



ORAL HEALTH IN MAINE



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Maine Center for Disease Control and Prevention

An Office of the Department of Health and Human Services



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Control and Prevention

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EXECUTIVE SUMMARY

INTRODUCTION

Good oral health helps to ensure overall health and well-being. Oral health is dependent on a variety of factors including diet, oral hygiene and other lifestyle choices, as well as community-based preventive interventions and access to professional dental services. Anyone unable to benefit from all of these factors is at risk of experiencing poor oral health. Poor oral health has many significant social and economic consequences, as well as an adverse impact on overall health.

Oral health is increasingly understood as an integral component of overall health. With this understanding, there is also a recognition that poor oral health – the presence of dental disease and other oral conditions – is itself a risk factor for poor overall health and for other chronic diseases and conditions. “Oral health” refers to the whole mouth and all of its structures, and is considerably more than just healthy teeth. Many diseases affect the health of the mouth and manifest oral symptoms; those symptoms may be the first signs of illness or problems elsewhere in the body.

There are significant societal and personal economic consequences to poor oral health. For children, poor oral health can result in difficulties in learning, school attendance, and socialization, and children with poor oral health status are more likely to experience problems with oral health when they reach adulthood. It is important to note that dental caries (the disease that causes tooth decay or cavities) is a progressive disease. If untreated, the extent of decay increases and spreads.

As the burden of untreated disease increases with age, caries can result in acute or chronic pain, dental abscesses, infections, and tooth loss. The burden of this disease is especially noteworthy because it is largely preventable; the childhood years are the optimum time for preventive measures. For adults, not only may people lose time from work, which may or may not be covered by an employer’s sick

leave policy, but some number of individuals find their ability to obtain or advance in employment limited by their oral health status.

The Oral Health Program of the Maine Center for Disease Control and Prevention (Maine CDC) seeks to reduce dental disease and improve the oral health of all Maine citizens by planning, implementing, and evaluating oral health promotion and disease prevention programs.

The purpose of this report, presented by the Oral Health Program, is to provide an overview of current available information on the burden of oral disease in children and adults of Maine. This report can only present our best efforts at representing oral health in Maine. One shortcoming is the time lag in data availability. Some of the data shown



are several years old. The degree of time lag differs across information sources, and the data presented are often from different time periods. During the time this report was constructed, other reports have been written and presented; these reports, although they may use the same data sources, may reflect information differently. For example, some data reflect point-in-time information, and the data were drawn from their sources at different times.

This report includes data on access to care, on the prevalence of oral diseases and oral health-related risk behaviors, and describes the oral health work force in Maine. This last variable in particular is sensitive to point-in-time data collection. The report also addresses the oral health burden in specific population groups, such as children with special health care needs, children enrolled in MaineCare (Maine's Medicaid program), pregnant women, and those 65 years and older.

To the extent possible, the report highlights disparities associated with oral health. Comparisons are made to national data when possible, and to Healthy People 2010 objectives.

Since this report was first drafted, a number of other reports have been compiled and published in Maine that provide some similar and complementary information to what is included here. Please see Appendix 1 at the end of this report for a list of recent reports.

METHOD

Data in this report include surveillance indicators that were outlined in the Maine Oral Health Surveillance Plan. Indicators represent five domains:

- Oral diseases, including caries, periodontal disease, tooth loss, oral/pharyngeal cancer, and cleft lip/palate
- Prevention, including dental cleaning, sealants, and water fluoridation
- Risk factors, such as tobacco use
- Access to care, such as recent dental visits, receipt of needed care, reasons for not receiving care, dental insurance, and MaineCare claims (which include Medicaid and the State Children's Health Insurance Program)
- Dental health workforce, including dentists, dental hygienists, school-based programs, and community health centers with oral health components

The report also used *The Burden of Oral Disease: A Tool for Creating State Documents* provided by the Centers for Disease Control and Prevention as a reference guide. Indicators are reported for the most recent year of data available; trend data are also reported for a small number of key indicators. Select indicators are presented for demographic subgroups.

More information on methods and data sources can be found in Appendix 2.



USE FOR PROGRAM DEVELOPMENT

This report was created to provide oral health-related data to members of the oral health workforce, public health professionals, legislators, and others engaged in maintaining and improving oral health in Maine. Such information is needed to develop and guide public health activities, monitor and evaluate progress, and identify disparate population groups. In addition, the data presented in this report can support the establishment of new priorities for surveillance.

KEY FINDINGS

Tooth decay among Maine children

- Maine children have a significant experience of tooth decay. In 2011, a statewide survey showed that 22% of kindergarteners and 33% of third grade children had treated or untreated tooth decay.
- Kindergarteners and third grade children whose last dental visit was more than a year prior to the survey were significantly more likely to have untreated tooth decay than children who had a dental visit within the past year (18% vs. 13%, respectively).
- Kindergarten and third grade children who received free or reduced price meals in school were significantly more likely to have untreated tooth decay as compared to those who did not receive school meal support (17% vs. 12%, respectively).

Tooth loss among Maine adults

- Although there has been some improvement in the extent of tooth loss among adults since the mid-1990s, in 2011 more than half (51%) of all adults in Maine had lost any (at least one) of their permanent teeth. Among all Maine adults, 8% had lost all of their permanent teeth; among adults 65 years and older, 21% had lost all of their permanent teeth.
- More than half (62%) of current smokers in Maine had permanent tooth loss compared to 40% of those who never smoked. Three out of four (75%) adults with diabetes had lost any of their permanent teeth compared to 48% among those without diabetes.
- Among Mainers 65 years of age and older, nearly half (49.6%) of those with less than a high school education had lost all of their permanent teeth compared to only 5.5% of college graduates. A similar relationship is seen with income.





Oral and pharyngeal cancer in Maine

- In 2006-08, Maine's average annual incidence rate of oral and pharyngeal cancer was 12.7 per 100,000 population, higher than the U.S. rate of 10.2 per 100,000 population.
- In 2006-08, the average annual death rate from oral and pharyngeal cancer was 2.4 per 100,000 population, similar to the U.S. rate of 2.5 per 100,000.

Preventive oral health services

- In 2011-12, eight out of ten (80.5%) Maine children ages 1-17 years old visited a dental professional at least once for preventive dental care such as check-ups or dental cleanings in the past 12 months.
- In 2011, a high percentage of Maine kindergarteners (86%) and 3rd graders (93%) had a dental visit within the last year.
- In 2011, seven out of ten (68%) Maine adults had a dental visit within the past year.
- In 2011, one in five (21%) kindergarteners and seven out of ten (69%) third graders in Maine had dental sealants. Nationally in 1999-2004, 25.5% of children 6-9 years old had dental sealants placed on their molar teeth.
- Of those Mainers on public water supply systems, 80% are served by optimally fluoridated water; however, because about half of Mainers get their water from private wells, only 40% of the population has access to optimally fluoridated water.

Access to Dental Care

- In 2008 (the latest year for which data are available), only 53% of adults in Maine had dental insurance.
- In 2007, there were 32,969 emergency department visits among Maine residents due to preventable dental conditions, including untreated dental caries and dental abscesses.

Dental health workforce

- Maine has fewer dentists per capita than the U.S. overall; in 2009, Maine had 0.5 dentists per 10,000 population while the U.S. overall had 0.6 dentists per 10,000 population.
- In 2011 there were 1,190 active licensed dental hygienists working in Maine, for an average of 1,116 people per practicing registered dental hygienist in the state.
- Maine's dental workforce is aging, and is not distributed evenly across the state, compounding other issues that contribute to limitations in access to care.





CONCLUSIONS

Oral Health in Maine shows that although there have been improvements in the oral health of Maine's residents, there are also areas of need. The data points to several specific areas for increased focus to address the burden of oral disease, and for further analysis and for program development. These include the following:

1. A lack of dental insurance and differential access to dental care is associated with significant untreated tooth decay among Maine children.
2. There are large socioeconomic disparities in oral health, as seen in caries experience among children and tooth loss among adults.
3. Tobacco use and diabetes are risk factors for the development of oral disease, and are also associated with suboptimal access to preventive services and treatment.
4. Dental workforce analysis will be important in assuring adequate access to care for Maine people and to improving oral health status.

Increased efforts in preventive interventions, control and surveillance of oral diseases and conditions, attention to workforce development and distribution of oral health care professionals are all key elements in improving and maintaining the oral health of Maine people.





INTRODUCTION

Oral health is an integral component of overall health [1]. It includes daily activities like brushing and flossing, regular visits to a dental professional, the use of fluoride and dental sealants, and avoidance of exposures that can lead to diseases of the teeth and gums [1]. Although oral health has typically been considered to be limited to structures of the mouth and throat, there is increasing evidence that oral diseases can have systemic effects on the body. The impact of poor oral health ranges from tooth decay to tooth loss and oral cancer, and accounts for significant physical and financial costs [2].

Good oral health helps to ensure overall health and well-being. Poor oral health has many significant social and economic consequences, as well as an adverse impact on overall health.

Oral health is increasingly understood as an integral component of overall health. Poor oral health – the presence of dental disease and other oral conditions – is itself a risk factor for poor overall health and for other chronic diseases and conditions. “Oral health” refers to the whole mouth and all of its structures, and is considerably more than just healthy teeth. Many diseases affect the health of the mouth and manifest oral symptoms; those symptoms may be the first signs of illness or problems elsewhere in the body.

There are significant societal and personal economic consequences to poor oral health. For children, poor oral health can result in difficulties in learning, school attendance, and socialization; and children with poor oral health status are more likely to experience problems with oral health when they reach adulthood. As the burden of untreated disease increases with age, caries can result in acute or chronic pain, dental abscesses, infections, and tooth loss. The burden of this disease is especially noteworthy because it is largely preventable. For adults, not only do many people lose time from work, which may

or may not be covered by an employer’s sick leave policy, but some number of individuals find their ability to obtain or advance in employment limited by their oral health status.

The Oral Health Program of the Maine Center for Disease Control and Prevention (Maine CDC) seeks to reduce oral diseases and improve the oral health of all Maine citizens. To carry out its mission, the Oral Health Program engages in leadership to enable communities to prevent, control and reduce oral diseases; planning, implementing and evaluating programs for oral health promotion and disease prevention; and statewide coordination of community-based oral health services through increased access and removal of barriers[3]. Among its responsibilities are surveillance of oral diseases and accurate, reliable reporting of data relevant for assessing the extent and burden of oral diseases in Maine.

The purpose of this report is to provide the most current information on the burden of oral disease in children and adults of Maine, including data on access to care, the prevalence of oral diseases and oral health-related risk behaviors, and the oral health work force in Maine. The report also addresses the oral disease burden in specific population groups, such as children with special health care needs, children enrolled in





MaineCare (Maine’s Medicaid program), pregnant women, and those 65 years and older. To the extent possible, the report highlights disparities associated with oral health. Comparisons are made to national data when possible, and to Healthy People 2010 objectives [1] which guided activities and objectives during the past decade. The information provided in this report can be used to direct oral health-related programs designed to reduce the burden of oral disease, and to support collaborations with other chronic disease prevention and management and health promotion programs, along with collaborations with efforts in early childhood intervention, for example. The report seeks to enhance awareness of oral health needs in Maine, and to provide information needed to guide efforts to prevent and treat oral diseases.

DATA SOURCES

Data for this report were obtained from multiple sources, including telephone and written surveys, dental screenings, insurance claims, emergency department visit records, cancer incidence reports, death certificates, and professional licensure databases. The specific data sources used are described in Appendix 2 at the end of the report. For each data source, we provide information on the purpose of data collection, the population sampled, data collection methods, and the frequency of data collection.

In addition to the information provided in Appendix 2, a few general comments about data are warranted here. It is important to note that all data have limitations and this report can only present our best efforts at representing oral health in Maine. One shortcoming is the time lag in data availability. Some of the data shown are several years old. The degree of time lag differs across information sources, and data presented are often from different time periods.

Another limitation is our inability to present statistics for some important subgroups. Compared to many areas of the U.S., Maine is relatively homogeneous with respect to race/ethnicity, particularly among the adult population, and we generally lack sufficient numbers to allow meaningful and stable comparisons across racial/ethnic groups. Nonetheless, there is no reason to believe that the racial/ethnic disparities that have been well-documented nationally do not apply in Maine. Also, we lack data on subpopulations that may require special attention in public health practice, such as those with disabilities.

The data in this report are generally reported at the state level, though some

data are presented by county or by Maine’s Public Health Districts. The Districts were created to provide a sub-state public health infrastructure and facilitate the delivery of public health activities. Three of the Districts are single counties: Aroostook, Cumberland, and York. Another five Districts comprise two or more contiguous counties and are named as follows: 1) Midcoast (Knox, Lincoln, Sagadahoc, and Waldo Counties), 2) Western (Androscoggin, Franklin, and Oxford Counties), 3) Penquis (Penobscot and Piscataquis Counties), 4) Downeast (Hancock and Washington Counties), and 5) Central (Kennebec and Somerset Counties). A ninth District comprises Maine’s American Indian tribes.





MAINE DEMOGRAPHICS

Several aspects of Maine's population demographics are likely to contribute to the status of oral health in the state. Maine has a population of 1.3 million, but a land mass equal to the other five New England states combined. It is often challenging for rural communities to attract health professionals, including dentists. In Maine, it can be difficult to access dental care even in non-shortage areas (see the section on access for more details). However, the difference between rural and non-rural counties is stark: in 2011, there was 1 dentist for every 1,219 residents in Cumberland County, but only 1 per 4,352 in Somerset County.

A second demographic consideration relevant to oral health is that many people in Maine live in poverty. In 2010-11, more than one-third (35%) of Maine's households were at or below 200% of the federal poverty level [4]. Poverty is particularly apparent among children, who are in most need of preventive dental services. In 2011, one in five (19%) Maine children under the age of 18 were living in families with incomes below the federal poverty level [5]. Although MaineCare, Maine's Medicaid program, covers dental services, Maine's Medicaid population remains underserved.

Maine's population is on average older than the rest of the nation. In 2010, Maine had the highest median age (42.7 years) of any state in the nation [6]. Nearly one in five (17%) Mainers are 65 years of age or older, and that percentage is expected to grow over the next decade [6]. In fact, nearly all of Maine's expected population growth through 2022 will be in the 65+ year age group [6]. The need for dental services increases as people transition into old age. In addition to preventive care, as people age there is an increased need for specialists, such as endodontists, periodontists, and oral surgeons. Maine dentists are aging along with the rest of the population, further contributing to dental workforce shortages.

Although Maine's population remains predominantly white, Maine is becoming more racially and ethnically diverse, especially in the younger age groups. From the 1993-94 school year to the 2006-07 school year, the proportion of Maine's students in public and approved private schools who were white decreased from 98% to 95%. Between 2000 and 2008, 11% of Maine's population growth was from international immigration. In addition to addressing well-documented racial/ethnic disparities in health, serving the immigrant population's oral health needs will require increased consideration of cultural differences.





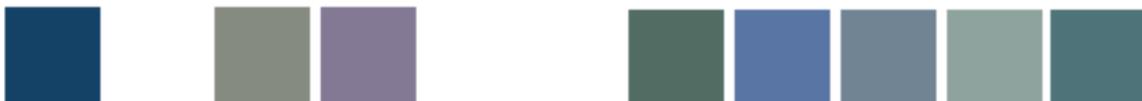
NATIONAL AND STATE ORAL HEALTH OBJECTIVES

O*ral Health in America: A Report of the Surgeon General* (the Report) alerted Americans to the importance of oral health [2]. Issued in May 2000, the Report detailed how oral health is promoted, how oral diseases and conditions are prevented and managed, and what needs and opportunities exist to enhance oral health. The Report noted that population disparities hinder the ability of some Americans to attain optimal oral health. The Report concluded with a framework for action, calling for a national oral health plan to improve oral health and eliminate disparities.

An oral health plan includes key indicators of oral health promotion and oral disease prevention. A set of national indicators was developed in November 2000 as part of *Healthy People 2010* [1]. *Healthy People 2010* is a comprehensive, nationwide health promotion and disease prevention agenda, 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.

The Surgeon General's report on oral health affirmed that oral health is essential to general health and well-being. The report spurred a broad coalition of public and private organizations and individuals to generate *A National Call to Action to Promote Oral Health* [7]. 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 for oral health such as those in *Healthy People 2010* provide measurable targets. The *Healthy People 2010* oral health objectives for the nation and the current status of each indicator for the United States and for Maine are summarized in Table 1 (for the full table see Appendix 3, Table 1).

Table 1. Healthy People 2010 Oral Health Objectives

Healthy People 2010 Objective	Target (%)	National^a (%)	Maine^g (%)
21-2) Untreated caries (tooth decay)			
a) Young children, aged 2-4 years	9	19 ^a	NA
b) Children, aged 6-8 years	21	29 ^a	17.6 ^{*b}
c) Adolescents, aged 15 years	15	18 ^a	NA
d) Adults, aged 35-44 years	15	28 ^a	NA
21-3) No tooth loss, aged 35–44 years	40	38 ^a	63.0 ^c
21-4) Edentulous (toothless), aged 65–74 years	22	24 ^a	18.3 ^c
21-5) Periodontal (gum) diseases, aged 35–44 years			
a) Gingivitis	41	48 ^d	NA
b) Destructive periodontal (gum) diseases	14	16 ^a	NA
3-6) Oral and pharyngeal cancer death rates (per 100,000 population)	2.7	3.0 ^{c*}	2.5 ^e
21-8) Dental sealants			
a) Children, aged 8 years (1st molars)	50	32 ^f	27.4
b) Adolescents (1st and 2nd molars) aged 14 years	50	21 ^f	NA
21-9) Population served by fluoridated water systems, all	75	69 ^f	84 ^g
21-12) Low-income children and adolescents receiving preventive dental care during past 12 months, aged 0–18 years	66	31 ^a	32 ^h

NA: Data not available
^{*}Age adjusted to the year 2000 standard population
a: Data are for 2004
b: 2009-2010 Maine Integrated Youth Health Survey
c: 2008 Behavioral Risk Factor Surveillance System
d: Data are for 1988–1994.
e: 2007 Maine Death Data.
f: Data are for 2006.
g: Target revised.

Data Sources:
2010 Maine Integrated Youth Health Survey,
2008 Behavioral Risk Factor Surveillance System
2007 Maine Death Data
2009 Maine Integrated Youth Health Survey
Water Fluoridation Reporting System
National Survey of Children's Health
2007 MaineCare Data

Note: Teeth cleaning data are required in the burden report. Teeth cleaning is a NOHSS indicator but are not included in Healthy People 2010. See Part V, Section D, "Preventive Visits," in this report.

THE BURDEN OF ORAL DISEASES

The Maine Oral Health Surveillance System was established to track and report on key indicators related to oral health across the life span. We will report here on indicators that describe the current status of oral health among children and adults in Maine, as well as on disparities in oral health status. Dental caries, tooth loss, cleft lip/palate, and cancer of the oral cavity and pharynx are addressed in this report.

CHILDREN & YOUTH

CARIES

Dental caries (the disease that results in tooth decay and cavities) is a significant public health concern. In the United States, dental caries affects 60-90% of school-age children as well as many adults [8-10]. Untreated or poorly controlled dental caries can lead to tooth loss or complications such as dental abscesses.

Preventive care decreases the likelihood of caries. In recent years, there has been a downward trend in caries among children due to public health measures such as the effective use of fluorides, sealants, and self-care practices. However, caries (tooth

decay) remains a challenge among children, especially those without access to oral health care [8-12].

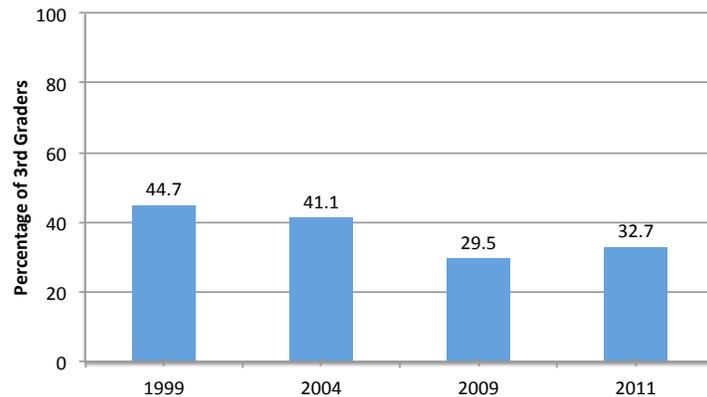
The 2011 Maine Integrated Youth Health Survey (Youth Health Survey) provides data on the oral health status of Maine children and youth.

Also, in 2009, Maine's American Indian Tribes participated in an oral health survey conducted by the Nashville Area Indian Health Service. The survey assessed oral health status of children 2-5 and 8-10 years old [11].

Total caries experience

Results from the 2011 Youth Health Survey indicate that 22% of kindergarteners and 33% of third grade children had dental caries experience, including treated and untreated tooth decay. In comparison, similar Maine data from 1998-1999 showed that 45% of third graders had caries experience, indicating an improvement over the past decade (Figure 1).

Figure 1. Caries Experience Among 3rd Graders, Maine, 1999-2011



Data Source: Maine Basic Screening Survey (component of Maine Child Health Survey and Maine Integrated Youth Health Survey).

There are significant socioeconomic disparities in tooth decay experience among Maine children. For example, in 2011, 27% of kindergarteners and third graders who received free or reduced price meals in school had decay experience, compared to 18% who did not receive free or reduced price meals.

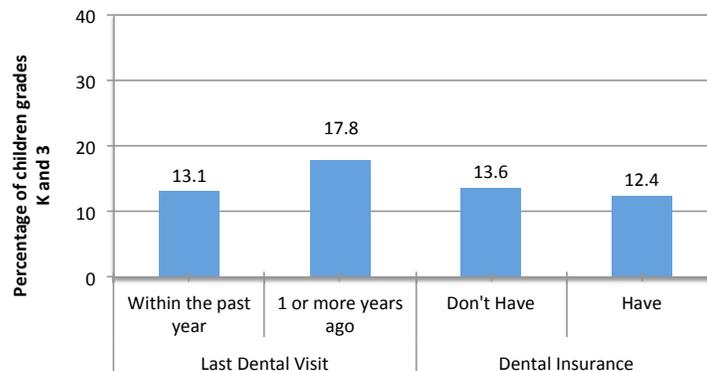
tooth decay experience. For example, the Nashville Area Indian Health Service survey revealed that 55% of 2-5 year old children in the Nashville Area had tooth decay experience; this percentage increased to 75% among 8-10 year old children [11]. This data describes all the children surveyed, and does not specifically identify Maine children [11].

Racial/ethnic disparities are also apparent in

Untreated caries

In 2011, 13% of kindergarteners and 15% of third graders in Maine had untreated caries. Maine kindergarten and third grade children who received free or reduced price meals in school were significantly more likely to have untreated caries (17%) than those who did not receive free or reduced price meals (12%).

Figure 2. Untreated Caries among Kindergarten and 3rd Grade Children, Maine, 2011

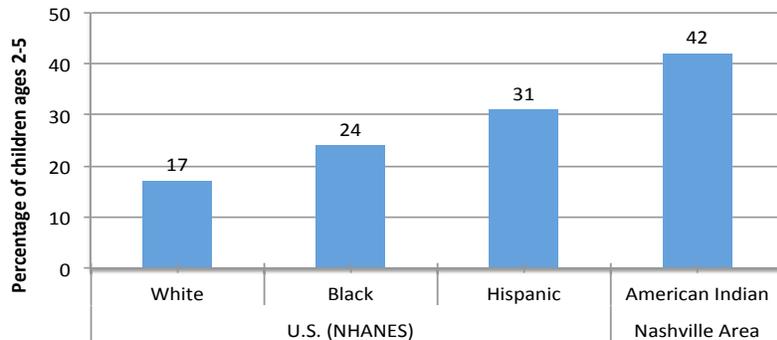


Data Source: 2011 Maine Integrated Health Youth Survey (MIYHS).

Among kindergarten and third grade children whose last dental visit was more than 12 months prior to the survey, a significantly higher percentage (18%) had untreated tooth decay as compared to those who had had a dental visit within the past year (13%; figure 2). Children without dental insurance were no more likely to have untreated tooth decay (14%) compared to children with dental insurance (12%; figure 2).

U.S. data reveal significant racial/ethnic disparities in untreated caries. Among 6-8 year old U.S. children, the prevalence of untreated dental decay was 39% for Hispanic, 37% for non-Hispanic black, and 22% for non-Hispanic white children. Although we lack racial/ethnic-specific data, there is no reason to believe that similar disparities do not exist in Maine. There is evidence that compared to other racial/ethnic groups in the United States, American Indians

Figure 3. Untreated Tooth Decay Among Children 2-5 Years Old, American Indian Children in the Nashville Area, 2009, Compared to U.S. Children Examined in NHANES, 1999-2002



Data Source: National Health and Nutrition Examination Survey (NHANES).

have a higher burden of oral disease. Based on the 2009 Nashville Area survey, 42% of 2-5 year old American Indian children in Nashville Area Tribes had untreated tooth decay, compared to 17% of white, 24% of black, and 31% of Hispanic children in the United States (figure 3) [11].

CLEFT LIP AND/OR CLEFT PALATE

Cleft lip and/or palate, one of the most common birth defects, is associated with dental abnormalities and with speech and hearing problems [13]. In 2005-2009, cleft lip and/or palate was present in 59 live births, and cleft palate without cleft lip was present in 54 live births to Maine residents. The average annual prevalence of cleft lip and/or palate and cleft palate without cleft lip was 8.9 per 10,000 births and 8.1 per 10,000 births to Maine residents, respectively [14].

The cause of oral clefts has both genetic and environmental components. Maternal folic acid deficiency, smoking, and age are possible risk factors for clefts [13].

Maine has a well-established program for the follow-up and referral of children born with oral clefts. Two specialized cleft lip and palate clinics, in Bangor and Portland, provide families access to multidisciplinary health professionals with expertise in the care of children with oral clefts. The Maine Cleft Lip and Palate Program provides services and information in the form of hospital/home visits for families, feeding assessments for infants, special bottle supply, information on and referrals for services, care coordination, parent to parent support, and clinical team care [15].

ADULTS

TOOTH LOSS OR PERMANENT TEETH EXTRACTED

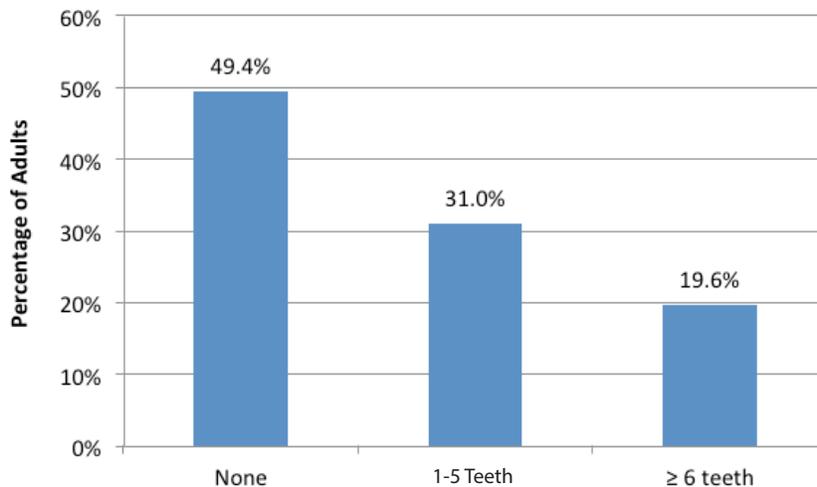
An adult has 32 permanent teeth. While a person may lose one or more teeth due to trauma or orthodontia, most people can keep their permanent teeth for life with adequate personal and professional care. The most common causes of tooth loss in adults are tooth decay and poor periodontal (gum)

health. Many adults who lose their teeth later in life start to develop tooth decay and periodontitis during childhood or adolescence [16, 17].

About half (51%) of all adults in Maine have had any (at least one) of their permanent teeth extracted for reasons

other than trauma or orthodontia: 31% had one to five teeth extracted, and 12% had six or more teeth extracted (figure 4). Among Maine adults of all ages, 8% have had all of their permanent teeth extracted.

Figure 4. Number of Teeth Lost by Adults 18 Years and Older, Maine 2010

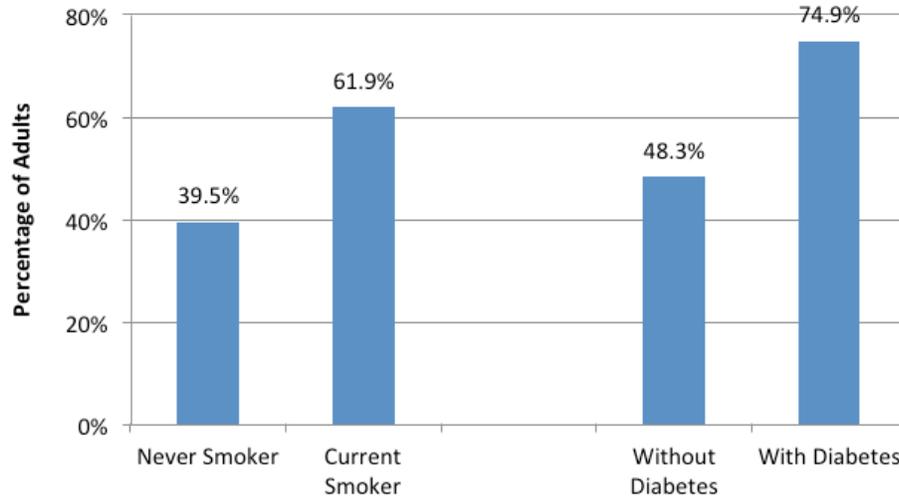


Source: 2010 Maine Behavioral Risk Factor Surveillance System

Among older adults, the percentages are much higher. Nearly half (46%) of Maine adults 65 years and older, and 29% of adults aged 55-64, have lost 6 or more teeth. The prevalence of having any permanent teeth extracted increased from 15% among adults 18-24 years old to 82% among those 65 years and older. Appendix 3, Table 5, has additional statistics on tooth loss among Maine adults.

Tooth loss was more likely among those who ever smoked or reported being diagnosed with diabetes [18-20]. More than half (62%) of current smokers in Maine reported having had permanent teeth extracted compared to 40% of adults who never smoked. Three out of four (75%) adults with diabetes in Maine had any of their permanent teeth extracted, compared to 48% among those without diabetes (figure 5).

Figure 5. The Percentage of Maine Adults Who Have Had Any Permanent Teeth Extracted According to Smoking and Diabetes Status, 2010



Source: 2010 Maine Behavioral Risk Factor Surveillance System

ADULTS AGED 65 YEARS AND OLDER

One in five (20.7%) adults aged 65 years and older has lost all of their permanent teeth. This represents an improvement from data reported about 10 years earlier, when about 28% of adults aged 65 and older had lost all of their permanent teeth.

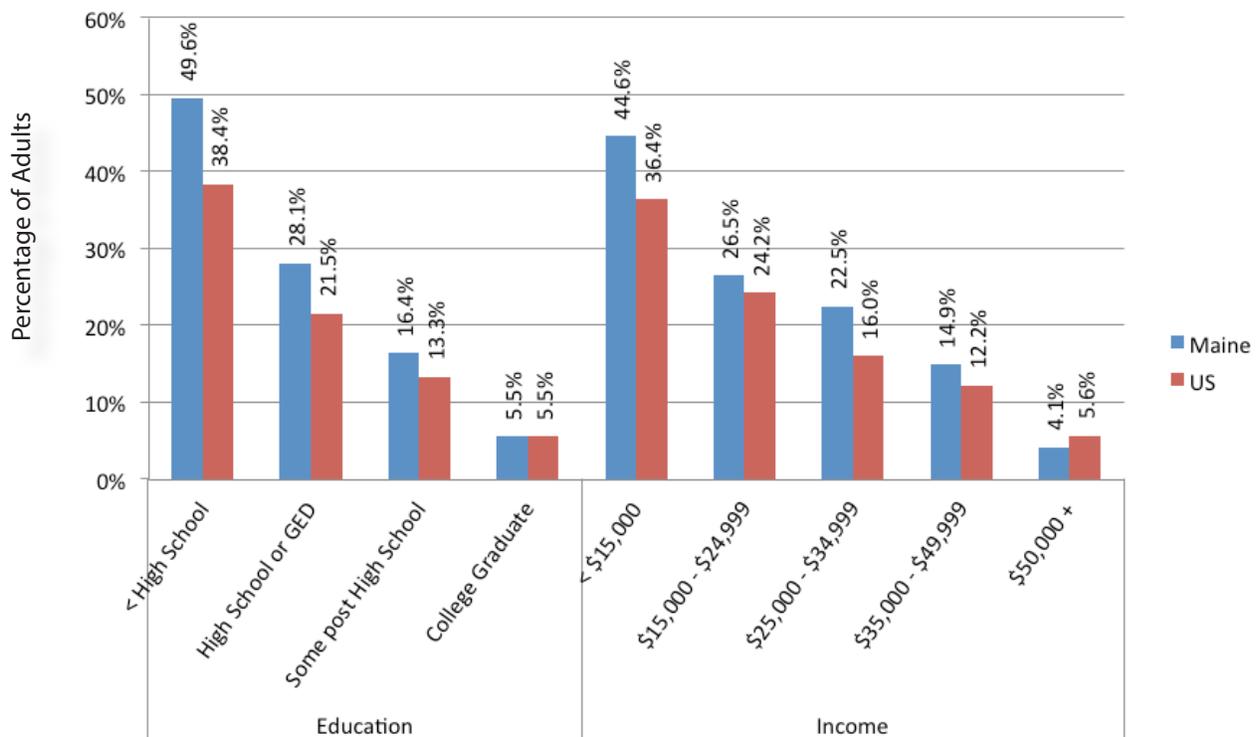
There are clear associations between lower income and educational attainment and tooth loss.

About half (49.6%) of Mainers aged 65 years and older who did not complete high school had lost all their permanent teeth, compared to one in three (28.1%) among high school

graduates, and to 5.5% who were college graduates (figure 6, see Appendix 3, Table 7).

Nearly half (44.6%) of those aged 65 years and older with an annual income of less than \$15,000 have lost all their permanent teeth, compared to one in four (26.5%) among those with an income between \$15,000 and \$25,000, one in five (22.5%) among those with an income between \$25,000 and \$35,000, and 4.1% among those with an income of \$50,000 or more (figure 6, see Appendix 3, Table 7).

Figure 6. Adults 65 Years and Older Who Had Lost All Their Permanent Teeth by Selected Demographic Characteristics, Maine 2010



Source: 2010 Maine Behavioral Risk Factor Surveillance System

CANCER OF THE ORAL CAVITY & PHARYNX

In the United States, the number of people who have been diagnosed with or who have died from cancer of the oral cavity and pharynx has declined over the last several decades. This decline can be attributed to declines in risk factors, and to earlier diagnosis and improved treatment [21].

The terms “oral cancer” and “cancer of the oral cavity and the pharynx” are used interchangeably here and refer to any cancers of the oral cavity and the pharynx. Oropharyngeal cancer is a subset of oral and pharyngeal cancer and refers to cancer of the oropharynx,

which includes the palatine and lingual tonsils, the posterior one-third (base) of the tongue, the soft palate, and the posterior pharyngeal wall.

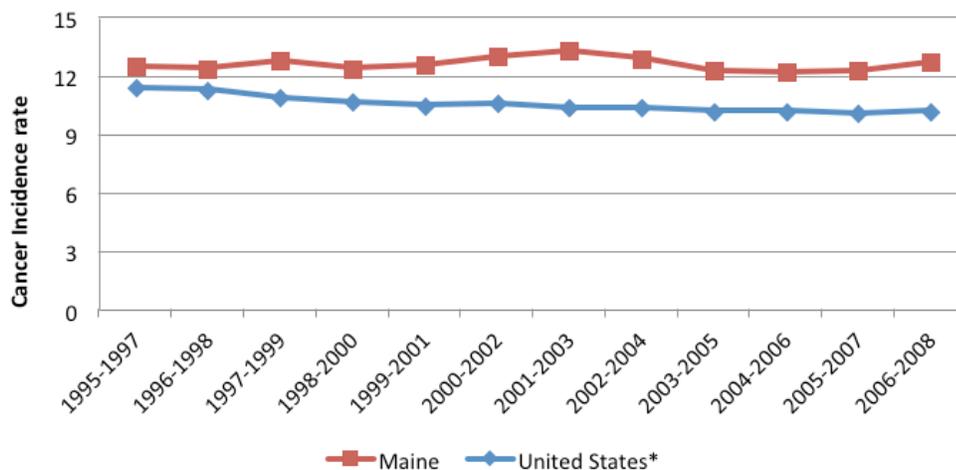
Recent studies of oral cancer have shown that trends differ significantly among population subgroups and by geographic location [21]. Maine, for example, is one of eight states that have not had declining rates of oral cancer incidence [21].

Maine’s age-adjusted incidence rate of cancer of the oral cavity and pharynx has remained fairly stable over the last decade (figure

7), and has been slightly higher than the incidence in the United States (figure 7).

The higher incidence in oral and pharyngeal cancer in Maine may be due to behavioral risk factors such as tobacco use or alcohol consumption [22]. The prevalence of current smoking and heavy alcohol consumption is higher in Maine and other states where oral cancer incidence has risen [21].

Figure 7. Age-adjusted Oral Cavity and Pharyngeal Cancer Incidence rate, Maine & United States, 1995-2008

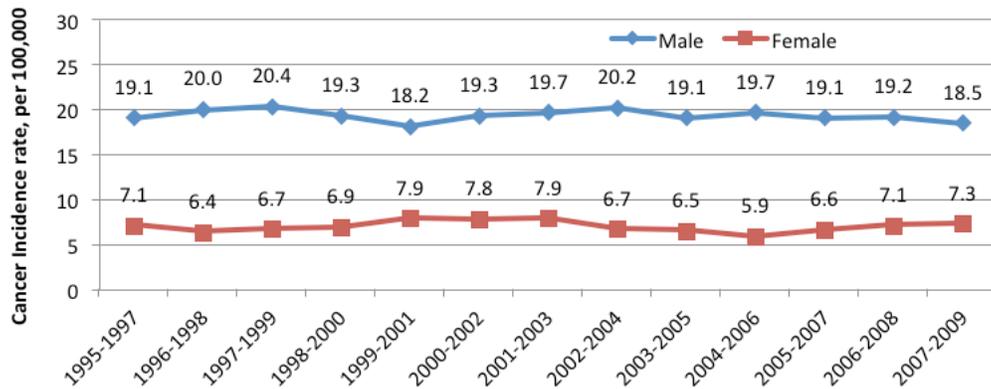


In the United States, the number of people who have been diagnosed with or who have died from cancer of the oral cavity and pharynx has declined over the last several decades.

Maine data source: Maine Cancer registry.
U.S. data source: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 13 Regs Research Data, Nov 2009 Sub (1992-2007) <Katrina/Rita Population Adjustment> - Linked To County Attributes - Total U.S., 1969-2007 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2010, based on the November 2009 submission

Males have a significantly higher incidence of cancer of pharynx and oral cavity than do females (figure 8). Gender differences in risk factor prevalence, such as smoking and alcohol consumption, may also help explain gender differences.

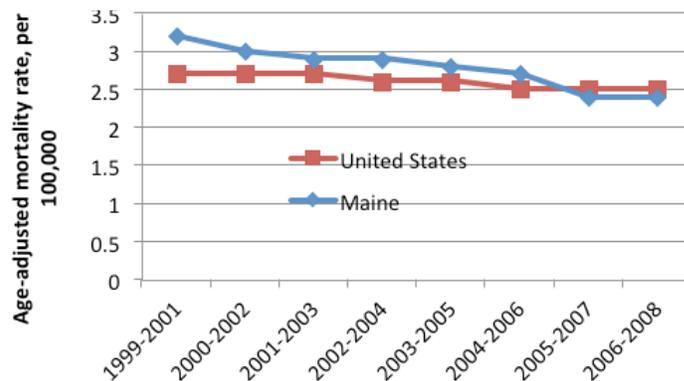
Figure 8. Age-adjusted Oral Cavity and Pharyngeal Cancer Incidence Rate by Gender, Maine 1995-2009



Maine data source: Maine Cancer Registry, November 2010 NPCR Submission.

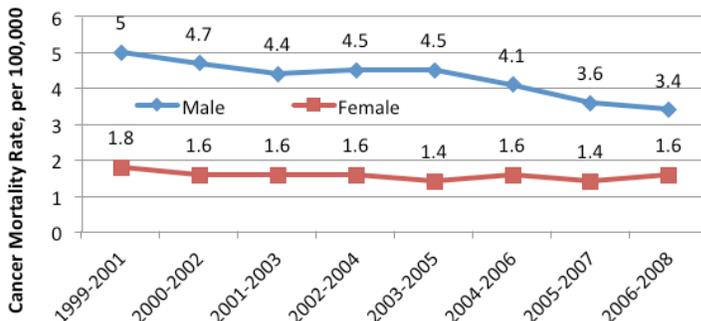
Deaths from cancer of the pharynx and oral cavity have declined in the last decade in Maine and the current mortality rate in Maine is similar to the national rate (figure 9).

Figure 9: Age-Adjusted Oral and Pharyngeal Cancer Mortality Rate, Maine and US, 1999-2008



Source: National Center for Health Statistics, 1999-2008

Figure 10: Age-Adjusted Oral and Pharyngeal Cancer Mortality Rate by Gender, Maine 1999-2008



Maine data source: 1999-2008 Maine death data, Office of Data, Research and Vital Statistics

As with oral cancer incidence rates in Maine, oral cancer deaths rates are significantly higher in males compared to females (figure 10).

RISK & PROTECTIVE FACTORS AFFECTING ORAL DISEASES

Oral diseases can be prevented or delayed through regular dental care that includes regular dental cleanings, placement of dental sealants, fluoride treatments, and screening for oral cancer [23-25]. In addition, exposure to optimally fluoridated community drinking water helps to prevent dental caries and to maintain oral health.

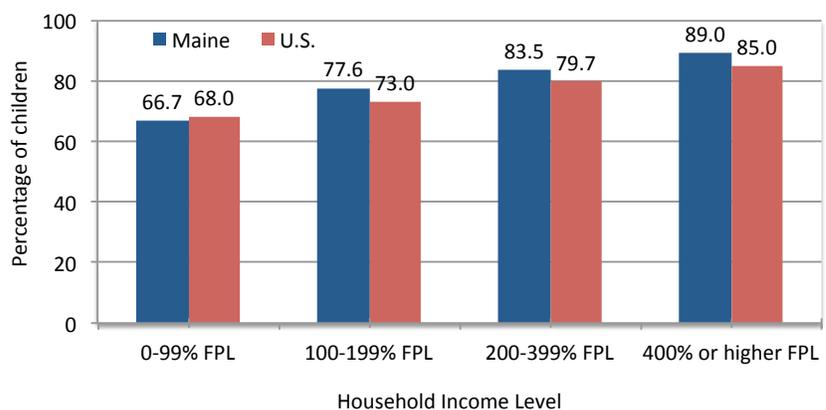
DENTAL CLEANING & PREVENTIVE VISITS

Children

The 2011-12 National Survey of Children's Health (NSCH) showed that eight out of ten (80.5%) Maine children aged 1-17 years visited their dentist one or more times for preventive dental care, such as check-ups or dental cleanings, in the past 12 months. This is significantly higher than the national average of 77.2%. In addition, the 2011 Maine Integrated Youth Health Survey (MIYHS) data show that a high percentage of Maine kindergarteners (86%) and third graders (93%) had a dental visit within the previous year.

As expected, there are socio-demographic disparities in preventive dental visits. For example, the NSCH 2011-12 data show that children in families with lower household incomes were less likely to have had a preventive dental visit in the past year, as compared to more affluent children (figure 11, see Appendix 3, Table 12).

Figure 11. The Percentage of Children, aged 1-17 years, Who Had at Least One Preventive Dental Care Visit During the Past Year, Maine and United States 2011/12



Data Source: 2011/12 National Survey of Children's Health (NSCH).

The 2011 MIYHS data show that while Maine kindergarten and third grade children who receive free or reduced price school meals were significantly more likely to have dental insurance than those who do not (93.6% vs. 83.2%, respectively), they were significantly less likely to have had a dental visit within the past 12 months (83.9% vs. 92.7%, respectively).

Adults

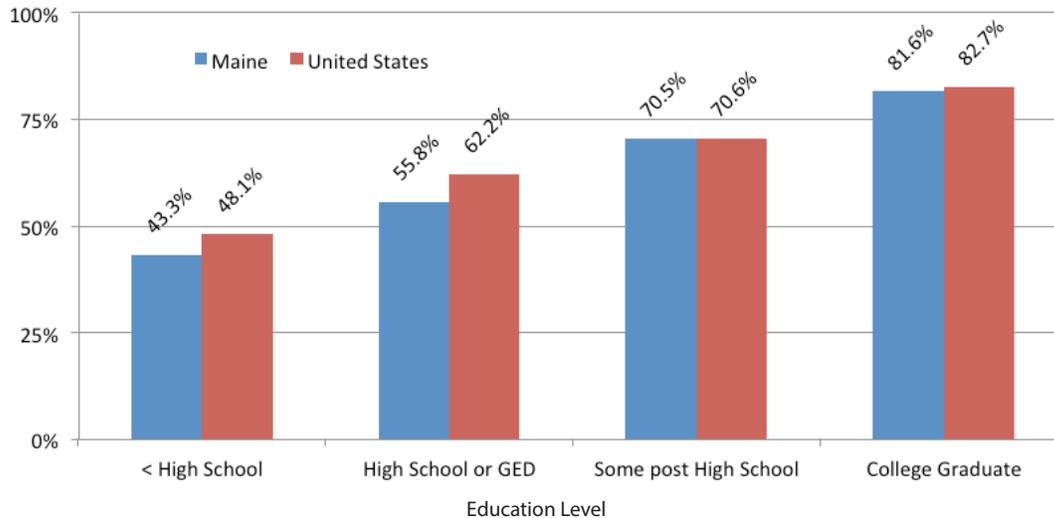
In Maine and the U.S. in 2010 roughly 70% of adults reported visiting the dentist within the past year (Appendix 3, Table 13).

As observed for children, among adults there were striking socio-demographic disparities in preventive dental care. Most notably, college graduates were 90% more likely to report a dental visit within the past year, compared to adults who reported not having graduated from high school (figure 12).

Similar disparities were observed for income.

There were also geographic differences, with a greater percentage of the population in southern Maine (York and Cumberland Public Health Districts) reporting having visited the dentist in the past year, compared to other Districts. Geographic variability is complex and likely reflects population differences in educational attainment and income, as well as access to a dental care provider.

Figure 12. Percentage of Adults 18 Years or Older Who Had Their Teeth Cleaned or Had a Dental Visit for Any Reason within the Past Year, by Education, Maine and United States, 2010



Source: 2010 Maine Behavioral Risk Factor Surveillance System

College graduates were 90% more likely to have had a dental visit in the past year than adults who had not graduated from high school.

Pregnant Women

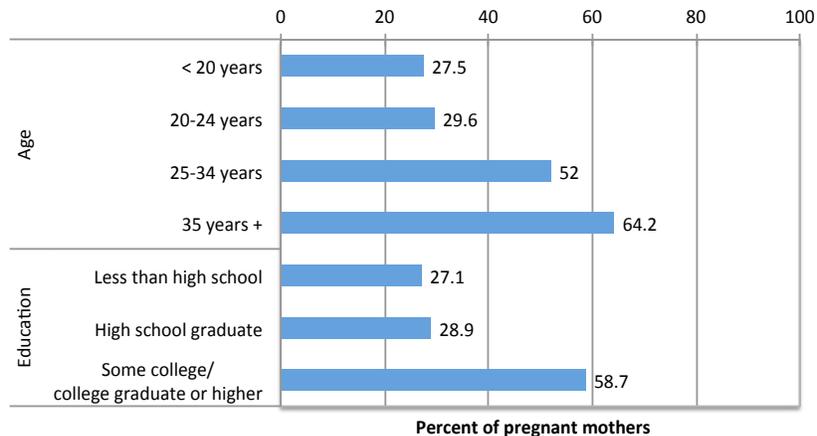
Poor oral health care during pregnancy has been associated with gingivitis during pregnancy and with concerns about adverse birth related outcomes, such as preterm birth [26]. Data also show that pregnant women use dental services less frequently than the general population [26]. In 2010, one in five (20.7% pregnant women in Maine reported needing to see a dentist for a problem related to their teeth and gums and 46.1% visited a dentist or dental clinic during their most recent pregnancy.

Less than half of pregnant women visited a dentist or dental clinic during their most recent pregnancy.

In 2010, four out of ten (45.4%) mothers reported that, during their most recent pregnancy, a dentist or healthcare worker talked to them about how to take care of their teeth and gums.

Oral health care during pregnancy is related to several demographic, social, and economic variables. A significantly higher percentage of pregnant mothers aged 25 years or older visited the dentist or dental clinic during their most recent pregnancy, compared to mothers who were younger than 25 years (figure 13).

Figure 13. Percent of Pregnant Mothers that Visited a Dentist or Dental Clinic during their Most Recent Pregnancy, Maine, 2010



Data Source: 2010 Maine Pregnancy Risk Assessment Monitoring System, Office of Data, Research and Vital Statistics.

A significantly higher percentage of mothers who had education beyond high school visited a dentist compared to mothers who did not complete high school or who were high school graduates (figure 13).

Nearly three out of four (71.9%) pregnant mothers in the \$50,000+ income group visited a dentist or dental hygienist during their most recent pregnancy, compared to only one in four mothers in the <\$10,000 (23.6%) and \$10,000-24,999 (28.4%) income groups (Appendix 3, Table 14).

DENTAL SEALANTS

The widespread use of dental sealants, along with exposure to fluoride in the past several decades, has reduced the occurrence of dental caries among children. A dental sealant is a coating that can be applied to the molars of children and adolescents to prevent the development of decay [24, 27].

In 2011, 69% of third graders in Maine had dental sealants placed on their teeth.

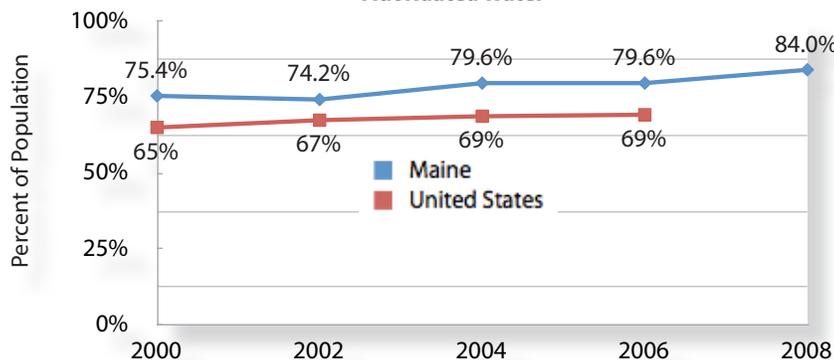
The 2011 Maine Integrated Youth Health Survey shows that one in five (20.6%) kindergarteners and seven in ten (68.5%) third graders in Maine had dental sealants placed on their teeth. Nationally in 1999-2004 (the latest years for which national data are available), 25.5% of children 6-9 years old had dental sealants placed on their molar teeth [28].

WATER FLUORIDATION

Community water fluoridation remains one of the most cost-effective and simple strategies to protect against dental caries [25, 29, 30]. Water fluoridation can reduce the occurrence of dental caries in primary teeth by up to 80% [29, 30]. The American Dental Association cites studies that indicate that community water fluoridation prevents at least 25% of tooth decay in children and adults throughout the lifespan. One of the Healthy People 2010 Objectives was to increase to 75% the percentage of Americans receiving optimally fluoridated water from community or public water supply systems [25]. Maine met this objective by the year 2000, the first time Healthy People Objectives were set for the nation.

Public water supply systems can insure that optimally fluoridated water is provided to the public to protect against dental caries [25, 29, and 30]. About eight out of ten (80%) Mainers on public water supply systems are served by optimally fluoridated water, compared to seven out of ten (69.2%) nationally (figure 14). However, because just over half of all Mainers get their water from private sources, only about 40% of the total state population has access to optimally fluoridated water provided by community systems. A current list of Maine's fluoridated communities can be accessed via the Oral Health Program's webpage: <http://www.maine.gov/dhhs/mecdc/population-health/odh/water-fluoridation.shtml>.

Figure 14. Percentage of Maine and U.S. Population on Public Water Supply Systems Receiving Fluoridated Water



40% of Maine's population has access to optimally fluoridated water.

Note: Changes over time is due to improvements in the quality and accuracy of water fluoridation data
Maine Data Source: Maine Water Fluoridation Reporting System (WFRS)
United States Data Source: National Oral Health Surveillance System, <http://apps.nccdc.cdc.gov/nohss/FluoridationV.asp>

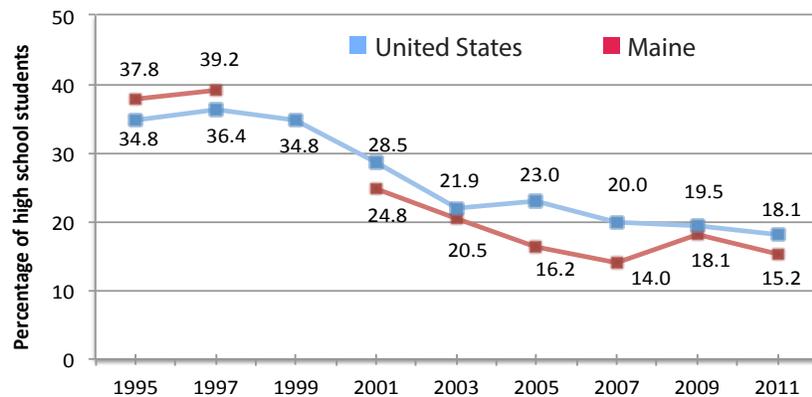
SMOKING AND TOBACCO USE

Tobacco is believed to contribute to nearly half of all cases of periodontal disease and nearly three-fourths of all cases of oral and pharyngeal cancers. Using any form of tobacco is a significant risk factor for these cancers, which can be devastating in their impact. Exposure to tobacco smoke and tobacco products affects the health of the mouth and the structures of the oral cavity, increasing the risk of periodontal disease and complicating its treatment. Gum recession, increased incidence of tooth decay, and tooth loss are also linked to the use of tobacco products.

Youth

The prevalence of adolescent cigarette smoking in Maine has declined significantly over the past decade, but remains a significant public health challenge. In 2011, 15% of Maine high school students reported cigarette smoking during the past 30 days (figure 15).

Figure 15. Percent of High School Students Who Smoked Cigarettes on One or More of the Past 30 days, Maine & United States, 1995-2011



Data Source: Youth Risk Behavior Surveillance System.

While the prevalence of cigarette smoking has declined, there have been increases in the prevalence of other forms of tobacco, such as smokeless tobacco and cigars. In 2011, 7.7% of Maine high school students reported using smokeless tobacco products.

Adults

In 1995, one in four Maine adults (25%) were current smokers. Smoking has declined in Maine and nationally, and in 2010 Maine's current smoking prevalence was 18.2%, similar to the U.S. prevalence of 17.3%.

The prevalence of smoking is significantly higher among younger adults. In 2011, current smoking prevalence rates for those ages 18-44 were around 24%; in comparison, 20.1% of those age 45-54, 14.6% of those age 55-64, and 7.6% of those age 65+ were current smokers. The lower smoking prevalence rates in the older age groups are

likely due in part to the survivor effect, with smokers dying at a younger age than non-smokers.

The prevalence of current smoking is highest in lower education groups and declines with increasing education. The current smoking prevalence is 34.5% among adults with less than a high school education, 25.6% among high school graduates, 19.6% among those with some college or technical school, and 7.0% among college graduates. A similar gradient is seen between income and smoking.

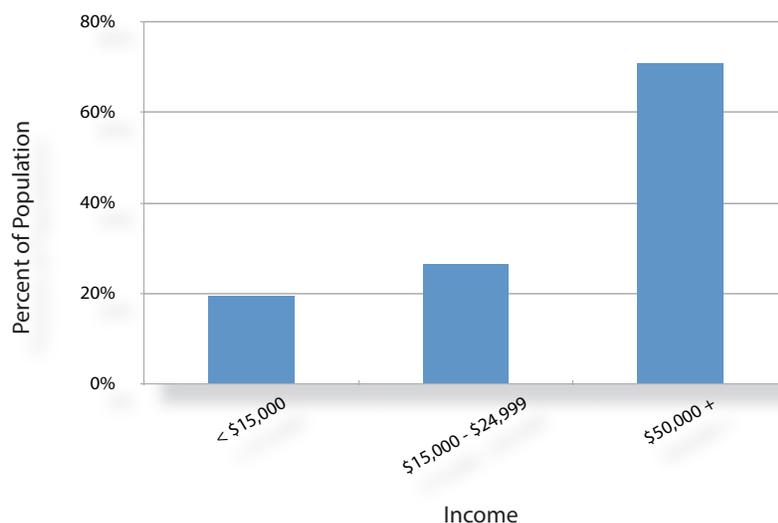
ACCESS TO DENTAL CARE

DENTAL INSURANCE

Although we do not have current or comprehensive information on the dental insurance status of Maine workers, it may be reasonable to presume that coverage follows the general national pattern and is restricted primarily to people who have full-time jobs with larger employers. Many private dental insurance programs are employment benefits and do not continue into retirement. Medicare does not cover dental care services except in very specific instances when they are related to severe medical conditions. In addition, dental insurance does not provide benefits in the same manner as does medical insurance, and usually sets annual dollar limits.

In 2008, 53% of adults in Maine had dental insurance. Roughly three out of ten (30.6%) adults who were high school graduates had dental insurance, compared to six out of ten (62.4%) among college graduates. Similarly, one in five (19.4%) adults whose income was less than \$15,000 a year had dental insurance, and one in four (26.5%) adults whose income was \$15,000 to less than \$25,000 a year had dental insurance, compared to seven out of ten (70.7%) adults with an income of at least \$50,000 (figure 16). Only one in five adults 65 years and older had dental insurance (22.6%).

Figure 16. Percent of Adults with Dental Insurance by Income, Maine 2008



Source: 2008 Maine Behavioral Risk Factor Surveillance System

ACCESS

In a 2008 survey, most active Maine dentists reported accepting new patients (87%), though only 136 dentists (26%) indicated that they were accepting new MaineCare patients. At that time, fewer than half (47%) of active dentists in 2008 reported that they treated MaineCare patients; this represented a decrease since 2002 when 57% of active dentists reported that they treated MaineCare patients. Among the providers who accepted MaineCare in 2008, 58% reported limiting the proportion of MaineCare patients seen in their practice [31].

Among the active dentists who did not accept MaineCare, approximately half said they would consider accepting MaineCare if reimbursements were increased (52%), administrative paperwork was reduced (53%), or if they were compensated for missed appointments (48%). In the past decade, MaineCare dental reimbursement decreased significantly relative to the costs of providing care, in spite of several targeted increases. This, along with a variety of administrative issues and concerns with patient attendance, has had an impact on the extent of dentist participation in MaineCare.

The survey was repeated in 2010, but data were not fully analyzed and are not available. Anecdotal and other reports indicate that half of all Maine licensed dentists are enrolled in MaineCare. Determining how many of those providers have active patients who are MaineCare members or how many are accepting new MaineCare patients would require further analysis at the least, and may not be a realistic objective. Whether a dental practice is taking new patients, regardless of their payment or insurance status, can change within months or even weeks. With the economic downturn, there have been

indications that more practices do accept MaineCare patients, but as this document is finalized, there are no objective data to report on.

Access to dental services can be a challenge regardless of insurance status. There is ongoing discussion in Maine about whether or not the state is experiencing a shortage of dentists or a maldistribution. However, it is generally understood that a significant obstacle to obtaining dental care in Maine is the combination of the number of dentists in the state and their geographic distribution. The reasons for this are complex, related to the state and national distribution of the dental workforce, the aging of the dentist workforce as a group and in Maine, and other factors. Addressing these reasons is beyond the scope of this document.

Maine's infrastructure for the provision of oral health services has grown over the past decade, but it remains vulnerable, and resources are not evenly distributed throughout the state. Reliable data regarding the oral health status of Maine people has been limited but is improving. The problem of access to oral health services is complex, and well documented. Anecdotally, people across the state report waiting longer than they would like to for routine appointments or to find a dentist taking new patients. Low dentist-to-population ratios in rural areas of the state compound the access problem; although such ratios are not definitive in describing access issues, in Maine they are an important component of understanding this issue. Many low-income families and many individuals in rural areas, regardless of income, have long been challenged to find a dentist accepting new patients; for many people, finding access to dental care

they can afford has become a serious financial and logistical challenge. MaineCare members, those without insurance, or those who are unable to pay in full for services at the time they are provided may have particular difficulty finding a source of regular dental care. Regardless of ability to pay, there are reports statewide of traveling significant distances to obtain care, or waiting a long time for routine appointments. This can be particularly problematic when specialty care is sought.

EMERGENCY DEPARTMENT USAGE FOR PREVENTABLE DENTAL CONDITIONS

In Maine, during 2007, there were 32,969 ED visits due to preventable dental conditions.

Medicaid paid for half (49%) and private insurance paid for one in six (17%) ED visits due to preventable dental conditions.

According to data in a report presented by the University of Southern Maine in 2010, MaineCare clients aged 15 through 44 had 8,379 visits to an emergency department (ED) for a dental issue in 2006; approximately 44% of these visits were attributable to frequent emergency department users (those with four or more past ED visits). Among the uninsured, 3,581 visits were attributed

to dental issues and approximately one-third of these visits were attributable to frequent emergency department users [32].

Analyses of data on ED visits from the Maine Health Data Organization Inpatient and Outpatient databases show that in Maine during 2007, there were 32,969 ED visits due to preventable dental conditions. Preventable dental conditions are those conditions for which emergency department (ED) visits or hospitalizations can potentially be prevented through prevention and early disease management, usually delivered through outpatient practices – that is, dental offices and dental clinics [10].

Nearly 20% of these ED visits were related to the hard tissues of the mouth including dental caries; 40% were due to disease of the pulp and periapical

tissues, such as dental abscesses; and 36% were due to other diseases and conditions of the teeth and supporting structures, such as tooth pain. Gingival and periodontal diseases made up about 3% of all ED visits due to preventable dental conditions.

Adults aged 18-34 years accounted for most ED visits (60%), with lower percentages for adults aged 35-64 years (33%), and children aged 0-17 years (5%). More males (53%) than females (47%) visited the ED for preventable dental conditions.

MaineCare paid for half (49%) and private insurance paid for one in six (17%) ED visits due to preventable dental conditions. One in five (21%) ED visits due to preventable dental conditions were self paid.

DENTAL WORKFORCE

DENTAL CARE PROVIDERS

Of Maine's 46 dental care analysis areas, 33 were designated as dental health professional shortage areas (HPSAs) in 2012; of these, 13 had this designation because of geographic criteria and 20 because of the proportion of low-income people in the population. In addition, 19 federally qualified health centers, two facilities, and three American Indian Tribal populations were designated as dental HPSAs. Every one of Maine's counties have included at least one such Shortage Area [33] in the past; in 2013, 15 of Maine's 16 counties have included at least one dental HPSA, and 34 areas were designated. The Kaiser Family Foundation has reported that 16.9% of Maine's population lives in a dental HPSA compared to 10.4% nationally [34]. Health Professional Shortage Areas (HPSAs) are designated by the U.S. Health Resources and Services Administration as having shortages of primary medical care, dental or mental health providers and may be geographic (a country or area), demographic (low income population) or institutional (comprehensive health center, federally qualified health center or other public facility). Shortage areas are determined based on a combination of factors including the number of licensed health care providers and geographic and population factors.

Maine has fewer dentists per capita than the U.S. overall; in 2009, Maine had 0.5 dentists per 10,000 population while the U.S. overall had 0.6 dentists per 10,000 population [35]. In January of 2011, the Maine Board of Dental Examiners reported that 835 individuals were licensed by the state as dentists, of whom 665 had Maine addresses (see also next page).

Maine's dental workforce is not distributed evenly across

the state, ranging from 1,219 people per active dentist in Cumberland County to 4,352 people per active dentist in Somerset County in 2011. One-third (35%) of all Maine dentists practice in Cumberland County, although this county is home to only 21% of Maine's population [31].

As noted above, whether Maine has a shortage of dentists or whether the issue is one of distribution is an ongoing question; although

it is understood that the distribution of dentists follows that of the general population, geographic access is a substantial concern.

Maine's dental workforce is also aging, compounding other issues that contribute to limitations in access to care.

In 2008, the Office of Data Research and Vital Statistics (ODRVS) of the Maine Center for Disease Control and Prevention conducted a survey of dentists practicing in Maine.

More than three-quarters (78.7%) of participating dentists were identified as general practitioners; the ratio of general practitioners to specialists ranged between 2.3 to 1 in Cumberland County to 13.0 to 1 in Lincoln County. In several counties there were no identified specialists [31].

Estimating future health care workforce needs is central to Maine's health care planning efforts. Based on the ODRVS survey, 81% of responding dentists indicated in 2008 that they planned to be working as dentists in Maine in five years. Approximately 43% of Maine dentists were aged 55 and older. The

mean age of dentists has increased over time: in 1986, the mean age of active dentists was 45.5 years, by 2006, the mean age had risen to 51.5 years. The majority (63%) of Maine dentists were self-employed in solo practices/single owner businesses and an additional 16% were self-employed in partnerships or group-owned practices [31].

In 2011, there were 1,190 dental hygienists with active licenses who had Maine addresses, for an average of 1,116 people per practicing registered dental hygienist in the state. The county-specific range was from 841 people per practicing dental hygienist in Cumberland County to 1,939 people per practicing dental hygienist in Waldo County.

Updated numbers on dental professionals are available, as reported to the Maine CDC Oral Health Program at the end of February 2013:

- Dentists: 847 licensed and 677 with Maine addresses.
- Registered dental hygienists: 1,348 licensed and 1,197 with Maine addresses.
- Independent practice dental hygienists: 58 licensed and 54 with Maine addresses.

Maine's Dental Practice Act authorizes licensure or certification of other dental providers: denturists, expanded function dental assistants (EFDA), and independent practice dental hygienists (IPDH), and also allows dental hygienists to practice under Public Health Supervision status. In mid-2011, there were 43 licensed denturists in Maine, some number of whom worked independently; 21 individuals had completed EFDA training and were certified; over 40 hygienists had chosen to license as IPDHs, several of whom were engaged in their own practices and a number who continued to work within established dental practices, with a dentist; and an undetermined number of hygienists utilized Public Health Supervision status, ranging from those who used it for short-term or one-time events to those whose full-time work was facilitated by having that status. See Appendix 4 for a more detailed description of these provider types.

INSTITUTIONS AND PROGRAMS

Maine's new dental school, the University of New England's College of Dental Medicine, located on its Portland campus, has enrolled its first class of students to start in August of 2013. The Penobscot Community Health Center in Bangor runs a nationally accredited general practice dentistry residency program in Maine [36]. In mid-2011, the Health Center also launched a Pediatric Dental Residency program. The state has two dental hygiene schools. In 2004, 81% of active Maine hygienists had received their education in Maine schools [37]; other reports indicate that the majority of Maine's dental hygienists complete their professional education in the state.

Maine's oral health infrastructure includes 15 dental clinics housed within Federally-Qualified Health Centers (FQHCs), 10 private non-profit dental centers, 3 DHHS clinics providing services for former and current clients, 5 Indian Health Services tribal programs, and 2 preventive care programs based at Maine's dental hygiene school campuses [38]. In 2010, Maine had 25 community-based dental clinics providing services using sliding-scale or otherwise discounted fees [39]. These numbers have remained consistent for several years.

Maine's School Oral Health Program (SOHP), a component of the Oral Health Program (OHP), has provided grant funding, training, and technical assistance to eligible public elementary schools since the late 1970s. Eligibility is based on a formula that includes the proportion of students eligible for the Free and Reduced Lunch Program and the proportion of the community with fluoridated drinking water. Each program is locally designed. All schools provide oral health education, and the majority have traditionally offered weekly fluoride mouth

rinse programs. Within the limits of funding, schools may provide dental screenings and dental sealant programs for second graders.

In 2008, there were 234 school-based dental programs; in the 2013-14 school year, this number will be reduced to 189 schools, due to a combination of factors including school consolidation and reorganization, program refinements, and increased funding constraints. The fluoride mouthrinse component is being phased out as a result of declining participation and funding priorities. The SOHP-funded dental sealant programs now include the provision of fluoride varnish when children receive sealants. These state-funded programs provide preventive services only [40]. See the Oral Health Program summary in Appendix 5 for more information about this program.

ORAL HEALTH CARE EXPENDITURES

The prevention and treatment of oral diseases accounts for a significant portion of Maine's health care expenditures. Based on 2009 health expenditure data from the Centers for Medicare and Medicaid Services analyzed by the Kaiser Family Foundation, 3.8% of Maine's health expenditures, or \$431 million, were for dental services. Per capita spending for dental services in Maine (\$328) was similar to national spending (\$333) [26]. In 2011, approximately half (48.6%) of dental expenditures in the U.S. was by private insurance, 41.6% was out-of-pocket, and 6.7% was by Medicaid. [41].

In 2008, MaineCare paid \$28.8 million to 333 providers to provide dental services to 80,763 MaineCare clients [31]. The average cost of services per dental client was \$357. In comparison, \$13.2 million was paid to 297 providers to provide dental services to 52,813 MaineCare clients in 2002, with an average cost per dental client of \$250. Dental providers in Penobscot, Cumberland, and Kennebec Counties served the largest number of MaineCare clients. The average cost per dental client ranged from \$157 among providers in Knox County to \$463 among providers in York County [32].

CONCLUSIONS & FUTURE CONSIDERATIONS

The purpose of this report is to provide information about the current status of oral health and disease in Maine, and to provide an overview of factors that influence oral health. The data presented in this report can be used as a starting point to measure the effectiveness of interventions in improving oral health, to decrease disparities related to oral health, and to reduce the burden of oral disease. Similarly, the data presented in this report can support the development of new interventions and facilitate the establishment of additional priorities for surveillance.

The data show that Maine has made strides in addressing the burden of oral disease and improving the oral health of its residents. However, there is more that can be done related to the prevention, control, and surveillance of oral diseases.

Maine has made significant progress in the use of dental sealants to prevent tooth decay, through the combined efforts of the public health community and private practicing dentists. Like the rest of the nation, Maine has made significant strides in reducing smoking prevalence among adults and youth; tobacco use is associated with the incidence of oral diseases.

The report also shows that Maine is doing well when it comes to its residents receiving optimally fluoridated water: nearly 80% of Maine residents using public water systems receive fluoridated water. However, since over half of the state's population does not use public water supplies in their homes, this translates to about 40% of Maine people with immediate access to this public health benefit. To achieve the best possible benefits from water fluoridation in reducing the incidence of tooth decay, as many Maine communities as possible should have access to optimally fluoridated water, and attention should be paid to efforts to retain fluoridation where it has been implemented.

As noted, access to dental care remains a significant issue in Maine. Many residents do not have or lack adequate insurance that covers their dental care, and experience financial as well as geographic challenges when they seek dental care. There is also a significant concern about the dental workforce in Maine, as evidenced by its ratio of 0.5 dentists per 10,000 population, which is lower than the national ratio of 0.6 dentists per 10,000 population, and the aging of that workforce, particularly dentists. These challenges are especially acute in a state with Maine's rural character.

Another significant issue that requires attention is the effect of systemic and chronic diseases on oral health, and of the relationships between oral health and those conditions. The converse also warrants attention – poor oral health is a risk factor for a number of chronic diseases and conditions. Chronic diseases result in substantial social and economic costs, with increasing morbidity and mortality. They share risk factors that, if modified and reduced, would result in improved health. A growing body of evidence supports the relationships between and among these diseases and oral health. The data in this report show, for example, that people with diabetes are significantly more likely to have tooth loss compared to those without diabetes.

There are aspects of, and issues relevant to, oral health that were not covered in this report due to current unavailability of a data source, but that are important when it comes to understanding the overall picture of oral health in Maine. For example, these include a lack of reliable state data on periodontal disease in adults, which has been implicated in the incidence and severity of several chronic diseases. Similarly, more data is needed about the use of the oral health care system by adult residents in long-term care facilities or the impact of oral health literacy in preventing oral diseases. In addition, existing data sources, such as the Maine Integrated Youth Health Survey, the Behavioral Risk Factor Surveillance System, and the Pregnancy Risk Assessment Monitoring System, may present limitations to our ability to provide detailed descriptions of oral health status because of the nature and interval of data collection. The data from these sources may be able to be better utilized to provide more descriptive information in the future.

Oral Health in Maine is designed to be regularly updated as new information becomes available or as the science of oral health and dental disease changes. In the meantime, the findings in the current report provide a starting point and an opportunity to use data to develop or enhance and prioritize oral health promotion and disease prevention programs, strategies and activities which can lead to achieving the overall goal of improved health and quality of life among all Maine residents.

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APPENDIX 1:

Listing of Selected Additional Reports on Oral Health in Maine

The following reports were prepared by Center for Health Workforce Studies, School of Public Health, University at Albany, State University of New York. <http://chws.albany.edu>:

Access at: <http://www.mcdph.org/headlinedet.asp?DET=24>

- Oral Health in Maine: A Background Report (January 2012).
- Assessment of Oral Health Delivery in Maine: An Analysis of Insurance Claims and Eligibility Data for Dental Services, 2006-2010 (September 2012).
- Executive Summary of the Report of Interview of Oral Health Stakeholders in Maine (November 2012).
- New or Expanded Oral Health Workforce Models in the US (November 2012).
- Report of the Survey of Dental Safety Net Providers in Maine (December 2012).

Access at: <http://www.mehaf.org/publications/policy-briefs-reports/>

- The Oral Health Workforce in Maine (December 2012). Prepared for: Maine Oral Health Funders, Augusta, Maine.

The following report was prepared by MCD Public Health:

- Oral Health Care in Maine: Report in response to Resolves 2011 Chapter 92 (LD1105), Resolve, To Study Oral Health Care in Maine and Make Recommendations Regarding How to Address Maine's Oral Health Care Needs, December 2012 (Amended April 2013)

The following report was prepared by Maine Dental Access Coalition:

- Maine Oral Health Improvement Plan (November 2007). Access at: <http://www.maine.gov/dhhs/mecdc/population-health/odh/news.shtml>

The following reports were prepared by Maine Department of Health and Human Services, Office of MaineCare Services:

- 11th Annual Report to the Joint Standing Committee on Health & Human Services regarding Improving Access to Dental Care for Children with MaineCare Coverage (February 27, 2012). Access at: http://www.maine.gov/dhhs/data_reports.shtml
- 10th Annual Report to the Joint Standing Committee on Health & Human Services regarding Improving Access to Dental Care for Children with MaineCare Coverage, (February 15, 2011). Access at: http://www.maine.gov/dhhs/data_reports.shtml

The following report was prepared by Maine Department of Health and Human Services, Office of MaineCare Services:

- Report of the Resolve, To Study Expenditures for Oral Health Care in the MaineCare Program (Public Law Chapter 146) Working Group (February, 2011). Access at: http://www.maine.gov/dhhs/data_reports.shtml

The following report was prepared by the Maine Department of Health and Human Services:

- Initiatives For Children's Oral Health Care: A Report to the Joint Committee on Health and Human Services, submitted pursuant to consideration of LD 1250, An Act to Implement an Oral Health Capitation System for Children on MaineCare, presented by Senator Peter Mills during the First Regular Session of the 123rd Legislature (January 28, 2008). Access at: http://www.maine.gov/dhhs/data_reports.shtml

The following reports were prepared by the Maine Department of Professional and Financial Regulation:

- Report of the Governor's Task Force on Expanding Access to Oral Health Care for Maine People (December 1, 2008). Access at: <http://www.maine.gov/pfr/legislative/index.htm>
- Sunrise Review of Oral Health Care Issues (February 2008). Access at: <http://www.maine.gov/pfr/legislative/index.htm>

APPENDIX 2: METHODS & DATA SOURCES

METHODS

Data in this report are based on surveillance indicators that were created in the Maine Oral Health Surveillance Plan. These indicators were created by reviewing the following key guidance reports and extracting all recommended measures:

- State Data/Surveillance Template (Association of State and Territorial Dental Directors)
- The Burden of Oral Disease: A Tool for Creating State Reports (Centers for Disease Control and Prevention)
- The National Oral Health Surveillance System
- Oral Health in America
- Chronic Disease Indicators (Centers for Disease Control and Prevention)
- Healthy People 2010
- Healthy Maine 2010

The indicators were then identified in five domains:

- Oral diseases (caries, periodontal disease, tooth loss, oral/pharyngeal cancer, cleft lip/palate)
- Prevention (dental cleaning, sealants, water fluoridation)
- Risk factors (tobacco use)
- Access to care (last dental visit [overall, preventive, other care], receipt of needed care, reasons care not received, dental insurance, MaineCare [which includes Medicaid and the State Children's Health Insurance Program] claims)
- Workforce (dentists, dental hygienists, school-based and community health centers with oral health components)

The report also used *The Burden of Oral Disease: A Tool for Creating State Report* provided by Centers for Disease Control and Prevention as a reference guide during the creation of this report.

Most indicators are only reported for the most recent year of data that is available; trend data is reported for a small number of key indicators (e.g., last dental visit, tooth loss). Select indicators are presented for demographic (e.g., age, sex, education, income) subgroups.

DATA SOURCES

Data for the oral health surveillance indicators were obtained from multiple data sources, including telephone surveys, written surveys, basic dental screening, MaineCare claims, vital records, registries, and professional licensure databases. The specific data sources are listed in the table below. Information is provided for each data source on the purpose for which data are collected, population sampled, collection methods, and frequency with which data are gathered.

Data Source	Purpose	Population Sampled	Collection Method	Frequency
Behavioral Risk Factor Surveillance System (BRFSS)	Collect information on risk behaviors and health conditions among adults	Non-institutionalized Maine adults ages 18 years and older	Telephone survey	Survey is annual; oral health questions are usually asked every other year
Death Certificate Dataset	Register deaths of Maine residents and deaths of residents of other states that occur in Maine	All Maine residents, plus non-Maine residents who die in Maine	Hard copy death certificates completed by funeral director, medical certifier, and medical examiner (when indicated) are entered into electronic dataset	Annual
Dental Health Professional Shortage Areas Map, Office of Rural Health & Primary Care, Maine CDC	Identify federally- and/or state-designated dental health professional shortage areas	Based on geographic distribution of dental health professionals in Maine	Designated by the Health Resources and Services Administration of the U.S. Department of Health and Human Services or the Maine Department of Health and Human Services	Annual

Data Source	Purpose	Population Sampled	Collection Method	Frequency
Head Start Program Information Report	Collect information on services, staff, children and families served by Head Start and Early Head Start	Oral health measures available only for preschool children	Web based data collection	Annual
Maine Birth Defects Registry	Conduct statewide surveillance of select major birth defects	Newborns	Combination of active and passive case ascertainment using multiple sources	Annual
Maine Board of Dental Examiners	Track individuals who are licensed to practice dentistry, dental hygiene (independent practice dental hygienist and registered dental hygienist) in Maine	Licensed dental professionals	Information collected through licensure process	Annual
Maine Cancer Registry	Conduct statewide surveillance of newly diagnosed and treated cancers; provide data on cancer incidence and mortality	Maine residents	Mandated reporting by hospitals that diagnose/treat a patient with cancer, plus mandated reporting by physicians of newly diagnosed cancer cases when the patient will not be referred to a hospital for diagnosis/ treatment	Annual
Maine Cooperative Health Manpower Resource Inventory	Provide descriptive data on dentists, dental hygienists, and individuals in select other health occupations living or working in Maine	Licensed dentists and dental hygienists (and individuals in select other health occupations) living or working in Maine during the current licensure cycle	Mailed survey	Biennial

Data Source	Purpose	Population Sampled	Collection Method	Frequency
Maine Integrated Youth Health Survey	Collect information on health-risk behaviors among youth	Kindergarten, 3rd grade, 5th grade, 6th grade, middle school and high school students in Maine public schools	Written survey completed by parents (kindergarten and 3rd grade) or students (5th grade and above)	Biennial
Maine Primary Care Association	Track availability of oral health care for underserved populations, including number of dental operatories	All community health centers except nonfederally qualified health centers	Mailed survey	Annual
Maine School-Based Health Center Grantee Data	Collect information on services (including oral health) provided to youth at school-based health centers	Participating schoolbased health centers (funded by Maine CDC)	Excel file submitted via email	Twice a year
MaineCare management information system	Track claims to pay providers for medical, dental, and pharmacy services	Maine residents enrolled in Medicaid or the State Children's Health Insurance Program	Claims submitted by providers	Annual
National School Lunch Program, Maine Department of Education	Federally assisted meal program to provide nutritionally balanced, low-cost or free lunches to Maine school children each day	All school going children in public and participating non-profit private schools and residential child care institutions	Web based form submitted by school on number of enrolled children	Annual
National Survey of Children's Health	Examine the physical and emotional health of children. Provide a broad range of information about children's health and well-being	Birth through 17 years	Telephone survey completed by parent or guardian	Approximately every four years

Data Source	Purpose	Population Sampled	Collection Method	Frequency
National Survey of Children with Special Health Care Needs	Assess the prevalence and impact of special health care needs	Children from birth through 17 years who have special health care needs	Telephone survey completed by parent or guardian	Approximately every four years
Pregnancy Risk Assessment Monitoring System (PRAMS)	Collect information on maternal experiences and attitudes before, during, and shortly after pregnancy	Mothers who have had a recent live birth	Mailed survey, with telephone follow-up of non-responders; linked to child's birth certificate data	Annual
Water Fluoridation Reporting System	Collect and report on fluoridation levels from participating public water systems in Maine	Community water systems	Web based data collection form	Annual

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APPENDIX 3:

Tables

Table 1. Healthy People 2010 Oral Health Objectives

Healthy People 2010 Objective	Target (%)	National^a (%)	Maineⁱ (%)
21-1) Dental caries (tooth decay) experience			
a) Young children, aged 2-4 years	11	24 ^a	
b) Children, aged 6-8 years	42	53 ^a	23.4 ^{a,b}
c) Adolescents, aged 15 years	51	56 ^a	
21-2) Untreated caries (tooth decay)			
a) Young children, aged 2-4 years	9	19 ^a	
b) Children, aged 6-8 years	21	29 ^a	17.6 ^{a,b}
c) Adolescents, aged 15 years	15	18 ^a	
d) Adults, aged 35-44 years	15	28 ^a	
<hr/>			
21-3) No tooth loss, aged 35–44 years	40	38 ^a	63.0 ^c
21-4) Edentulous (toothless), aged 65–74 years	22	24 ^a	18.3 ^c
21-5) Periodontal (gum) diseases, aged 35–44 years			
a) Gingivitis	41	48 ^d	NA
b) Destructive periodontal (gum) diseases	14	16 ^a	NA
3-6) Oral and pharyngeal cancer death rates (per 100,000 population)	2.7	3.0 ^{c,*}	2.5 ^f
21-6) Oral and pharyngeal cancers detected at earliest stages, all	51	35 ^g	NA
21-7) Oral and pharyngeal cancer exam within past 12 months, aged 40+ years	20	13 ^c	NA
<hr/>			
21-8) Dental sealants			
a) Children, aged 8 years (1st molars)	50	32 ^a	27.4 ¹
b) Adolescents (1st and 2nd molars) aged 14 years	50	21 ^a	NA
21-9) Population served by fluoridated water systems, all	75	69 ^h	84 ⁱ

21-10) Dental visit within past 12 months

Children and adults aged 2+ years	56	45 ^a	80.9 ^j (1-17 year), 71.5 ^c (18+)
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21-11) Use of oral health care system by adult residents in long-term care facilities

25	19 ^k	NA
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21-12) Low-income children and adolescents receiving preventive dental care during past 12 months, aged 0–18 years

66	31 ^a	32 ¹
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21-13) School-based health centers with oral health component, K–12

a) Dental sealants	15	12 ^m	121
b) Dental care	9	11 ^m	NA

21-14) Community-based health centers and local health departments with oral health components, all

75	70 ^h	38
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21-15) System for recording and referring infants and children with cleft lip and cleft palate, all

51 (all) states and District of Columbia	32 states and District of Columbia ⁿ	Yes
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21-16) Oral health surveillance system, all

51 (all) states and District of Columbia	0 states ⁿ	Yes
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21-17) Tribal, state, and local dental programs with a public health trained director, all

a) state and local	41	51 ^h	Yes
b) tribal and Indian Health Service	9	10 ^h	Yes

NA= Data not available

*Age adjusted to the year 2000 standard population

aa Data are for 2004.

b 2009-2010 Maine Integrated Youth Health Survey

c 2008 Behavioral Risk Factor Surveillance System

d Data are for 1988–1994.

e e Data are for 1998.

f 2007 Maine Death Data

g Data are for 2000.

h Data are for 2006.

i Water Fluoridation Reporting System

j National Survey of Children's Health

k Data are for 1997.

l MaineCare Data,

Note: Teeth cleaning data are required in the burden report. Teeth cleaning is a NOHSS indicator but are not included in Healthy People 2010. See Part V, Section D, "Preventive Visits," in this report.

m Data are for 2008

n Data are for 1999.

o Target revised.

p 1. 2010 Maine Integrated Youth Health Survey, 2. 2008 Behavioral Risk Factor Surveillance System, 3. 2007 Maine Death Data, 4. 2009 Maine Integrated Youth Health Survey, 5. Water Fluoridation Reporting System, 6. National Survey of Children's Health 2007 MaineCare Data,

Note: Teeth cleaning data are required in the burden report. Teeth cleaning is a NOHSS indicator but are not included in Healthy People 2010. See Part V, Section D, "Preventive Visits," in this report.

Table 2. Caries Experience Among 3rd Graders, Youth Health Survey Maine

	(%)
1999	44.7
2004	41.1
2009	29.5
2011	32.7

Source: Maine Integrated Youth Health Survey

Table 3. Untreated Caries Among Kindergarten and 3rd Grade Children, Maine, 2011

	(%)
Last Dental Visit	
Within the past year	13.1
1 or more years ago	17.8
Dental Insurance	
Don't have	13.6
Have	12.4

Source: Maine Integrated Youth Health Survey.

Table 4. Untreated Tooth Decay Among Children 2-5 Years Old; American Indian Children in the Nashville Area (2009) compared to U.S. Children Examined in NHANES (1999-2002)

	(%)
White, U.S. NHANES	17
Black, U.S. NHANES	24
Hispanic, U.S. NHANES	31
American Indian, Nashville Area	42

Source: National Health and Nutrition Examination Survey (NHANES).

Table 5. Adults Who Had Any Permanent Teeth Extracted or No Permanent Teeth Extracted by Selected Demographic Characteristics, Maine 2010

		Any Permanent tooth extracted	No Permanent tooth extracted
		Percent and 95% CI	Percent and 95% CI
Total	Total	50.6(49.1-52.1)	49.4(47.9-50.9)
Race	White Non-Hispanic	50.6(49.0-52.1)	49.4(47.9-51.0)
	Non-White Non-Hispanic	58.0(48.6-67.3)	42.0(32.7-51.4)
	Hispanic	41.6(28.9-54.3)	58.4(45.7-71.1)
Age Group	18-24 yrs	14.9(9.6-20.2)	85.1(79.8-90.4)
	25-34 yrs	26.3(22.0-30.5)	73.7(69.5-78.0)
	35-44 yrs	35.5(32.2-38.7)	64.5(61.3-67.8)
	45-64 yrs	60.6(58.7-62.5)	39.4(37.5-41.3)
	65-74 yrs	79.0(76.7-81.3)	21.0(18.7-23.3)
	75+ yrs	85.5(83.2-87.8)	14.5(12.2-16.8)
Education	Less than High School	72.9(65.9-79.9)	27.1(20.1-34.1)
	High School or GED	63.7(60.9-66.5)	36.3(33.5-39.1)
	Some post High School	48.1(45.2-51.1)	51.9(48.9-54.8)
	College Graduate	35.7(33.6-37.9)	64.3(62.1-66.4)
Income	Less than \$15,000	65.4(59.7-71.1)	34.6(28.9-40.3)
	\$15,000 - \$24,999	66.6(62.4-70.8)	33.4(29.2-37.6)
	\$25,000 - \$34,999	61.5(56.8-66.1)	38.5(33.9-43.2)
	\$35,000 - \$49,999	53.4(49.6-57.2)	46.6(42.8-50.4)
	More than \$50,000	38.0(35.9-40.1)	62.0(59.9-64.1)
Sex	Male	50.7(48.3-53.0)	49.3(47.0-51.7)
	Female	50.6(48.7-52.5)	49.4(47.5-51.3)
Public Health District	Aroostook District	61.6(54.9-68.2)	38.4(31.8-45.1)
	Central District	54.7(50.5-58.9)	45.3(41.1-49.5)
	Cumberland District	42.0(38.8-45.3)	58.0(54.7-61.2)
	Downeast District	54.8(50.0-59.6)	45.2(40.4-50.0)
	Midcoast District	51.6(48.1-55.1)	48.4(44.9-51.9)
	Penquis District	55.1(50.6-59.5)	44.9(40.5-49.4)
	Western District	51.0(46.8-55.2)	49.0(44.8-53.2)
	York District	45.8(41.6-50.1)	54.2(49.9-58.4)

Table 5. Continued

		Any Permanent tooth extracted	No Permanent tooth extracted
		Percent and 95% CI	Percent and 95% CI
County	Androscoggin	47.6(41.7-53.5)	52.4(46.5-58.3)
	Aroostook	61.6(54.9-68.2)	38.4(31.8-45.1)
	Cumberland	42.0(38.8-45.3)	58.0(54.7-61.2)
	Franklin	53.8(45.6-61.9)	46.2(38.1-54.4)
	Hancock	47.5(41.2-53.8)	52.5(46.2-58.8)
	Kennebec	52.0(46.9-57.0)	48.0(43.0-53.1)
	Knox	51.4(45.3-57.6)	48.6(42.4-54.7)
	Lincoln	53.6(46.9-60.2)	46.4(39.8-53.1)
	Oxford	54.9(47.0-62.7)	45.1(37.3-53.0)
	Penobscot	53.3(48.3-58.3)	46.7(41.7-51.7)
	Piscataquis	65.1(56.5-73.7)	34.9(26.3-43.5)
	Sagadahoc	45.6(37.7-53.5)	54.4(46.5-62.3)
	Somerset	60.4(52.8-67.9)	39.6(32.1-47.2)
	Waldo	55.5(48.6-62.3)	44.5(37.7-51.4)
	Washington	67.1(59.9-74.3)	32.9(25.7-40.1)
York	45.8(41.6-50.1)	54.2(49.9-58.4)	

Source: 2010 Maine Behavioral Risk Factor Surveillance System

Note: CI=Confidence intervals are 95% for prevalence. 95% CI can be used to compare the prevalence within group; if the 95% CI for prevalence of two categories overlap the prevalence is considered similar. If the confidence intervals do not overlap, the prevalence is considered significantly different.

Table 6. Adults With Smoking and Diabetes Status Who Had Any Permanent Teeth Extracted, Maine 2010

		Any Permanent tooth extracted
		Percent (95% CI)
Smoking Status	Current Smoker	61.9(57.8-65.9)
	Former Smoker	62.8(60.5-65.1)
	Never Smoker	39.5(37.5-41.5)
Diabetes	With Diabetes	74.9(71.1-78.6)
	Without Diabetes	48.3(46.8-49.9)

Source: 2010 Maine Behavioral Risk Factor Surveillance System

Note: CI=Confidence intervals are 95% for prevalence. 95% CI can be used to compare the prevalence within group; if the 95% CI for prevalence of two categories overlap the prevalence is considered similar. If the confidence intervals do not overlap, the prevalence is considered significantly different.

Table 7. Adults 65 Years and Older Who Had Lost All Their Permanent Teeth by Selected Demographic Characteristics, Maine 2010

		Maine (%)	U.S. (Median %)
Total	Total	20.7	16.9
Race	White Non-Hispanic	20.3	16.2
	Non-White Non-Hispanic	32.7	NA
	Hispanic	22.3	14.3
Education	Less than High School	49.6	38.4
	High School or GED	28.1	21.5
	Some post High School	16.4	13.3
	College Graduate	5.5	5.5
Income	Less than \$15,000	44.6	36.4
	\$15,000 - \$24,999	26.5	24.2
	\$25,000 - \$34,999	22.5	16.0
	\$35,000 - \$49,999	14.9	12.2
	More than \$50,000	4.1	5.6
Sex	Male	17.9	15.4
	Female	22.8	18.1
Public Health District	Aroostook District	30.3	NA
	Central District	24.9	NA
	Cumberland District	12.7	NA
	Downeast District	16.6	NA
	Midcoast District	17.2	NA
	Penquis District	30.5	NA
	Western District	22.2	NA
	York District	20.5	NA
County	Androscoggin	26.5	NA
	Aroostook	30.3	NA
	Cumberland	12.7	NA
	Franklin	18.7	NA
	Hancock	13.5	NA
	Kennebec	19.6	NA
	Knox	16	NA
	Lincoln	11.5	NA
	Oxford	17.7	NA
	Penobscot	28.5	NA
	Piscataquis	40.7	NA
	Sagadahoc	22.4	NA
	Somerset	36	NA
	Waldo	21.4	NA
Washington	22.7	NA	
York	20.5	NA	

Source: 2010 Maine Behavioral Risk Factor Surveillance System.

Table 8. Age Adjusted Oral and Pharyngeal Cancer Incidence Rate, Maine & United States

	Maine Rate (95% CI)	U.S.* Rate (95% CI)		
1995-1997	12.5 (11.4 - 13.7)	11.4 (11.1 - 11.6)	Maine Data Source: Maine Cancer Registry. U.S. Data Source: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 13 Regs Research Data, Nov 2010 Sub (1992-2008) <Katrina/Rita Population Adjustment> - Linked To County Attributes - Total U.S., 1969-2009 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2011 (updated 10/28/2011), based on the November 2010 submission.	
1996-1998	12.4 (11.3 - 13.5)	11.3 (11.1 - 11.5)		
1997-1999	12.8 (11.7 - 13.9)	10.9 (10.7 - 11.1)		
1998-2000	12.4 (11.3 - 13.5)	10.7 (10.5 - 10.9)		
1999-2001	12.6 (11.5 - 13.7)	10.5 (10.3 - 10.7)		
2000-2002	13.0 (11.9 - 14.1)	10.6 (10.4 - 10.8)		
2001-2003	13.3 (12.2 - 14.4)	10.4 (10.2 - 10.6)		
2002-2004	12.9 (11.9 - 14.0)	10.4 (10.2 - 10.6)		
2003-2005	12.3 (11.3 - 13.3)	10.2 (10.0 - 10.4)		
2004-2006	12.2 (11.3 - 13.3)	10.2 (10.0 - 10.4)		
2005-2007	12.3 (11.3 - 13.4)	10.1 (9.9 - 10.3)		Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population. 95% CI= 95% Confidence interval.
2006-2008	12.7 (11.7 - 13.8)	10.2 (10.0 - 10.4)		
2007-2009	12.5 (11.5 - 13.5)	NA		

Table 9. Age Adjusted Oral and Pharyngeal Cancer Incidence Rate by Gender, Maine & United States

	Male Rate (95% CI)	Female Rate (95% CI)	
1995-1997	19.1 (17.1 - 21.3)	7.1 (6.0 - 8.4)	Maine Data Source: Maine Cancer Registry. Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population. 95% CI: 95% confidence interval.
1996-1998	20.0 (18.0 - 22.2)	6.4 (5.4 - 7.5)	
1997-1999	20.4 (18.4 - 22.6)	6.7 (5.7 - 7.9)	
1998-2000	19.3 (17.3 - 21.4)	6.9 (5.9 - 8.1)	
1999-2001	18.2 (16.3 - 20.2)	7.9 (6.8 - 9.2)	
2000-2002	19.3 (17.4 - 21.3)	7.8 (6.7 - 9.0)	
2001-2003	19.7 (17.8 - 21.7)	7.9 (6.8 - 9.1)	
2002-2004	20.2 (18.3 - 22.3)	6.7 (5.7 - 7.8)	
2003-2005	19.1 (17.3 - 21.1)	6.5 (5.5 - 7.6)	
2004-2006	19.7 (17.8 - 21.7)	5.9 (5.0 - 7.0)	
2005-2007	19.1 (17.3 - 21.0)	6.6 (5.6 - 7.7)	
2006-2008	19.2 (17.4 - 21.1)	7.1 (6.0 - 8.2)	
2007-2009	18.5 (16.8 - 20.4)	7.3 (6.3 - 8.5)	

Table 10. Age Adjusted Oral and Pharyngeal Cancer Death Rate, Maine & United States

	Maine (Rate)	U.S. (Rate)
1999-2001	3.2	2.7
2000-2002	3.0	2.7
2001-2003	2.9	2.7
2002-2004	2.9	2.6
2003-2005	2.8	2.6
2004-2006	2.7	2.5
2005-2007	2.4	2.5
2006-2008	2.4	2.5

Source: National Center for Health Statistics.

Note: Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population (19 age groups - Census P25-1130) standard.

95% CI: 95% confidence interval.

Table 11. Age Adjusted Oral Cancer Death Rate by Gender, Maine

	Male Rate (95% CI)	Female Rate (95% CI)
1999-2001	5.0 (4.0 - 6.1)	1.8 (1.3 - 2.4)
2000-2002	4.7 (3.8 - 5.8)	1.6 (1.2 - 2.2)
2001-2003	4.4 (3.5 - 5.5)	1.6 (1.1 - 2.2)
2002-2004	4.5 (3.6 - 5.5)	1.6 (1.2 - 2.2)
2003-2005	4.5 (3.6 - 5.5)	1.4 (1.0 - 2.0)
2004-2006	4.1 (3.2 - 5.1)	1.6 (1.1 - 2.1)
2005-2007	3.6 (2.9 - 4.6)	1.4 (1.0 - 1.9)
2006-2008	3.4 (2.6 - 4.3)	1.6 (1.2 - 2.2)

Source: National Center for Health Statistics.

Note: Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

95% CI: 95% confidence interval.

Table 12. Percentage of Children, Aged 1-17 Years, Who Had at Least One Preventive Dental Care Visit During the Past Year, Maine and United States 2011/12

	Maine (%)	United States (%)
Total	80.5	77.2
Race/Ethnicity*		
White, non-Hispanic	81.9	79.7
African American, non-Hispanic	87.5	75.9
Non-White, non-Hispanic	68.1	73.5
Hispanic	65.2	73.9
Household Income Level		
0-99% FPL	66.7	68.0
100-199% FPL	77.6	73.0
200-399% FPL	83.5	79.7
400% or higher FPL	89.0	85.0

Source: 2011/12 National Survey of Children's Health.

* Hispanic includes all children reporting Hispanic/Latino origin; Non-Hispanic children reporting a single race category of either White or Black are grouped respectively; Non-Hispanic children reporting more than one race category are grouped under "other non-hispanic." FPL: Federal Poverty Level.

Table 13. Percentage of Adults 18 Years or Older Who Had Their Teeth Cleaned or Had a Dental Visit for Any Reason within the Past Year, by Selected Demographic Characteristics, Maine and United States, 2010

		Maine (%)	U.S. (Median %)
Total	Total	67.6	69.7
Race	White Non-Hispanic	68.3	73.0
	Non-White Non-Hispanic	56.0	NA
	Hispanic	56.2	61.9
Education	Less than High School	43.3	48.1
	High School or GED	55.8	62.2
	Some post High School	70.5	70.6
	College Graduate	81.6	82.7
Income	Less than \$15,000	39.2	46.3
	\$15,000 - \$24,999	47.5	52.4
	\$25,000 - \$34,999	58.5	62.7
	\$35,000 - \$49,999	69.3	70.2
	More than \$50,000	84.7	83.3
Sex	Male	63.6	68.0
	Female	71.3	72.4
Public Health District	Aroostook District	58.3	NA
	Central District	61.9	NA
	Cumberland District	77.5	NA
	Downeast District	65.1	NA
	Midcoast District	69.5	NA
	Penquis District	66.1	NA
	Western District	63.0	NA
	York District	71.1	NA
County	Androscoggin	62.6	NA
	Aroostook	58.3	NA
	Cumberland	77.5	NA
	Franklin	68.1	NA
	Hancock	71.1	NA
	Kennebec	67.2	NA
	Knox	69.9	NA
	Lincoln	74.2	NA
	Oxford	60.8	NA
	Penobscot	66.3	NA
	Piscataquis	64.8	NA
	Sagadahoc	67.4	NA
	Somerset	51.2	NA
	Waldo	66.9	NA
Washington	54.8	NA	
York	71.1	NA	

Source: 2010 Maine Behavioral Risk Factor Surveillance System.

*Other Non-Hispanic includes African American, Asian, Alaska Native/Native American, Native Hawaiian, or Pacific Islander.

Table 14. Percent of Pregnant Mothers who Visited a Dentist or Dental Clinic during their Most Recent Pregnancy, Maine and Selected States PRAMS, 2010

Characteristics	Maine (n=5,815)	
	Weighted percentage	95% confidence interval
All ME mothers	46.1	(42.5-49.6)
<hr/>		
Age group		
< 20 years	27.5	(16.8-41.6)
20 -24 years	29.6	(23.6-36.5)
25 -34 years	52.0	(47.3-56.7)
35 years and older	64.2	(54.1-73.1)
<hr/>		
Marital status		
Married	58.7	(54.3-63.0)
Not Married	28.2	(23.2-33.7)
<hr/>		
Education		
Less than high school	27.1	(16.6-41.0)
High school graduate	28.9	(23.6-34.8)
Some college	58.7	(54.2-63.0)
<hr/>		
Annual Household Income		
<\$10,000	23.6	(17.9-30.4)
\$10,000-24,999	28.4	(20.5-38.0)
\$25,000-49,999	45.2	(37.9-52.8)
\$50,000+	71.9	(66.4-76.7)

Source: 2010 Maine Pregnancy Risk Assessment Monitoring System, Office of Data, Research and Vital Statistics

Table 15. Percentage of Maine and U.S. Population on Public Water Supply Systems Receiving Fluoridated Water

	Maine (%)	United States (%)
2000	75.4	65.0
2002	74.2	67.4
2004	79.6	68.7
2006	79.6	69.2
2008	84.0	

Source: Water Fluoridation Reporting System

Table 16. Percent of High School Students Who Smoked Cigarettes on One or More of the Past 30 Days, Maine & United States

	Maine (%)	United States (%)
1995	37.8	34.8
1997	39.2	36.4
1999	-	34.8
2001	24.8	28.5
2003	20.5	21.9
2005	16.2	23.0
2007	14.0	10.0
2009	18.1	19.5
2011	15.2	18.1

Source: Youth Risk Behavior Survey.

Table 17. Percent of Adults with Dental Insurance by Income, Maine 2008

Income	(%)
Less than \$15,000	19.4
\$15,000-\$24,999	26.5
\$25,000-\$34,999	-
\$35,000-\$49,999	-
\$50,000 +	70.7

Source: Behavioral Risk Factor Surveillance System (BRFSS)

APPENDIX 4:

ORAL HEALTH PROFESSIONALS IN MAINE: DEFINITIONS

<p>Dentist (DMD or DDS)</p>	<p>Dentists graduate from a 4 year graduate (post college) dental training program that confers the degree of DMD or DDS. Dentists provide the diagnosis, prevention and treatment of diseases of the oral tissues, especially the restoration and replacement of defective teeth. They can practice general dentistry or specialize. Dental specialists include endodontists (root canals), periodontists (gum diseases), oral and maxillofacial surgeons (surgery), pedodontists (pediatric dentistry) orthodontists (braces) and prosthodontists (restoration/replacement of teeth with artificial substitutes, such as dentures). Dentists practice is regulated by the Maine Board of Dental Examiners and must be licensed every two years.</p>
<p>Dental Hygienist (RDH) *</p>	<p>Hygienists graduate from a two to four year post-secondary college program and receive the title of Registered Dental Hygienist (RDH) in addition to the appropriate college degree. They work under the direct or general supervision of a dentist, and in Maine may also work under Public Health Supervision. Hygienists can work in dental offices and public health settings, and provide a wide range of preventive services and other procedures depending on their work settings and patient needs. As a part of their training and licensure, they are also licensed as Dental Radiographers. Hygienists who practice under Public Health Supervision Status can provide preventive services in settings such as schools and nursing homes or at local community events, among others. Hygienists practice under the direction of the Maine Board of Dental Examiners and must be licensed every two years.</p>
<p>Independent Practice Dental Hygienist (IPDH) *</p>	<p>In April 2008, Maine passed legislation to permit licensure of Independent Practice Dental Hygienists. This licensure category is available to individuals who possess a valid license to practice dental hygiene in Maine and meet specified requirements for education and experience, and if chosen, replaces the dental hygiene license. The scope of practice for an IPDH includes many but not all of all the duties described under general supervision of RDHs practice, allowing practice without supervision by a dentist to the extent permitted by the applicable statute and rules.</p>
<p>Dental Assistant (DA) and Certified Dental Assistant (CDA)</p>	<p>A dental assistant works under the direct supervision of a dentist. Assistants can be trained on the job or may attend a certificate program (usually less than one year). They provide assistance to a dentist during patient treatment to help complete a variety of tasks related to operative and surgical procedures. In Maine dental assistants who take x-rays must pass a test and be licensed and registered by the State Board of Dental Examiners as Dental Radiographers; radiographers are licensed and registered every five years. With additional training or by documenting at least two years of experience, and after passing a certification examination administered by the Dental Assisting National Board, a dental assistant may become certified (CDA).</p>
<p>Expanded Function Dental Assistant (EFDA)*</p>	<p>This is a new team member in Maine and means a certified dental assistant (CDA) or a licensed dental hygienist who has successfully completed a Board approved EFDA training program and who has been issued a license by the Maine Board of Dental Examiners to perform reversible procedures under the direct supervision of a dentist. These may include the placement and contouring of amalgam and composite restorative materials. Training requirements include completion of specific, Board-approved continuing education courses, or EFDA certification may be obtained by credentialing from another state or province, provided that the coursework completed is accepted by the Board of Dental Examiners.</p>

Denturist (LD)	A member of the dental profession who has graduated from an accredited post-secondary denturist program. Denturists are licensed and registered by the Maine Board of Dental Examiners to practice the specialty of fabricating removable dentures - that is, dentures that do not attach to natural or restored teeth.
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*For specific information about licensure and scope of practice for these practitioners within the Maine Dental Practice Act, go to <http://www.mainedental.org/statutes.htm> where links to applicable statutes and rules may be accessed.

APPENDIX 5:

AN OVERVIEW OF THE MAINE CDC'S ORAL HEALTH PROGRAM

The Oral Health Program seeks to improve the oral health of Maine people through assisting community initiatives to prevent, control and reduce oral diseases; by planning, implementing and evaluating programs for oral health promotion and disease prevention; and by providing statewide coordination and integration of community based oral health services through increased access and removal of barriers. The OHP promotes and supports community-based/community-level primary dental disease prevention programs and oral health promotion efforts by working with and funding schools and community agencies, and administers funding to support both community-based oral health promotion and treatment capacity. The OHP also coordinates data collection and analysis to document oral health status and needs and provides technical assistance within the Maine CDC and the Department of Health and Human Services, to other state agencies, communities, dental and other health professionals and others. There has been an oral health program with similar responsibilities within Maine's public health agency since the mid 1970's.

The Program:

- Provides technical assistance and funding to schools, school districts and community agencies to support school-based dental disease prevention/oral health education programs, with fluoride mouthrinse, dental sealant and fluoride mouthrinse components; and provides limited funding to community agencies to support community-based oral health promotion and treatment capacity.
- Works with other programs in the Maine CDC and within DHHS to provide an oral health presence, by providing training, consultation and technical assistance to assist in providing oral health education and disease prevention strategies to their clients.
- Assists communities in authorizing and maintaining community water fluoridation and in collaboration with the Maine CDC Drinking Water Program, to monitor compliance with applicable standards.
- Collects/coordinates data documenting oral health status and needs and provides technical assistance and consultation.
- Provides training and technical assistance to dental and other health professionals on oral health issues.
- Works with state-level and community partners to implement and update the strategies set forth in the Maine Oral Health Improvement Plan.

The Oral Health Program also works to:

- Assess and track dental disease rates to document gains and disparities by supporting systems for collecting, tracking and reporting oral health and program information.
- Promote and support dental disease prevention activities and access to affordable dental care.
- Use evidence-based strategies to promote best oral health practices and policies.
- Build public/private partnerships to promote and support state and local programs and policies.
- Assure an adequate and competent oral health workforce.
- Evaluate effectiveness, availability and quality of oral health programs and services.
- Promote media or education campaigns to educate the public – in coordination with other MCDC initiatives and other partners.

Examples of other program initiatives:

- Administration of other initiatives, such as the Dental Care Access Credit Program (a tax incentive program for dentists opening or joining practices in underserved areas), and other legislatively directed programmatic activities.
- Collaboration with the ME Department of Education in policy development/recommendations for the provision of oral health services in schools.
- Support to other agencies and organizations in dental workforce development initiatives, such as the Dental Education Loan and Loan Repayment Programs at the Finance Authority of Maine (FAME).

More about... The ME CDC's School Oral Health Program:

The Maine Oral Health Program funds and coordinates the school-based/school-linked School Oral Health Program (SOHP). Grants are made to individual schools, school districts for several schools, and a few community agencies on behalf of groups of schools. Children in many schools have traditionally participated in a weekly fluoride mouthrinse program, and in about half of all participating schools, 2nd graders may receive dental sealants at school; the grants also support classroom-based oral health education activities, and increasingly include a fluoride varnish component.

- School eligibility for the SOHP is determined by a formula that includes the proportion of students eligible for the Free and Reduced Lunch Program and MaineCare as well as the proportions of the community receiving fluoridated public water and whose family income is at the FPL. The formula results in a score that determines eligibility for funding. In this way, the SOHP is directed toward those communities and schools where children are more likely to have problems with accessing dental services, since socio-economic status is directly related to the ability to obtain dental care. Funding constraints have resulted in closer scrutiny of the eligibility criteria and compliance with program requirements.
- Local SOHP directors work to assure that children who may be eligible for MaineCare do enroll; they also often work within their communities to find dental care for children who do not have a regular source for dental care.
- Schools are awarded small grants based on the numbers of children in grades K-6, within the limits of available funding. In the 2011-12 school year, the OHP awarded 84 grants to support programs in 232 schools, covering 30,000 children in grades K-6. For the 2013-14 school year, funding supports fewer programs in 189 schools.
- About half of participating schools have supplemental grants to provide dental sealants for second-graders, limited because of funding constraints. The OHP only funds sealant programs in schools already eligible for the SOHP, so this program component meets the same eligibility screen.

The OHP cannot fund all interested and eligible schools; there is a waiting list for the SOHP and a waiting list for SOHP schools that want to add the sealant component. More attention is being given to fine-tuning program requirements, auditing reports, and assuring that funding is targeted to schools where children can be expected to have greater oral health needs and less regular access to care.



Paul R. LePage, Governor

Mary C. Mayhew, Commissioner



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