focused on the association of Human Papilloma Virus (HPV) with certain types of oral cancer. In 25% of 253 patients diagnosed with head and neck cancers, the tissue taken from tumors was tested positive for HPV. Of those that tested positive, HPV strain 16 was present in 90% of the tissues (Johns Hopkins Medical Institutions, 2010). CDC states HPV DNA was found in 2%-38% of all oral cancers and in 12%-93% of oropharyngeal cancers.

In 2007, 1,138 Michigan residents were diagnosed with oral cancer and the age-adjusted incidence rate was 10.4 per 100,000. Michigan ranked 18th worst out of all 50 states for statewide oral cancer incidence in 2007. Although oral cancer incidence rates have been decreasing nationally and in Michigan for the past thirty years, it occurs disproportionately in differing categories of gender, age, race and geographic location. The Michigan Cancer Surveillance Program and the Metropolitan Detroit Surveillance System reported 47% of new (incident) cases of invasive oral cancer in adults between 1991 and 2000 occurring in Metropolitan Detroit. In 2007, Michigan males (15.8, CI: 14.7-16.9) had a significantly higher oral cancer incidence compared to females (5.9, CI 5.3-6.5). Figure 5 displays higher oral cancer incidence rates in black males compared to white males and females as well as black females in Michigan from 2000-2007.

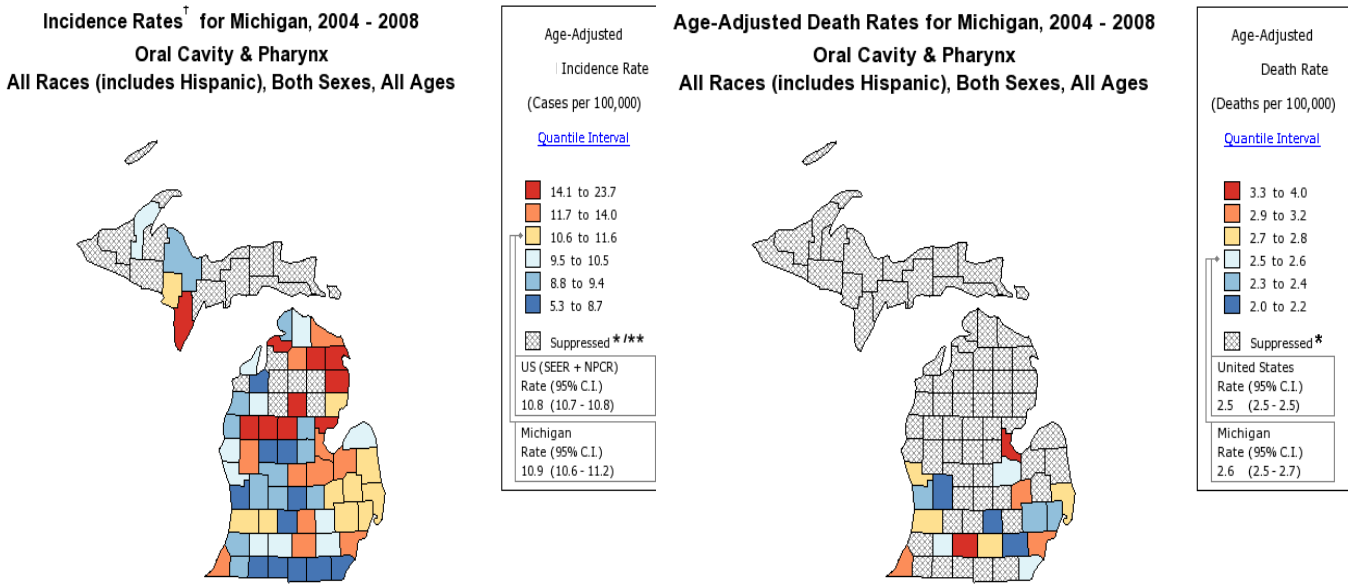
Figure 5. Oral Cancer Incidence by Race and Gender, Michigan, 2000-2007



Source: http://statecancerprofiles.cancer.gov/

Oral cancer accounts for 3% of all cancer deaths in the United States. In 2007, the oral cancer mortality rate in Michigan was 2.8 per 100,000 which was 36th worst out of 49 states. A total of 311 Michigan residents died due to oral cancer in 2007. Despite a steady improvement in cancer survival rates since 1975, survival rates have continued to be significantly lower for black men and women, nationally. The mortality rate for whites (2.7 per 100,000, CI: 2.4-3.0) was considerably lower than for blacks (4.2 per 100,000, CI: 3.1-5.6).

Figure 6: Incidence and age-adjusted rates for Michigan, 2004-2008, oral and pharynx cancer



* Source: National Cancer Institute: State Cancer Profiles
**Data was suppressed for counties with less than 16 oral cancer cases to ensure confidentiality and stability of rate estimates

Survival rates for oral cancer have not improved substantially over the past 25 years, despite significant progress in cancer treatments for other forms of cancer. More than 61% of persons diagnosed with oral cancer die within five years of diagnosis (Horner, et al., 2009), although survival varies widely by stage of disease when diagnosed. Early detection and treatment is crucial for improving survival. The five-year relative survival rate for persons with oral cancer diagnosed at the earliest stage is 81%. In contrast, the five-year survival rate is only 22% at an advanced stage. In Michigan, only 32.9% of those diagnosed with oral cancer were at the earliest recordable stage in 2007.

Data from the 1998 National Health Interview Survey showed that only 20.1% of adults had ever received an oral cancer exam. In addition, blacks, Hispanics, and patients with low educational attainment were considerably less likely to have had such an examination. Lack of patient awareness and access to dental care have been major contributors to failing to obtain an oral cancer screening.

Based on available evidence that early diagnosis of oral cancer improves its prognosis, several *Healthy People 2020* objectives specifically address early detection of cancer:

> Objective OH-6: Increase the proportion of oral and pharyngeal cancers detected at the earliest stage.
>
> Objective 21-7: Increase the proportion of adults who received an oral and pharyngeal cancer screening from a dentist of dental hygienist in the past year.

Disparities

Oral health status along with general health tends to vary in United States on the basis of sociodemographic factors. Some social factors that can contribute to these differences are lifestyle behaviors such as tobacco use, frequency of alcohol use, and poor dietary choices. Just like they affect general health, these behaviors can affect oral health. The economic factors that often relate to poor oral health include access to health services and an individual's ability to attain and keep dental insurance. Several national surveys show that the proportion of the U.S. population that annually makes at least one dental visit and the average number of visits made vary

significantly by age, race, dental status, level of education, and family income. The Centers for Disease Control and Prevention indicated some of the following oral health disparities in the United States:

- **Overall.** Non-Hispanic blacks, Hispanics, and American Indians and Alaska Natives generally have the poorest oral health of any racial and ethnic groups in the United States.
- **Children and Tooth Decay.** The greatest racial and ethnic disparity among children aged 2–4 years and aged 6–8 years is seen in Mexican American and black, non-Hispanic children.
- **Adults and Untreated Tooth Decay.** Blacks, non-Hispanics, and Mexican Americans aged 35–44 years experience untreated tooth decay nearly twice as much as white, non-Hispanics.
- **Tooth Decay and Education.** Adults aged 35–44 years with less than a high school education experience untreated tooth decay nearly three times that of adults with at least some college education.
    - In addition, adults aged 35–44 years with less than a high school education experience destructive periodontal (gum) disease nearly three times that of adults with a least some college education.
- **Adults and Oral Cancer.** The 5–year survival rate is lower for oral pharyngeal (throat) cancers among black men than whites (36% versus 61%).

Racial and Ethnic Groups

Although there have been gains in oral health status for the population as a whole, they have not been evenly distributed across subpopulations. Non-Hispanic blacks, Hispanics, and American Indians and Alaska Natives generally have the poorest oral health of any racial and ethnic groups in the U.S. population. As reported above, these groups tend to be more likely than non-Hispanic whites to experience dental caries, are less likely to have received treatment for it, and have more extensive tooth loss. African-American adults in each age group are more likely than other race/ethnic groups to have gum disease. Compared to white Americans, African Americans are more likely to develop oral or pharyngeal cancer and are diagnosed at later stages, resulting in a worse 5-year survival rate.

Racial disparities concerning oral health status in Michigan mimic national statistics. Black non-Hispanics are more likely to have tooth loss and to experience edentulism than whites. African American males have the highest oral cancer incidence and mortality rate. African Americans are also less likely to have visited the dentist in the past year, have their teeth cleaned in the past year, and to have sealants on their first molars compared to whites.

Special Populations

Pregnant Women

Most pregnant women in America don't see their dentists for important oral health care as often as recommended. **It is estimated that** children of mothers with untreated decay **have four times the risk of decay compared with children of mothers without untreated decay.** In some studies, an association was found in pregnant women between gum disease and having a low-weight or pre-term babies who are at risk for many serious diseases including chronic lung disease, brain injury, motor and sensory impairment, learning difficulties, and behavioral problems. Delta Dental commissioned the Children's Oral Health Survey to build greater knowledge about the state of children's oral health as the oral health of baby has a direct effect through the vertical transmission/colonization of the *S.mutans* from mother. The results suggest that caregivers recognize the importance of oral health care for infants, but don't always understand the techniques that promote oral health.

A survey conducted in the summer of 2009 on behalf of Delta Dental Plans Association found that 25% of pregnant women had not seen the dentist at all during pregnancy and 38% visited the dentist just once. According to the American Academy of Periodontology, approximately 50% of women get "pregnancy gingivitis," a disease that makes the gums sore and swollen. Pregnancy gingivitis usually starts around the second month of pregnancy and decreases during the ninth month. If the mother already had **gingivitis** prior to pregnancy, it will most likely **get worse during pregnancy,** especially without treatment.

During pregnancy, a woman may be particularly amenable to disease prevention and health promotion interventions that could enhance her own health or that of her infant (Gaffield et al., 2001).
In 2009, 41.6% (95% CI: 38.8-44.5) of Michigan women did not have their teeth cleaned during the twelve months before their pregnancy (PRAMS, 2009). One in four (27.0%; 95% CI: 24.5-29.7) Michigan women who delivered a live birth in 2008 reported a need for dental care. A large proportion (38.5%; 95% CI: 33.2-44.1) of the pregnant women with a dental need did not seek care. Less than half of pregnant women reported being counseled about how to care for their teeth and gums during pregnancy (PRAMS, 2009). Nearly one in four pregnant women in 2004 was uninsured for dental services (Brooks et al 2007).

Since cariogenic bacteria (especially *mutans streptococci*) are transmitted soon after an infant's first teeth erupt, decreasing the mother's *mutans* levels may decrease the child's risk of developing ECC. The American Dental Association recommends that parents, including expectant parents, visit a dentist to ensure their own oral health. Needed treatment can be provided throughout the pregnancy; the **ideal period** of dental treatment/visit for a pregnant woman is the **second trimester** which includes the 14th to the 20th week of pregnancy. By this period the baby's organs have formed, reducing the risk of exposure to harmful agents, minimizing the occurrence of malformed organs.

Women's Health

Most oral diseases and conditions are complex and represent the product of interactions between genetic, socioeconomic, behavioral, environmental, and general health influences. Multiple factors may act together to place some women at higher risk for oral diseases. For example, the comparative longevity of women, compromised physical status over time, and the combined effects of multiple chronic conditions often with multiple medications, can result in increased risk of oral disease (Redford, 1993). Many women live in poverty, are not insured, and are the sole head of their household. For these women, obtaining needed oral health care may be difficult. In addition, gender-role expectations of women may affect their interaction with dental care providers and could affect treatment recommendations as well.

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

Women in Michigan have tooth loss rates similar to men (Table 3). Furthermore, women in Michigan have been shown to have lower oral cancer incidence and mortality rates than men.

Special Health Care Needs

The oral health needs of individuals with disabilities are complex. These needs may be due to underlying congenital anomalies as well as the inability to receive the personal and professional health care needed to maintain oral health. There are more than 41.2 million individuals nationally defined as disabled under the Americans with Disabilities Act, including 6% of children 5 to 15 years, 12% of people 16 to 64 years, and 41% of adults 65 years and older (U.S. Census Bureau, 2009).

People with disabilities frequently have serious dental problems and have difficulty accessing dental services. For persons with disabilities and medically compromised individuals, regular dental care is vital to health and function.

The Oral Health Needs Survey in 2009 reported approximately 11.9% of the population between the ages 15-59 years and 38.2% of the population 65 years and older had at least one form of disability. The survey demonstrated a strong need for dental professionals across the state of Michigan to undertake treatments for persons with disabilities. Only 3.9% of dentists that participated in the survey accepted all of the following four insurances: Medicaid, Healthy Kids Dental, MI Child, and a sliding scale payment plan.

People with Disabilities

According to the 2010 MiBRFS, disabled adults were more likely to be missing six or more teeth (28.1%) than adults without disabilities (9.1%). Disabled adults were also less likely to have visited a dentist or have had a teeth cleaning in the past year than non-disabled adults (Table 5). Data from the 2008 MiBRFS show that those without a disability were more likely to have dental insurance than those who had a disability. Data from the 2010 survey found that disabled patients were less likely to have accessed dental care in the past 12 months due to cost (Table 4).

Table 4: No Access to Oral Health Care due to Cost According to Disability, 2010 Michigan BRFS

	No Dental Care Access During Past 12 Months Due to Cost % (95%CI)
With Disabilities	21.5% (17.6-25.8)
Without Disabilities	10.3% (8.4-12.5)

Table 5: Oral Health by Disability Status, 2010 Michigan BRFS

	No dental Visit in Past Year (%, 95%CI)	**No Teeth Cleaning in Past Year (%, 95%CI)**	**6+ Teeth Missing (%, 95%CI)**
With Disabilities	35.4% (32.9-38.1)	37.4% (34.6-40.2)	28.1% (25.9-30.4)
Without Disabilities	25.0% (23.4-26.6)	26.7% (25.0-28.4)	9.1% (8.4-9.9)

Adult Long-term Care

Preliminary findings from survey of nursing home facilities and alternative long-term care (ALTC) facilities such as assisted living facilities found that willingness of general dentists to treat residents at an alternative long-term facility was the greatest barrier to dental care for its residents. Nursing home facilities identified treatment at a dental office, treatment by specialty dentists and financial concerns as important barriers facing their residents (Smith, 2006).

Socioeconomic Disparities

Low-income families bear a disproportionate burden of oral diseases and conditions. Despite progress in reducing dental caries in the United States, individuals in families living below the poverty level experience more dental decay than those who are economically better off. Furthermore, the caries seen in these individuals are more likely to be untreated than caries in those living above the poverty level.

The US National Health and Nutrition Examination Survey 1999-2004 indicated that among youths ages 2-11 years had an average of 1.6 decayed primary teeth, with severe decay occurring in the black and Hispanic subgroups and among those with lower incomes. Poor adolescents aged 12-17 years in each racial/ethnic group had a higher percentage of untreated decayed permanent teeth than the corresponding non-poor adolescent group (Dye et al, 2007).

Adult populations show a similar pattern, with the proportion of untreated decayed teeth higher among the poor than the non-poor. At every age, a higher proportion of those at the lowest income level have periodontitis than those at higher income levels. Adults with some college (15%) had 2 to 2.5 times less destructive periodontal disease than those with high school (28%) and with less than a high school (35%) education (USDHHS, 2000). Overall, a higher percentage of Americans living below the poverty level were edentulous (had lost all their natural teeth) compared to those living above (USDHHS, 2000). Among persons aged 65 years and older, 31% of persons with less than a high school education were edentulous in 2010, compared with 12% of persons with some college education (Table 1). People living in rural areas also had a higher disease burden primarily due to difficulties in accessing preventive and treatment services.

People of low socioeconomic status in Michigan bear similar oral health burdens compared to their national counterparts. Those in poverty were less likely to have visited a dentist in the past year or have had their teeth cleaned. Those with a high school educations or lower were also less likely to visit a dentist either for treatment or preventive services. For those at low-income and low-education levels, tooth loss occurs at much higher rates. The 2010 BRFSS reported that 55.5% (95% CI: 51.4-59.5) of individuals with household incomes below $20,000 had not visited a dentist in the previous year. In contrast, only 18.5% (95% CI: 15.4-22.0) and 12.0% (95%CI 10.1-14.1) of individuals with household incomes between $50,000 -$74,999 and $75,000+, respectively, had not visit the dentist within the previous year.

Children participating with the Free and Reduced Lunch Programs (FRLP) within Michigan Schools had higher rates of caries experience, untreated dental disease, immediate dental needs, signs or symptoms of pain, swelling, or infection, and toothaches when biting or chewing in the past six months. Children enrolled in the FRLP also had fewer annual dental visits, encountered barriers to receiving dental care more often, and were less likely to have sealants placed on first molar teeth (CYS, 2006).

Oral Health Related to Systemic Health

"You are not a healthy person unless you have good oral health. Oral health is part of general health and it can affect your overall health and your quality of life*" Surgeon General C. Everett Koop 2000.*

It's been recognized that oral infections, especially periodontitis, may affect the course and development in a wide range of systemic diseases such as cardiovascular disease, stroke, bacterial pneumonia, diabetes mellitus, and low birth weight. Periodontitis as a major oral infection may affect host's susceptibility to systemic disease in three ways: shared risk factors; sub-gingival biofilms acting as reservoirs for bacteria; and the periodontium acting as a reservoir of inflammatory mediators. This may result in metastatic spread of infection through bacteremia (presence of bacteria in bloodstream) causing secondary systemic effects in favorable conditions (Li et al, 2000).

Diabetes and Oral Health

People with diabetes are at an increased risk for periodontal disease. It is crucial for them to keep their blood glucose under control. When they experience high glucose levels, blood vessels in the mouth can narrow causing the blood supply to lower in the gums increasing their chances of having problems with their teeth and gums.

Diabetes can aggravate gingival inflammation and periodontal disease, furthering the damage and destruction caused by infectious processes on the teeth and gums. As a result, type 2 diabetes has been found to be associated with having lost 6 or more teeth.

People with diabetes are also prone to other oral problems, such as thrush, poor post-surgery healing, and dry mouth. Thrush is a white (sometimes red) patch that can appear on the gums or tongue which get sore and turn into ulcers. To avoid thrush, persons with diabetes must keep their blood glucose levels as close to normal as possible. If a person with diabetes has dentures, it is best to take them out at night and avoid smoking. Due to medication, there may be an elevated risk of dry mouth. Dry mouth can cause tooth decay, infections, and ulcers. Use of tobacco products will make these problems worse.

It is important for most diabetics to get a dental cleaning and exam three to four times a year and control blood glucose levels. People diagnosed with diabetes should immediately visit the dentist. Diabetics are more prone to red swollen bleeding gums, pulled away gums from teeth, oral infections, and persistent bad breath and/or taste in the mouth. The proportion of Michigan residents with diabetes who reported visiting the dentist within the past year remained consistent from 2002-2010 (Figure 7). In addition, the percentage of persons told they had diabetes in Michigan having lost 6 or more teeth has declined from 52% in 1996 to 30.2% in 2010 (Table 6).

Figure 7: Proportion of Michigan Adults with Diabetes who Visited a Dentist in the Past Year, BRFS 1996-2010

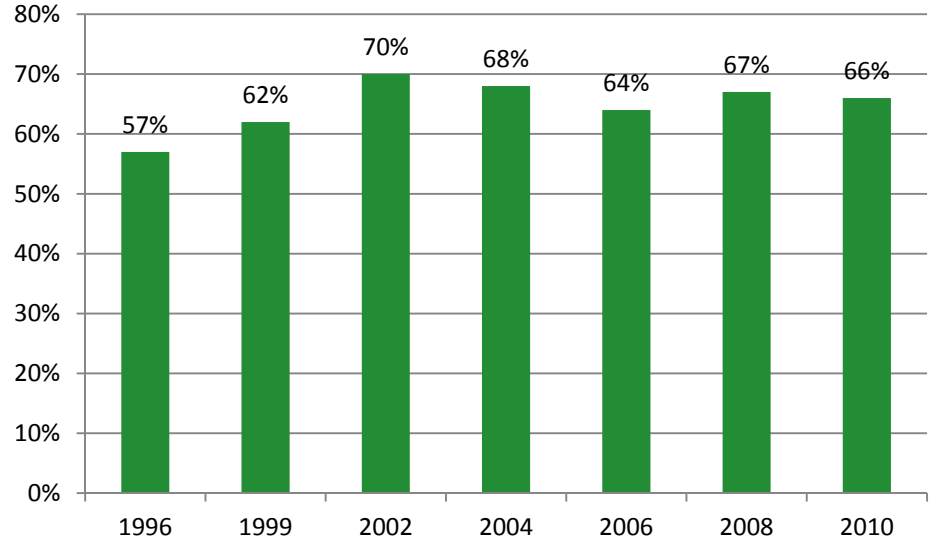


Table 6: Oral Health by Diabetes Status, 2010 Michigan BRFS			
	No dental Visit in Past Year (%)	**No Teeth Cleaning in Past Year (%)**	**6+ Teeth Missing (%)**
Ever Told Diabetes	34.0% (30.4-37.8)	34.7% (30.7-38.8)	30.2% (27.1-33.6)
Never Told Diabetes	26.8% (25.3-28.3)	28.6% (27.1-30.2)	12.0% (11.1-12.8)

Cardiovascular Disease and Oral Health

The National Health and Nutrition Examination Survey (NHANES) found that people with periodontal disease were much more likely to be diagnosed with heart disease than those without periodontal disease (Dye et al, 2007). While studies do not all yield the same results relating the link between periodontal disease and heart disease, most have detected a significant association between tooth loss and heart disease. Several theories exist to explain the link between periodontal disease and heart disease. One theory is that oral bacteria can affect the heart when they enter the blood stream, attaching to fatty plaques in the heart blood vessels and contributing to clot formation. Blood clots can obstruct normal blood flow leading to heart attacks. Another possibility is that the inflammations caused by periodontal disease increases plaque buildup, which may contribute to swelling of the arteries. Researchers have found that people with periodontal disease are almost twice as likely to suffer from coronary artery disease as those without periodontal disease (Fisher et al, 2010).

As shown in Table 7, 37.3% in Michigan with cardiovascular disease reported having 6 or more missing teeth, compared to 11.2% of people without cardiovascular disease. Tooth loss is often a result of severe periodontal disease, so the connection between the two may be indirect.

Table 7: Oral Health by Cardiovascular Disease Status, 2010 Michigan BRFS			
	No Dental Visit in Past Year	**No Teeth Cleaning in Past Year**	**6+ Teeth Missing**
	% (95%CI)	**% (95%CI)**	**% (95%CI)**
Total	27.5% (26.2-28.9)	29.2% (27.7-30.7)	13.8% (13.0-14.6)
Cardiovascular Disease			
Yes	37.1% (33.8-40.6)	37.8% (34.1-41.8)	37.3% (34.1-40.6)
No	26.3% (24.8-27.8)	28.1% (26.6-29.7)	11.2% (10.4-12.1)

Additional studies have pointed to a relationship between periodontal disease and stroke. In 2000, a population-based cohort study found people with severe gum disease were at twice the risk of suffering from a stroke than those with good oral health (Wu et al, 2000).

Bacterial Pneumonia and Oral Health

Pneumonia is an infection of lungs parenchyma caused by a wide variety of infectious agents, including bacteria, fungi, parasites, and viruses. Pneumonia can be a life-threatening infection. Pneumonias are of two types, community acquired and hospital acquired (nosocomial). These types differ in their contributing agents. Approximately one in 10 cases of death from pneumonia in elderly nursing home residents may be prevented by improving oral hygiene (Sjogren et al., 2008).

Low Birth Weight and Oral Health

Oral infections may also contribute to low birth weight status in newborns. Low birth weight, defined as a birth weight of <2,500g, is a major public health problem in both developed and developing countries. The incidence of preterm delivery and low birth weight has not decreased significantly over the last decade and remains at about 10% of all live births in the United States. As a remote gram-negative infection, periodontal disease may have the potential to affect pregnancy outcome. During pregnancy, the ratio of anaerobic gram-negative bacterial species to aerobic species increases in dental plaque in the second trimester. The gram-negative bacteria associated with progressive disease can produce a variety of bioactive molecules that can directly affect the host. Although increasing efforts have been made to diminish the effects of risk factors through preventive interventions during prenatal care, they have not reduced the frequency of preterm low-birth-weight infants. Ongoing studies are being conducted to determine the link between oral health and low birth weight.

Societal Impact

Social Impact

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

diminished quality of life. It is associated with sleep deprivation, depression, and multiple adverse psychosocial outcomes.

More than any other body part, the face bears the stamp of individual identity. Appearance has an important effect on psychological development and social relationships. Considering the importance of the mouth and teeth in verbal and nonverbal communication, diseases that disrupt their functions are likely to damage self-image and alter the ability to sustain and build social relationships. The social functions of individuals encompass a variety of roles, from intimate interpersonal contacts to participation in social or community activities. Dental diseases and disorders can interfere with these social roles at any or all levels.

Economic Impact

Direct Costs of Oral Diseases: Expenditures for dental services in the United States in 2005 were $87 billion, 4.4% of the total amount spent on health care services that year (CMS, 2007). In Michigan FY2004, $175 million were spent on dental services, representing 2.3% of Medicaid health care expenditures in Michigan.

A large proportion of dental care is paid out-of-pocket by patients. Nationally in 2005, 44% of dental care was paid out-of-pocket, 50% was paid by private dental insurance, and 6% was paid by federal or state government sources. In comparison, 10% of physician and clinical services was paid out-of pocket, 48% were covered by private medical insurance, and 35% were paid by government sources (CMS, 2007).

Indirect Costs of Oral Diseases: Oral and craniofacial diseases and their treatment place a burden on society in the form of lost days and years of productive work. In 1996, the most recent year for which national data are available, U.S. school children missed a total of 1.6 million days of schools due to acute dental conditions, or more than 3 days for every 100 students (USDHHS, 2000). Acute dental conditions were responsible for more than 2.4 million days of work loss, and contributed to a range of problems for employed adults, including restricted activity and bed days.

RISK & PROTECTIVE FACTORS FOR ORAL DISEASES

The most common oral diseases and conditions can be prevented. There are safe and effective measures that can reduce the incidence of oral disease and disparities, and increase quality of life.

Community Water Fluoridation

Grand Rapids, Michigan was the birthplace of community water fluoridation for the world in 1945, and has since been recognized as one of the 10 great achievements in public health in the 20th century (CDC, 2012). Community water fluoridation is the process of adjusting the natural fluoride concentration of a community's water supply to a level that is best for the prevention of dental caries. In the United States, community water fluoridation has been the basis for the primary prevention of dental caries for 65 years (CDC, 2012).

Not only does community water fluoridation effectively prevent dental caries, it is one of very few public health prevention measures that offer significant cost saving in almost all communities (Griffin et al., 2001). About every $1 invested in community water fluoridation saves $38 in averted costs. The cost per person of instituting and maintaining a water fluoridation program in a community decreases with increasing population size.

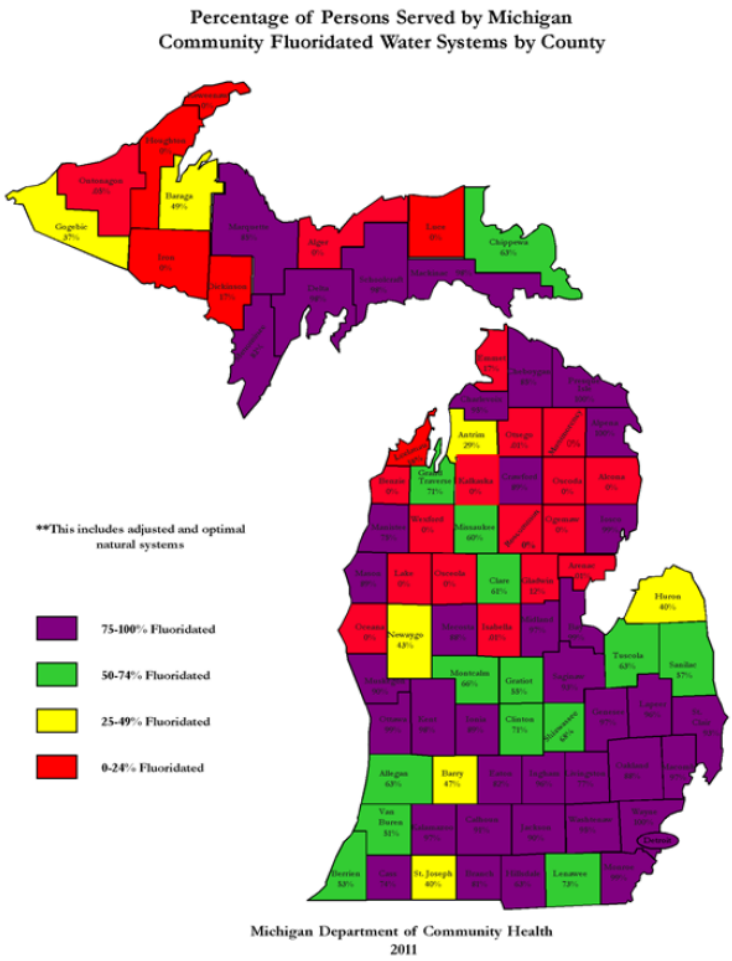
A total of 1,441 public water systems service 71% of the Michigan population. There is a wide range in the number of residents serviced by each system; small mobile home parks with 25 residents and large cities such

as Detroit with 900,000 residents are serviced by such systems. Three-hundred-seventy-seven systems add fluoride or are consecutive to a main fluoridated system, while adjustment is unnecessary for 172 systems since they have sufficient natural levels of fluoride.

The remaining 892 systems, mostly small in size, do not add fluoride and do not have adequate natural levels for optimal fluoridation. These systems leave 838,949 people without access to community water fluoridation. In addition, many areas of Michigan are rural areas with families having private wells. Most of these wells have below optimal levels of fluoride for oral health.

In the United States during 2010, approximately 204.3 million people (73.9% of the population served by public water systems) received optimally fluoridated water (CDC, 2012). Access to fluoridated water was available to 7,370,786 Michigan residents, representing 89.6% of the population served by public water systems in 2011. Fluoridation is at its highest in the Southern Lower Peninsula and the Eastern Upper Peninsula. Conversely, fluoridation is relatively low in the Northern Lower Peninsula and the Western Upper Peninsula (Figure 8). Individual private wells can obtain fluoride levels by contacting county health departments or submitting a test sample. It is recommended for those with private wells to have their well tested annually for fluoride level.

Figure 8: Percentage of Persons Served by Michigan Community Fluoridated Water Systems by County, 20111



Topical Fluorides and Fluoride Supplements

Because frequent exposure to small amounts of fluoride each day best reduces the risk for dental caries in all age groups, all people should drink water with an optimal fluoride concentration and brush their teeth twice daily with fluoride toothpaste (CDC, 2009). For communities that do not receive fluoridated water and persons at high risk for dental caries, additional fluoride measures might be needed. Community measures include fluoride mouth rinse or tablet programs, typically conducted in schools. Individual measures include professionally applied topical fluoride gels or varnishes for persons at high risk for caries.

Fluoride Varnish

Application of fluoride varnish on a very young population can significantly reduce dental disease. National and international studies demonstrate a 40-63% reduction in dental caries with the application of fluoride varnish. Early intervention is necessary to reduce the prevalence of oral disease among high risk infants and children before oral disease causes dental decay, pain and suffering.

The Michigan Department of Community Health's Oral Health Program encourages medical professionals to do oral screenings and apply fluoride varnish to high risk 0-2 year olds and connect them to a dental home. The Varnish! Michigan-Babies Too! Program currently offers free fluoride varnish to medical practice groups collecting oral screening data. The medical professionals can bill Medicaid for applying fluoride varnish at well baby checks after assessing for risk of decay and conducting an oral screening. In 2011, more than 2,000 children 0-3 years old received oral screenings, fluoride varnish applications and referral to a dental home through the Babies Too! Program.

Dental Sealants

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

Pit-and-fissure dental sealants—plastic coatings bonded to susceptible tooth surfaces—have been approved for use for many years and have been recommended by professional health associations and public health agencies. First permanent molars erupt into the mouth at about age 6 years. Placing sealants on these teeth shortly after their eruption protects them from the development of caries in areas of the teeth where food and bacteria are retained. If sealants were applied routinely to susceptible tooth surfaces in conjunction with the appropriate use of fluoride, most tooth decay in children could be prevented (USDHHS, 2000).

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

The *Healthy People 2020* targets for dental sealants on molars are 28.1% for 6-9-year-olds and 21.9% for 13-15-year-olds. Nationally, use of dental sealants was less prevalent among the adolescent age group compared to the younger age group. Michigan ranks 37th out of 42 reporting states for the percent of 3rd grade children with sealants present on first molars (NOHSS, 2012). Despite high annual dental utilization, just 26.4 % of Michigan third grade children had sealants present on their first molars. The Southern Lower Peninsula had the lowest proportion of sealants present on first molars, especially among minorities. Table 11 shows the proportion of children 6-9 years of age that had sealants present on first molars by race and ethnicity.

Table 8: Percentage of Children in the U.S. with Dental Sealants on Molar Teeth, 6-9 Years of Age by Selected Characteristics		
	United States % (95% CI)	**Michigan % (95% CI)**
Healthy People 2010 Target	50	50
Healthy People 2020 Target	28.1	28.1
Total	25.5 (21.8,29.2)	26.4 (22.1,30.7)
By Race/Ethnicity		
Native American	DNA	32.5 (11.7,53.3)
Black non-Hispanic	18.4 (14.2,22.5)	28.0 (18.0,38.0)
White non-Hispanic	30.1 (24.6,35.7)	27.0 (22.9,31.1)
Hispanic	18.4 (16.2,25.8)	17.0 (6.8,27.2)
Sex		
Male	24.4 (19.7,29.2)	23.7 (19.4,28.0)
Female	26.6 (22.1,31.0)	28.4 (23.3,33.5)
Insurance Type		
Private	31.3 (27.3,35.3)	27.5 (22.8,32.2)
Public	20.2 (12.6,27.9)	26.5 (18.9,34.1)
Uninsured	11.8 (6.9,16.7)	22.6 (15.5,29.7)
By Poverty Level and Free/Reduced Lunch Eligibility		
Less than 100% FPL	17.4 (9.6,25.2)	DNA
100%-199% FPL	17.4 (12.8,21.9)	DNA
200-399% FPL	33.9 (27.7,40.1)	DNA
400-499% FPL	43.9 (29.2,58.6)	DNA
500+% FPL	32.3 (22.0,42.5)	DNA
Eligible for National Free/Reduced Lunch Program	DNA	23.9 (17.6,30.2)
Not Eligible for National Free/Reduced Lunch Program	DNA	29.1 (24.4,33.8)

DNA= Data Not Available

Children who experienced difficulties getting dental care had a lower prevalence of sealants compared to other children. In addition, children who visited the dentist in the past year had about twice the prevalence of sealants compared to children who had not visited the dentist in the past year. Community water fluoridation remains the primary source of evidence-based caries prevention. Still, nearly one in ten children (10.2%) neither have sealants present on first molars nor attend school in an optimally fluoridated community.

The Michigan Department of Community Health Oral Health Program implemented the SEAL! Michigan Dental Sealant Program in 2007 to increase the number of dental sealants in Michigan's children. Since the inception of the program, dental sealants have been provided to thousands of first, second, sixth and seventh grade students in schools that have had a high proportion of children of participating in the Free and Reduced School Lunch Program. In addition to dental sealants, the program provides oral health education to students and parents and also fluoride varnish to those students who consent for services. SEAL! Michigan is currently listed as a best practice by the Association of State and Territorial Dental Directors and has continued to expand.

Preventive Visits

Maintaining good oral health requires ongoing efforts from the individual, caregivers, and health care providers. Daily oral hygiene routines and healthy lifestyle behaviors play an important role in prevention of oral diseases. Regular preventive dental care can reduce the development of disease and facilitate early diagnosis and treatment. The 2010 Behavioral Risk Factor Survey estimated that 68.5% of United States and 71.2% of Michigan residents had visited the dentist in the past year.

Tobacco Control

Tobacco is the nation's leading preventable cause of premature mortality. Tobacco use has a devastating impact on the health and well-being of the public. An estimated 443,000 Americans die each year as a direct result of cigarette smoking or from exposure to second hand smoke (CDC, 2009). Annual health care costs amounting to $3.4 billion dollars in Michigan result directly from smoking. That cost estimate does not account for health care costs from exposure to secondhand smoke, smoking-caused fires, spit tobacco use, or cigar and pipe smoking. (Tobacco Free Kids, 2010). The use of any form of tobacco – including cigarettes, cigars, pipes, and smokeless tobacco – has been established as a major cause of oral and pharyngeal cancer.

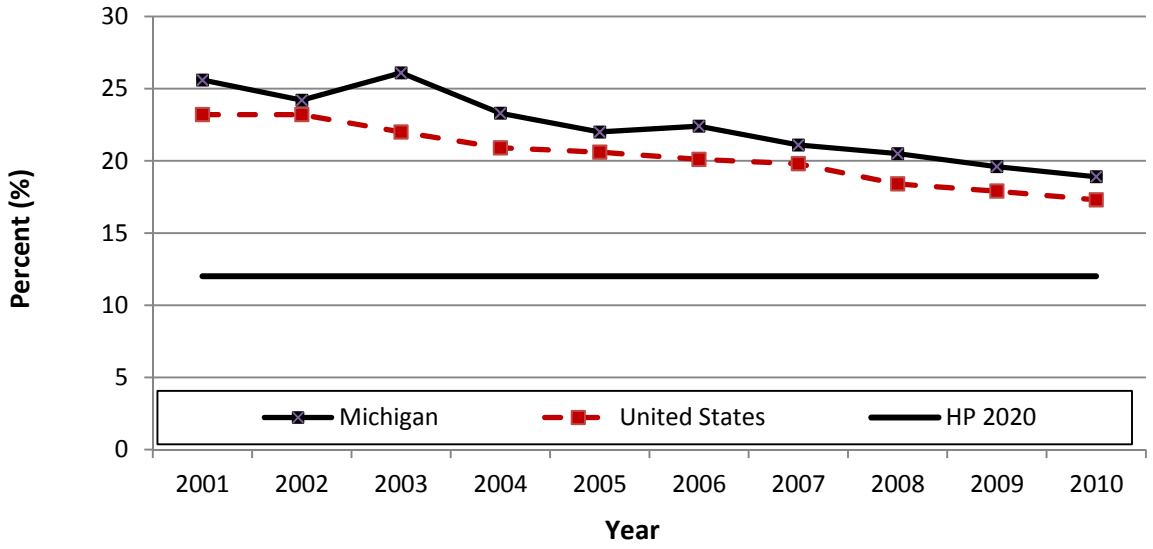
In accumulation with the health risks from tobacco, smokers are 4 times more likely to develop periodontal disease compared to non-smokers. The sugar in spit tobacco increases the risk of tooth decay. Continuous use of smokeless tobacco results in gingival recession, periodontitis and gradual tooth loss. (USDHHS, 2004a). The evidence is sufficient to consider smoking a causal factor for adult periodontitis (USDHHS, 2004a); one-half of the cases of periodontal disease in this country may be attributable to cigarette smoking (Tomar et al., 2000). Tobacco use substantially worsens the prognosis of periodontal therapy and dental implants, impairs oral wound healing, and increases the risk for oral soft tissue changes (Christen et al., 1991; AAP, 1999).

In 2008, Michigan stakeholders developed a five-year strategic plan for tobacco use and prevention and reduction was released for 2008-2013 with a tobacco free movement. The tobacco-free movement in Michigan dedicates itself to:

- Smoke-free air for everyone;
- Accessible and affordable tobacco dependent treatment for everyone who wants to quit, when they want to quit;
- New alignments and partnerships to promote social and health policy that bring health equity to Michigan residents who because of poverty, racial/ethnic/ social discrimination, age or disability do not benefit equally from the still unfulfilled promise of good health;
- An increasingly robust media campaign to bring awareness and information to all segments of the population about the health and economic effects of tobacco-free environment; and
- A stable and adequately funded statewide infrastructure to continue these important strategies and activities

On May 1, 2010, the Dr. Ron Davis Smoke Free Air Law took effect in Michigan. This law prohibits smoking in restaurants, bars and businesses that include hotels and motels. Comprehensive tobacco control could have a large impact on oral health status in Michigan residents.

Figure 9: Prevalence of Current Cigarette Smoking* among Adults, 18 and Over, in Michigan and United States Compared to the Healthy People 2020 Target, 2001 to 2010



Sources: Michigan Behavioral Risk Factor Survey (BRFS) and CDC Behavioral Risk Factor Surveillance System
*The proportion who reported that they had ever smoked at least 100 cigarettes in their life and that they smoke cigarettes now, either every day or on some days.

The dental office provides an excellent venue for providing tobacco intervention services. Dental patients are particularly receptive to health messages at periodic check-up visits, and oral effects of tobacco use provide visible evidence and a strong motivation for tobacco users to quit. Because dentists and dental hygienists can be effective in treating tobacco use and dependence, the identification, documentation, and treatment of every tobacco user they see needs to become a routine practice in every dental office and clinic (Fiore et al., 2000). However, national data from the early 1990s indicated that just 24% of smokers who had seen a dentist in the past year reported that their dentist advised them to quit, and only 18% of smokeless tobacco users reported that their dentist *ever* advised them to quit.

Oral Health Education

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

The Michigan Department of Community Health Oral Health Program joined forces with the State of New York through a Health Resources and Services Administration (HRSA) 2009 workforce grant to offer live webinars telecasted in multiple locations around the two-states. The partnership expanded into additional sites in Rhode Island, Hawaii, and Alaska. The Michigan Department of Community Health Oral Health Program offered an online one dental professional credit (CE) course that reviewed steps to start a screening/fluoride varnish program in preschools. The CE course was to be utilized by dentists, dental hygienists, other health professionals, and preschool staff to learn the necessary steps to set up a program. In addition, the training

included information regarding early childhood caries, caries risk assessment, oral screenings and fluoride varnish application. Collaborative efforts internally at MDCH with diabetes, tobacco, nutrition, disabilities, and maternal/infant health programs helped to create educational materials and additional webinars concerning oral health. (USDHHS, 2009)

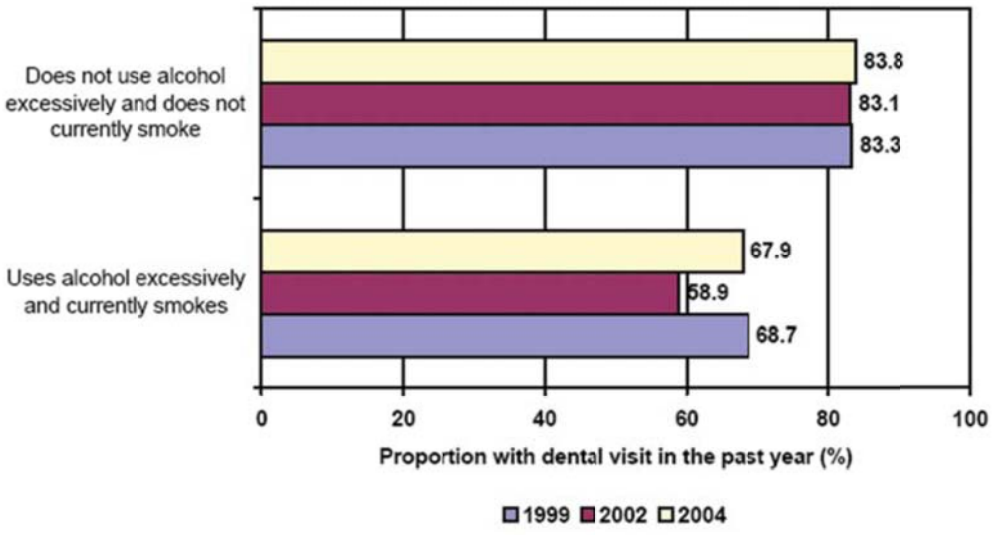
Oral health education is typically performed at the dental office during regular dental visits. There are many examples of oral health education campaigns currently delivered within Michigan communities. Community dental, dental hygiene, and dental assisting societies provide oral health education to classrooms and to groups such as Head Start. In addition, community college dental hygiene students provide community oral health education through elementary classroom teaching and population-based education. For example, community college projects include providing oral health care to long-term care staff and residents. Furthermore, Delta Dental and the Michigan Oral Health Program collaborated on an oral health campaign to increase awareness of oral health for children, diabetics, and oral cancer. Through Dental Dental funding, the campaign developed media announcements and posters that were presented to the public. The media clip can be found at http://www.michigan.gov/oralhealth or www.mohc.org.

Screening for Oral Cancer

Oral cancer detection is accomplished by a thorough examination of the head and neck and an examination of the mouth, including the tongue and the entire oral and pharyngeal mucosal tissues, lips, and palpation of the lymph nodes. Although the sensitivity and specificity of the oral cancer examination have not been established in clinical studies, most experts consider early detection and treatment of precancerous lesions and diagnosis of oral cancer at localized stages to be the major approaches for secondary prevention of these cancers (Silverman, 1998; Johnson, 1999; CDC, 1998). If suspicious tissues are detected during examination, definitive diagnostic tests are needed, such as biopsies, to confirm diagnosis.

Figure 10 compares adults over the age of 40 that engaged in two primary preventable risk factors for oral cancer, smoking and excessive alcohol use, to adults over the age of 40 that did not engage in either. The figure demonstrates that those most at risk for oral cancer are less likely to visit the dentist and are thus less likely to be screened for oral cancer.

Figure 10: Proportion of Adults, age 40 and above, with a Dental Visit in the Past Year, CDC BRFSS 1999, 2002, & 2004



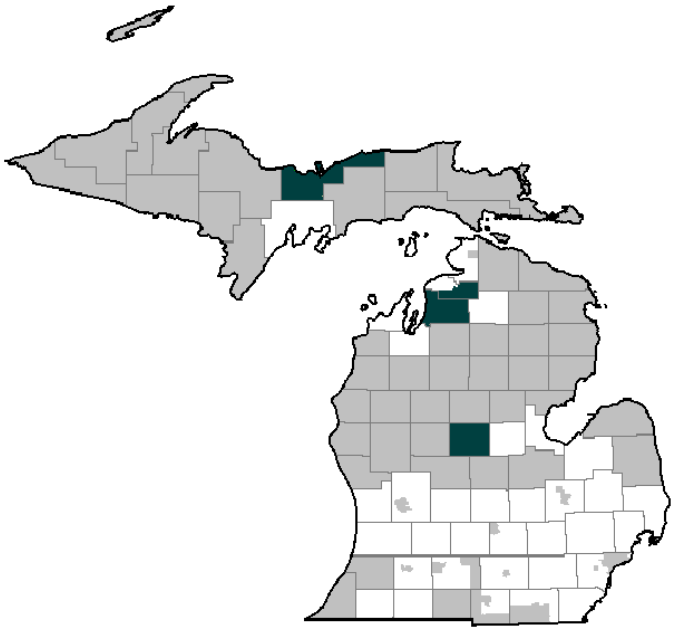
PROVISION OF DENTAL SERVICE

Dental Workforce and Capacity

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

Figure 11 shows county Health Provider Shortage Area (HPSA) designations as they relate to the provision of dental services in 2009. A HPSA designation may result from inadequate providers for the entire county as well as inadequate providers for certain demographic groups such as low-income persons or certain ethnic and racial populations. Of Michigan's 83 counties, 15 have no dental health care HPSA designations currently listed with a "designated" status. That leaves 68 counties with a full county, partial county, or facility HPSA designation. Among those, 7 only have facility HPSA designations. That leaves 61 counties having either a partial county or a full county HPSA designation (MDCH HPSA, 2012).

Figure 11: Health Provider Shortage Area Designations for the Provision of Dental Services, by County, 2009



Geographic HPSA

Population Group HPSA

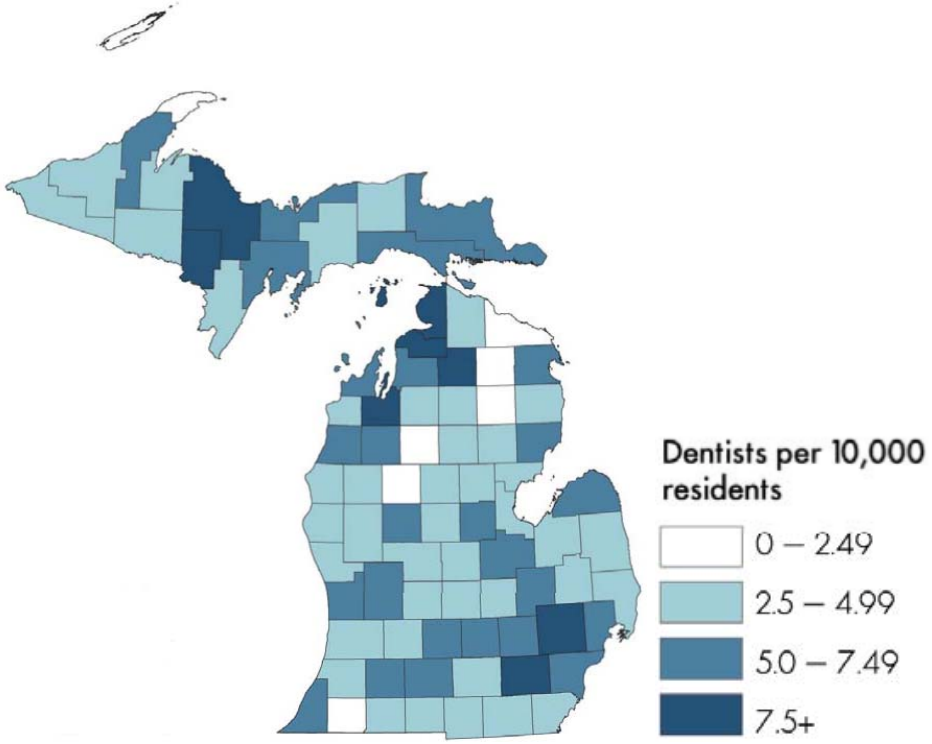
No HPSA Designation

Health Resources & Services Administration

Dentists

There were 7,540 dentists licensed by Michigan and residing within the state in 2009. Figure 12 shows the dental provider density by county in Michigan.

Figure 12: Number of Licensed Dentists with a Current Michigan Address per 10,000, by County, 2009



Bureau of Licensing & Health Professions, 2009

1,659 (22%) of the 7,540 dentists in 2009 had at least one claim for Medicaid, and just 754 (10%) could be considered critical access providers (having Medicaid claims totaling $10,000 or greater) the equivalent of three to four Medicaid child visits per week. Currently, only one county, Keewenaw County, in Michigan lacks a dentist. However, twelve out of 83 counties have less than five dentists, and nine counties lack a dentist that accepts Medicaid (MDCH Survey of Dentists, 2009).

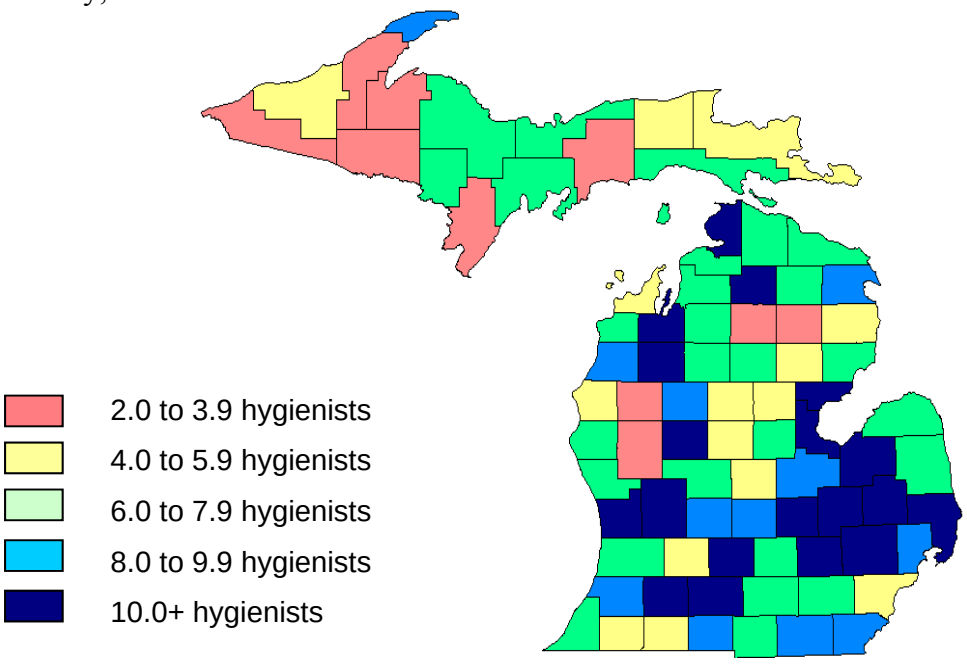
According to the MDCH Survey of Dentists in 2009, about 10% of dentists licensed in Michigan are working as a dentist, but not in Michigan. General dentistry is practiced by 85% of dentists. Four out of five (80%) dentists are willing to provide care for children three years of age or older. Only ten percent of dentists are accepting new Medicaid patients. Nearly half (48%) plan to continue practicing dentistry for only one to ten more years. Currently, 50% of practicing dentists are 55 years of age or older (MDCH, 2009).

Dental Hygienists

In 2009, there were 9,856 dental hygienists licensed in Michigan and residing within the state. Figure 16 represents the distribution of dental hygienists across Michigan in 2007. According to the MDCH Survey of Dental Hygienists in 2009, 12% were not working in a dental hygiene related area. Among those who were

seeking employment in dental hygiene, 86% reported a difficulty finding dental hygiene positions. (MDCH, 2009).

Figure 13: Number of Licensed Dental Hygienists with a Current Michigan address per 10,000 Population, by County, 2009.



In Michigan, Public Acts of 2005(Act No. 161) was approved by the 93rd Legislature to determine rules in which a dental hygienist may provide preventive dental hygiene services to underserved patients. The law, in particular, regulates the supervision requirements for a hygienist practicing under PA 161. Under PA 161, of 2005, a dental hygienist may perform dental hygiene services under the supervision of a dentist as part of a program for dentally underserved populations in this state conducted by a local, state, or federal grantee health agency for patients who are not "assigned by a dentist." In other words, the dental hygienist can provide the scope of dental hygiene services without the dentist assigning the patient prior to the services being performed. As of 2011, there were 53 programs, 181 hygienists and 93 supervising dentists registered under PA 161.

Dental Educational Institutions

Accredited dental education institutions in Michigan include two dental schools, thirteen dental hygiene programs and six dental assisting programs. The University of Detroit Mercy has a Doctor of Dental Surgery (DDS) program and specialty graduate programs in endodontics, orthodontics, periodontics, and Advanced Education in General Dentistry (AEGD) programs. The University of Michigan offers a DDS program and specialty graduate programs in oral health sciences, prosthodontics, endodontics, restorative dentistry, orthodontics, pediatric dentistry, periodontics, and dental public health. The University of Detroit Mercy, Ferris State University and the University of Michigan, all offer a baccalaureate program in dental hygiene. The University of Detroit Mercy offers a dental hygiene baccalaureate degree completion program and the University of Michigan offers both a baccalaureate degree completion and a graduate degree program for dental hygiene. The six dental assisting programs are a minimum of one year in length; however, many dental assistants are taught with on-the-job education.

Dental Workforce Diversity

One cause of oral health disparities is lack of access to oral health services among under-represented minorities. Increasing the number of dental professionals from under-represented racial and ethnic groups is viewed as an integral part of the solution to improving access to care. Table 14 shows the race/ethnicity of dental care providers in Michigan derived from surveys of professionally active dentists conducted by the Michigan Department of Community Health Workforce Research Center (MDCH, 2009). About 8% of dental hygienists reported an ability to speak a language in addition to English.

Table 9: Proportion of Dentists and Dental Hygienists by Selected Demographic Factors in Michigan in 2006

	Dentists (%)	Dental Hygienists (%)
By Race/Ethnicity		
White non-Hispanic	85	95
Black non-Hispanic	2	2
Asian	6	1
Hispanic/Latino	2	1
Other	5	1
By Gender		
Male	81	<1
Female	19	99

Community Health Centers

Fifty one local agencies, including local health departments, primary care centers, migrant health clinics, and Indian Health Services (IHS) conduct public health dental programs. These centers include 20 Federally Qualified Health Centers, 13 local health departments with 27 clinics, and 4 Native American dental clinics.

As of 2011, Michigan Community Dental Clinics Inc. (MCDC) operates 21 dental clinics on behalf of local health departments. The Health Department partnership with MCDC includes Barry-Eaton District HD, Benzie-Leelanau District HD, Branch-Hillsdale-St Joseph Community Health Agency, Central Michigan District HD, Detroit Department of Health & Wellness Promotion, District Health Departments #2, #4, and #10, Grand Traverse County HD, Health Department of NW Michigan, Marquette County HD, Mid-Michigan District HD, St. Clair County HD. MCDC has 62 dentists on staff, and 29 hygienists located within the health departments. About half of the dentists are part-time, the remainders are full-time employees; but the vast majority of the hygienists are employed full-time. In 2011, MCDC served over 68,000 individuals.

Utilization of Dental Services

Primary prevention of tooth decay or other oral disease conditions requires access and use of preventive services. Secondary prevention in oral health primarily relies on the treatment of tooth decay. Due to shortages of Medicaid dental providers, there is an access limitation among residents receiving services based on their type of insurance coverage. Adult dental Medicaid was reduced to emergency extractions only in 2003 and

reinstated in 2005 to the 2003 fee structure. A budget crises in Michigan in 2009 again limited adult dental Medicaid to emergency services.

Oral Health Coverage

Regular dental visits provide an opportunity for early diagnosis, prevention, and treatment of oral diseases and conditions for people of all ages, as well as for the assessment of self-care practices. Adults who do not receive regular professional care can develop oral diseases that eventually require complex treatment and may lead to tooth loss and health problems. There are major differences in health care access due to cost. Only 4.3% of persons that reported an income of $75,000+ did not have a dental visit during the past 12 months due to cost compared to 37.6% whose household income was <$20,000 (Table 15). Black non-Hispanics were less likely to have had a dental visit due to cost compared to non-Hispanic whites.

Table 10: Access to Oral Health Care, 2008 Michigan BRFS		
	Have Dental Insurance* (%)	**No Dental Care Visit During Past 12 Months Due to Cost** (%)**
Total	70.9	15.6
Age		
18-24	69.4	15.4
25-34	72.4	18.1
35-44	74.3	18.7
45-54	77.8	20.2
55-64	73.2	11.3
65-74	57.9	9.7
75+	55.0	6.3
Gender		
Male	71.0	14.6
Female	70.9	16.5
Race/Ethnicity		
White non-Hispanic	71.5	13.4
Black non-Hispanic	73.1	25.1
Other non-Hispanic	68.6	24.4
Hispanic	56.8	15.4
Education		
Less than high school	61.3	29.0
High school graduate	64.7	16.4
Some college	70.5	17.8
College graduate	79.0	10.0
Household Income		
< $20,000	49.3	37.6
$20,000-$34,999	58.4	23.5
$35,000-$49,999	68.7	15.9
$50,000-$74,999	77.6	14.1
$75,000+	88.1	4.3

*Answered the question 'Do you have any kind of insurance coverage that pays for some or all of your routine dental care, including dental insurance, prepaid plans such as HMOs, or government plans such as Medicaid?'
**Answered the question 'During the past 12 months, was there any time you needed dental care, but didn't get it because you couldn't afford it?'

In 2007, Michigan continued to have lower rates of uninsured than most states, raking 15th lowest in the country. However, from 2006-2007, the number of uninsured in Michigan increased from 1.04 million to 1.15 million, representing an increase from 10.5% to 11.6% of the population. In addition, the uninsured are not distributed evenly throughout the state. For example, 2006-2007 data show that 23% of the uninsured were African American, while African Americans represented only 15% of the state's population overall. Most of those who were uninsured were employed: 84% lived in families in which at least one adult worked full or part time.

Michigan ranks in the middle (21st highest) when compared to other states on the number of individuals who are publicly insured. Twenty-seven percent of Michigan residents – more than one in four – had some form of publicly offered health coverage in 2007. Approximately one in six were covered by Medicaid. Clare, Ogemaw, Oceana, and Lake Counties had the highest percentage of population enrolled in Medicaid; Wayne, Oakland, Macomb, and Kent counties had the highest numbers of Medicaid recipients.

Medicaid Dental Programs

Medicaid is the primary source of health care for low-income families, elderly, and disabled people in the United States. This program was authorized in 1965 as Title XIX under the Social Security Act and is jointly funded by the Federal and State governments (including the District of Columbia and the Territories) to assist States in providing medical long-term care assistance to people who meet certain eligibility criteria. People who are not U.S. citizens can only get Medicaid to treat a life-threatening medical emergency. Eligibility is determined based on state and national criteria. Dental services are a required service for most Medicaid-eligible individuals under the age of 21, as a required component of the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit. Services must include at a minimum, relief of pain and infections, restoration of teeth and maintenance of dental health. Dental services may not be limited to emergency services for EPSDT recipients.

Since 1999, 1.9 million people in Michigan are currently enrolled in Michigan. A total of 912,000 Michigan's Medicaid enrollees are infants and children up to age 18, including disabled children. 70% of the Medicaid budget is for middle-class and low-income elderly and disabled. 29% of the Medicaid budget is for medical care for children and their mother, resulting in 50% of all births in Michigan being covered by Medicaid (State Budget Office, 2012). Medicaid covers preventive, emergency, and some restorative and surgical services for children. Adult coverage is a basic preventive package that is more limiting than the children's benefit. Children enrolled in Michigan's Children's Special Health Care Services program are eligible for additional medically-related orthodontic, prosthodontic, or endodontic services.

MIChild is a Michigan health coverage program using Federal funds authorized under Title XXI of the Social Security Act to furnish health care coverage to a targeted population. This population consists of individuals under age 19 who are not eligible for Medicaid, whose family income is above 150% and at or below 200% of the federal poverty level, and who do not have comprehensive health coverage. The state contracts with dental plans to provide covered dental services to MIChild beneficiaries on a per member per month capitation basis.

According to the 2010 Count Your Smiles Survey, Dental utilization rates were similar across the state except in the city of Detroit where children had significantly fewer recent dental visits than the rest of Michigan. Racial and ethnic minorities had lower rates of dental utilization compared to Whites. Compared to 91.7% of privately insured children who had a dental visit in the past year, only 66.6% of children without insurance and 80.0% of children on public insurance had visited the dentist in the past year. Children enrolled in the Free and Reduced Lunch Program also had lower rates of utilization.

As with other health services, people can encounter difficulties when trying to access oral health services. Parents of 10.9% of Michigan third grade children reported difficulty when trying to obtain dental care for their child. Racial and ethnic minorities reported more difficulty when trying to obtain dental care, as did Free and Reduced Lunch Program participants. Type of dental insurance was strongly associated with difficulty obtaining dental care. One in four uninsured children, 25.9%, had reported difficulties obtaining dental care compared to 13.2% of publicly insured children and just 5.6% of privately insured children.

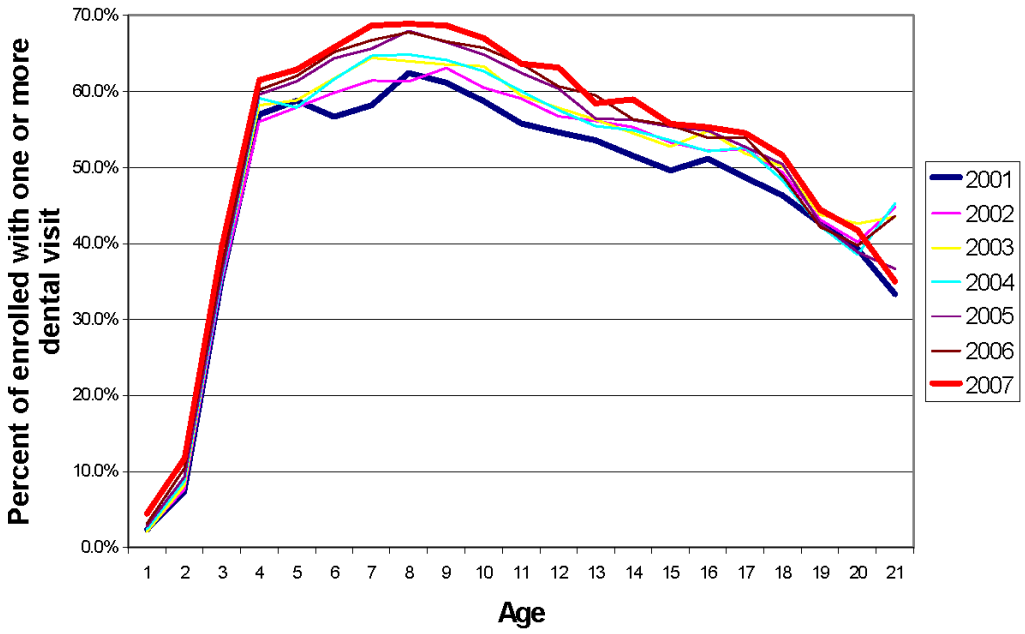
Half of all parents who reported an inability to obtain dental care for their child cited a lack of dental insurance as a main reason. Type of dental insurance and the inability to afford dental care were also frequently cited. Many parents also reported that finding a dentist, difficulty getting an appointment, or inconvenient dental hours contributed to their inability to obtain dental care for their child.

In May 2000, the Michigan Department of Community Health and Delta Dental instituted the Healthy Kids Dental (HKD) project. Healthy Kids Dental, a Medicaid funded program, initially covered 22 primarily rural counties, but was expanded in October 2000 to include an additional 15 counties. Expansions in 2006 added 22

counties in the Upper Peninsula and the Northern Lower Peninsula. Expansions to date have expanded the number of counties to a total of 65 counties.

The HKD has alleviated certain barriers to care. Through increased reimbursement rates and removing administrative barriers, 33% more Medicaid children in the Healthy Kids Dental counties received dental services during the first year of its implementation. Figure 14 demonstrates the dental utilization of Michigan kids in the Healthy Kids Dental program.

Figure 14: Michigan Healthy Kids Dental Utilization of Dental Care, 12 Month Enrollment in Calendar Year, by Age



The child's county of residence determines HKD eligibility, not the location of the dentist. This allows a HKD child to visit any participating dentist in the state. In the year prior to implementation of HKD, 32% of continuously-enrolled Medicaid children received dental care in these original 22 counties. Following the first year of HKD, that number had risen to 44%. (Eklund, 2003). About 280,000 children as of July 1st, 2008 are covered in the HKD program. Michigan expanded into two more counties, Genesee and Saginaw. "The expansion of Healthy Kids Dental into these two counties with major urban population centers is a clear testimony to the success of the program," said Joanne Dowley, DDS, president of the Michigan Dental Association (MDA).

PROGRAMS AND PRACTICES

Michigan Department of Community Health (MDCH) – Oral Health Program

The focus of the Oral Health Program (OHP) is to improve the oral health of the people of Michigan. Improving access to oral health includes oral health education, prevention of dental disease and dental restorative treatment. All three elements are critical to promote oral health throughout the lifespan. Children and adults in Michigan should not suffer from pain, loss of employment or school hours, have difficulty chewing food or speaking, or face social decline due to a preventable disease. The OHP collaborates with internal and external agencies and collaborative partners to increase oral health access.

Oral Health Infrastructure: The oral health program staff equals 3.75 Full Time Equivalency (FTE). A 1 FTE Program Director, 1 FTE Oral Health Coordinator (education and fluoridation), 1 FTE Oral Health Coordinator (dental sealants), 0.5 FTE Epidemiologist, and 0.25 FTE Evaluator. The program director is funded by the state and a grant, three staff are state employees paid through grant funds with the additional staff employees being contract employees funded by grants. Through the CDC Cooperative Agreement DP08-802, the OHP is developing infrastructure in the following areas:

- Staffing, Management and Support
- Data Collection and Surveillance
- Strategic Planning – The State Oral Health Plan
- Partnerships and Coalitions
- Access to and Utilization of Preventive Interventions
- Policy Development
- Evaluation
- Program Collaboration

Oral Health Funding: The annual budget for oral health varies depending on available grants.

Oral Health Delivery System

Professional Dental and Dental Hygiene Schools: Michigan has two dental schools, 13 dental hygiene programs, 9 accredited dental assisting programs, and no accredited dental laboratory programs.

Oral Health Prevention Programs:

- SEAL! Michigan Dental Sealant Program – Provides dental sealants to children in 1st, 2nd, 6th and 7th grades in participating schools that have a minimum of 50% participation in the Free and Reduced Lunch Program or 25% with justification. Grants are provided to providers to deliver the dental sealants based on selected criteria and an established selection process.
- VARNISH! Michigan and VARNISH! Babies Too Programs – These programs encourage the placement of fluoride varnish to infants and Head Start children. The OHP provides a fluoride varnish course for physicians and nurse practitioners which when successfully completed, allows billing for varnish application, parental guidance, and oral health screening by Medicaid during the primary care visit. The OHP provides technical assistance for the development and implementation of Head Start fluoride varnish programs.
- School Weekly Fluoride Rinse Program – Approximately 7500 children in non-fluoridated communities participate in the school-based weekly Fluoride Mouth Rinse Program. The program is funded by the schools or local health departments. The OHP tracks data and provides technical consulting.

- Community Water Fluoridation – Working with the Department of Natural Resources and Environment and Michigan Oral Health Coalition Fluoridation Advisory Committee, the OHP is responsible for populating the CDC Water Fluoridation Reporting System and promoting community water fluoridation
- School-based/school-linked oral health programs – Working collaboratively with the MDCH Child, Adolescent and School Health Program and funded through the Health Resources and Services Administration Workforce Grant, technical support and funding are provided to school systems and health systems to establish comprehensive dental health programs within schools with child and adolescent health centers.
- Education Program – Working to change behavior, create awareness and improve the oral health of persons through all stages of life by linking oral health to total body health. The OHP has partnered with the Office of Rural Health located at Michigan State University to provide quarterly webinars through their Oral Health Grand Rounds on oral health issues that include public health objectives, preventive practices and clinical issues. In addition, the OHP has provided numerous seminars and webinars to a wide audience of administrators, school personnel, parents, etc. on the importance of oral health and its relation to systemic health.
- Program Collaboration – OHP has significantly expanded its partnerships and collaboration efforts throughout Michigan and other states. The OHP has reached out to organizations to increase state level and community capacity to address specific oral disease prevention working to keep other oral health programs up to date on oral health issues. In doing this they provide information to policy makers, staff, and the public with education al resources needed including links, written materials when requested, presentations, and trainings when requested.

Other Grant-Supported Programs: Grant projects to increase oral health care access are continually being sought.

Oral Health Program - Managed Programs:

- **Donated Dental Services:** A network of volunteer dentists provides dental care to persons who are mentally and physically handicapped, who are medically compromised, or who are elderly and indigent.
- **Developmentally Disabled Treatment Fund:** A dental treatment fund provides dental care for persons with developmental disabilities who do not have Medicaid coverage or access to a dentist.
- **PA 161**: Hygienists in Michigan can provide dental services to underserved populations with relaxed supervision through PA 161. The OHP approves applications, tracks providers and services provided, and expiration dates.
- **Referral Directories:** Multiple directories for oral health care access is located on the Michigan oral health website: http://www.michigan.gov/oralhealth

Additional Services Provided: Oral health surveillance, consultation, technical assistance, and program coordination are provided for many oral health programs and issues. Considerable statewide efforts are needed to assist Michigan in achieving the standards set forth by Healthy People 2020. For more information contact the Michigan Oral Health Program at oralhealth@michigan.gov or (517) 335-8879.

Other State Programs (Not Managed by the OHP) Providing Dental-related Services. For more information on any of the state programs listed below refer to: http://www.michigal.gov/mdch

Medicaid Adult Dental Benefits: Medicaid currently provides Basic comprehensive dental services.

- MIChild is a dental health insurance program for uninsured children of Michigan's working families.
- Healthy Kids Dental is a Medicaid waiver program for children who meet specific criteria and reside in a designated Healthy Kids Dental County

- Children with Special Health Care Services: A program for children and some adults with special health care needs and their families. Children must have a qualifying medical condition and be 20 years old or under.
    - Michigan Dental Program: The Michigan Dental Program covers dental care for persons living with HIV/AIDS who qualify for the program.

Local Services Access:

- Fifty one local agencies, including local health departments, primary care centers, migrant health clinics, and Indian Health Services (IHS) conduct public health dental programs. These centers include 20 Federally Qualified Health Centers, 13 local health departments with 27 clinics, and 4 Native American dental clinics.
- Other programs are funded locally, through fee-for-service collection, Medicaid, private foundation funds, and federal funding (IHS, primary care, and migrant health).

Oral Health Program Publications available @ http://www.michigan.gov/oralhealth/Oral Health Resources, Reports and Links

- Surveillance:
    - Count Your Smiles Survey: Survey of dental decay prevalence and sealant placement in Michigan's 3rd grade children (2010)
    - Burden of Oral Disease: A compilation of data and factual information documenting oral disease in Michigan (2012)
    - State Oral Health Plan: Demonstrates a collaborative partnership among diverse stakeholders that outlines the goals, objectives and activities to improve oral health across the state.
- Workforce:
    - Developmental Disabilities Oral Health Policy Paper (2009)
    - Mi-Door Report (2009)
    - Addressing Dental Workforce in the State of Michigan (2009)
    - Addressing Dental Education Curriculum for Treating Persons with Special Needs (2009)
- Oral Health:
    - Fluoride Varnish Brochures (English, Spanish, and Arabic)
    - Sealant Brochures (English, Spanish, and Arabic)
    - Diabetes and Oral Health Brochure
    - Community Water Fluoridation brochure and fact sheets
    - State Sealant and Community Water Fluoridation Plans

Michigan Oral Health Coalition

Since 2003, the Michigan Oral Health Coalition has been a leader in the oral health access movement in Michigan. The Coalition's membership is comprised of primary care clinicians, oral health clinicians, dental benefit providers, advocacy and provider organizations, state and local government officials, and consumers working together to improve oral health in Michigan. The Michigan Oral Health Coalition's mission is to improve oral health in Michigan by focusing on prevention, health promotion, oral health data, access and the link between oral health and overall health. For more information, visit www.mohc.org.

CONCLUSIONS

The Department of Health and Human Services (DHHS) recently recognized the importance of oral health and its link to chronic diseases, premature birth, and low birth weight. DHHS selected oral health as one of the 12 Leading Health Indicators for Healthy People 2020 (HP2020). The chosen indicator was to increase those aged 2 and older who utilized the oral health care system in the past year.

There are several sub-populations in Michigan who have a higher oral health care need. The city of Detroit is an area where disparate oral health conditions exist. Detroit residents were more likely than Michigan residents to be edentulous and less likely to have visited a dentist in the past year. Although the oral health of Michigan children and youth is better than national comparisons; there is still a need in the state. In a 2010 Count Your Smiles survey, 7% of Michigan children were in need of immediate dental care and 28.1% were in need of routine dental care. Non-Hispanics black children, as compared with non-Hispanic white children, are more likely to experience dental caries, less likely to receive treatment for it, and, as a result, more likely to have more extensive tooth loss.

While much is known about the status of oral health in Michigan, several deficiencies remain. The oral health status of elderly citizens, developmentally disabled persons, and many racial and ethnic groups is difficult to assess across the state. These groups and their oral health needs should not be forgotten solely due to limited information.

The Michigan Department of Community Health has projects currently in place to illustrate need in these populations. For example, Jackson County Senior Smiles Survey is focused on gathering data about the needs of the aging and their oral health status. It serves as a model for assessing need elsewhere.

Considerable statewide efforts are needed to assist Michigan in achieving the standards set forth by HP 2020 objectives. Improvements in insurance coverage alone will not solve the oral disease burden. Additional health promotion efforts are necessary for the integration of oral health as a component of overall health and well-being. Individuals must practice preventive measures such as daily brushing and flossing, use of topical fluoride and supplements, placement of dental sealants, regular teeth cleanings, and proper nutrition to prevent disease. In addition, individuals need to practice healthy behaviors such as decrease or eliminate tobacco use, limit the amount of sweetened beverages, and decrease oral piercings of the lips and tongue. Citizens need timely access to an adequately trained oral health workforce who can provide education, prevention, and treatment. Oral health must become a fundamental health priority for every Michigan resident throughout life.

For more information about this document or other oral health information, contact the Michigan Department of Community Health, Oral Health Program at 517-335-8879. Or visit the Michigan Oral Health Website at http://www.michigan.gov/oralhealth.

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TERMINOLOGY

Behavioral Risk Factor Surveillance System (BRFS): an ongoing telephone survey that collects annual data on emerging public health issues, health conditions, risk factors, and behaviors in adults. http://www.cdc.gov/BRFSS/

Basic Screening Survey (BSS): Developed by the Association of State and Territorial Dental Directors (ASTDD), the BSS is a means of measuring dental caries prevalence within a community.

Caries: A progressive, destructive chronic disease caused by bacteria that damage the hard tooth structures, enamel, dentin and cementum. The damage caused by caries is called a cavity also known as tooth decay.

Children with Special Health Care Needs: Children who have or are at increased risk for a chronic physical, development, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.

Community Water Fluoridation (CWF): Community water fluoridation is the upward adjustment of the concentration of fluoride of a community water supply for optimal oral health. Optimal fluoride levels in Michigan are 0.9-1.2 ppm.

Count Your Smiles (CYS): A 2005 survey designed to address dental outcomes in Michigan that pertain to *Healthy People 2010* objectives.

Dental Health Professional Shortage Area: Federal designations reflecting a shortage of dental health providers for the number of community members, in accordance with the federal guidelines.

Dental Sealant: A resin-based material placed on the pits and fissures of the chewing surfaces of teeth. Sealants prevent tooth decay by creating a barrier between a tooth and decay-causing bacteria. Sealants also stop cavities from growing and can prevent the need for expensive fillings.

Diabetes: A chronic disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed for daily life.

Disability: *American's with Disability Act* defines disability as a physical or mental impairment that substantially limits one or more of the major life activity of an individual, a record of an impairment or being regarded as having an impairment.

Donated Dental Program: A collaboration between Michigan Department of Community Health (MDCH) and the Michigan Dental Association (MDA) working to find dentists and dental labs to donate dental services to the elderly and disabled.

Early Childhood Caries (ECC): A chronic disease where one or more tooth surfaces are decayed, missing, or filled before reaching 6 years of age.

Edentulism: The absence of three or more teeth in one arch, not including third molars (wisdom teeth).

Fluoride: A form of fluorine, a naturally occurring mineral found in all water sources, including the ocean. The fluoride ion comes from the element fluorine. Fluorine is the 17th most abundant element in the earth's crust.

Fluoride Varnish: A highly concentrated (~22,000 ppm) topical application of fluoride which may prevent tooth decay by as much as 30%. Fluoride varnish has been used in Europe for the last 30 years. The use of

fluoride varnish to prevent tooth decay is an off-label use. The Food and Drug Administration (FDA) recognizes fluoride varnish as a desensitizing agent and cavity liner.

Fluoride Mouth Rise Program: Program primarily for elementary school children grades K-6 who do not have access to optimal levels of fluoride in community water.

Healthy Kids Dental: Healthy Kids Dental replaces the children's Medicaid dental program in 61 Michigan counties and has been named one of five national models for improving access to dental care for low-income populations.

History of Decay: Denotes the historical presence of dental decay noted by fillings, extraction and/or untreated decay.

Incidence: The number of people who are newly diagnosed with a disease, condition, or illness during a particular time period.

Medicaid: A federal-state program established in 1965 that provides health insurance coverage for low income individuals and families, as well as those with disabilities. Payment of the coverage is split 50:50 by the state and federal government.

Medicare: A federal program established in 1965 that provides health insurance coverage for individuals 65 years of age and older and those that are disabled. Medicare is not based on income-eligibility and includes very limited, highly specialized dental coverage.

MIChild: A state and federally funded health insurance program developed in 1998 by the State of Michigan to provide low-cost health and dental insurance to the state's uninsured children who don't qualify for Medicaid.

MI-Door: A donated day initiated in 2008 by the Governor of Michigan, Jennifer Granholm, to provide free emergency dental care and oral health education to adults who have an immediate dental need.

Michigan Dental Program: Program that covers dental care for persons living with HIV/AIDS who qualify for the program.

Mortality: The number of people who die from a disease, condition, or illness during a particular time period.

Oral Cancer: Cancer that forms in tissues of the oral cavity (the mouth) or the oropharynx (the part of the throat at the back of the mouth).

Surveillance Epidemiology and End Results (SEER) describes cancers in five stages:

In situ cancer: early cancer that is present only in the layer of cells in which it began
Localized cancer: cancer that is limited to the organ in which it began, without evidence of spread
Regional cancer: cancer that has spread beyond the original (primary) site to nearby lymph nodes or organs and tissues.
Distant cancer: cancer that has spread from the primary site to distant organs or distant lymph nodes
Unstaged cancer: cancer for which there is not enough information to indicate a stage.

Pregnancy Risk Assessment Monitoring System (PRAMS): The Pregnancy Risk Assessment Monitoring System is a surveillance project of the Centers for Disease Control and Prevention (CDC) in collaboration with state health departments. PRAMS collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy.

Prevalence: Total number of existing cases of a disease in the population at a given time.

PA 161 Program: Public Act 161 (PA 161) was passed into law in 2005 to facilitate greater access to oral health care services for underserved populations in the state. The policy allows dental hygienists approved by the state Department of Community Health to provide preventive oral health care without the prior authorization of a dentist in a variety of public health settings, including federally qualified health centers. Under PA 161, dental hygienists maintain a supervisory relationship with the dentist and make referrals for patients in need of additional dental care. The program enables hygienists to bring preventive oral health care directly to those who are unable to access care in traditional office settings. As links between oral health and systemic health continue to emerge, making oral health care accessible to all residents of Michigan becomes increasingly important.

SEAL! Michigan: a program for public and non-profit eligible organizations to support the development and/or expansion of sustainable school-based/school-linked dental sealant programs.

VARNISH! Michigan: a program launched in 2007 to provide early intervention to prevent or reduce dental disease among low-income children aged birth to five through oral screenings, applying fluoride varnish and connecting these children to a dental home.

Xerostomia: A medical condition known as "dry mouth" caused by a lack of saliva. The condition may be caused from medication-use, diabetes or another underlying medical condition.

MDCH is an equal opportunity employer, service and program provider.