

The Status of Oral Disease in Massachusetts



Office of Oral Health

Massachusetts Department of Public Health

November 2009

The Office of Oral Health

The mission of the Office of Oral Health is to improve, promote and protect the oral health of Massachusetts residents.

The Office seeks to assure that:

- Evidence-based prevention programs such as community water fluoridation and school fluoride and sealant programs are utilized by Massachusetts communities and residents.
- All residents have access to dental services, especially underserved populations.
- Publicly supported dental programs are efficiently managed and coordinated.
- Oral health information is available to residents and decision-makers to promote oral health.



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Additional and related information is also available from the
Massachusetts Department of Public Health website:
www.mass.gov/dph/oralhealth

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The Status of Oral Disease in Massachusetts:

A Great Unmet Need



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Dear Colleagues:

November 2009

The Office of Oral Health is pleased to present *The Status of Oral Disease in Massachusetts 2009: The Great Unmet Need*. This comprehensive report summarizes the most up-to-date and available information on the burden of oral disease in our state. The report was developed in collaboration with many different programs within the Department of Public Health exemplifying a commitment to oral health and its integration with general health and wellness.

This report demonstrates that we have made great strides in improving and promoting oral health in our state since the Massachusetts Special Legislative Commission Report was released in 2000. It will also demonstrate that there is still much more work to be done, especially among our most vulnerable residents who continue to experience a crisis in accessing dental care. Some points worth noting are:

- 57% of women did not have their teeth cleaned during their pregnancy
- 17% of the state's 3rd graders had untreated decay
- 71% of non-Hispanic Black 3rd graders did not have dental sealants
- 90% of residents between ages 25 and 44 living in dental health professional shortage areas have lost at least one tooth
- 59% of nursing home residents have untreated decay
- 93% of public schools did not have a school-based oral health prevention (dental sealant) program
- Massachusetts ranks 36th in the nation for water fluoridation status
- 66% of licensed dentists with a Massachusetts address are not MassHealth (Medicaid) providers

We hope this report will provide decision-makers and oral health stakeholders with the information needed to continue their work in improving and promoting the oral health of all our residents.

Sincerely,

A handwritten signature in blue ink, appearing to be "Lynn A. Bethel".

Lynn A. Bethel, RDH, MPH
Director, Office of Oral Health

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Demographic Profile of Massachusetts

Population: 6,497,967 is the estimated Massachusetts population as of 2007, (US Census Bureau). The population has grown by 2.5% between 2000 and 2007.

Race and Ethnicity: The majority of the state's population (79.7%) is white and non-Hispanic. In 2007, Hispanic persons represented 8.2% of the population, Black persons represented 6.9% of the population, and 4.9% of the population were Asian. From 2000 to 2007 there was a 28.1% increase in the Asian population, a 23.1% growth in Hispanic residents and an 11.3% change in the growth of Black residents.

Languages¹: One hundred thirty-seven different languages and dialects are spoken in households with children attending public schools throughout the Commonwealth of Massachusetts. Slightly more than one in two public school students come from a home where Spanish is the first language. The top ten non-English languages spoken in the state are Spanish, Portuguese, Chinese, Haitian Creole, Vietnamese, Khmer, Cape Verdean, Russian, Arabic and Korean.

Family Income and Education: In 2007, an estimated 10% of the state's residents were living below the federal poverty level compared to 13% nationally². The median Massachusetts household income (2007) was \$62,383 compared nationally to \$50,740. Eighty-four percent of the state's residents have graduated from high school and one-third (33.2%) have a Bachelor's degree or higher.

Health and Dental Insurance^{3 4}: The percentage of Massachusetts residents without health insurance has substantially decreased over the last two years since the implementation of Health Reform Legislation in the state. Those most likely to be uninsured are non-elderly adults (3.7%), Hispanic residents (7.2%) and residents with a family income at least 300% below poverty level (5%). About 1.2% of children are uninsured.

Among those residents with insurance coverage, the majority of children (70%) and non-elderly adults (81%) have employee sponsored coverage. While 89% of elderly adults were covered by Medicare, children were twice as likely as non-elderly adults to be enrolled in public or other coverage (29% versus 15%).

The majority of health insurance plans, including Medicare, do not include routine dental services. In 2007, about 25% (1.58 million) of residents had no dental insurance coverage at all, while 75% (4.86 million) of residents had dental coverage (including those with coverage through MassHealth). Currently, there are more than 1.2 million residents, 17% of the Massachusetts population, served by MassHealth which includes more than 500,000 children under 21 years of age. Trends show that little has changed over time.

¹ First Language is Not English (FLNE) and Limited English Proficiency (LEP) Students in Massachusetts Public Schools 2005-2006 School Year. Massachusetts Department of Public Health. Boston, MA. 2007.

² Massachusetts QuickFacts, US Census Bureau, <http://quickfacts.census.gov/qfd/states/25000.html> (accessed 8/9/2009).

³ Health Insurance Coverage in Massachusetts: Estimates from the 2008 Massachusetts Health Insurance Survey. Executive Office of Health and Human Services Office of Health Care Finance and Policy, Boston, MA. 2008.

⁴ Delta Dental of Massachusetts, email communication with Dennis Leonard, President, Commercial Business. October 26, 2009.



The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need

Executive Summary

In Massachusetts, a Special Legislative Commission on Oral Health was appointed in 1998 to investigate and assess oral health status in the Commonwealth. In 2000, the Commission released a report titled, *The Oral Health Crisis in Massachusetts* that outlined five major recommendations for legislators, policy-makers, community advocates and residents to improve the oral health of the Commonwealth.

In the same year, two additional publications placed oral health on the national agenda. *Oral Health in America: A Report of the U.S. Surgeon General* was released alerting Americans to the importance of optimal oral health in their daily lives. Following this report, a set of national oral health indicators were developed as part of *Healthy People 2010*, a document that presents comprehensive, nationwide health promotion and disease prevention objectives, including oral health.

The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need is a comprehensive summary of oral diseases in Massachusetts throughout the human life cycle and was derived from the analysis of state survey data. Oral disease indicators are provided for:

- Pregnant women and newborns
- Children and adolescents
- Adults
- Elders

In addition, information is provided on community-based oral health prevention programs, including water fluoridation and dental sealants, as well as the dental workforce.

Pregnant Women and Newborns:

The Pregnancy Risk Assessment Monitoring System (PRAMS) includes results that describe the oral health care of pregnant and perinatal women stratified by age, race and ethnicity, and income. Pregnant women are at greater risk for oral disease. Disparities exist based on poverty, race, ethnicity, as well as age. The older the pregnant women the greater the likelihood they will access dental care. Cleft lip and palate is the most prevalent oral congenital anomaly and is a major oral health indicator for infants. In Massachusetts:

- In 2007, 90% of women who were pregnant reported ever having had their teeth cleaned by a licensed dental professional.
- In 2007, among the women who had their teeth cleaned during a pregnancy, 43% had their teeth cleaned during the most recent pregnancy.
- In 2005, 64 infants were born having a cleft lip, with or without a cleft palate, for a rate of 8.3 clefts per 10,000 births in Massachusetts.

Children and Adolescents:

Tooth decay is the most common oral disease among children and adolescents, disproportionately affecting children of racial and ethnic minority groups from areas of lower socioeconomic status. The oral health of adolescents becomes compromised through a poor diet comprised of fermentable carbohydrates and activities that increase risk of oral disease and injury such as contact sports, tobacco use, and oral piercings. Irrespective of age, dental caries is almost completely preventable given a child's accessibility to prevention measures, such as dental sealants, regular cleanings/exams, topical fluoride, and fluoridated drinking water. In Massachusetts:

- In 2005, 37% of Head Start children between the ages of three and five had experienced dental decay.
- 12% of middle school students and high school students reported never being examined by a dentist in the previous year.
- 30% of middle school students and 35% of high school students self-reported having a cavity during the previous year.
- 60% of oral/facial injuries on school grounds required medical intervention, however only 31% of Massachusetts schools required mouth protection for sports activities.

Adults:

Tooth loss is a major indicator of oral health among adults, which may be increased by the lack of access to care, certain chronic diseases, and/or insurance status. In addition, disparities exist based on race and ethnicities, income and education. In Massachusetts:

- 66% of 35 to 44 year olds have lost at least one tooth, and 14% of adults 65 to 74 have lost all of their teeth.
- Residents ages 25 to 44 living in Massachusetts Dental Health Professional Shortage Areas have more tooth loss comparatively than those in the same age group living in non-DHSPA (36% and 27%, respectively).
- 74% of residents living with diabetes have lost teeth to oral disease or decay, compared to 42% of those without diabetes.

Seniors:

Seniors make up an increasing portion of the population who are at greater risk of oral disease. In Massachusetts 13% of the population is 65 years of age and older and the numbers are expected to increase by 36% by 2020. Edentulism, or complete tooth loss, is the principal oral health indicator among adults aged 65 or older. Along with deteriorating physical and mental acuity, many elderly individuals lack access to oral health care due to financial barriers and being homebound. In Massachusetts:

-
- 14% of Massachusetts elderly residents were found to be edentulous, which is less than the national average of 22%.
 - 27% of MassHealth members over the age of 60 living in the community and 45% of eligible residents in long term care facilities utilized the dental benefit in Fiscal Year 2007.
 - 59% of seniors in long term care facilities were found to have untreated decay.
 - 7% of those seniors with untreated decay in nursing homes were found to have urgent dental needs.
 - 35% of seniors at state subsidized meal sites were found to have untreated decay with 4% having urgent dental needs.

Special Health Needs:

There are more than one million disabled residents 5 years of age and older in the Commonwealth and about 3% of the population is developmentally disabled. Oral health care continues to be a critical problem for these residents with special health needs. Massachusetts is unique in that it has seven specialized dental clinics operated by the Tufts Dental Facilities (TDF) located statewide to provide comprehensive dental care to those residents across the lifespan who have an intellectual disability and/or who are developmentally disabled.

- More than 21,000 dental patient visits were provided to the most vulnerable residents in our state in FY 2008 by the Tufts Dental Facilities.

Oral Cancer:

Information provided by the Massachusetts Cancer Registry shows that the incidence of oral/pharyngeal cancer and mortality rates due to oral/pharyngeal cancer have fallen significantly in Massachusetts from 1995 to 2005. This decline is also reflected in national statistics.

- There were 8,190 incident cases of oral/pharyngeal cancer diagnosed from 1995-2005 in Massachusetts.
- The incidence rate for males from 1995 to 2000 and from 2001 to 2005 was significantly higher compared to females.
- For the 1995-2000 period, the incidence rate for white non-Hispanics (NH) was significantly lower than that of black NHs (11.5/100,000 and 13.3/100,000, respectively), while the rates among white, NHs, Asian, NHs, and Hispanics were comparable.
- There were 2,033 deaths due to oral/pharyngeal cancer from 1995-2005.
- The mortality rate for oral/pharyngeal cancer decreased significantly from 3.6 per 100,000 residents in 1995 to 2.1 per 100,000 residents in 2005.

Community-based Prevention Programs:

The majority of oral diseases are preventable, though the burden of disease is far worse for those who have limited access to prevention strategies. Access to effective, evidence-based prevention strategies targeting the individual and the community are imperative for preventing oral diseases through the lifespan. School dental sealant programs have been shown to be highly cost-effective in preventing caries experience among the school-aged population; however, Massachusetts has very few schools with school-based oral health prevention programs.

- 8% of Massachusetts's schools had a school dental sealant program in 2006 and little has changed since that time.
- 56% of school nurses reported an interest in implementing a (new) dental sealant program in their schools for the 2009-2010 school year.

Fluoridation and Fluorides:

Community water fluoridation, fluoride mouthrinse programs, and fluoride varnish programs serve to prevent oral disease in the Commonwealth.

- 3.9 million Massachusetts residents (59.1% of the state's population) are receiving the health and economic benefits of community water fluoridation in 2009.
- In 2009, of the 351 cities and towns in Massachusetts 40% already fluoridate their water, 42% have the ability to fluoridate, and 18% can not fluoridate their water due to not having a public water supply.
- The number of schools in non-fluoridated communities participating in fluoride mouthrinse programs increased from 236 in the 2007-2008 school year to 271 in the 2008-2009 school year, with over 52,000 school children participating.
- Massachusetts recently added MassHealth (Medicaid) coverage for oral health screenings and fluoride varnish applied in the medical setting.

Dental Workforce:

The Commonwealth currently has 5,889 (includes limited licensees) dentists with a Massachusetts address serving 6,449,755 residents for a dentist-to-patient ratio of 1 to 1,095, as compared to a 1 to 1,700 national ratio. Geographical constraints in accessing dental care have left 53 areas in Massachusetts designated as dental health professional shortage areas (DHPSA) representing about 1,292,643 residents. Along with DHPSAs, Massachusetts' dental workforce is an increasingly aging population, with an average age of 50.6 years of age for dentists.

Massachusetts has 5,161 licensed dental hygienists with the majority having more than 15 years of experience. New legislation has allowed dental hygienists to offer direct access to preventive services to residents in public health settings. Massachusetts has three dental schools, ten AEGD/GPR dental residency programs, and eight dental hygiene programs.

The Massachusetts Department of Public Health's Primary Care Office offers a loan repayment program to encourage dentists and hygienists to work with the developmentally disabled or in the most underserved areas in the Commonwealth.

MassHealth (Medicaid):

MassHealth provides comprehensive dental insurance to financially-eligible residents of Massachusetts. In 2009, there were more than 1.2 million residents enrolled, and of that number about 500,000 were younger than 21 years of age. The proportion of the state's residents who had no insurance and had not visited the dentist in the past year was not significantly different from those who had MassHealth (Medicaid), suggesting that more reform should be done to increase participation in and utilization of the MassHealth (Medicaid) dental benefits and programs.

Between 2006 and 2008, the number of children enrolled in the MassHealth dental program increased significantly; however, less than half of these child members received any type of dental examination, suggesting there are an inadequate number of dentists participating in MassHealth to meet the demands of those enrolled. In 2009, 34% of the licensed dentists in Massachusetts were MassHealth providers, with just 16% of licensed dentists having paid claims greater than \$10,000.

Community Health Centers:

The dental safety-net consists of 48 community health center dental programs and satellites that are situated throughout the Commonwealth. These centers provide culturally and linguistically sensitive dental care, but with more than 377,577 patient visits per year, the centers are understaffed and overwhelmed.

- MassHealth is the greatest payer source for community health center dental programs in Massachusetts
- Close to 50% of all patient visits are provided to adults 22-64 years of age, and almost 30% are provided to those 21 years of age and younger.

Purpose of the Report:

The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need may be used as an aid to policy development and fiscal priority setting by public and private agencies, organizations, and institutions in promoting and improving the oral health of Massachusetts residents. This Executive Summary provides a snapshot of significant findings regarding oral disease across the lifespan of residents in the Commonwealth of Massachusetts.

The provision of oral health services, prevention and treatment, is a collaborative effort between communities, families, individuals, providers, and decision-makers, as well as the public and private sectors. This oral disease burden document describes the important work that has already been done in Massachusetts regarding oral health promotion and disease prevention. It also describes the challenges that still need to be addressed until all residents of the state have access to appropriate and culturally responsive dental services with a focus on prevention.



State and National Objectives on Oral Health

Massachusetts Special Legislative Commission on Oral Health

In Massachusetts, a Special Legislative Commission on Oral Health was appointed in 1998 to investigate and assess oral health status in the Commonwealth [1]. The Special Commission met once a month from November 1998 through September 1999 and used data from the Behavioral Risk Factor Surveillance System (BRFSS), cancer mortality statistics, information from local community-based agencies and organizations, and national data to determine the oral health status and the major oral health needs of the residents of Massachusetts [1]. In 2000, the Commission released a report titled, *The Oral Health Crisis in Massachusetts* that outlined five major recommendations for legislators, policy-makers, community advocates and residents that would improve the oral health of the Commonwealth [1]. The five major recommendations were to [1]:

1. Improve access to public and private dental insurance for residents of the Commonwealth, to increase access to dental care.
2. Improve access to oral health screening and treatment services for all residents of the Commonwealth by increasing the private and public capacity to provide dental services.
3. Promote statewide individual and population based preventive services and programs, especially for children and high-risk populations.
4. The Department of Public Health should develop and implement an oral health data and information system to monitor oral health status as well as access and utilization of oral health preventive and treatment services for all residents of the Commonwealth.
5. A Special Advisory Committee on Oral Health, whose primary focus will be to improve the oral health of residents of the Commonwealth, should be established as an ongoing advisory body for the Department of Public Health, the Division of Medical Assistance, and other relevant state agencies.

Oral Health in America: A Report of the U.S. Surgeon General

At about the same time, *Oral Health in America: A Report of the U.S. Surgeon General (SG Report)* was released alerting Americans to the importance of optimal oral health in their daily lives [USDHHS 2000a]. Issued in May 2000, the *SG 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 *SG Report's* message was that oral health is essential to general health and well-being; however, several barriers may hinder the ability of some Americans to obtain optimal oral health. The *SG Report* concluded with a framework for action, calling for a national oral health plan to improve quality of life and eliminate oral health disparities.

National Oral Health Indicators and Healthy People 2010

One component of an oral health plan is a set of measurable and achievable objectives on key indicators of the oral disease burden, oral health promotion, and oral disease prevention. One set

of national indicators was developed in November 2000 as part of *Healthy People 2010*, a document that presents comprehensive, nationwide health promotion and disease prevention objectives. *Healthy People 2010* was designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. Included are objectives for key structures, processes, and outcomes related to improving oral health. These objectives represent the ideas and expertise of a diverse range of individuals and organizations concerned about the nation's oral health.

A National Call to Action to Promote Oral Health

The *Surgeon General's Report on Oral Health* was a wake-up call, spurring policy makers, community leaders, private industry, health professionals, the media, and the public to affirm that oral health is essential to general health and well-being and to take action, just as the *Special Legislative Commission Report* spurred action in the Commonwealth.

That call to action led a broad coalition of public and private organizations and individuals to generate *A National Call to Action to Promote Oral Health* [USDHHS 2003]. The Vision of the *Call to Action* is "To advance the general health and well-being of all Americans by creating critical partnerships at all levels of society to engage in programs to promote oral health and prevent disease." The goals of the *Call to Action* reflect those of *Healthy People 2010*:

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

The *Healthy People 2010* provides measurable targets for the nation, but most core public health functions of assessment, assurance, and policy development occur at the state level. Therefore, the *National Call to Action to Promote Oral Health* calls for the development of plans at the state and community levels, with attention to planning, evaluation, and accountability. The *Healthy People 2010* oral health targets for the nation and the current status of each indicator for the United States and for Massachusetts are summarized in Table I.

Table 1: Healthy People 2010 Oral Health Objectives Compared to National Statistics and Massachusetts Statistics **DNA Does Not Apply

Oral Health Indicators	Health People 2010 Target	US Status 2000	US Status 2006: Midcourse Review	Massachusetts Status	State Data Source
Dental Caries Experience					
Young Children, ages 2-4	11%	18%	22%	28%	MDPH 2005
Children, ages 6-8	42%	52%	51%	58%	Catalyst Institute (2009)
Adolescents, age 15	51%	61%	57%	35%	MA Youth Health Survey 2007
Untreated Caries					
Young children, ages 2-4	9%	16%	17%	15%	Catalyst Institute (2008)
Children, ages 6-8	21%	29%	28%	17%	Catalyst Institute (2008)
Adolescents, age 15	15%	20%	18%	DNA**	BRFSS (2004)
Adults, ages 35-44	15%	27%	26%	DNA	BRFSS (2004)
Adults with No Tooth Loss, ages 35-44	42%	31%	38%	67%	BRFSS (2004)
Periodontal Diseases, Adults ages 35-44					
Gingivitis	41%	48%	DNA	DNA	
Destructive Periodontal Diseases	14%	22%	20%	DNA	
Oral Cancer					
Oral Cancer Mortality (Rate per 100,000 persons)	2.7	3.0	DNA	2.1	MA Cancer Registry (2005)
Oral Cancer Detected in Earliest Stage	50%	35%	DNA	Females: 48% Males: 14%	MA Cancer Registry (2005)
Oral Cancer Exam in Past 12 Months, age 40+	20	13	DNA	DNA	
Dental Sealants					
Children (1 st molar), age 8	50%	28%	35%	46%	Catalyst Institute (2008)
Adolescents (1 st and 2 nd molars), age 14	50%	14%	19%	52%	Catalyst Institute (2008)
Population Served by Fluoridated Water Systems	75%	62%	67%	59.1%	MA DPH and the CDC
Dental Visit in Past 12 Months, Children and Adults ages 2+	56%	44%	44%	76%	BRFSS (2004)
Preventive Dental Care in Past 12 Months, Low-Income Children and Adolescents, ages 0-18	66%	25%	29%	43%	MA DPH and the CDC
School-based Health Centers with Oral Health Component, K-12	75%	52%	64%	61%	MA DPH and the CDC
Community-based Health Centers and Local Health Departments with Oral Health Component	75%	52%	64%	61%	MA DPH and the CDC
States with System for Recording and Referring Infants with Cleft Lip and Palate	100%	23%	DNA	DNA	
States with an Oral Health Surveillance System	100%	DNA	DNA	DNA	
States and Local Dental Programs with a Public Health Trained Director	100%	DNA	DNA	1	MA DPH

Massachusetts Department of Public Health Office of Oral Health, *The Oral Health Crisis in Massachusetts: Report for the Special Legislative Commission on Oral Health*. February, 2000

National Objectives on Oral Health

Healthy People 2010 Objectives: Oral Health

Goal: Prevent and control oral and craniofacial diseases, conditions, and injuries and improve access to related services.

<u>Number</u>	<u>Objective Short Title</u>
21-1	Dental caries experience
21-2	Untreated dental decay
21-3	No permanent tooth loss
21-4	Complete tooth loss
21-5	Periodontal diseases
21-6	Early detection of oral and pharyngeal cancers
21-7	Annual examinations for oral and pharyngeal cancers
21-8	Dental sealants
21-9	Community water fluoridation
21-10	Use of oral health care system
21-11	Use of oral health care system by residents in long-term care facilities
21-12	Dental services for low-income children
21-13	School-based health centers with oral health component
21-14	Health centers with oral health service components
21-15	Referral for cleft lip or palate
21-16	Oral and craniofacial State-based surveillance system
21-17	Tribal, State, and local dental programs

Complete detail on Healthy People 2010 Oral Health Objectives can be found here:

<http://www.healthypeople.gov/document/HTML/Volume2/21Oral.htm>

The Burden of Oral Disease Throughout the Lifespan

I. Pregnant Women and Newborns

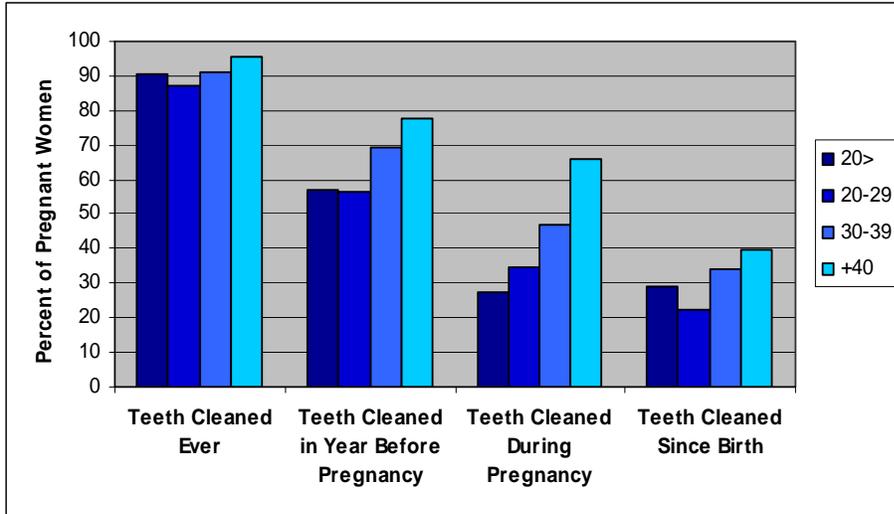
Women who are pregnant have an increased risk of oral disease. Studies indicate that gingivitis is significantly greater in pregnant women compared to women who are not pregnant [5]. Periodontal disease or pregnancy gingivitis can begin in the second or third month of pregnancy and increase in severity throughout the eighth month of pregnancy. Gingivitis in pregnant women can lead to the growth of non-cancerous pregnancy tumors that, if persistent, must be removed by a periodontist [1]. Bacteria-causing tooth decay can be transmitted from mother to infant [3]. One school of thought suggests that decay-causing bacteria that spreads to the placenta or amniotic fluid along with the systemic inflammation associated with periodontitis can induce preterm labor and membrane rupture [4]. The oral health care of pregnant mothers directly influences the health outcome of the infant and is, thus, equally important to both the mother and the infant.



According to the 2007 Pregnancy Risk Assessment Monitoring System (PRAMS), age was a predictor of accessing preventive dental care. Women thirty and older were more likely to receive a dental cleaning before, during and after pregnancy, (Figure 2) than mothers younger than 30 years or younger. Additionally, PRAMS found that disparities existed among racial and ethnic groups and those living below the poverty level (Figure 3).

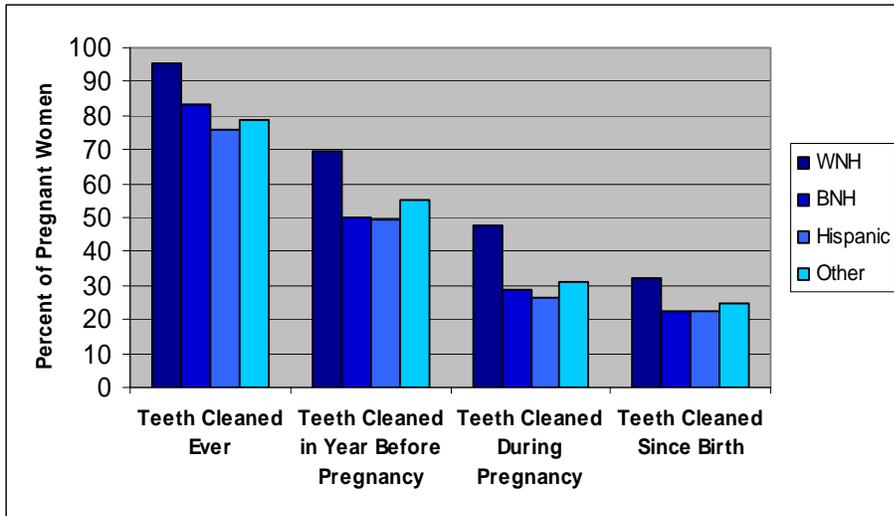
- 90% of women who were pregnant reported ever having had their teeth cleaned by an oral health professional.
- Among the women who had their teeth cleaned during a pregnancy, 43% had their teeth cleaned during the most recent pregnancy.
- Among the women who had their teeth cleaned while pregnant, 64% had their teeth cleaned within the year before pregnancy.
- Among the women who had their teeth cleaned while pregnant, 29% had their teeth cleaned since giving birth.

Figure 1: Percent of Pregnant Women by Age Who Had Their Teeth Cleaned Professionally, 2007



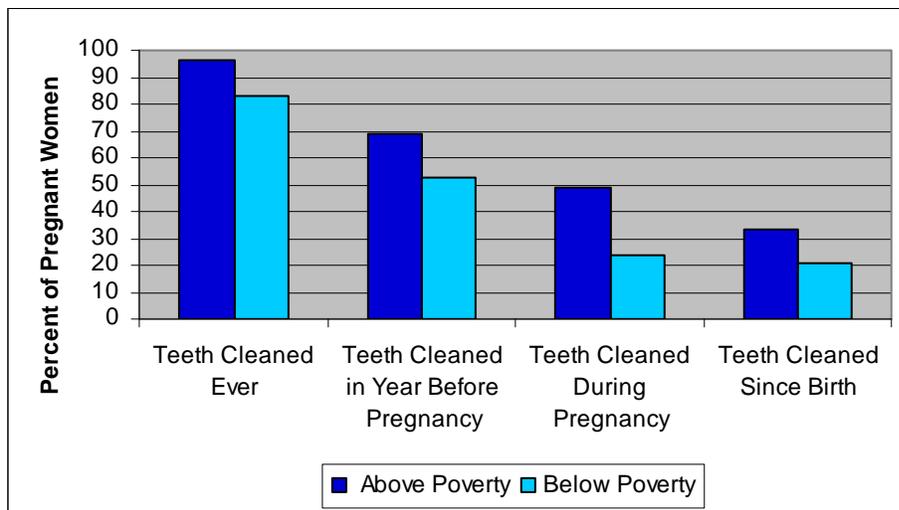
Massachusetts PRAMS, 2007

Figure 2: Percent of Pregnant Women by Race/Ethnicity Who Had Their Teeth Cleaned Professionally, 2007



Massachusetts PRAMS, 2007

Figure 3: Oral Health Care of Pregnant Women by Poverty Level, 2007



MDPH PRAMS, 2007

Cleft Lip and Palate

Genetics also influences the variability of oral health and disease. Predispositions to periodontal disease, the body’s susceptibility to dental caries, and cleft lip/palates all have multi-factorial etiologies, with genetics being a major influence.



Cleft lip and palate are currently the most prevalent oral congenital anomalies today. Genetics, various environmental agents, deficiencies in essential nutrients during pregnancy such as folic acid, and maternal smoking during pregnancy all have an effect on whether a child is born with a cleft lip/palate [2].

The treatment for cleft lip/palate involves intensive surgeries and therapies often lasting several years post-surgery. A recent estimate of hospital costs during the first two years of life for Massachusetts children born between 1998 and 2004 with orofacial clefts was \$10 million, as indicated by the Massachusetts Birth Defects Monitoring Program, or about \$160,000 per child.

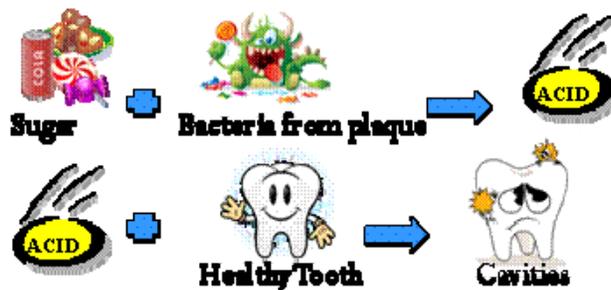
Table 1: Massachusetts Cleft Lip/Palate Comparison with National Values, 2005, Massachusetts Birth Defects Monitoring Program

	Count	Rate per 10,000 Births MA	95% Confidence Interval	Rate per 10,000 Births US	95% Confidence Interval
Cleft Palate without Cleft Lip	51	6.64	4.94-7.73	6.39	6.08-6.71
Cleft Lip with and without Cleft Palate	64	8.33	6.42-10.64	10.48	10.08-10.88

Massachusetts Department of Public Health, Massachusetts Birth Defects Monitoring Program

II. Children and Adolescents

Dental caries, or tooth decay, remains the most common childhood chronic disease. According to the Centers for Disease Control and Prevention (CDC), *dental caries is five times more common than childhood asthma and seven times more common than hay fever*. Dental caries results from a chronic demineralization of the tooth enamel.



The process of demineralization begins after consuming sugars and carbohydrates that are metabolized by cariogenic bacteria present in oral plaque [2]. This bacterial metabolism of sugar produces acid as a byproduct. Acid then lowers the pH of the oral cavity, and creates an environment where demineralization of the tooth enamel can occur. If the pH is restored in a reasonable time (approximately 20 minutes), the tooth can absorb minerals naturally present in the saliva and from sources such as fluoride toothpaste and fluoridated drinking water [2]. If the remineralization process does not occur either naturally or with the application of fluoride, prolonged acidic pH of the oral cavity will cause a substantial amount of demineralization of the tooth enamel [2]. This demineralization starts as a white spot on a tooth, and then progresses to actual tooth cavitation. Once cavitation occurs, the tooth must be restored. Dental caries are almost completely preventable given a child's accessibility to such prevention strategies as dental sealants, regular cleanings, fluoride, and fluoridation.

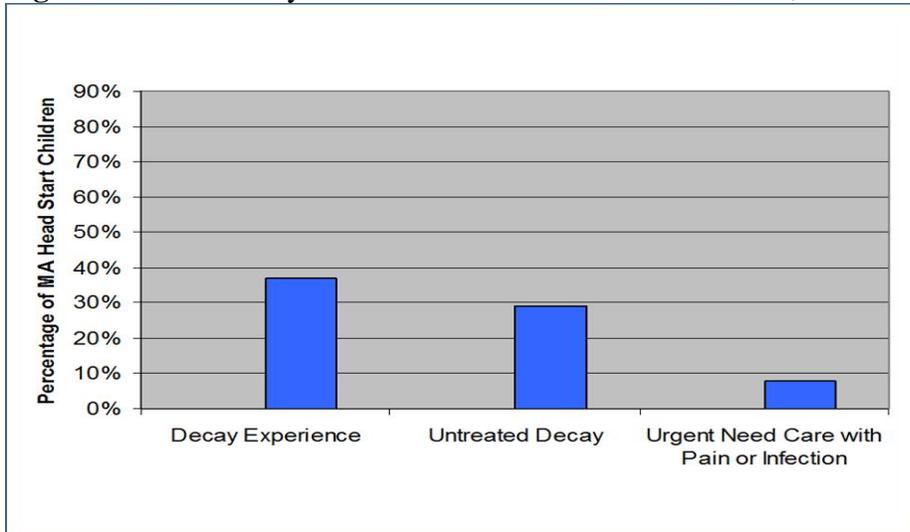
Early Childhood

A child's baby teeth begin erupting around six months of age and are susceptible to decay as soon as they appear. Early Childhood Caries (ECC) is defined by the American Academy of Pediatric Dentistry (AAPD) as one or more tooth surfaces that are decayed, missing, or filled before reaching 6 years of age. Left untreated, ECC can lead to serious illnesses, including abscesses, which could have significant health and financial consequences.



Data from a 2005 Massachusetts Department of Public Health statewide oral health assessment shows that 37% of Head Start children 3-5 years of age had experience decay (Figure 4). Nationally, the prevalence of ECC among young children in the same age groups is 5% (NHANES III) [3].

Figure 4: Tooth Decay in Massachusetts Head Start Children, 2004



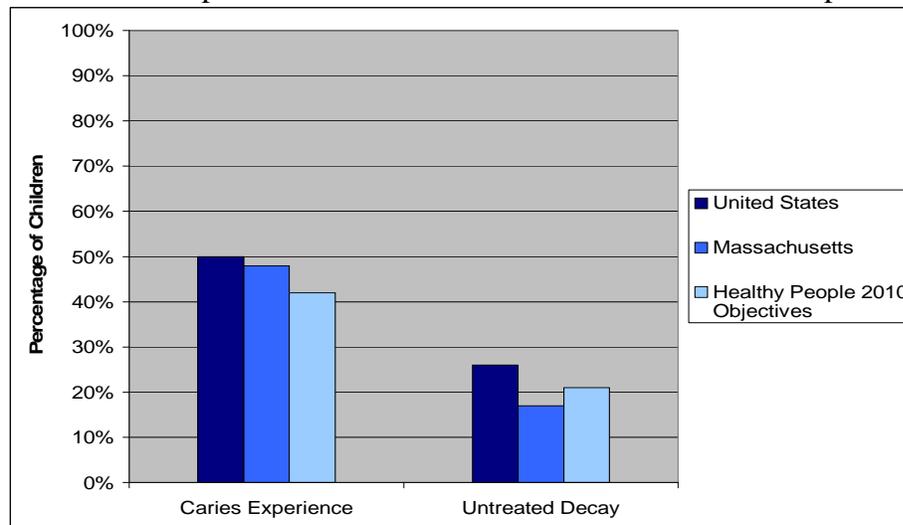
Statewide Survey of Massachusetts Head Start Children, 2004

School-age Children

The prevalence of caries experience and untreated decay in Massachusetts among 3rd graders was 48% and 17%, respectively. This was below the U.S. national averages of 50% caries experience and 26% untreated decay among 6-8 year-olds [6]. Massachusetts has met the objectives of *Healthy People, 2010* for untreated decay, but has not met the objectives for caries experience (Figure 5).



Figure 5: Caries Experience and Untreated Decay Among 3rd Graders in Massachusetts in 2007 Compared to 6-8 Year Olds in the US and Health People 2010



Catalyst Institute, *The Oral Health of Massachusetts' Children*. January, 2008

Table 2: Caries Experience and Untreated Decay among 3rd Graders of Massachusetts Compared to the United States Across Selected Demographic Characteristics

	Caries Experience		Untreated Decay	
	United States, %	Massachusetts, %	United States, %	Massachusetts, %
Select Populations				
3rd Grade Students (8-9 Years Old)	60 ^b	48	33 ^b	17
Race and Ethnicity				
American Indian or Alaska Native	91 ^c	DNA	72 ^c	DNA
Asian	90 ^d	DNA	71 ^d	DNA
Black or African American	50 ^b	51 ^e	36 ^b	36 ^e
White	51 ^b	36 ^e	26 ^b	14 ^e
Hispanic or Latino	DSU	58 ^e	DSU	26 ^e
Gender				
Females	49	41	24	17
Males	50	40	28	17
Children Eligible for Free or Reduced Lunch Program				
Free/Reduced Lunch Eligible	DNA		Massachusetts	30.7%
Family Income				
Low-Income		61 ^e		32 ^e
Higher Income		33 ^e		11 ^e

Health People 2010, Midcourse Review, 2005, U.S. Department of Health and Human Services <http://www.healthypeople.gov/data/midcourse/default.htm> Accessed February 13, 2009

DSU: Data are statistically unreliable or do not meet criteria for confidentiality

DNA: Data not available

^a All national data are for children 6-8 years, 1999-2000, unless otherwise noted

^b Data are from NHANES III, 1988-1994

^c Data are for Indian Health Service Areas, 1999

^d Data are for California, 1993-1994

^e Data are from 2007, The Catalyst Institute, *The Oral Health of Massachusetts' Children*. January, 2008

^f Data are from Massachusetts 2008, School Nurse Health Survey

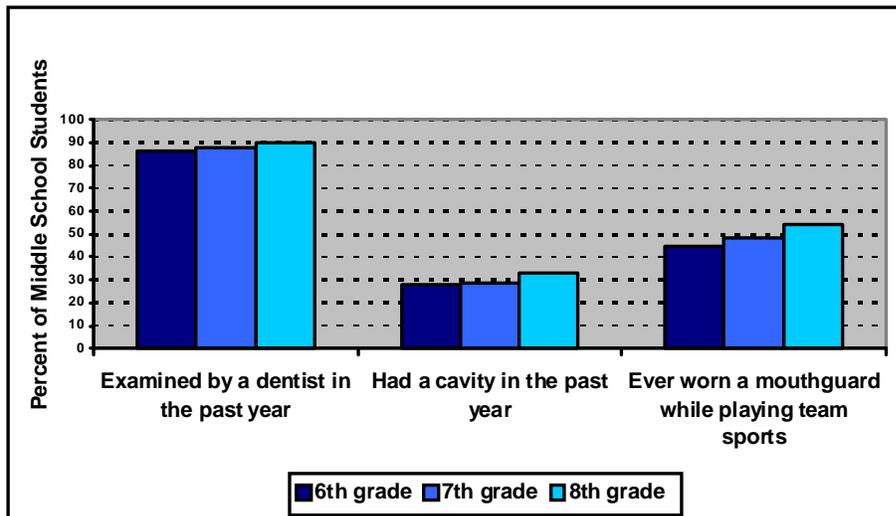
Adolescents



As children grow and mature into adolescence, oral health concerns are compounded by increasing exposure to oral disease risks factors such as tobacco use, oral piercing, drug use, and sports-related injuries.

In the Commonwealth of Massachusetts, students that reported ever wearing a mouth guard while playing team sports increased from middle school-aged adolescents to high school-aged adolescents (Figures 6 and 7). A school nurse survey conducted throughout Massachusetts in 2008 reported that only 31% of schools require mouth protection to be worn during sports activities [4]. Interestingly, the same survey reported 60% of oral/facial injuries that occurred on school grounds required medical intervention [4].

Figure 6: Massachusetts Middle School Student Oral Health Indicators, 2007



Massachusetts Youth Health Survey, 2007

Middle School (11-15 Years of Age)

- Overall, 88% of middle school students reported being examined by a dentist in the previous year [1].
- Three in ten (30%) middle school students self-reported having a cavity during the previous year [1].
- Close to half (49%) of middle school students reported wearing a mouth guard while playing a team sport [1].

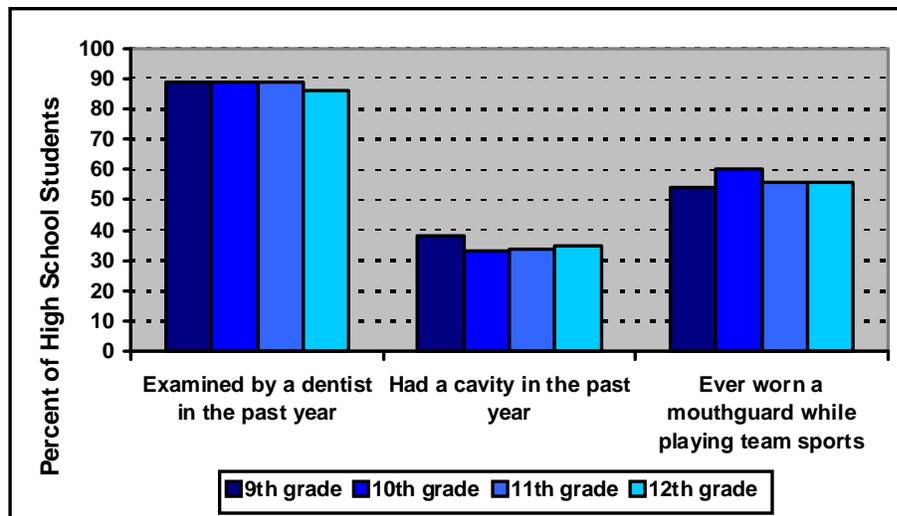
High School (15-18 Years of Age)

Oral health indicators remain approximately constant across high school grade levels.

- Nearly nine out of ten high school students (88%) reported being seen by a dentist in the past year [1].
- Approximately one in three (35%) high school students self-reported having a cavity in the previous year [1].
- Over half (57%) of all high school students reported ever wearing a mouthguard while playing a team sport [1].



Figure 7: Massachusetts High School Student Oral Health Indicators, 2007



MYHS, 2007

Oral Health Disparities

Minorities and children in areas of lower socioeconomic status are less likely to receive oral health care and experience greater rates of disease. Black children in Massachusetts have a greater percent of caries experience compared to the national percent. Caries experience and untreated decay for Non-Hispanic White children in Massachusetts are both lower than the national averages. The following data further exemplifies the disparities that exist in Massachusetts.

MassHealth Child Members

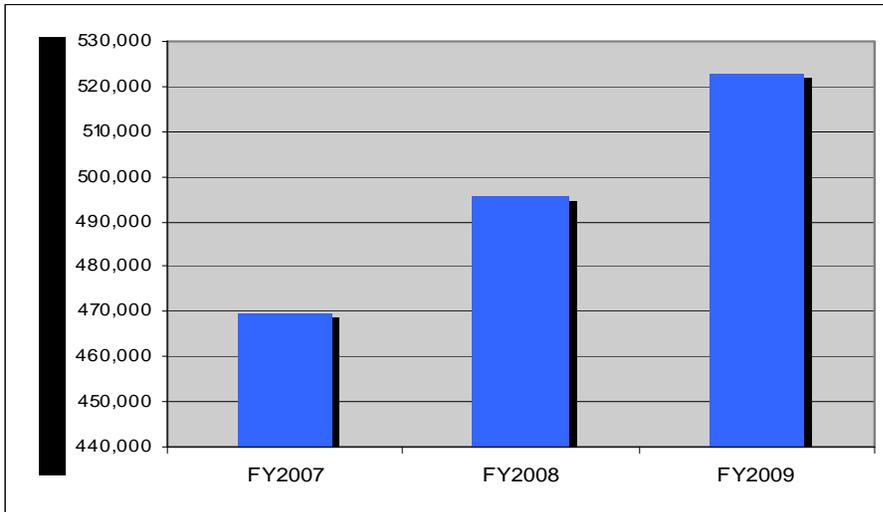
In the Commonwealth of Massachusetts, Medicaid and the State Children’s Health Insurance Plan (SCHIP) are combined into a single program called MassHealth. It is a public, need-based health insurance program for Massachusetts residents with low-to-medium incomes. Members of MassHealth can apply for dental benefits that include, but are not limited to examinations, cleanings, radiographs, fillings, extractions, emergency dental care, fluoride treatments, sealants, and custom-fitted mouth guards for youth under 21 years of age.

The number of MassHealth members 0-21 years of age with dental coverage has steadily increased, however less than half receive any type of dental examinations (Figure 9) [3a]. In FY 2009, there were 2,006 (34%) MassHealth dental providers out of 5,889 licensed dentists in the Commonwealth and, of these, 930 (16%) had paid claims totaling more than \$10,000 for the year [3a]. While the number of MassHealth providers has increased in the last fiscal year, the accessibility of dentists participating in MassHealth remains low and cannot meet the needs of the eligible children within the program.

The percent of MassHealth children that were eligible for dental services who received a sealant were greatest in children ages six to fourteen years (Figure 10) [3a]. Dental intervention programs, such as school-based sealant programs, would ideally focus on elementary school-aged children. Given the importance of the provision of sealants to middle school-aged children,

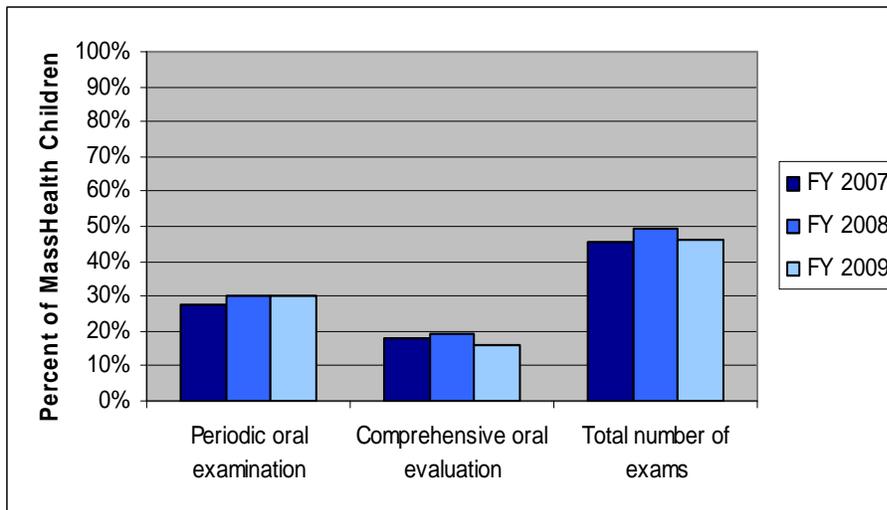
the emphasis of school-based sealant programs could enhance the cost benefit of oral health care provided to this age group [5].

Figure 8: Number of Children Enrolled in the MassHealth Dental Program, 2007-2009



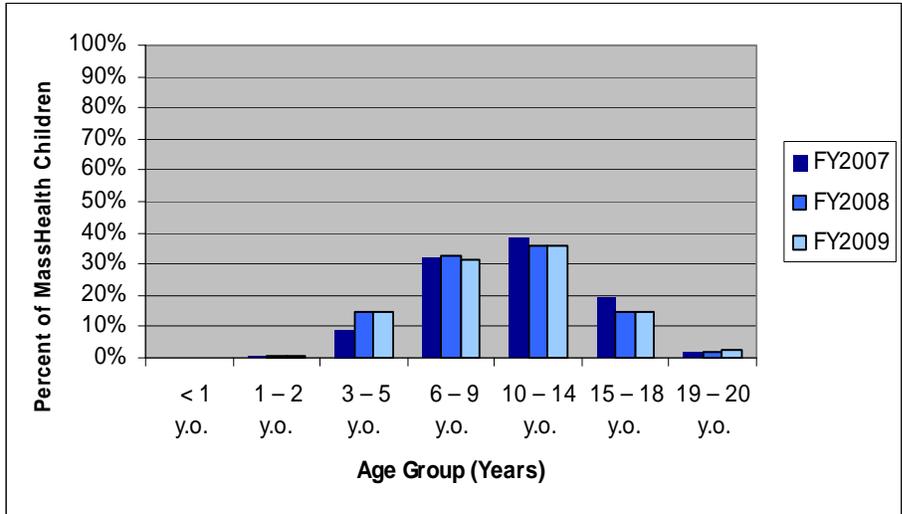
United States District Court, District of MA, Remediation Monitor, 6th Report, 2009

Figure 9: Percent of MassHealth Children Who Received a Clinical Dental Exam, 2007-2009



United States District Court, District of MA, Remediation Monitor, 6th Report, 2009

Figure 10: Percent of (Unduplicated) MassHealth Children Eligible for Dental Services Who Received a Sealant, 2007-2009



United States District Court, District of MA, Remediation Monitor, 6^h Report, 2009

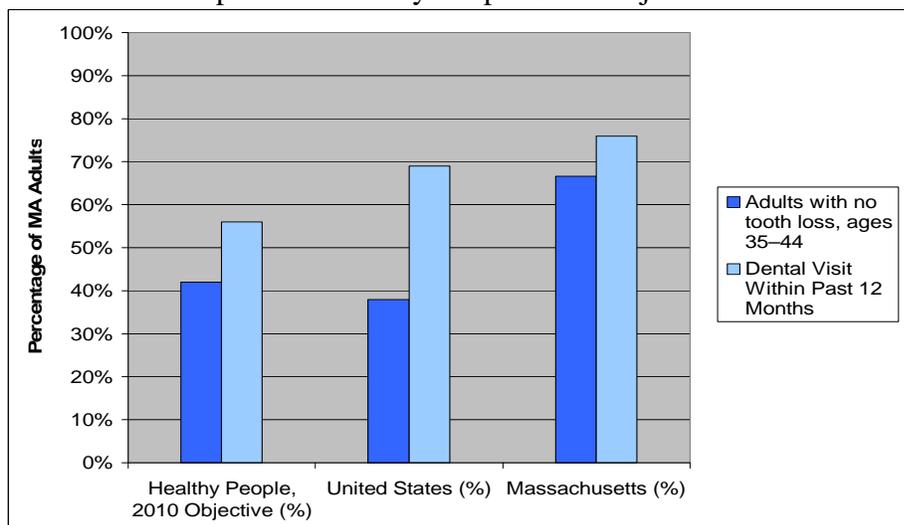
III. Adults

Tooth Loss

Dental caries, a disease that can lead to loss of minerals from the enamel, along with gingivitis, periodontal (gum) disease, and other oral diseases, can result in pain, infection, and tooth loss. As teeth are lost, chewing and speech are impaired, impeding efforts to eat well and lead a healthy lifestyle, which in turn can lead to worsening health and interfere with social functioning. With proper hygiene most oral disease is preventable, but those without preventive services—such as regular dental checkups—are at a higher risk for dental caries and other oral diseases. Factors associated with an increased incidence of oral diseases include lower socioeconomic status, tobacco use, and having diabetes [4]. For example, nationally over 40% of poor adults have at least one untreated decayed tooth, while this is the case for only 16% of non-poor adults [2]. While systemic diseases can increase the risk for oral diseases, oral diseases can also negatively impact systemic conditions such as diabetes and heart disease [4]. Therefore, oral health and systemic health influence each other and must be considered together in addressing total body health.



Figure 11: Proportion of Massachusetts Adults Age 35 to 44 Years Who have Lost No Teeth, and Proportion of Adults Who have Visited the Dentist in the Past 12 Months Compared to Healthy People 2010 Objectives and U.S. Adults, 2006



Healthy People, 2010 Midcourse Review, 2006
BRFSS 2006, National Oral Health Surveillance System

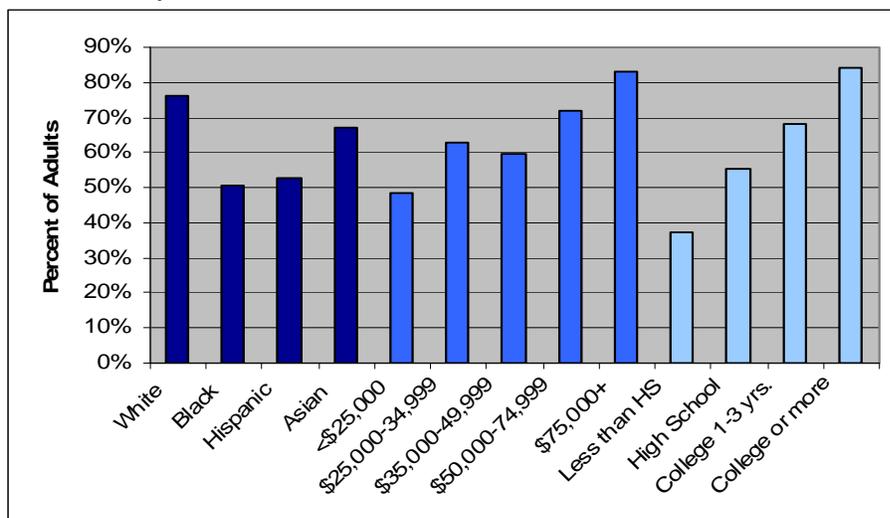
As a whole, the population of Massachusetts has already surpassed the Healthy People 2010 goals: 66% of 35 to 44 year olds have not lost any teeth, and only 14% of adults 65 to 74 have lost all their teeth (Figure 11). In addition, over three quarters (76%) of Massachusetts adults have visited a dentist in the past year. Nevertheless, a closer examination of the data reveals subgroups that have disproportionately larger rates of tooth loss. For example, 30% of residents with annual household incomes less than \$25,000 are missing six or more teeth, compared with only 5% in households with incomes over \$75,000.

The highest risk for tooth loss in Massachusetts residents is found among those with lower income and education levels. In addition, Black and Hispanic residents were more likely to have tooth loss. Furthermore, residents with diabetes, disabilities, heart disease and those who use tobacco were also at an increased risk for tooth loss.

Among adults age 25 and 44, education has more of an influence on tooth loss than race or income, (Figure 12). Prevalence of tooth loss decreases with increasing levels of education.

- Those adults having a four-year college degree or more had less tooth loss compared to those with a high school diploma, 16% to 45%, respectively.
- White residents had less tooth loss compared to Black and Hispanic residents in the same age group, 76% compared to 51% and 53% respectively.

Figure 12: Percent of Massachusetts Adults Age 25 to 44 with No Tooth Loss by Race, Income, and Education, 2006



BRFSS 2006, National Oral Health Surveillance System

Adults with Increased Risk of Disease

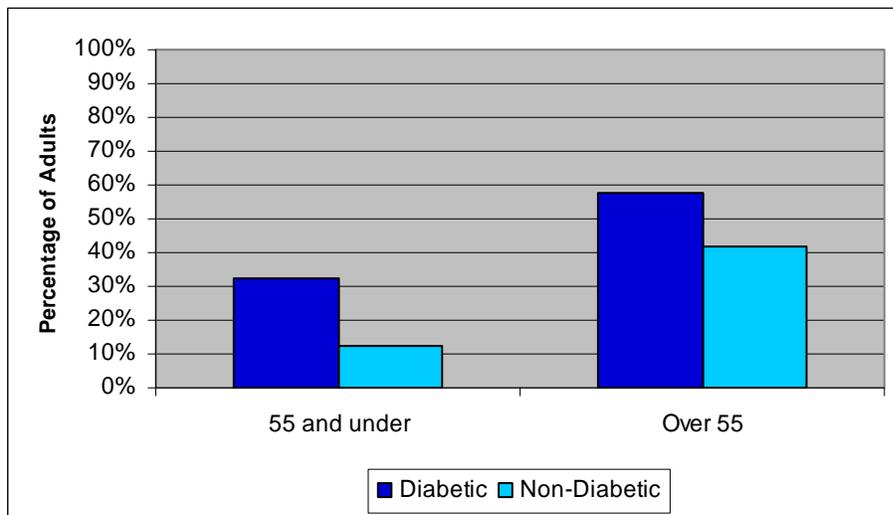
Several factors can increase an adult’s risk for oral disease. Persons living with a chronic medical condition like diabetes often experience oral disease. Lack of access to professional dental care in this population increases their risk of oral disease.

Diabetes:

Individuals living with diabetes are at higher risk for oral disease, as poor glycemic control is associated with gingivitis and other periodontal diseases that can lead to tooth loss [6]. Diabetes and increasing age are risk factors for oral disease and tooth loss.

- 74% of residents living with diabetes had lost at least one tooth to oral disease or decay, compared with 42% of those without the disease
- Individuals living with diabetes were 40% less likely to have visited the dentist in the past year than those without the disease

Figure 13: Proportion of Massachusetts Adults With and Without Diabetes Who Are Missing Six or More Teeth, 2006



BRFSS 2006, National Oral Health Surveillance System

- Over 30% of those living with diabetes in Massachusetts had six or more missing teeth, versus 12% of non-diabetics.
- Of the 15.5% of adults 55 and older who had diabetes, almost 58% were missing six or more teeth, while only 42% of those who did not have diabetes in the same age range were missing six or more teeth.

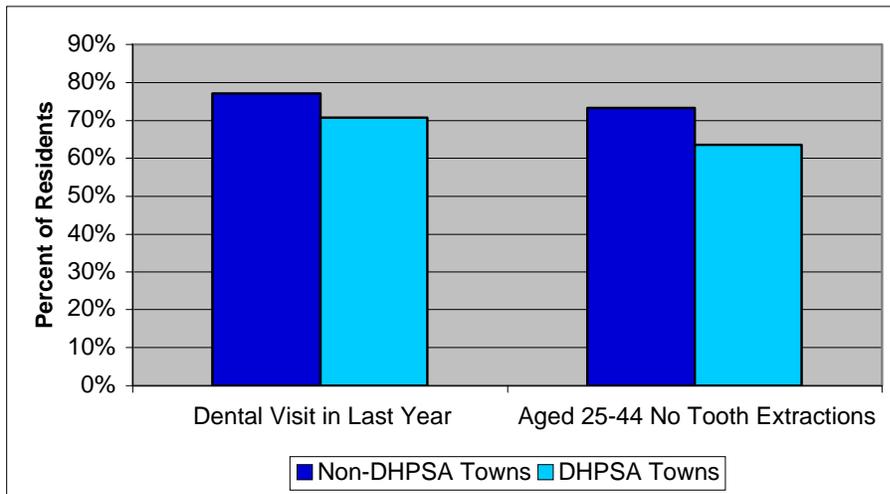
Access to Care:

Certain towns in Massachusetts where there are a lack of dental care providers for the number of community members are deemed Dental Health Professional Shortage Areas (DHPSA). Massachusetts has 24 DHPSA designations, representing 1,292,643 residents [8]. According to the 2004 BRFSS, 69 towns in the state have no dentist [7]. The residents of these towns were less likely to have seen a dentist in the past year, compared to residents of non-DHPSA towns (Figure 14).



- Residents ages 25 to 44 living in Massachusetts DHPSA have more tooth loss comparatively than those in the same age group living in non-DHSPA (36% and 27%, respectively).
- Residents from towns considered DHPSA were associated with a lower likelihood of a recent dental visit.

Figure 14: Percent of Massachusetts Residents in DHPSA and Non-DHPSA Towns that have Visited the Dentist in the Past Year and Those Age 25 to 44 with No Tooth Loss, 2004



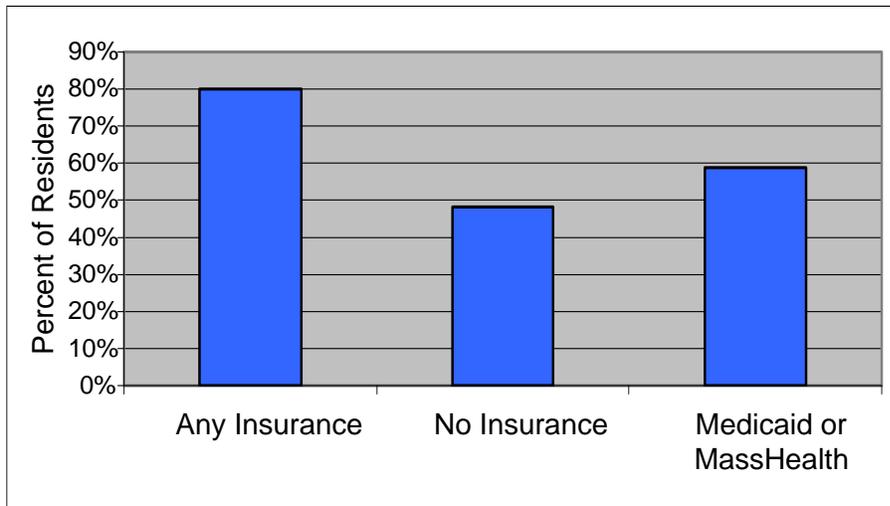
BRFSS 2004, National Oral Health Surveillance System

The groups found to have higher rates of tooth loss were also less likely to have been to a dentist in the past year. The elderly and individuals living with diabetes in Massachusetts are much less likely to have visited the dentist in the past year compared to their younger or non-diabetic counterparts respectively. In addition, the elderly living with diabetes have even poorer oral health status.

Among Massachusetts residents age 18 to 64 not eligible for MassHealth (Medicaid), a significantly higher proportion had been to the dentist in the past year, compared to those without dental insurance (Figure 15). The proportion of residents who had visited the dentist in the past year between those who had no insurance and MassHealth (Medicaid) was not significantly different.

- Approximately 80% of residents with any insurance reported visiting a dentist in the past year, and just 48% without insurance reporting a dental visit within the past year.
- Residents that reported having MassHealth (Medicaid) for their health coverage also reported visiting the dentist at a somewhat higher rate than those without any insurance, 58.8% and 48.3% respectively; but at a lower rate than those with insurance, 58.8% and 80.0% respectively .

Figure 15: Percent of Residents Age 18 to 64 who have Visited the Dentist in the Past Year, by Insurance Coverage, 2006



BRFSS 2006, National Oral Health Surveillance System

IV. Seniors

As adults increase in age, physical ability inevitably deteriorates and cognitive acuity may be reduced. The oral health needs of the elderly are markedly different from the rest of the population, and thus, require different preventive oral health measures. In Massachusetts, 13% of the population is 65 years of age and older and the numbers are expected to grow to 21% by 2030 [9]. The elderly make up an increasing portion of the population who are at greater risk of oral disease. Edentulism, or complete tooth loss, is the principal oral health indicator to determine dental health for adults, aged 65 or older. The *Healthy People 2010* target is that 20% or less of the population aged 64 years to 74 years of age have edentulism. 14% of Massachusetts elderly residents were found to be edentulous, which is comparably less than the national average of 22% (Figure 16).



Not only do the elderly have increased risk of oral disease, but many also lack access to oral health care. Financial barriers stem from individuals that are homebound, on fixed incomes, and/or those that have Medicare coverage or lack dental coverage.

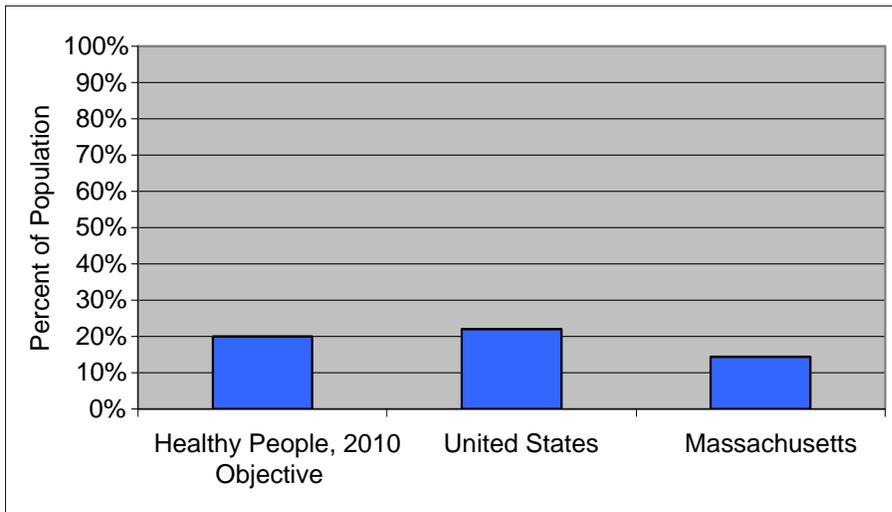
- 27% of MassHealth members over the age of 60 and 45% of eligible residents in long term care facilities utilized the dental benefit in Fiscal Year 2007 [10].

Preliminary data from a 2009 statewide oral health assessment of seniors (those 60 years of age and older) in long term care facilities and those who participate in state subsidized meal sites shows overwhelming oral health needs.

- 65% of residents in long term care facilities had some natural teeth.
- 59% of seniors with teeth in long term care facilities had untreated decay, with 7% having urgent dental needs.

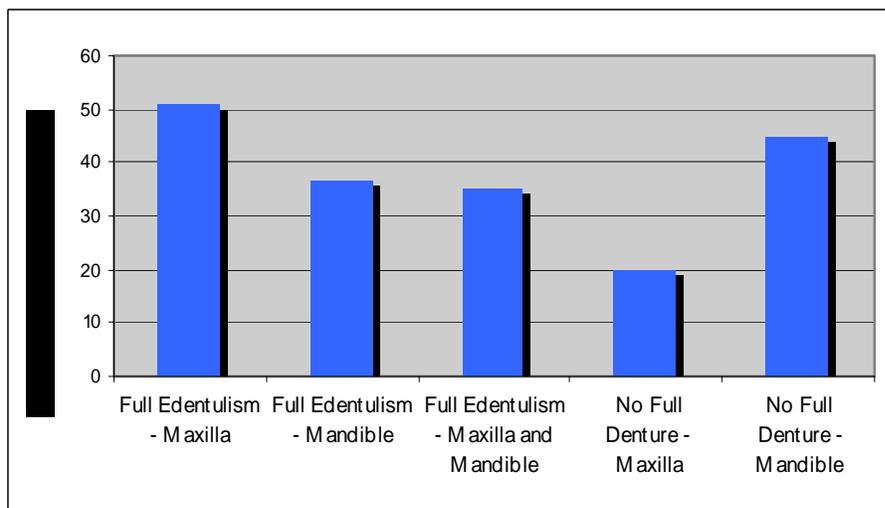
- 18% of edentulous seniors in long term care facilities had no denture.
- 34% of seniors at meal sites had untreated decay, with 4% having urgent dental needs.
- About 1 in 5 (19.8%) seniors at meal sites had not visited a dentist in at least 5 years.

Figure 16: Proportion of Adults Age 65 to 74 Years with Edentulism Compared to Healthy People 2010 Objectives and National Data, 2004



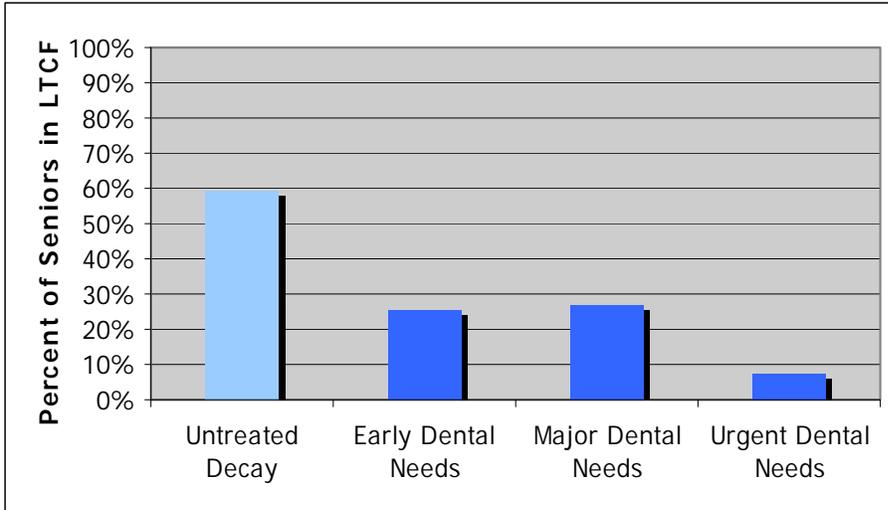
BRFSS 2004, National Oral Health Surveillance System

Figure 17: Percent of Edentulism and the Prevalence of Dentures Among Seniors in Massachusetts Long Term Care Facilities, 2009



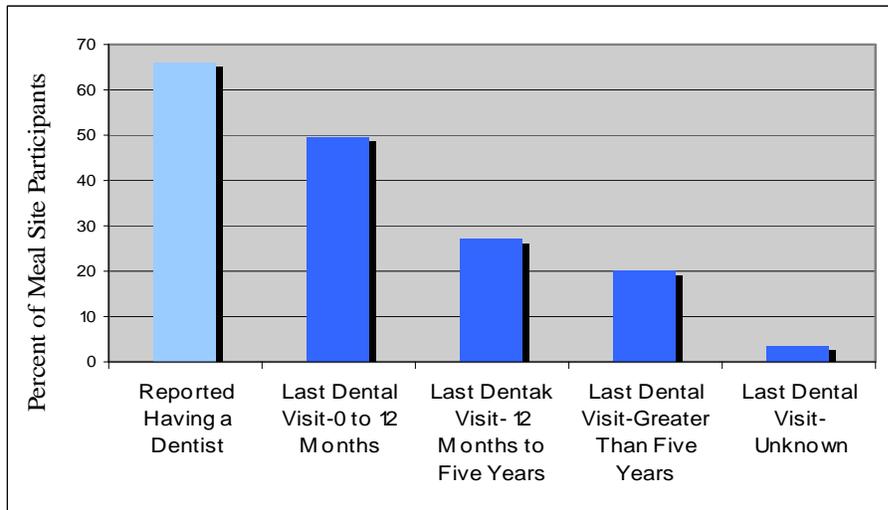
MDPH, Oral Health Assessment of Seniors, 2009

Figure 18: Percent of Untreated Decay and Treatment Urgency Among Seniors in Massachusetts Long Term Care Facilities, 2009



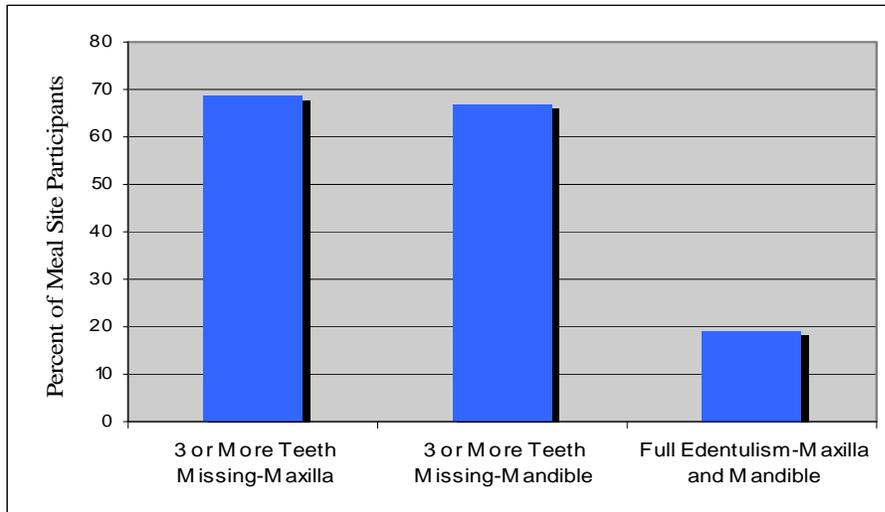
MDPH, Oral Health Assessment of Seniors, 2009

Figure 19: Time Since Last Dental Visit Among Seniors at Meal Sites, 2009



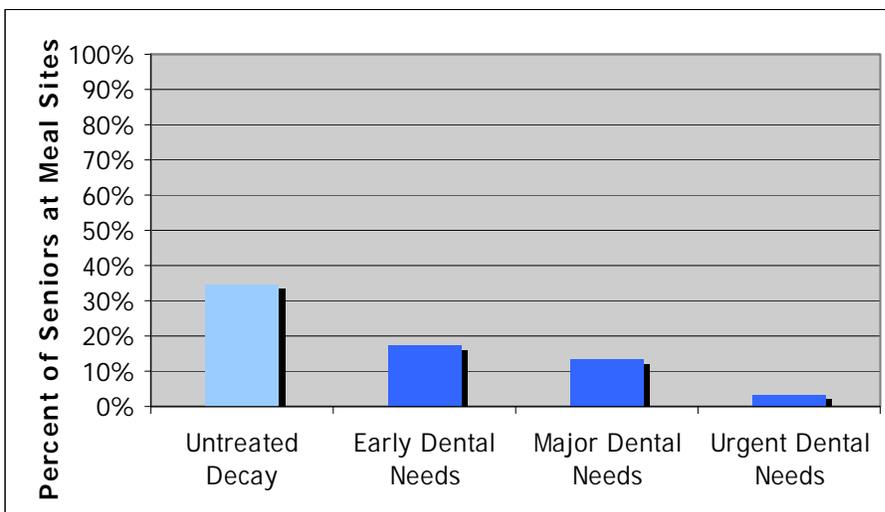
MDPH, Oral Health Assessment of Seniors, 2009

Figure 20: Seniors at Meal Sites Missing More Than Three Teeth, 2009



MDPH, Oral Health Assessment of Seniors, 2009

Figure 21: Untreated Decay and Treatment Urgency Among Seniors at Meal Sites, 2009



MDPH Office of Oral Health, Oral Health Assessment of Seniors, 2009

V. Special Health Needs

Children and Adolescents with Special Health Needs

There are more than one million disabled residents 5 years of age and older in the Commonwealth, and about 180,000 or 3% of the state's population are developmentally disabled [11]. For children and youth in Massachusetts, 15% (221,840) under 17 years of age have special health care needs, which is greater than the national average of 13% [12].

The highest prevalence by age group were 8-11 years olds (30%), followed by youth 12-14 years old (30%); and then 0-7 year olds (26%). Children with special health needs:

- Miss 11 more days of school than the average child; and
- Almost 25% were not getting specialty care.

Adults with Special Health Needs

Oral health care continues to be a critical need and access problem for the special needs population due to a lack of dental providers with expertise to treat them, the effect of medications on their oral health, and physical and behavioral issues that affect their homecare and/or dental treatment. According to the 2005-2006 National Survey of Children with Special Health Care Needs (CSHCN), accessing routine preventive dental care was the number one unmet health need of this child population.

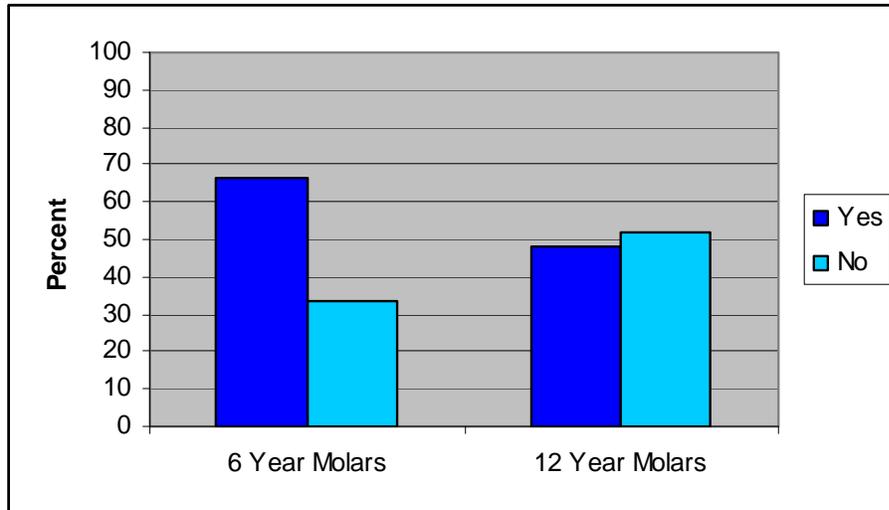
Massachusetts is unique in that it has eight specialized dental clinics located throughout the state providing comprehensive dental care to more than 9,000 residents across the lifespan who have an intellectual disability and/or who are developmentally disabled. The Tufts Dental Facilities Serving Persons with Special Needs (TDF) has been providing these services since 1976 as part of a class action suit that sought to improve the medical and dental services for special needs residents who lived in state facilities.

- More than 21,000 dental patient visits were provided to the most vulnerable residents in our state in FY 2008 by the Tufts Dental Facilities.
- 26% of disabled adult residents in the state are missing 6 or more teeth, compared with 11% of non-disabled residents [13].

The Department of Public Health, through its four public health hospital dental clinics, also provides comprehensive dental care to both chronically ill inpatient and outpatient high-risk residents. See Appendix B for a description of these four hospitals. A 2007 oral health assessment of both child and adult inpatients at the four hospitals showed that:

- 71% of the children screened had a functional disability.
- 66% of the children had dental sealants on their six-year molars and 48% had sealants on their twelve-year molars.
- 61% of the children had a history of dental decay.
- 83% of the adults had a history of dental decay, and 47% had untreated decay.

Figure 22: Percent of CSHCN with Dental Sealants Residing in a State Public Health Hospital, 2007

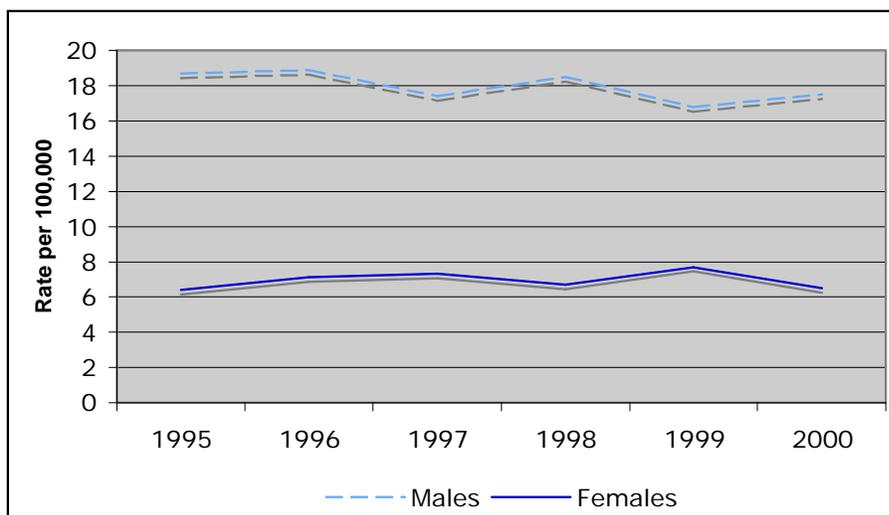


MDPH Office of Oral Health, Public Health Hospital Oral Health Assessment, 2007

VI. Oral and Pharyngeal Cancer

Oral cancer affects any part of the oral cavity, including the lips, tongue, mouth, and throat [1]. The Massachusetts Cancer Registry (MCR) groups oral cavity and pharyngeal cancers as one category. The pharynx is the part of the neck and throat situated immediately behind the mouth and nasal cavity, and above the esophagus, larynx, and trachea. Cancers of the oral cavity include the lip, tongue, salivary gland, floor of the mouth, and the gums. Cancers of the pharynx include the nasopharynx, oropharynx, hypopharynx, and the tonsils [5]. Tobacco use, alcohol consumption, prolonged sunlight exposure, and oral human papillomavirus (HPV) have all been shown to increase the risk of developing oral and pharyngeal cancer [1]. Oral cancer is a lesser known cancer to the general public. Screening for cancer is integral for early detection, prevention, and positive treatment outcomes.

Figure 23: Age-Adjusted Incidence Rate (per 100,000) of Oral/Pharyngeal Cancer by Sex, 1995-2005



Massachusetts Cancer Registry, 1995-2005

- There were 8,190 incident cases of oral/pharyngeal cancer diagnosed from 1995-2005 in Massachusetts.
- The overall incidence of oral/pharyngeal cancer decreased significantly between 1995 and 2005 (Figure 26).
 - Cases among males decreased from 18.7/100,000 in 1995 to 16.2/100,000 in 2005.
 - Cases among females decreased from 6.4/100,000 in 1995 to 6.0/100,000 in 2005.
- The incidence rate for males from 2001 to 2005 was significantly higher than females (16.3/100,000 vs. 6.5/100,000).

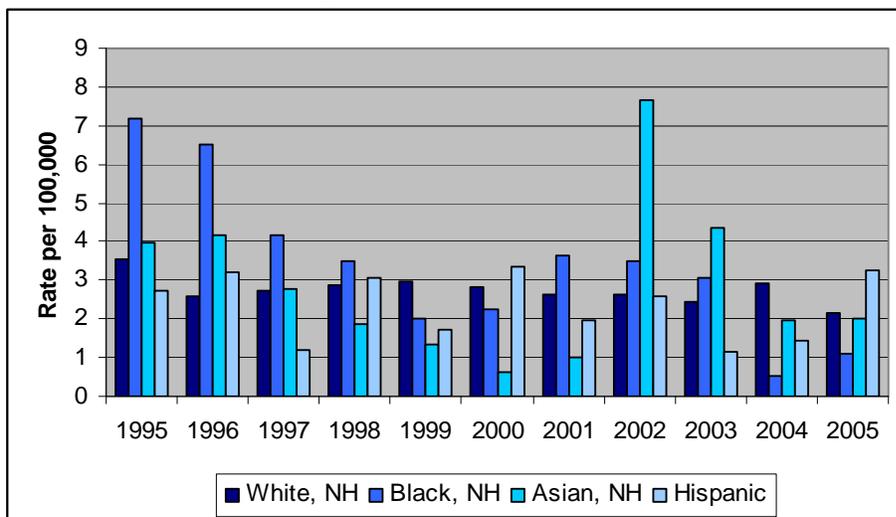
The overall incidence rate of oral/pharyngeal cancer in Massachusetts decreased significantly from 1995 to 2005. This decrease reflects national trends over the past 30 years. Nationally, rates have been declining in both sexes and among both Blacks and Whites [3], which is consistent with Massachusetts rates from 1995 to 2005. Mortality rates declined from 1995 to 2005 overall, again in both sexes and in both black non-Hispanics and white non-Hispanics alike. This too is reflected in the national data [3].

Table 3: Percent of Massachusetts and U.S. Oral/Pharyngeal Cancer Cases Detected at the Earliest Stage by Selected Demographic Characteristics, 1995-2005

	United States, %	Massachusetts, %
<i>Healthy People, 2010</i> Objective	50	50
Total	33	37
Race/ Ethnicity		
American Indian or Alaska Native	24	DSU
Asian or Pacific Islander	29	DSU
Black or African American	21	33
White	38	37
Hispanic or Latino	35	33
Gender		
Female	40	48
Male	30	32

DSU: Data Statistically Unreliable

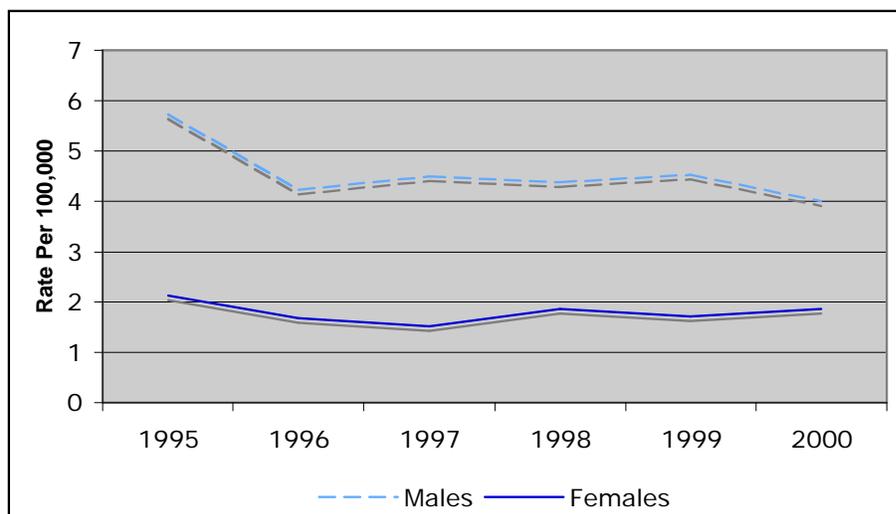
Figure 24: Age-Adjusted Incidence Rate of Oral/Pharyngeal Cancer in Massachusetts by Race/Ethnicity, 1995-2005



Massachusetts Cancer Registry, 1995-2005

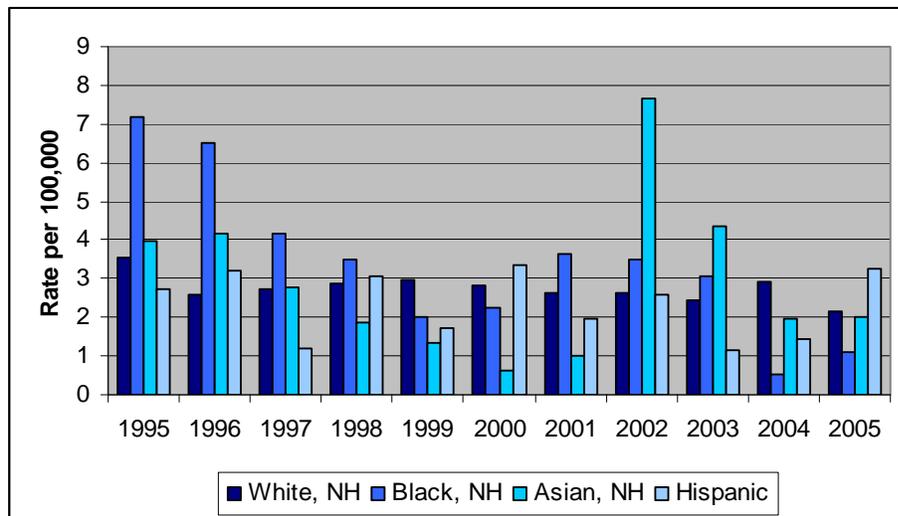
- For the 1995-2000 period after adjusting for age, the incidence rate for white non-Hispanics (NH) was significantly lower than that of black NHs (11.5/100,000 and 13.3/100,000, respectively), a statistically significant difference, while the rates among white NHs, Asian NHs, and Hispanics were comparable.
- For the 2001-2005 period, there were no statistically significant differences between the four racial/ethnic groups.
 - White NHs experienced a significant decrease in the incidence rate of oral/pharyngeal cancer, from 11.4/100,000 in 1995 to 10.6/100,000 in 2005.
 - Black NHs experienced a much larger significant decrease of cases from 17.8/100,000 in 1995 to 7.1/100,000 in 2005.
 - Asian NH cases dropped from 12.7/100,000 in 1995 to 6.8/100,000.
 - Hispanic cases dropped from 11.3/100,000 in 1995 to 9.6/100,000 in 2005.

Figure 25: Oral/Pharyngeal Cancer Mortality in Massachusetts by Sex, 1995-2005



Massachusetts Cancer Registry, 1995-2005

Figure 26: Oral/Pharyngeal Cancer Mortality in Massachusetts by Race/ Ethnicity, 1995-2005



Massachusetts Cancer Registry 1995-2005

In Massachusetts, there were 2,033 deaths due to oral/pharyngeal cancer from 1995-2005. The mortality rate for oral/pharyngeal cancer decreased significantly from 3.6/100,000 in 1995 to 2.1/100,000 in 2005. Mortality rates decreased significantly among both males and females (Figure 25).

Mortality rates decreased significantly for white non-Hispanics from 1995 to 2005 and even more so for Black non-Hispanics. While there were some yearly fluctuations in the mortality rates from 1995-2005 for Asians and Hispanics, the overall Annual Percentage Change was insignificant for the two groups (Figure 26).

Oral Pharyngeal Cancer by Stage

Oral/pharyngeal cancer stages for this report were classified as local, regional, and distant. Stages are described in detail in the Appendix B of this document. In situ oral/pharyngeal cancers were excluded from analyses. Since staging criteria were changed in 2000, oral/pharyngeal cancer stage at diagnosis was only compared for 2001-2005. Females were significantly more likely to be diagnosed at the local stage than males (Figure 27). There were no significant differences in stage at diagnosis between white NHs, Black NHs, and Hispanics (Figure 28).

Figure 27: Stage at Diagnosis of Oral/Pharyngeal Cancer by Sex, Massachusetts 2001-2005

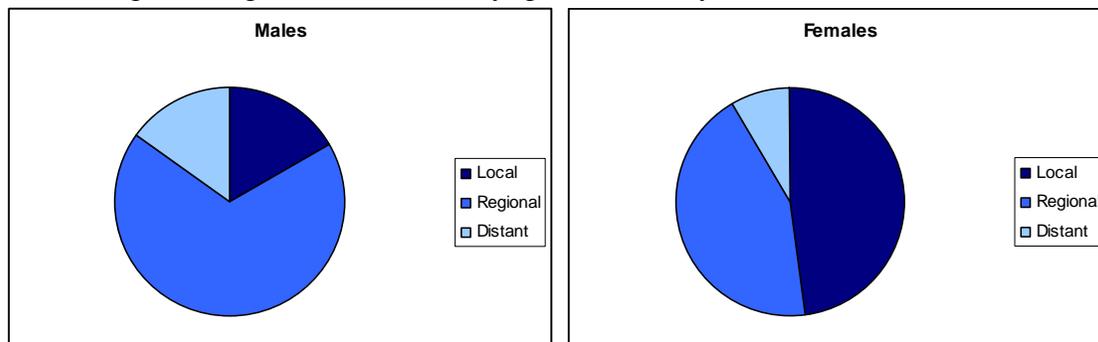


Figure 28: Stage at Diagnosis of Oral/Pharyngeal Cancer by Race/Ethnicity, Massachusetts 2001-2005

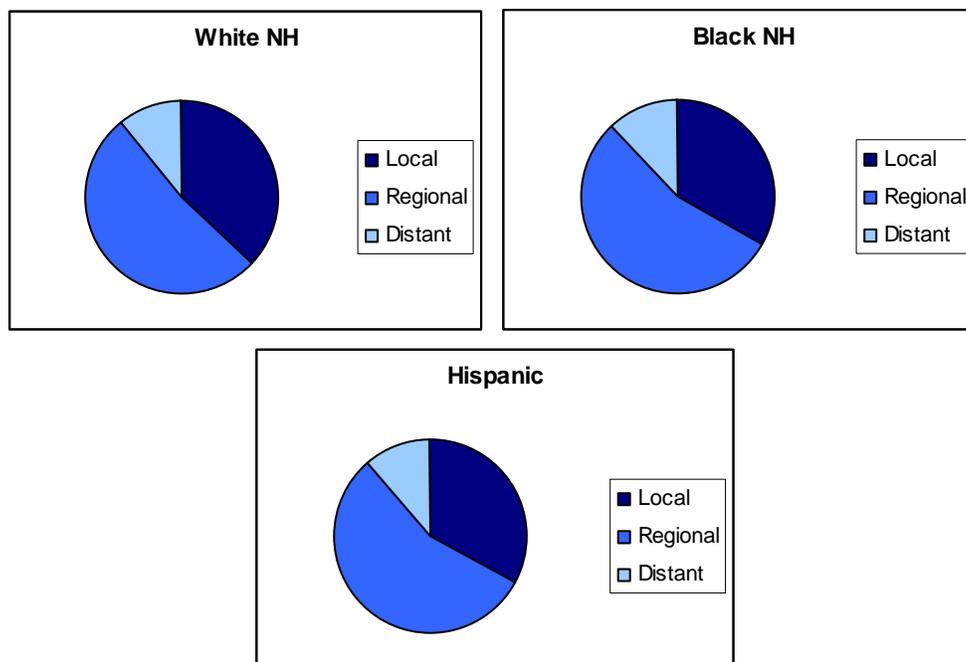
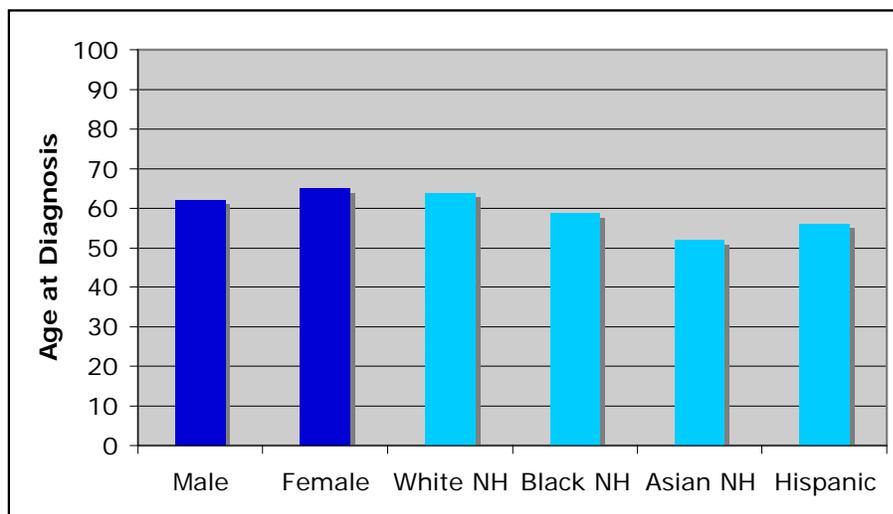


Figure 29: Mean Age at Diagnosis of Oral/Pharyngeal Cancer by Sex and Race/Ethnicity, Massachusetts 1995-2005



Massachusetts Cancer Registry, 1995-2005

- The mean age at diagnosis for oral/pharyngeal cancer cases diagnosed between 1995 and 2005 was significantly younger for males (62) than for females (65). There was no significant trend change in the age at diagnosis for either sex from 1995 to 2005.
- The mean age at diagnosis for oral/pharyngeal cancer among white NHs was 63.8, which was significantly older than the mean age for the three other racial/ethnic groups [black NHs (58.7), Asian NHs (51.9), and Hispanics (56.1)].

-
- As compared to white NHs, black NHs were significantly younger when diagnosed at a local stage (64.4 vs. 58.2) and a regional stage (62.8 vs. 59.2), but not a distant stage (63.6 vs. 59.4).

When comparing all oral/pharyngeal cancers by age groups:

- People in their 20s were significantly more likely to be diagnosed at the local stage (60%) compared to other age groups (37%).
- People in their 30s were significantly more likely to be diagnosed at the local stage compared to other age groups (49% vs. 37%).
- Among people in their 40s, there were no significant differences in stage at diagnosis.
- People in their 50s were significantly less likely to be diagnosed at the local stage compared to other age groups (31% vs. 39%).
- There were no significant differences in stage at diagnosis among people in their 60s and 70s.
- Those in their 80s were significantly more likely to be diagnosed at the local stage compared to other age groups (48% vs. 35%).

Cancers of the Oral Cavity

Cancers of the oral cavity include the lip, tongue, salivary gland, floor of the mouth, and gums. Any racial/ethnic specific analyses for oral cancers were limited to black and white, non-Hispanics, as the other racial/ethnic groups had too few cases (<20) to perform a meaningful analysis. Age related analyses involved all cases, regardless of race/ethnicity.

Lip: There were 460 cases of cancer of the lip diagnosed from 1995 to 2005. It almost exclusively affected white NHs during this period (98% of cases). There were no cases among black NHs. The mean age during the period was 68, which was significantly higher than all the other oral and pharyngeal subtypes. The age range at diagnosis was 27 to 104. Lip cancer incidence rates have been declining significantly by about 5% per year, from 1995 to 2005. The most recent incidence rate for 2001-2005 was 0.5 cases/100,000.

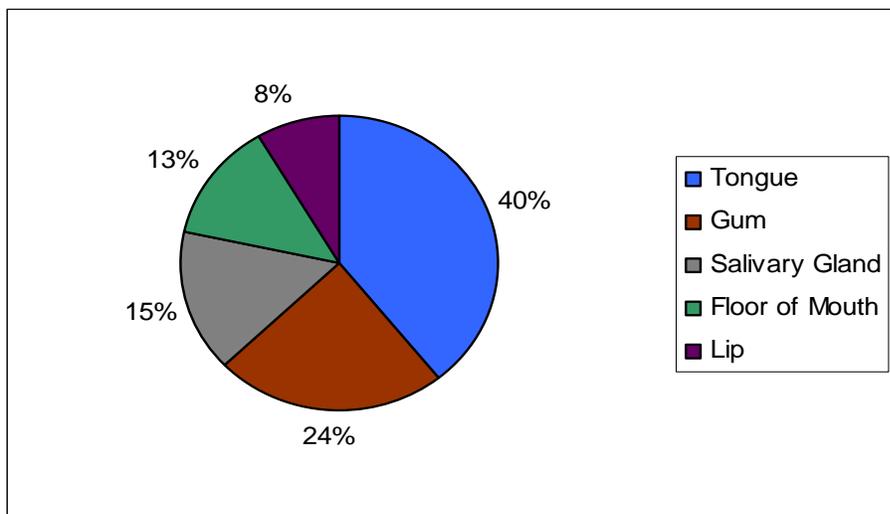
Tongue: There were 2,124 cases of cancer of the tongue diagnosed from 1995 to 2005. Incidence rates remained stable from 1995 to 2005 at approximately 2.9 cases/100,000. The mean age was 62, with an age range at diagnosis from 19 to 99. From 1995 to 2000, the rates did not differ significantly among the four racial/ethnic groups, but from 2001-2005, white NHs had a significantly higher rate of tongue cancer (3.3/100,000) than black NHs (1.9/100,000).

Salivary Gland: There were 837 cases of cancer of the salivary gland diagnosed from 1995 to 2005. Incidence rates remained stable from 1995 to 2005 at approximately 1.1 cases/100,000. The mean age at diagnosis was 62, with an age range from 3 to 98. For 2001-2005, the only period with enough numbers to perform a statistical analysis, salivary cancer rates did not differ significantly between black NHs and white NHs.

Floor of the Mouth: There were 720 cases of cancer of the floor of the mouth (area under the tongue) diagnosed from 1995 to 2005. The rates declined significantly from 1995 to 2005, by 4.7% per year. The most recent incidence rate for 2001-2005 was 0.8 cases/100,000. The mean age at diagnosis was 64, with a range from 26 to 97.

Gums: Cancers of the gum include the cheek mucosa, the buccal cavity, the hard and soft palates, and the vestibule of the mouth. There were 1,284 cases of gum cancer diagnosed from 1995 to 2005. The incidence rate for 2001-2005 was 1.6/100,000. The rates declined significantly from 1995 to 2005, by 3.9% per year. The decrease was significant for white NHs, but not for black NHs. The mean age at diagnosis was 66, with a range from 7 to 99.

Figure 30: Cancers of the Oral Cavity, Massachusetts 1995-2005



Massachusetts Cancer Registry, 1995-2005

Table 4: Comparison of Oral Cancer Incidence Rates by Subtype, Sex, and Time Period, Massachusetts, 1995-2005, (Rates per 100,000)

Subtype	1995-2000 Incidence Rate			2001-2005 Incidence Rate		
	Total	Males	Females	Total	Males	Females
Lip	0.7	0.5	0.2	0.5	0.3	0.2
Tongue	2.9	1.9	1.0	3.0	2.1	0.9
Salivary Gland	1.2	0.7	0.5	1.1	0.5	0.5
Floor of the Mouth	1.2	0.8	0.3	0.8	0.6	0.3
Gums	1.9	1.1	0.8	1.6	0.9	0.7

Oral/ Pharyngeal Cancer in Massachusetts, 1995-2005

Cancers of the Pharynx

Cancers of the pharynx include the nasopharynx, oropharynx, hypopharynx, and the tonsils. When sufficient data were available, racial/ethnic rate differences were compared. Age related analyses involved all cases, regardless of race/ethnicity.

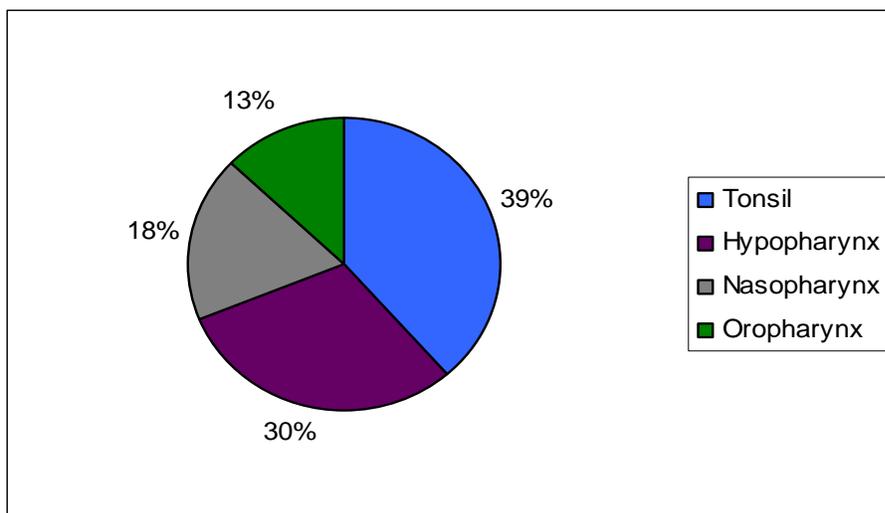
Nasopharynx: There were 473 cases of cancer of the nasopharynx diagnosed from 1995 to 2005. The incidence rate from 2001 to 2005 was 0.6/100,000. The rates decreased from 1995 to 2005, but not significantly. Of note, Asian NHs had a nasopharyngeal cancer rate of 7.1/100,000 from 1995-2000, which dropped, non-significantly, to 4.8/100,000 from 2001-2005. Despite the drop, rates among this group remained five to seven times higher than among white NHs. Nationally, Surveillance, Epidemiology and End Results (SEER) Data for 2000-2004 revealed rates among Asians to be 7.5 higher compared to the white NHs. The numbers for the other racial/ethnic groups were too small to perform any analyses. The mean age at diagnosis was 55, with a range from 3 to 94. This was significantly younger than the other oral/pharyngeal cancers.

Oropharynx: There were 325 cases of cancer of the oropharynx diagnosed from 1995 to 2005, with nearly 92% of the cases occurring among white NHs. Incidence rates remained stable at about 0.4/100,000 from 1995 to 2005. The mean age at diagnosis was 65, with a range from 18 to 98.

Hypopharynx: There were 782 cases of cancer of the hypopharynx diagnosed from 1995 to 2005. The incidence rate from 2001 to 2005 was 0.9/100,000. Incidence rates decreased significantly from 1995 to 2005 by 4.5% per year. This decrease was significant for both black and white NHs. The mean age at diagnosis was 65, with a range from 16 to 96.

Tonsils: There were 988 cases of cancer of the tonsils diagnosed from 1995 to 2005. The incidence rate from 2001-2005 was 1.5/100,000. The rates increased significantly from 1995 to 2005 by 4.2% per year. Among the four racial groups, the increase was only significant among white NHs. The rates for black NHs and Hispanics decreased from 1995 to 2005. The mean age was 59, with a range from 24 to 96 years.

Figure 31: Cancers of the Pharynx, Massachusetts 1995-2005



Massachusetts Cancer Registry, 1995-2005

Table 5: Comparison of Pharyngeal Cancer Incidence Rates by Subtype, Sex, and Time Period, Massachusetts, 1995-2005

Subtype	1995-2000 Incidence Rate			2001-2005 Incidence Rate		
	Total	Males	Females	Total	Males	Females
Nasopharynx	0.7	0.4	0.3	0.6	0.4	0.2
Oropharynx	0.4	0.3	0.1	0.5	0.3	0.1
Hypopharynx	1.2	1.0	0.3	0.9	0.7	0.2
Tonsils	1.2	0.9	0.3	1.5	1.2	0.3

Oral/ Pharyngeal Cancer in Massachusetts, 1995-2005

Preventing Oral Disease in the Commonwealth

The majority of oral diseases are preventable, though the burden of disease is far worse for those who have limited access to prevention strategies. Effective, evidence-based prevention strategies, targeting the individual and a community, are imperative for preventing oral diseases through the lifespan.

I. Dental Sealant Programs



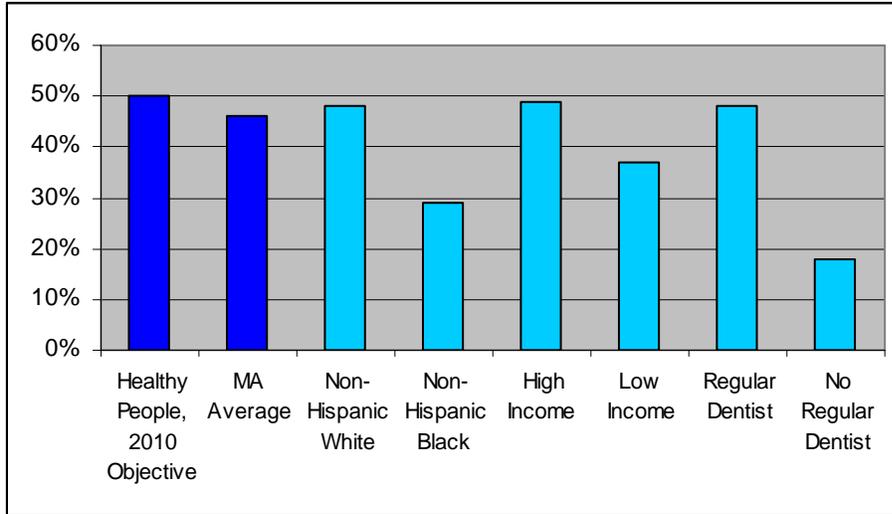
Dental sealants are a plastic material placed on the pits and fissures of the chewing surfaces of teeth. Sealants cover up to 90 percent of the places where decay occurs in school children's teeth [8]. Sealants prevent tooth decay by creating a barrier between a tooth and decay-causing bacteria. Sealants also stop cavities from growing and can prevent the need for expensive fillings. Sealants are 100 percent effective if they are fully retained on the tooth [9]. According to the Surgeon General's 2000 report on oral health, sealants have been shown to reduce decay by more than 70 percent [4]. The combination of sealants and fluoride has the potential to nearly eliminate tooth decay in school-age children [3]. Sealants are most cost-effective when provided to children who are at highest risk for tooth decay [2].

In 2002, the Task Force on Community Preventive Services strongly recommended school sealant programs as an effective strategy to prevent tooth decay [6]. The Task Force is a national, independent, nonfederal multidisciplinary task force appointed by the director of the Centers for Disease Control and Prevention (CDC). CDC estimates that if 50% of children at high risk participated in school sealant programs, over half of their tooth decay would be prevented and money would be saved on their treatment costs [8]. School-based sealant programs reduce oral health disparities in children [10].

Massachusetts faces many challenges in providing oral health care to children through the school system. Massachusetts has an inadequate number of schools with dental professionals/programs providing school-based oral health services. The target of 50% set forth by *Healthy People, 2010* (21-13) is nearly twice the proportion that is currently seen in Massachusetts (22%) [5]. Fortunately, 56% of school nurses reported an interest in implementing a dental sealant program in their schools for the 2009-2010 school year [5]. In 2006, only 8% of schools had a school-based oral health prevention (dental sealant and topical fluoride) program and little changed over the next two school years [5].



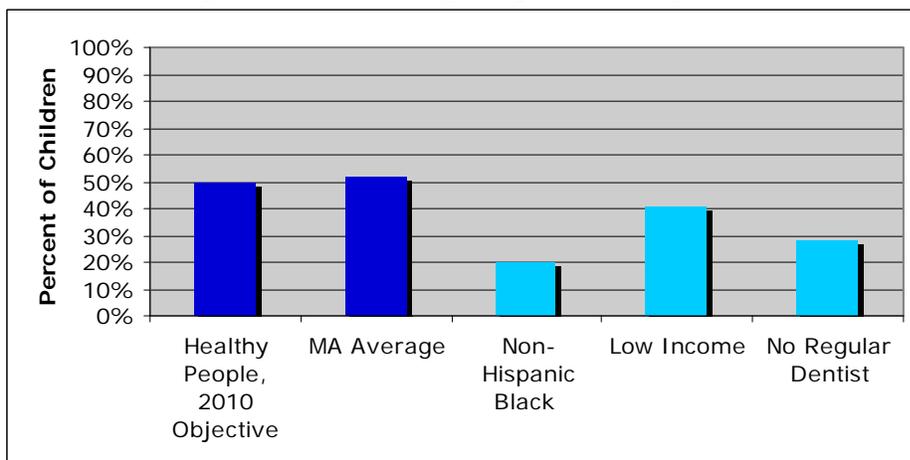
Figure 1: Percent of 3rd Grade Children Who Received Dental Sealants in Massachusetts Compared to the Healthy People 2010 Objectives, 2007



Catalyst Institute, *The Oral Health of Massachusetts' Children*. January, 2008

- In Massachusetts, less than half of 3rd grade students had dental sealants [1].
- 3rd grade children that had no regular dentist, those that come from low-income families, and those that are of an ethnic minority were less likely to have received dental sealants during their lives [1].
- Massachusetts did not meet the Healthy People 2010 target of 50%, as only 46% of 3rd grade children had a dental sealant [1].

Figure 2: Percent of 6th Grade Children Who Received Dental Sealants in Massachusetts Compared to the Healthy People 2010 Objectives, 2007



Catalyst Institute, *The Oral Health of Massachusetts' Children*. January, 2008

- On average, 52% of Massachusetts adolescents in the 6th grade received dental sealants in 2008 [1].
- Although the average of Massachusetts adolescents that received dental sealants is above the *Health People 2010* national goal of 50%, dental sealant provision in low income adolescents, non-Hispanic black adolescents, and adolescents with no regular dentist is significantly lower [1].

II. Fluoridation and Fluorides

Fluoride is the foundation for preventing tooth decay. Fluoride is a natural substance and is the 17th most abundant element in nature. Fluoridation is “nature’s way of preventing tooth decay” and is the foundation for improving the oral health of a community. Fluoride protects teeth from tooth decay by strengthening teeth and it helps in remineralization. Fluoride has a topical effect (on the outer surface), and it may have an effect systemically. Fluoride in a community water supply offers a systemic and topical effect, which is the most beneficial and economical way to strengthen both baby teeth and permanent teeth.



Unfortunately, not all Massachusetts communities’ public waters supplies have this benefit. Fluoride in toothpaste, provided as part of dental treatment, and as part of the state’s Mouthrinse Program offers a topical effect. Other important sources of fluoride include toothpaste, fluoridated community drinking water, and foods and drinks prepared with fluoridated water. Dietary fluoride supplements in the form of tablets, lozenges, or liquids (including fluoride-vitamin preparations) have been used throughout the world since the 1940s.

Community Water Fluoridation



Fluoride is found in all water sources, however it may not be found at optimal levels to prevent tooth decay. In Massachusetts, the natural fluoride content of most ground water is 0.1ppm, yet optimal levels of fluoride for Massachusetts are considered to be 0.9-1.2ppm [8]. With more than 60 years of scientific evidence to support fluoridation’s safety and effectiveness, it benefits everyone in a community, young and old.

Community water fluoridation is the upward adjustment of the concentration of fluoride of a community water supply for optimal oral health. In 2009, of the 351 cities and towns in Massachusetts, 140 already fluoridate their water (40%), 149 (42%) could be fluoridated, and 62 (18%) cannot fluoridate due to not having a public water supply [15]. Twenty-five communities in Massachusetts have been fluoridating their water since 1968. The first three communities started in 1951: Danvers, Middleton and Templeton [15]. From 2000-2008, five communities began fully offering the health and economic benefits of fluoridation to more than 158,000 residents, and three partially implemented fluoridation. The Healthy People 2010 target for community water fluoridation calls for 75% of a state’s population on a public water supply to be receiving fluoridated water. In 2009, Massachusetts is providing fluoridated water to 59.1% of its residents (3.9 million), placing it 36th in the nation [16].

A map of the state’s fluoridated communities is located in Appendix A.



In 1968, the passing of *M.G.L. Chapter 111: Section 8C. Fluoridation of public water supplies by local boards; advice of commissioner; election; discontinuance* marked a change in the way fluoridation was implemented. Prior to this, a referendum by the residents of a community was required before a Board of Health could order fluoridation. With the new law, upon recommendation of the Commissioner of the Massachusetts Department of Public Health, a community's board of health may order fluoridation.

Preliminary results of a 2009 survey of Massachusetts Boards of Health in non-fluoridating communities are that 90% of the respondents reported that fluoridation benefited children and just 22% thought that fluoridation benefited the elderly [17]. In the same survey, 53% were unfamiliar with the state's fluoridation law, 57% stated they had concerns about fluoridation and 35% of the respondents stated they would consider implementing fluoridation for their community over the next two to ten years [17].

School Fluoride Mouthrinse Programs

Since 1978, the Massachusetts Department of Public Health has supported the School Fluoride Mouthrinse Program, providing school-age children in grades 1-6 living in non-fluoridated communities with an effective way to prevent decay at no cost to parents. This service is valuable to children because fluoride has been shown to be safe, inexpensive, and effective in preventing tooth decay. When acid from plaque bacteria begin taking minerals out of the tooth enamel, fluoride strengthens the teeth and helps put minerals back in, therefore preventing tooth decay. Weekly mouthrinsing with fluoride provides a topical effect and the child does not swallow the rinse. This type of topical fluoride can prevent tooth decay by 20-40% [11]. In 2008, Massachusetts conducted 21 regional trainings statewide for school nurses at schools participating in the program. In addition, a multi-lingual fact sheet on the benefits of topical fluoride and the fluoride mouthrinse program has been developed to educate populations of greatest need.

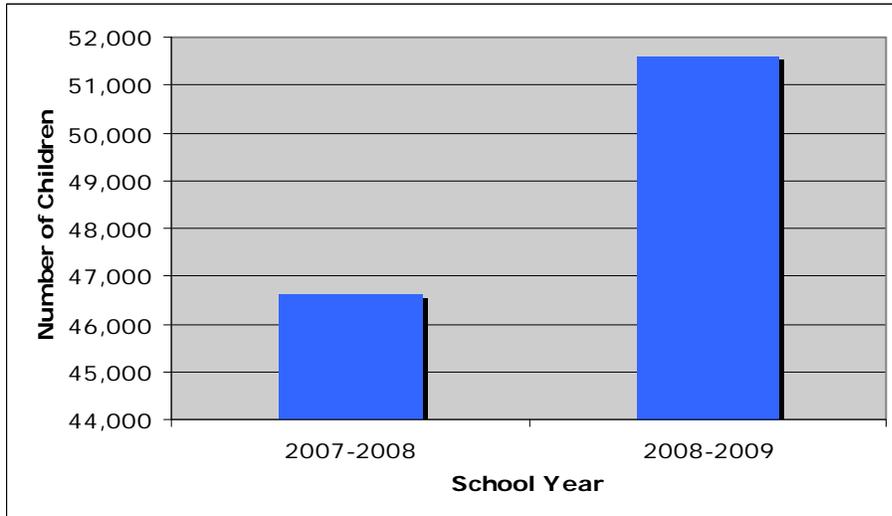


A map of the communities with schools participating in the fluoride mouthrinse program is located in Appendix A.



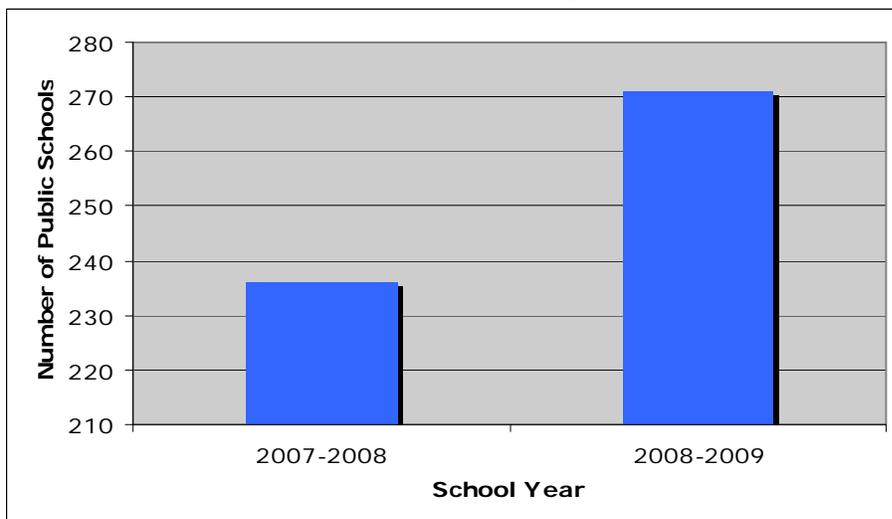
Massachusetts has increased the number of schools in non-fluoridated communities participating in the program from 236 in the 2007-2008 school year to 271 in the 2008-2009 school year (Figure 3) with fluoride mouthrinse now available to about 52,000 children weekly.

Figure 3: Number of School-aged Children Participating in Weekly Fluoride Mouthrinse Program for the 2007-2008 and 2008-2009 School Years



Massachusetts Department of Public Health, Office of Oral Health

Figure 4: Number of Public Schools in Non-Fluoridated Communities Participating in the Weekly Fluoride Mouthrinse Program



Massachusetts Department of Public Health, Office of Oral Health

Fluoride Varnish



The application of fluoride varnish as a preventive measure for dental decay is an off-label use of this product. Though few population-based studies on fluoride varnish have been done in the United States, it has been studied and used widely in European countries for more than 30 years.

Currently, 25 states provide Medicaid coverage for oral health screenings and fluoride varnish applied in the medical setting by non-dental health providers [12]. Massachusetts has recently joined these states by allowing MassHealth reimbursement for fluoride varnish applied by physicians, physician assistants, nurse practitioners, registered

nurses, and licensed practical nurses. This is a positive step towards increasing children's access to preventive oral health services, and therefore decreasing the incidence of tooth decay among moderate to high-risk children, especially those under five years of age.

Dental Workforce and Capacity

I. Dental Workforce and Capacity

In July 2008, the Massachusetts Legislature passed S2863 *An Act to Promote Cost Containment, Transparency and Efficiency in the Delivery of Quality Health Care*, commonly referred to as “Health Care Reform II”. This legislation mandated the development of a Health Care Workforce Center (HCWC) at the Department of Public Health to address workforce shortages by expanding initiatives to attract primary care health professionals with the focus on to increasing access to medical and dental services for the underserved and unserved, as well as other high-risk populations. One focus of the HCWC is assessing the healthcare providers that are licensed in the state. Since 2007, each year the OOH has surveyed the dental workforce during the annual license renewal period. These surveys have assisted in setting policies for increased access to dental care for vulnerable populations, and they have assisted in expanding eligibility for MassHealth dental providers, i.e. public health dental hygienists.

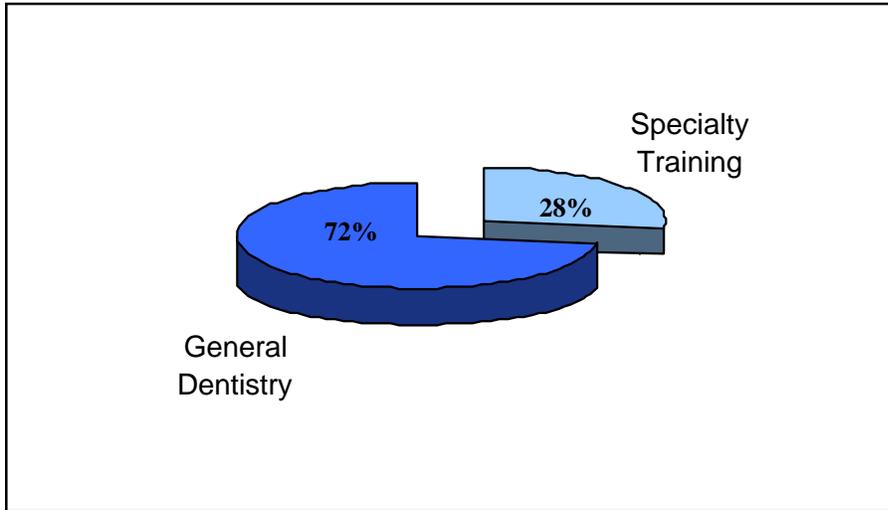
Dentist Workforce in the State

There are 5,522 fully licensed dentists with a Massachusetts address and 367 limited license dentists [1] to serve about 6,449,755 residents, [2] for a dentist-to-population ratio of 1 to 1,095 as compared to a 1 to 1,700 dentist-to-population ratio nationally [3]. Though these ratios would suggest convenient access to dental care for every resident, the Commonwealth has regions of the state considered to be Dental Health Professional Shortage Areas. In addition to geographic constraints in accessing dental care, some residents have difficulty in accessing care due to age, income, insurance status and type, ethnicity, chronic illness and/or developmental disability. In addition, dentists in the Commonwealth are notably increasing in age. On average, dentists practicing in Massachusetts are 50.6 years of age [4].

The majority of dentists practicing in Massachusetts are engaged in the practice of general dentistry (72%), according to a survey of dentists conducted in 2008 (Figure 1) [4]. Of those dentists who have completed specialty training, most are in the area of Orthodontics, followed by Oral Surgery, Periodontics and Pedodontics, Endodontics, Prosthodontics, Oral Pathology, Public Health, and Oral Radiology. The same survey found that just over half (53%) of practicing dentists work in a solo practice; 40% in group practices; 4% work in an academic setting; 2% practice in a community health center; and 1% practice in a hospital-based setting (Figure 2).

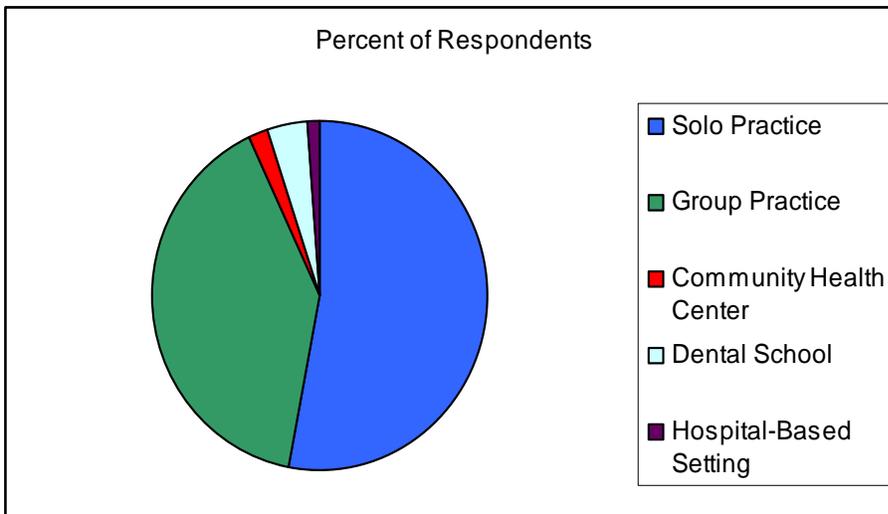


Figure 1: Percent of Massachusetts Dentists that Practice General Dentistry Compared to those Dentists with Specialty Training, 2008



MDPH Office of Oral Health, Massachusetts Dentists' Survey, 2008

Figure 2: Distribution of Massachusetts Dentists by Work Setting, 2008



MDPH Office of Oral Health, Massachusetts Dentists' Survey, 2008

Massachusetts Dentists Specialty Training, 2008

Specialty	Percent
Orthodontics	23.4
Oral Surgery	18.5
Periodontics	16.4
Pedodontics	16.4
Endodontics	12
Prosthodontics	11.6
Oral Pathology	1.1
Public Health	0.6
Oral Radiology	0

MassHealth/Dental Shortage Areas

In Fiscal Year 2009 there were 2,006 dentists who were MassHealth (Medicaid) providers, including 166 providers representing individual dentists who deliver care in clinics, hospitals and community health centers [7]. This is a 12% increase in the number of MassHealth dentists from FY 2008. In a 2008 statewide survey of licensed dentists, 97% of respondents reported not accepting MassHealth patients, and only 6% of those were interested in becoming a MassHealth provider [4]. In addition to geographic constraints to accessing dental care, Massachusetts has 1,302,883 residents living in 53 dental health professional shortage area communities. The number of private practitioners who treat rural and special populations who are low income, underserved or on MassHealth is quite limited.

In Fiscal Year 2009:

**A map of the state's
Dental Health
Professional Shortage
Areas is located in
Appendix A.**



- 5 counties in Massachusetts with a total population of 470,523 had less than 30 MassHealth dentists, with two counties having just four MassHealth dentists between them [7].
- 930 MassHealth providers had paid claims greater than \$10,000. [7]
- 126 MassHealth providers submitted up to 10 claims for members under 21 years of age and 132 providers submitted 101 to 200 claims for this same population. [7]

Dental Hygiene Workforce in the State

Currently, the state has 5,161 licensed dental hygienists with a Massachusetts address [5]. In January 2009, the Massachusetts Legislature passed Chapter 530 which allows:

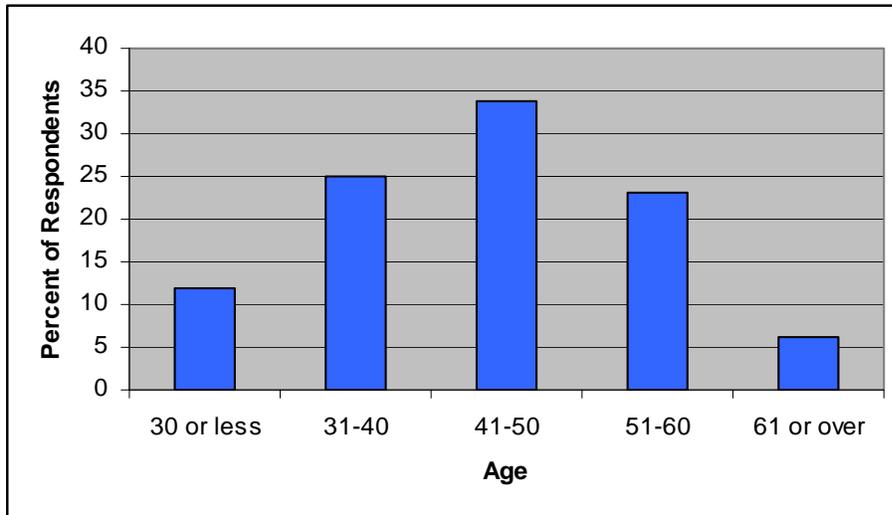
1. Licensed dental hygienists with three years of full-time clinical experience to provide preventive dental services including, but not limited to a dental hygiene examination, sealants, and fluoride without a dentist's supervision, but with a collaborative agreement with a licensed dentist.
2. Dental hygienists to become MassHealth providers in public health settings, increasing access to preventive services for low income residents, the elderly, and the chronically ill living in dental health professional shortage and underserved areas.



This law brings Massachusetts in line with twenty-eight other states that allow dental hygienists to offer direct access to preventive services to residents who would not receive it otherwise. This legislation also opens the door for the expansion of school prevention (sealant) programs that previously required a supervising dentist who had to provide an examination before sealants could be placed.

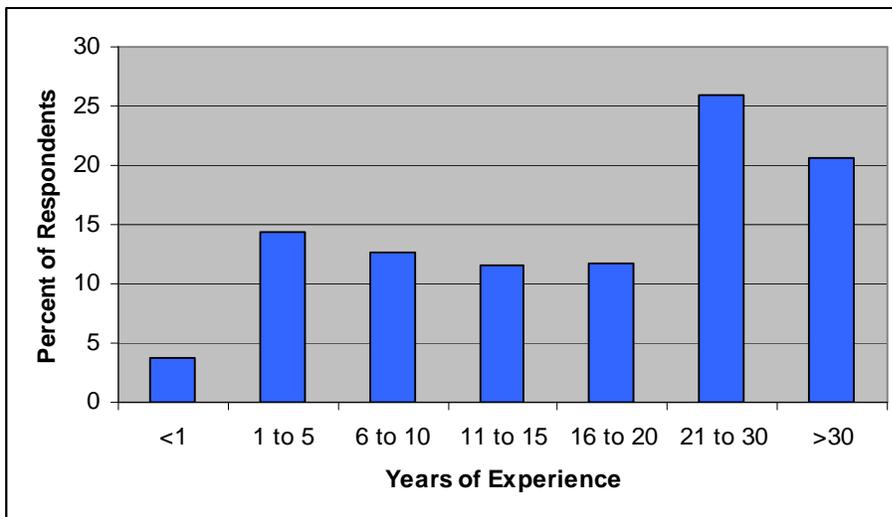
In 2007, a survey of dental hygienists in the Commonwealth determined the status, practices, and potential utilization of the dental hygiene workforce. Of the 70% of dental hygienists that responded to the survey, 71% (3,182) were working as hygienists in Massachusetts. The majority of Massachusetts dental hygienists that were surveyed were over 40 years of age and had over 15 years of practice (Figure 3 and 4). The older distribution of hygienists and greater years of experience are both indicative of a population that is gradually aging out of the workforce [6].

Figure 3: Age Distribution of Respondents Licensed in Massachusetts and Currently Employed as Dental Hygienists, 2007



MDPH Office of Oral Health, Massachusetts Dental Hygienists' Survey, 2007

Figure 4: Distribution of Dental Hygienists by Number of Years of Practice, 2007



MDPH Office of Oral Health, Massachusetts Dental Hygienists' Survey, 2007

Dental Education

Dental Schools:

Massachusetts has three private dental schools, all located in Boston: Boston University Goldman School of Dental Medicine, Harvard University School of Dental Medicine, and Tufts University School of Dental Medicine (see Appendix C for more information on each school), with about 277 new dental students admitted each school year. There are 10 Advanced Education in Graduate Dentistry (AEGD)/General Practice Residency (GPR) programs throughout the state that offer dental graduates additional post-graduate didactic and clinical experience in general dentistry. Within the dental residency programs, some of the 69 dental resident positions serve high-risk underserved populations.

Dental Hygiene Schools:

The state also has eight dental hygiene programs positioned throughout the state, with varying degrees of community dental health experience in the curriculum. They include: Bristol Community College, Cape Cod Community College, Massachusetts College of Pharmacy and Health Sciences – Forsyth Dental Hygiene Program, Middlesex Community College, Mount Ida College, Mount Wachusett Community College General Studies Department, Quinsigamond Community College, and Springfield Technical Community College (see Appendix C for further information on each school).

Loan Repayment

The Massachusetts Department of Public Health’s Primary Care Office offers a loan repayment program to assist dentists and dental hygienists providing dental services to the Commonwealth’s most underserved residents. The programs are designed to repay loans that have been accrued by dental health care providers during their education, if they wish to provide services in areas of greater need. These dental professionals must commit to working for two-years in a community health center located in a dental health professional shortage area.

- From May 2003 to the present, 13 dental health professionals have or are currently working through the loan repayment program.

Community Health Centers

The dental safety-net consists of 48 health center dental programs (including satellites) serving residents throughout the state, more than doubling the number providing services in 2000. Community health centers are unique in that they can employ limited license (foreign trained) dentists to provide culturally and linguistically competent dental treatment for the state’s most vulnerable residents across the lifespan (Figure 5).

The community health center dental programs provided more than 377,577 patient visits in calendar year 2008 (Figure 8), an increase of 16% from 2005 [9]. In a 2009 survey of community health center dental directors conducted by the Department of Public Health’s Office of Oral Health, the survey respondents reported that more than half of the source for reimbursement came from MassHealth and Commonwealth Care and almost one quarter was uncompensated care (Figure 6 and 7). These are marked differences from 2005, when just under 30% was from MassHealth and more than 50% was uncompensated



A map of the community health center dental programs is located in Appendix A.

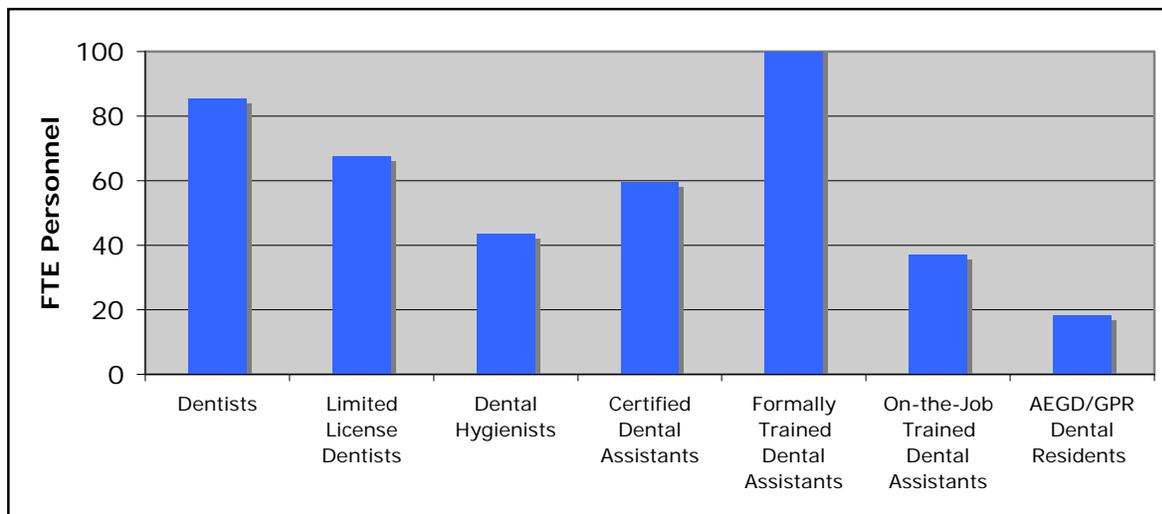


care [9]. Sixty-one percent indicated their capacity to expand the physical site of the center, and 71% indicated their ability to expand hours of operation. Of the 33% that indicated they do not have capacity to expand, over 90% indicated insufficient space for expansion and more than two-thirds (68.8%) indicated insufficient funds [9].

Translation services for more than twenty-one foreign languages are available at the community health center dental programs, as is American Sign Language and telephonic interpretation. The percentage of community health center dental programs offering translation services by language is as follows:

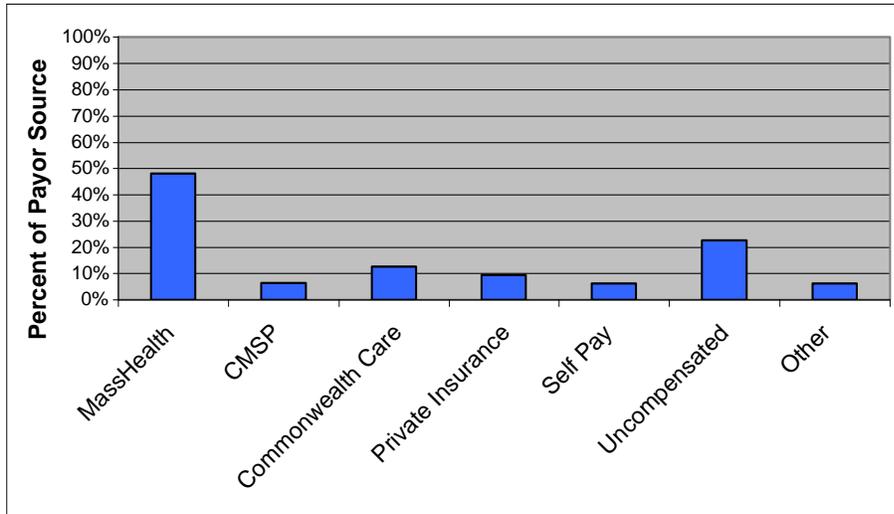
- Spanish 86%
- Portuguese 55%
- Haitian 41%
- Chinese 34%
- Vietnamese 32%
- Russian 27%
- American Sign Language 25%

Figure 5: Massachusetts Community Health Center Dental Program Personnel in FTE, 2009



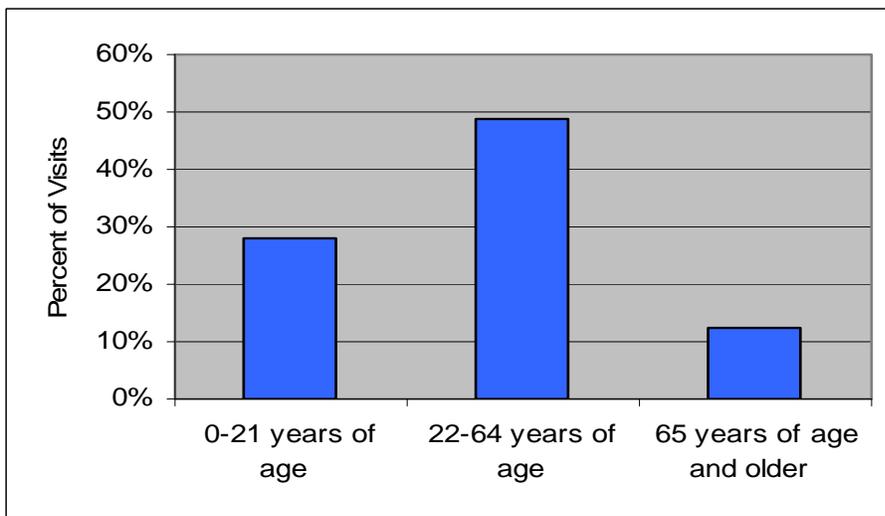
MDPH Office of Oral Health, Community Health Center Dental Program Survey, 2009

Figure 6: Payor Source for Massachusetts Community Health Center Dental Programs, 2008



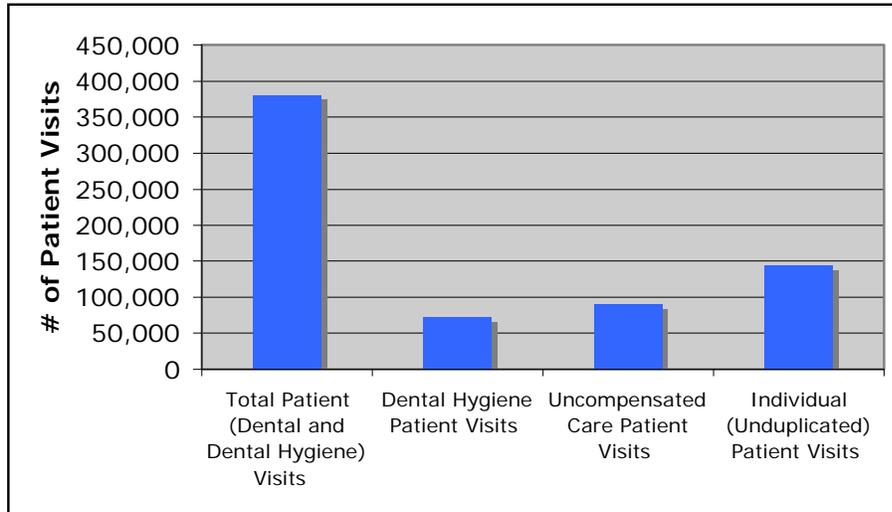
MDPH Office of Oral Health, Community Health Center Dental Program Survey, 2009

Figure 7: Percent of MassHealth Patient Visits by Age Category in Massachusetts Community Health Center Dental Programs, 2008



MPDH Office of Oral Health, Community Health Center Dental Program Survey, 2009

Figure 8: Massachusetts Community Health Center Dental Program Patient Visits for Calendar Year 2008



MDPH Office of Oral Health, Community Health Center Dental Program Survey, 2009

Conclusion

The provision of oral health services, prevention and treatment, is a collaborative effort between communities, families, individuals, providers, and decision-makers, as well as the public and private sectors. This oral disease burden document describes the important work that has already been done in Massachusetts regarding oral health promotion and disease prevention, as well as the challenges that still need to be addressed until all residents of the state have access to appropriate and culturally responsive dental services with a focus on prevention.

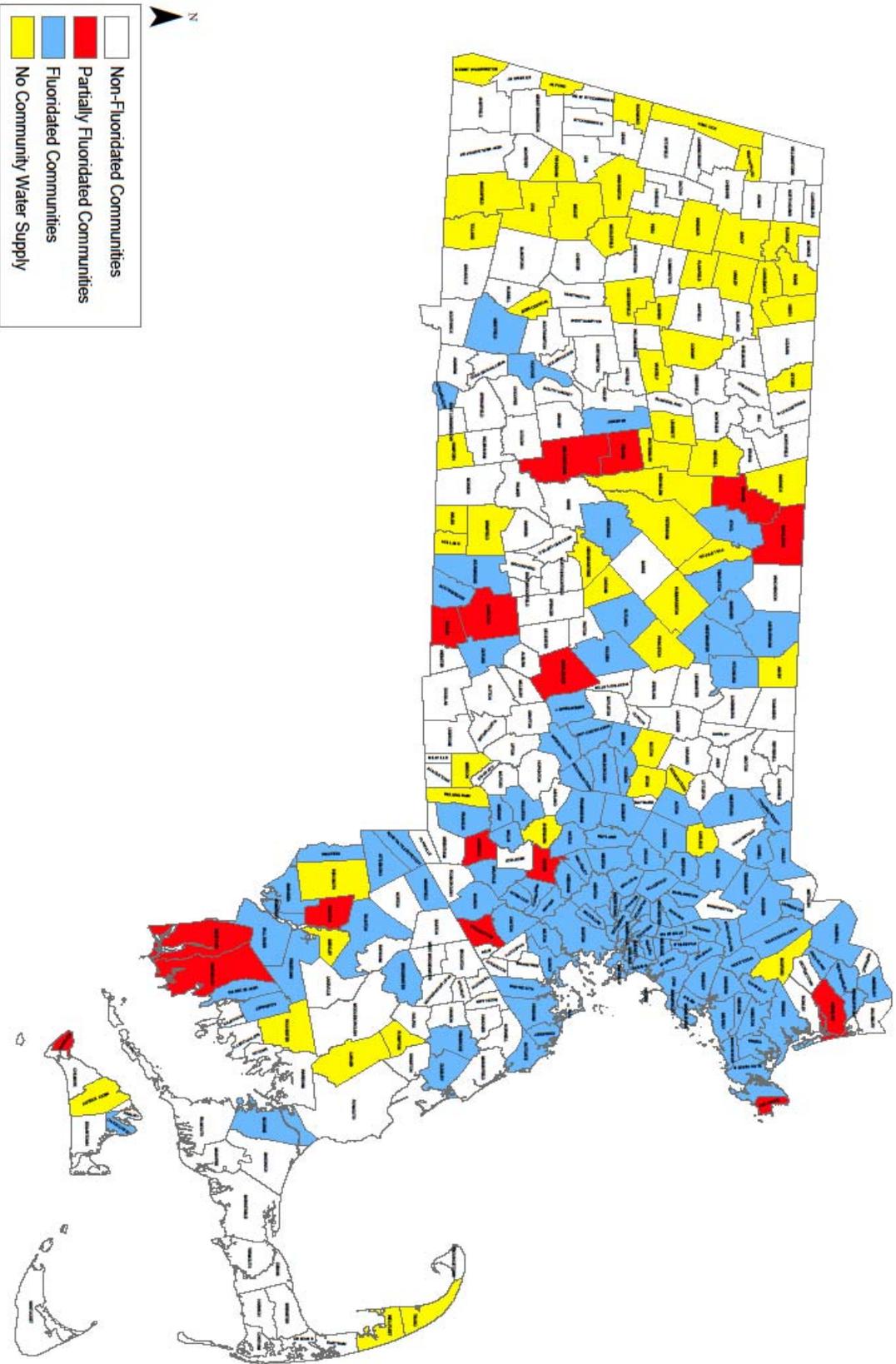
It is the intention of the Massachusetts Department of Public Health's Office of Oral Health that *The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need* may be used as an aid to policy development and fiscal priority setting by public and private agencies, organizations, and institutions in promoting and improving the oral health of Massachusetts residents.

The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need

Appendix A: Maps

- Fluoridation Status of Massachusetts Cities and Towns- December 2008
- Massachusetts Cities and Towns with Schools Participating in the Fluoride Mouthrinse Program- June 2009
- Dental Health Professional Shortage Area (HPSA) Designated Areas-September 2009
- Massachusetts Community Health Centers with Dental Programs-July 2009

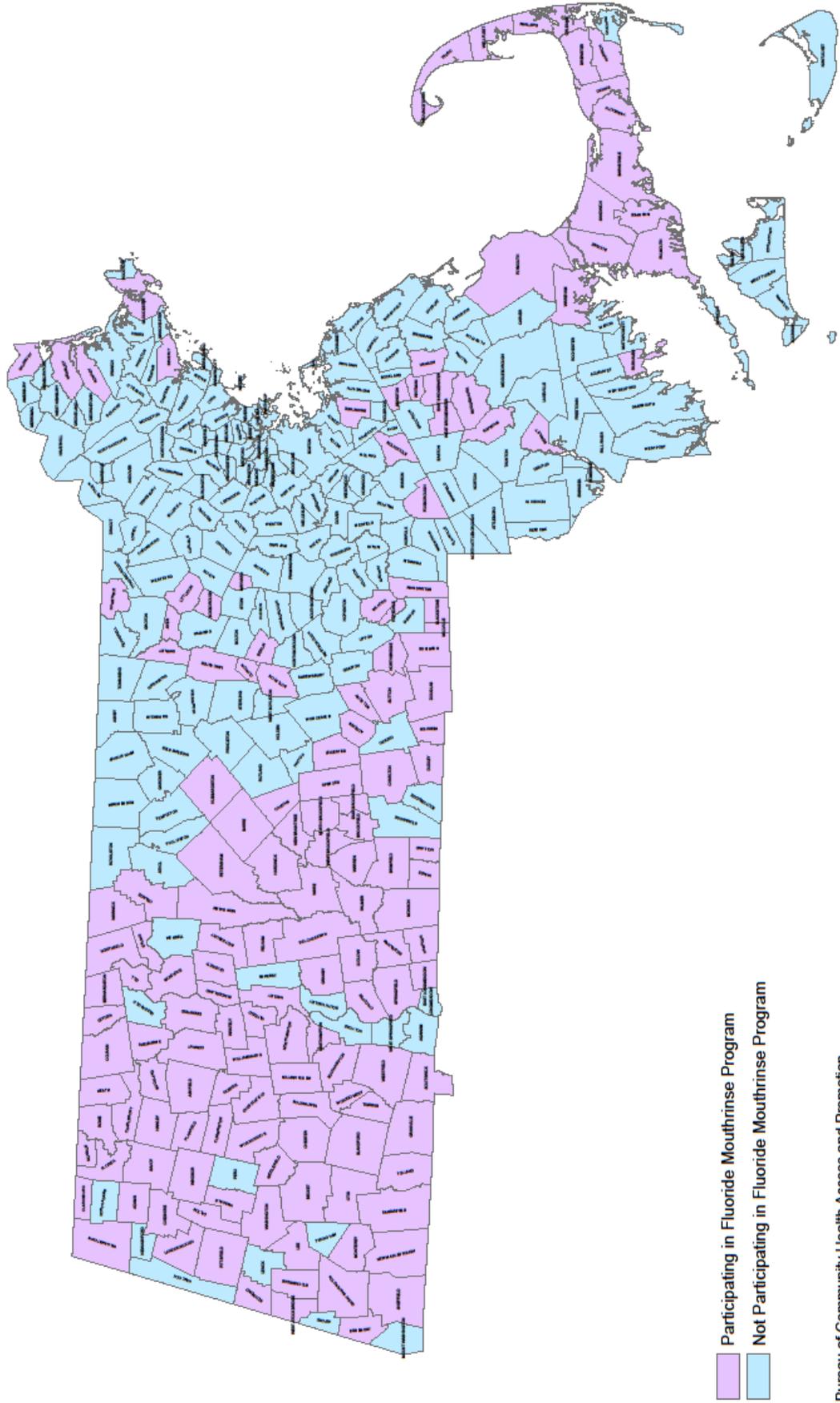
Fluoridation Status of Massachusetts Cities and Towns



Massachusetts Department of Public Health Office of Oral Health

December 2008

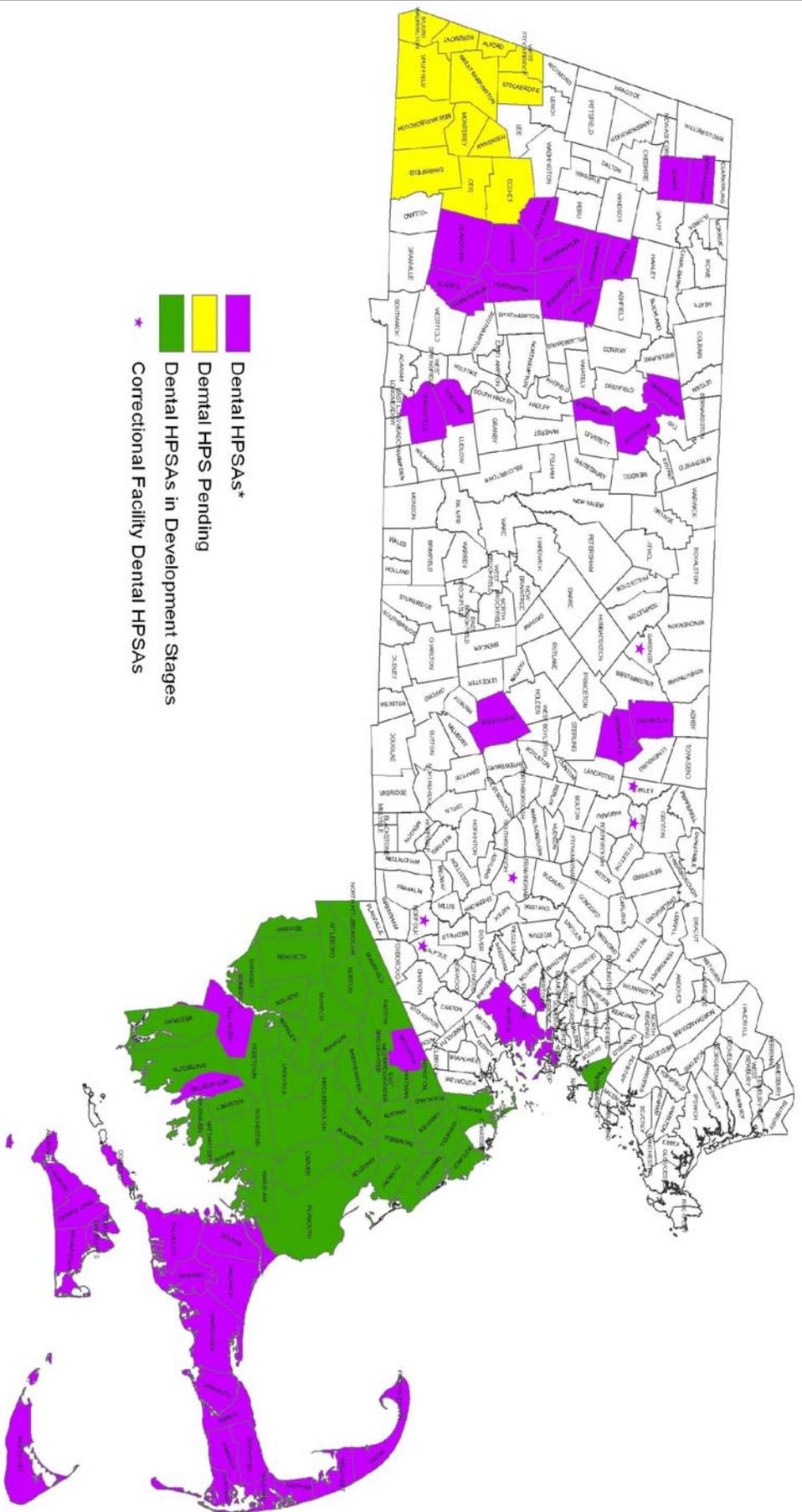
Massachusetts Cities and Towns with Schools
Participating in the Fluoride Mouthrinse Program



June 2009

Bureau of Community Health Access and Promotion
Division of Primary Care & Health Access Office of Oral Health

Massachusetts Dental HPSA Designated Areas



Source: Division of Primary Care and Health Access, MDPH, September 2009.
 *Some areas are designated by census tract only.



The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need

Appendix B: Terminology

Definitions

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

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

Cancer-Stages:

- *In situ* (early stage) – This is the earliest stage of cancer, before the cancer has spread, when it is limited to a number of small cells and has not invaded the organ itself.
- Localized (early stage) – Cancer is found only in the body part (organ) where it began; it hasn't spread to any other parts.
- Regional (late stage) – The cancer has spread beyond the original point where it started to the surrounding parts of the body (other tissues).
- Distant (late stage) – The cancer has spread to parts of the body far away from the original point where it began. This is the most difficult stage to treat, since the cancer has spread through the body.
- Unstaged – There is not enough information about the cancer to assign a stage.

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

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

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

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

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

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

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

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

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

Fluoride Varnish: A highly concentrated (~22,000 ppm) topical application of fluoride which may prevent tooth decay by as much as 30%. Fluoride varnish has been used in Europe for the last 30 years. The use of fluoride varnish to prevent tooth decay is an off-label use. The Food and Drug Administration (FDA) recognizes fluoride varnish as a desensitizing agent and cavity liner.

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

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

Massachusetts Cancer Registry (MCR): All Massachusetts incidence data are provided by the Massachusetts Cancer Registry, which is part of the Massachusetts Department of Public Health (MDPH). The MCR is a population-based cancer registry that began collecting reports of newly diagnosed cancer cases in 1982. Facilities reporting to the MCR in 2005 included 74 Massachusetts acute care hospitals, one medical practice association, pathology laboratories, one radiation oncology facility, endoscopy centers, dermatologists, and urologists. The MCR also identifies cancers noted on death certificates that were not previously reported to the MCR. The North American Association of Central Cancer Registries (NAACCR) has estimated that MCR case ascertainment is over 95% complete, resulting in gold certification of the registry. The Massachusetts cancer cases presented in this report are primary cases of invasive cancer—cancers that have moved beyond their area of origin to invade surrounding tissue—that were diagnosed among Massachusetts residents.

Massachusetts Head Start/Early Head Start: Head Start and Early Head Start are comprehensive child development programs that work to advance the health and development of children that come from low-income families and that range in age from 0 to 5 years. The overall goal of the initiative is to help each Head Start child to attain and maintain oral health by ensuring that he or she receives the early periodic, screening, diagnostic, preventive, and treatment services as defined by each state Medicaid office. The Massachusetts Department of Public Health, Office of Oral Health in conjunction with Head Start administrators and the Massachusetts College of Pharmacy and Health Sciences, Dental Hygiene Program, coordinated a survey of Head Start children from December 2003 to May 2004. <http://massheadstart.org/>

Massachusetts Registry of Vital Records and Statistics: Massachusetts death data were obtained from the MDPH's Registry of Vital Records and Statistics, which has legal responsibility for collecting reports of deaths of Massachusetts residents.

Massachusetts Youth Health Survey (MYHS): The Massachusetts Department of Public Health conducts a Youth Health Survey (YHS) to assess the health of young adults in grades six through twelve. The self-reported survey contains questions concerning health status, including the prevalence of physical and mental health conditions, the prevalence of risky behaviors that may compromise the well-being of individuals, and the prevalence of protective factors that exist within the lives of adolescents. <http://www.mass.gov/>

Medicaid: A federal-state program established in 1965 that provides health insurance coverage for low income individuals and families, as well as those with disabilities. Payment of the coverage is split 50:50 by the state and federal government. In Massachusetts the Medicaid program is referred to as **MassHealth**. For more information on the MassHealth Dental program visit:

<http://www.massresources.org/pages.cfm?contentID=35&pageID=13&subpages=yes&dynamicID=872>

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

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

Pharynx: Part of the neck and throat which sits directly behind the mouth. It is comprised of:

Nasopharynx: The nasopharynx lies behind the nasal and oral cavities.

Oropharynx: The oropharynx lies behind the oral cavity.

Hypopharynx: The hypopharynx lies below the epiglottis and extends to the larynx where the respiratory and digestive pathways diverge.

Tonsils: The tonsils are areas of lymphoid tissue on either side of the throat.

Pregnancy Risk Assessment Monitoring System (PRAMS): The Pregnancy Risk Assessment Monitoring System is a surveillance project of the Centers for Disease Control and Prevention (CDC) in collaboration with state health departments. PRAMS collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. Every month, the PRAMS survey is sent to a random sample of Massachusetts mothers of newborns aged 2-6 months, with over sampling by race/ethnicity. If women do not respond to the mail survey, attempts are made to contact them by phone.

In 2007, Massachusetts PRAMS over-sampled by race and Hispanic ethnicity to better understand birth outcome disparities between minority groups. PRAMS data are weighted in order to generalize results to the MA birth population. <http://www.mass.gov>

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

Public Health Hospitals: Massachusetts has an organized-system of four public health hospitals that are operated under the Department of Public Health's Bureau of Public Health Facilities. Each of the hospitals provides acute and chronic hospital medical care to individuals

for whom community facilities are not available or access to health care is restricted. Through a combined focus on delivery of health care services to special populations, education and research, the public health hospitals serve as a catalyst for change in the health care system by developing and modeling new treatment programs and responding to emerging health needs. The four hospitals are located in Boston, Canton, Tewksbury and Westfield.

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

Surveillance, Epidemiology and End Results (SEER): National data on cancer incidence are from the National Cancer Institute’s SEER Program, an authoritative source on cancer incidence in the United States that collects and publishes data from registries in selected areas. The national cancer incidence data in this report include malignant cases from the 12 SEER areas (including Atlanta, Connecticut, Detroit, Hawaii, Iowa, New Mexico, San Francisco-Oakland, Seattle-Puget Sound, Utah, Los Angeles, San Jose-Monterey and Alaska). SEER rates are presented per 100,000 persons and are age-adjusted to the 2000 United States standard population.

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

The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need

Appendix C: Dental and Dental Hygiene Schools

Dental Schools:

Formal dental education in this country began when the Baltimore College of Dentistry accepted its first class of prospective dentists in 1840. Prior to this, preceptor education was the norm and this “formal” education was not yet associated with other university programs. It wasn’t until Harvard Dental School was founded in 1867 that formal dental education was university-based. Massachusetts has three dental schools that are all private.

Boston University School of Dental Medicine-Boston

Established 1963

Degree Conferred: DMD

Possible Total Enrollment 1st Year Class: 115

Harvard School of Dental Medicine-Boston

Established 1840

Degree Conferred: DMD

Possible Total Enrollment 1st Year Class: 35

Tufts University School of Dental Medicine-Boston

Established 1868

Degree Conferred: DMD

Possible Total Enrollment 1st Year Class: 171

Dental Hygiene Schools:

The first dental hygiene school in Massachusetts opened in Boston in 1916, and was the only dental hygiene school operating in the state for more than fifty years. Currently Massachusetts has eight dental hygiene schools, seven conferring an associates degree and one conferring a baccalaureate degree, with a total possible first year enrollment of 233 students.

Forsyth School of Dental Hygienists, Boston

Massachusetts College of Pharmacy and Health Science

Established 1916

Highest Degree Conferred: Bachelor of Science

Possible Total Enrollment 1st Year Class: 60

Bristol Community College, Fall River

Established 1969

Highest Degree Conferred: Associates in Science

Possible Total Enrollment 1st Year Class: 22

Springfield Technical Community College, Springfield

Established 1971

Highest Degree Conferred: Associate of Science

Possible Total Enrollment 1st Year Class: 21

Cape Cod Community College, West Barnstable
Established 1972
Highest Degree Conferred: Associate of Science
Possible Total Enrollment 1st Year Class: 22

Quinsigamond Community College, Worcester
Established 1975
Highest Degree Conferred: Associate of Science
Possible Total Enrollment 1st Year Class: 30

Middlesex Community College, Lowell
Established 1975
Highest Degree Conferred: Associate of Science
Possible Total Enrollment 1st Year Class: 42

Mount Ida College, Newton
Established 1999
Highest Degree Conferred: Associate of Science
Possible Total Enrollment 1st Year Class: 24

Mount Wachusett Community College, Fitchburg/Gardner
Established 2005
Highest Degree Conferred: Associate of Science
Possible Total Enrollment 1st Year Class: 12

The Status of Oral Disease in Massachusetts 2009: A Great Unmet Need

Data Tables

The Burden of Oral Disease Throughout the Lifespan

Pregnant Women and Newborns

Table 1: Percent of Pregnant Women By Age Who had Their Teeth Cleaned Professionally, 2007 Pregnancy Risk Assessment Monitoring System (PRAMS)

Mother's Age	% Teeth Cleaned Ever	% Teeth Cleaned in Year Before Pregnancy	% Teeth Cleaned During Pregnancy	% Teeth Cleaned Since Birth
<20	89.1	55.9	26.6	30.2
20-29	86.7	55.1	33.5	21.8
30-39	91.4	69.2	47.5	34.1
40+	96.1	75.9	65	40

Table 2: Percent of Pregnant Women by Race/Ethnicity Who had Their Teeth Cleaned Professionally, 2007 Pregnancy Risk Assessment Monitoring System (PRAMS)

Mother's Race/Ethnicity	% Teeth Cleaned Ever	% Teeth Cleaned in Year Before Pregnancy	% Teeth Cleaned During Pregnancy	% Teeth Cleaned Since Birth
WNH	95.15	69.43	47.72	32.14
BNH	83.32	50.05	28.54	22.59
Hispanic	75.80	49.32	26.54	22.70
Other	78.92	55.20	31.08	25.00

Table 3: Oral Health Care of Pregnant Women by Poverty Level, 2007 Pregnancy Risk Assessment Monitoring System (PRAMS)

Poverty Level	% Teeth Cleaned Ever	% Teeth Cleaned in Year Before Pregnancy	% Teeth Cleaned During Pregnancy	% Teeth Cleaned Since Birth
Above Poverty	95.93	68.73	49.09	33.37
Below Poverty	83.06	52.33	23.92	20.9

Children and Adolescents

Table 4: Percent of Caries Experience and Untreated Decay among 3rd Graders of Massachusetts Compared to 6-8 Year Olds in the United States and 2010 Health Objectives

	Caries Experience	Untreated Decay
United States	50%	26%
Massachusetts	48%	17%
Healthy People 2010 Objectives	42%	21%

Table 5: Massachusetts Middle School and High School Oral Health Indicators, 2007 YHS Report

Variable	Middle School (n=2,727)		High School (n=3,216)	
	Have Seen a Dentist in the Past Year (%)	Of Those that Have Seen a Dentist in the Past Year: Had a Cavity (%)	Have Seen a Dentist in the Past Year (%)	Of Those that Have Seen a Dentist in the Past Year: Had a Cavity (%)
Sex				
Male	91	33	89	38
Female	92	31	90	39
Race				
White (Non-Hispanic)	95	29	93	35
Black (Non-Hispanic)	83	43	80	45
Asian/PI	91	25	81	44
Other	83	37	88	48
Time in the US				
Always	93	30	91	37
0-3 yrs	68	22	72	41
4+ yrs, but not whole life	86	44	85	45
Language other than English				
Never	93	30	92	36
Rarely	94	28	90	37
Sometimes	91	33	88	41
Most of the time	89	44	82	50
Always	82	43	80	45
Disability				
No disability	93	31	92	37
Any disability	86	35	87	40
Sexual Orientation				
Heterosexual	--	--	91	38
Bisexual	--	--	79	53
Homosexual	--	--	76	46
Not sure	--	--	82	42

Table 6: Percent of MassHealth Children Who Received a Clinical Dental Exam, 2007-2009

	FY 2007		FY 2008		FY2009	
	# of members by procedure	% of eligible enrolled	# of members by procedure	% of eligible enrolled	# of members by procedure	% of eligible enrolled
Periodic oral examination	129,895	27.7%	148,927	30.1%	157,230	30.1%
Comprehensive oral evaluation	83,011	17.7%	96,590	19.5%	83,460	16.0%
Total number of exams	212,906	45.4%	245,517	49.6%	242,286	46.3%

Table 7: Percent of (Unduplicated) MassHealth Child Members Eligible for Dental Services Who Received a Sealant, 2007- 2009

	FY2007		FY2008		FY2009	
	Number of members	% of members receiving procedure	Number of members	% of members receiving procedure	Number of Members	% of members receiving procedure
< 1 y.o.	3	0.01%	1	0.001%	2	0.003%
1 – 2 y.o.	296	0.47%	525	0.72%	623	0.90%
3 – 5 y.o.	7,705	12.13%	10,761	14.84%	10,385	15.05%
6 – 9 y.o.	20,652	32.52%	26,653	32.61%	21,766	31.55%
10 – 14 y.o.	23,568	37.11%	26,243	36.18%	24,915	36.11%
15 – 18 y.o.	10,602	16.70%	10,639	14.67%	10,112	14.66%
19 – 20 y.o.	1,109	1.75%	1,254	1.73%	1,592	2.31%
Total number of unduplicated members	63,501		72,262		68,997	

Adults

Table 8: Proportion of Adults Aged 35–44 Years Who have Lost No Teeth, Proportion of Adults Aged 65–74 Years Who have Lost All Natural Teeth and Proportion of Adults Who Have Visited the Dentist in the Past 12 Months Compared to *Healthy People 2010* Indicators

	<i>Healthy People, 2010 Objective (%)</i> , 2006	United States (%)	Massachusetts (%) 2004
Adults with no tooth loss, ages 35–44	42%	38%	67%
Toothless older adults, ages 65–74	20%	24%	14%
Dental Visit Within Past 12 Months	56%	69%	76%

Table 9: Percent of Massachusetts Adults Age 25 to 44 with No Tooth Loss, By Race, Income, and Education, 2006

	Aged 25–44 Years No Tooth Extractions (%)	Aged 65+ Years Lost 6 or More Teeth (%)	Aged 65+ Years Lost All Natural Teeth (%)
OVERALL	71.6 (69.6 – 73.6)	44.3 (41.8 – 46.8)	16.5 (14.9 – 18.2)
Race			
White, non- Hispanic	75.9 (73.8 – 78.0)	43.1 (40.5 – 45.7)	15.8 (14.1 – 17.5)
Black or African American	50.7 (39.9 – 61.4)	54.9 (40.6 -69.3)	NED
Hispanic or Latino	52.8 (45.5 – 60.0)	66.7 (54.2 – 79.2)	38.6 (25.7 – 51.4)
Asian or Pacific Islander	67.1 (54.8 – 79.3)	NED	NED
Education			
No HS Diploma	37.4 (28.8 – 46.0)	74.2 (68.3 – 80.1)	42.0 (35.5 – 48.5)
High School Grad	55.3 (50.4 – 60.3)	51.0 (46.8 – 55.3)	20.4 (17.3 – 23.6)
1-3 Yrs of College	67.9 (63.3 – 72.5)	44.2 (38.6 – 50.0)	13.0 (9.8 – 16.2)
4 Yrs of College or More	84.1 (81.9 – 86.3)	28.5 (24.5 – 32.4)	6.9 (4.6 – 9.2)
Income			
<\$25,000	48.5 (42.2 – 54.9)	59.0 (54.6 – 63.3)	25.7 (22.0 – 29.4)
\$25,000-34,999	62.8 (54.0 – 71.5)	51.0 (43.6 -58.4)	17.7 (12.7 – 22.8)
\$35,000-49,999	59.8 (53.4 – 66.2)	36.7 (30.0 – 33.4)	NED
\$50,000-74,999	71.9 (66.7 -77.0)	29.5 (21.8 -37.1)	NED
\$75,000+	82.9 (80.4 -85.5)	24.6 (17.7 -31.5)	NED
Insurance	Aged 25–44 Years No Tooth Extractions (%)	Aged 65+ Years Lost 6 or More Teeth (%)	Aged 65+ Years Lost All Natural Teeth (%)
Has coverage	73.3 (71.2 – 75.3)	44.3 (41.9 – 46.8)	16.5 (14.8 – 18.2)
Does not have coverage	56.4 (48.2 – 64.7)	NED	NED
Preventative Care			
Dentist visit in past year	73.2 (71.0 – 75.5)	33.1 (30.3 – 36.0)	4.8 (3.6 – 6.0)
Dentist visit over one year ago	67.1 (62.7 – 71.6)	72.9 (68.9 – 77.0)	46.4 (42.1 – 50.7)

Table 9, Continued

	Aged 25–44 Years No Tooth Extractions (%)	Aged 65+ Years Lost 6 or More Teeth (%)	Aged 65+ Years Lost All Natural Teeth (%)
Region of MA			
Western	69.9 (64.7 – 75.2)	49.5 (43.4 – 55.7)	19.5 (15.0 – 24.0)
Central	71.2 (66.0 – 76.3)	48.7 (41.5 – 56.0)	20.7 (15.0 – 26.4)
Northeast	70.8 (66.0 – 75.5)	46.1 (40.5 -51.8)	17.3 (13.2 – 21.3)
Metro West	81.1 (77.2 – 85.1)	38.4 (33.3 – 43.4)	11.7 (8.6 – 14.8)
Southeast	67.5 (62.7 – 72.3)	42.5 (37.1 – 48.0)	14.5 (11.2 – 17.9)
Boston	64.6 (58.6 – 70.7)	49.0 (41.7 – 56.4)	26.1 (20.1 – 32.1)
DHPSA			
Overall	71.6 (69.6 – 73.6)	44.3 (41.8 – 46.8)	16.5 (14.9 – 18.2)
Non DHPSA	73.2 (71.0 – 75.4)	43.2 (40.4 – 45.9)	16.1 (14.2 – 18.0)
DHPSA Towns	63.5 (59.0 – 68.1)	49.2 (43.7 – 54.7)	18.3 (14.8 – 21.8)
Sexual Orientation			
Heterosexual	72.0 (69.9 – 74.0)	DNA	DNA
Homosexual	73.0 (60.0 – 86.0)	NED	NED
Bisexual	NED	NED	NED
Diabetes			
Diabetic	54.9 (42.0 – 67.9)	57.7 (51.9 – 63.5)	26.1 (21.1 – 31.2)
Non-Diabetic	72.0 (70.0 – 74.1)	41.8 (39.1 – 44.5)	14.8 (13.1 – 16.6)

Table 9, Continued

	Aged 25–44 Years No Tooth Extractions (%)	Aged 65+ Years Lost 6 or More Teeth (%)	Aged 65+ Years Lost All Natural Teeth (%)
Heart Disease			
Has had an MI, angina or has CHD	NED	51.0 (44.2 – 57.8)	24.7 (23.2 – 35.7)
Has not had any of above	DNA	43.3 (40.6 – 45.9)	15.3 (13.5 – 17.0)

NED = Not Enough Data for statistical significance

DNA = Data Not Analyzed

DHPSA = Dental Health Professional Shortage Area

* Including health insurance, prepaid plans such as HMOs or govt. plans such as Medicare

Table 10: Proportion of Residents in DHPSA and Non-DHPSA Towns That Have Visited the Dentist in the Past Year and Those Ages 25 to 44 with No Tooth Loss

	Dental Visit in Last Year	Aged 25-44 No Tooth Extractions
Non-DHPSA Towns	77.10%	73.20%
DHPSA Towns	70.80%	63.50%

Table 11: Proportion of Massachusetts Adults with and Without Diabetes Who Are Missing Six or More Teeth

	55 and under	Over 55
Diabetic	32.30%	57.70%
Non-Diabetic	12.40%	41.80%

Table 12: Proportion of Residents Age 18 to 64 who have Visited the Dentist in the Past Year, By Insurance Coverage

Any Insurance	80.10%
No Insurance	48.30%
Medicaid or MassHealth	58.80%

Seniors

Table 13: Percent of Edentulism/Prevalence of Dentures Among
Massachusetts Long Term Care Facility Patients, 2009 (n=834)

Full Edentulism- Maxilla	50.7
Full Edentulism - Mandible	36.6
Full Edentulism - Maxilla and Mandible	35.1
No Full Denture- Maxilla	19.6
No Full Denture- Mandible	44.7

Table 14: Percent of Untreated Decay and Treatment Urgency Among
Massachusetts Long Term Care Facility Patients, 2009 (n=540)

Untreated Decay	59.3
Early Dental Needs	25.4
Major Dental Needs	26.7
Urgent Dental Needs	7.0

Table 15: Time Since Last Dental Visit Among Seniors at Meal Sites, 2009
(n=212)

Reported Having a Dentist	66.9
Last Dental Visit-Up to 12 Months	49.5
Last Dental Visit-12 Months to Five Years	26.8
Last Dental Visit-Greater Than Five Years	19.8
Last Dental Visit-Unknown	3.7

Table 16: Percent of Seniors at Meal Sites Missing More Than Three Teeth, 2009
(n=212)

3 or More Teeth Missing-Maxilla	68.8
3 or More Teeth Missing - Mandible	66.9
Full Edentulism - Maxilla and Mandible	19.3

Table 17: Percent of Untreated Decay and Treatment Urgency Among
Meal Site Participants, 2009 (n=171)

Untreated Decay	34.5
Early Dental Needs	17.5
Major Dental Needs	13.5
Urgent Dental Needs	3.5

Special Health Needs

Table 18: Percent of CSHCN with Sealants on Molars Residing at a State Public Health Hospital (n=54)

	Yes	No
6 Year Molars	66.6	33.3
12 Year Molars	48.1	51.9

Oral and Pharyngeal Cancer

Table 19: Age-Adjusted Incidence Rate of Oral and Pharyngeal Cancer by Sex, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Males	18.7	18.9	17.4	18.5	16.8	17.5	15.4	17	17	15.8	16.2
Females	6.4	7.1	7.3	6.7	7.7	6.5	6.8	6.5	6.7	6.4	6

Table 20: Age-Adjusted Incidence Rate of Oral and Pharyngeal Cancer by Race/Ethnicity, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
White NH	11.4	12	11.3	11.9	11.3	11.2	10.5	11	11.3	10.6	10.6
Black NH	17.8	12.8	12.7	14.6	12.6	10.3	10.1	13.3	10.9	8.1	7.1
Asian NH	12.7	9	18.8	13.4	10.7	10.9	9.7	11.5	13.3	9.5	6.8
Hispanic	11.3	9	12.6	4.8	14.8	15.4	9.7	11.7	8.5	9.5	9.6

Table 21: Oral/ Pharyngeal Cancer Mortality in Massachusetts by Sex, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Males	5.73	4.23	4.5	4.38	4.53	4.01	3.96	4.54	3.71	4.31
Females	2.12	1.68	1.51	1.86	1.71	1.86	1.65	1.45	1.6	1.55

Table 22: Oral/ Pharyngeal Cancer Mortality in Massachusetts by Race/ Ethnicity, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
White, NH	3.55	2.59	2.75	2.89	2.95	2.83	2.62	2.61	2.45	2.9	2.17
Black, NH	7.16	6.5	4.17	3.48	2.03	2.25	3.62	3.48	3.06	0.53	1.11
Asian, NH	3.96	4.16	2.76	1.88	1.36	0.61	1.01	7.66	4.38	1.97	2
Hispanic	2.71	3.22	1.19	3.04	1.74	3.33	1.98	2.57	1.15	1.43	3.24

Table 23: Diagnosis of Oral/Pharyngeal Cancer by Site, Massachusetts 2001-2005

Tongue	Gum	Salivary Gland	Floor of Mouth	Lip
2124	1284	837	720	461

Table 24: Diagnosis of Oral/Pharyngeal Cancer by Site, Massachusetts 2001-2005

Tonsil	Hypopharynx	Nasopharynx	Oropharynx
988	782	473	325

Table 25: Mean Age at Diagnosis of Oral/Pharyngeal Cancer by Sex and Race/Ethnicity, Massachusetts 1995-2005

	Male	Female	White NH	Black NH	Asian NH	Hispanic
Age in Years	62	65	63.8	58.7	51.9	56.1

Data Tables

Preventing Oral Disease in the Commonwealth

Table 1: Percent of 3rd Grade Children Who Received Dental Sealants in Massachusetts Compared to the Healthy People 2010 Objectives, 2008

Healthy People, 2010 Objective	50%
MA Average	46%
Non-Hispanic White	48%
Non-Hispanic Black	29%
High Income	49%
Low Income	37%
Regular Dentist	48%
No Regular Dentist	18%

Table 2: Percent of 6th Grade Children Who Received Dental Sealants in Massachusetts Compared to the Healthy People 2010 Objectives, 2008

Healthy People, 2010 Objective	50%
MA Average	52%
Non-Hispanic Black	20%
Low Income	41%
No Regular Dentist	28%

Table 3: Number of Children and Schools Participating in the Weekly Fluoride Mouthrinse Programs in the 2007-2008 and 2008-2009 School Year.

	2007-2008	2008-2009
# of Schools with Fluoride Mouthrinse Program	236	271
# of Children Participating - Weekly Fluoride Mouthrinse Program	46,599	51,597

Data Tables

Dental Workforce and Capacity

Table 1: Distribution of Massachusetts Dentists by Number of Years of Practice in Massachusetts, 2008 (n=3,326)

	<1	1 to 5	6 to 10	11 to 15	16 to 20	21 to 30	>30
Percent of Respondents	2.6	9.4	12.2	9.2	10.1	24	32.6

Table 2: Distribution of Massachusetts Dentists by Work Setting, 2008 (n=3,226)

	Solo Practice	Group Practice	Community Health Center	Dental School	Hospital
Percent of Respondents	53	40	2	4	1

Table 3: Number of Children Enrolled in the MassHealth Dental Program by County and Number of MassHealth Dental Providers by County, FY 2008-2009

Massachusetts County	Children Enrolled		MassHealth Providers	
	FY 2008	FY 2009	FY 2008	FY 2009
Barnstable	13,820	13,956	19	28
Berkshire	11,944	11,918	31	34
Bristol	50,093	50,454	112	128
Dukes and Nantucket	1,739	1,804	1	4
Essex	65,052	65,887	167	188
Franklin	5,683	5,641	20	18
Hampden	64,704	64,169	110	117
Hampshire	7,608	7,666	15	20
Middlesex	76,302	77,740	313	357
Norfolk	28,317	28,497	108	126
Plymouth	34,093	34,299	120	144
Suffolk	84,271	82,123	212	225
Worcester	62,549	63,384	145	181
Total Members	506,175	507,538	1,373*	1,570

* Does not reflect the additional 166 providers for FY 2008 working in clinics, hospitals and community health centers

Table 4: Number of Years in Practice of Massachusetts Dental Hygienists, 2007 (n=3,151)

	<1	1 to 5	6 to 10	11 to 15	16 to 20	21 to 30	>30
Percent of Respondents	3.7	14.4	12.7	11.5	11.7	25.9	20.6

Table 5: Age Distribution of Dental Hygienists Survey Respondents Licensed in Massachusetts and Currently Employed as Dental Hygienists, 2007 (n=3,886)

	30 or less	31-40	41-50	51-60	61 or over
Percent of Respondents	11.8	25.1	33.7	23.1	6.3

Table 6: All Community Health Center Dental Program (FTE) Personnel, 2009 (n=45)

Dentists	85.50
Limited License Dentists	67.50
Dental Hygienists	43.50
Certified Dental Assistants	59.50
Formally Trained Dental Assistants	102.50
On-the-Job Trained Dental Assistants	37.00
AEGD/GPR Dental Residents	18.50

Table 7: Payor Source for Community Health Dental Programs, 2008 (n=46)

MassHealth	48.20%
CMSP	6.30%
Commonwealth Care	12.50%
Private Insurance	9.30%
Self Pay	6.10%
Uncompensated	22.90%
Other	6.20%

Table 8: Percent of MassHealth Patient Visits by Age Category in Community Health Center Dental Programs, 2008 (n=45)

0-21 Years of Age	28%
22-64 Years of Age	48.90%
65 Years of Age and Older	12.50%

Table 9: Community Health Center Dental Program Patient Visits by Calendar Year, 2008 (n=46)

Total Patient (Dental and Dental Hygiene) Visits	381,045
Dental Hygiene Patient Visits	72,864
Uncompensated Care Patient Visits	89,536
Individual (Unduplicated) Patient Visits	143,130

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