



# ISSUE BRIEF

The Massachusetts Health Policy Forum

## Putting the Mouth Back in the Body:

*Improving Oral Health Across the Commonwealth*

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## Executive Summary

Oral health is often considered separate from overall health. However, dental disease is associated with heart disease, stroke, and diabetes. Furthermore, pain due to tooth decay can result in lost work productivity and missed school days. Major oral health conditions include tooth decay, gum disease, oral cancers, and cleft lip and cleft palate. While children are often the focus of oral health initiatives, preventive oral health services are necessary for people of all ages. As baby boomers age, seniors are keeping their teeth longer, resulting in an increase in gum disease and greater need for restorative dental services. This report documents the recent successes in improving access to oral health care and the access barriers that remain. It also examines potential strategies for continued progress.

Part of Massachusetts health reform in 2007 reinstated adult dental care as a Medicaid benefit. It also made dental benefits available to people in the new Commonwealth Care program for adults up to 100% FPL. Additionally, children eligible for MassHealth with family income up to 300% FPL are eligible for dental benefits. A recent survey by the Urban Institute shows that these reforms increased the number of adults receiving dental care and reduced the number of adults forgoing necessary dental care between 2006 and 2008. In 2006, prior to reform, 48.9% of adults with family income less than 300% FPL reported having a dental care visit in the past year. This number increased to 58.5% in 2007 and to 63.0% in 2008. Prior to reform 20.8% of people in this income category put off necessary dental care. This number decreased to 13.6% in 2007. Some of this progress is at risk as the governor and legislature consider eliminating adult dental benefits in the MassHealth program to help address the state fiscal crisis.

The recent passage of the Omnibus Oral Health Bill was an important step in improving access to oral health services for Massachusetts residents. The bill modified the dental director positions in both the Department of Public Health and the MassHealth program, outlined a career ladder for dental assistants, and created the public health dental hygienist. Additionally, oral health stakeholders in Massachusetts recently formed the Better Oral Health for Massachusetts Coalition to establish a state plan to improve oral health across the Commonwealth. At the national level, the reauthorization of the Children's Health Insurance Program (CHIP) included several oral health provisions such as mandating dental benefits in CHIP benefit packages up to 300% FPL and allowing states to offer wraparound dental benefits for children up to 300% FPL who have private insurance but not dental benefits. While Massachusetts currently provides dental benefits through 300% FPL for children in state programs, the new wraparound option may provide new opportunities for some low-income children. Furthermore, with national health reform on the President's agenda, it is critical that oral health be included in any broader health reform proposals.

Access to good oral health remains a significant problem for Massachusetts residents of all ages. The *Health Care for All v. Governor Mitt Romney* remediation process and legislative efforts have improved access to dental services for children participating in MassHealth. An increase in children's dental reimbursement rates, administrative simplifications, and the ability of providers to limit the number of MassHealth members accepted by the practice has modestly expanded access to dental services for children. While some of these improvements have benefited adults, reimbursement rates and available services remain more restrictive. Seniors lack access to dental benefits as well. Medicare does not offer basic dental services resulting in high rates of dental

uninsurance and high out-of-pocket costs. Furthermore, frail elders living in residential settings face additional barriers to care. Given these barriers, it is not surprising that individuals with special health care needs have difficulty finding providers who offer accessible services and have appropriate training. Across all ages, people with low incomes and racial and ethnic minorities face the most severe access barriers and bear a disproportionate burden of dental disease. Significant access barriers remain in part driven by the low rate of dental insurance compared to medical insurance, the shortage of MassHealth dental providers, the absence of adequate dental preventive services, and the high number of communities that lack access to fluoridated water.

Community health center (CHC) dental programs are a critical provider of dental services to MassHealth participants and the uninsured. In 2007, there were 33 CHC dental programs at 47 service sites across the state. Enrolling providers in MassHealth has been a persistent challenge. Consistently, dentists report low reimbursement rates, administrative complexity, and difficult patient behaviors as reasons for not enrolling in MassHealth. Increasing dentists' participation in MassHealth is an ongoing challenge.

There continues to be dental care shortages in certain areas of the state and concerns that as baby boomer dentists retire they will not be replaced in sufficient numbers to meet the demand for care. Massachusetts has three dental schools, all located in Boston. While the dental schools are changing the make-up of their graduating classes, the total number of students graduating from dental school across the country has increased only from 4,041 to 4,714 between 1998 and 2007. Over the past ten years, there has been a significant increase in the number of females and a moderate increase in the number of racial and ethnic minorities entering dental school. Dental education is costly. Nationwide, the average cost of four years of tuition for non-residents is \$157,908. On average, Massachusetts dental schools tend to be more expensive. Increased tuition remission and scholarship programs could help meet demand and increase the number of dentists practicing in community-based settings. Additionally, making dental public health training programs more readily available could encourage more dentists to pursue public health dentistry.

Dental hygienists are an essential part of the dental team. The inclusion of dental hygienists in public health settings is seen as one way to increase access to dental services for populations at high risk of dental disease such as low-income, racial and ethnic minorities, children, elderly, and people with chronic conditions. States continue to explore new roles for dental hygienists. The effective use of dental assistants can also expand the capacity of a dental practice. Additionally, new levels of dental providers are one way to improve access to dental services. There are several models under consideration throughout the country—models vary with regard to education, scope of practice, and supervision requirements.

Physicians are increasingly playing an important role in oral health. Training is needed to adequately prepare physicians to conduct oral health assessments and screenings. Individuals are more likely to see physicians than dentists—this is particularly true for very young children and seniors. Thus, physicians can help facilitate the creation of a dental home by assessing patient needs and referring patients to dentists as appropriate. Recently, MassHealth reimbursement was made available for the provision of fluoride varnish by physicians and other qualified health professionals to children at high risk of dental decay. Through programs like this, physicians can help improve oral health outcomes for those most at risk of dental disease.

Public health and prevention are essential for good oral health across the Commonwealth. The Office of Oral Health at the Department of Public Health aims to improve oral health through education about preventing dental disease, community water fluoridation, and school-based fluoride and sealant programs. The Watch Your Mouth Campaign in Massachusetts is particularly effective at educating the public about the importance of good oral health and the links between tooth decay and school performance. Community water fluoridation is the most cost effective way to prevent dental disease. In Massachusetts, 140 out of 351 cities and towns (59.1% of residents) have access to fluoridated water. The process of community water fluoridation is primarily local, and politically difficult. Opposition endures despite extensive scientific evidence of the safety and effectiveness of community water fluoridation. Typically fluoridation efforts are successful only half of the time. Recent successes include North Attleboro, New Bedford, Acushnet, Dartmouth, and Woburn. In addition to community water fluoridation, topical fluoride and sealants are effective preventive techniques. Massachusetts has recently expanded school-based prevention programs to provide fluoride varnish and sealants to children at high risk of dental decay.

Bringing oral health stakeholders and policy leaders together for the policy forum *Putting the Mouth Back in the Body: Improving Oral Health Across the Commonwealth* is critical during these challenging economic times. While recent efforts have drawn attention to the importance of oral health throughout the state, budget constraints threaten that progress. This forum will feature two panels of experts exploring the current state of oral health and future policy directions to improve oral health in Massachusetts. Panel discussions will address improvements to the MassHealth dental program, innovative fluoride and sealant prevention programs for children, the oral health needs of vulnerable seniors, opportunities for integration and capacity enhancements in the workforce, and policy advancements at the state and national level. Local and national health leaders will discuss what we can learn from other states, how public health policy can improve oral health, and the role for oral health in national health reform.

## Introduction

Oral health has long been considered separate from overall health. However, recent attention to the importance of oral health and its relation to overall health has underscored the need to reconnect the mouth to the rest of the body. The first ever Report of the Surgeon General on oral health in 2000 highlighted that, “oral health means much more than healthy teeth...oral health is integral to general health.”<sup>1</sup> That same year, improving oral health was included as a goal of the Healthy People 2010 initiative sponsored by the U.S. Department of Health and Human Services.<sup>2</sup> Later, in 2003, the federal government issued a *National Call to Action* to raise awareness about the prevalence of dental disease and to promote oral health.<sup>3,4</sup> This national attention and local leadership has helped spur oral health initiatives across Massachusetts.

As we approach 2010 and assess how well the Healthy People 2010 goals have been met, it is essential that Massachusetts reassess the oral health status of its residents, the existing infrastructure to effectively deal with oral health challenges, the successes that have been achieved, and the work that remains to be done. This issue brief will describe the progress the Commonwealth has made to improve oral health over the past decade and explore how Massachusetts can continue to be a leader in promoting good oral health for all of its residents.

## The Problem

Oral health significantly impacts quality of life.<sup>1</sup> Poor oral health can cause persistent pain, difficulty eating and swallowing, lost sleep, and problems with speaking.<sup>2</sup> Dental pain and dental disease can interfere with professional and social interactions, impact self esteem, and result in lost economic productivity through missed work days.<sup>1</sup> For children, chronic pain due to untreated dental decay often results in missed school days, difficulty speaking or eating, and problems focusing in the classroom.<sup>5</sup> For elders, poor oral health can result in nutrition deficiencies and systemic health problems, and also limit one’s ability to remain actively engaged in society.<sup>6</sup>

Oral health conditions are closely linked with other medical conditions, and individual behaviors. Dental disease is associated with heart disease, stroke, and diabetes.<sup>1</sup> Individuals living with diabetes are particularly at risk for gingivitis and more severe periodontal disease.<sup>7</sup> A third of the 320,000 people with diabetes in Massachusetts did not visit the dentist in 2007.<sup>8</sup> While earlier studies suggested that periodontal disease during pregnancy could lead to low birth weight or preterm babies,<sup>2,9</sup> more recent literature suggests that further research is necessary to determine if a link exists.<sup>10-13</sup> People living with HIV/AIDS are at greater risk of developing certain oral health problems due to a weakened immune system.<sup>14</sup> For example, people living with HIV/AIDS can develop oral lesions, oral hairy leukoplakia, or herpetic ulcers—often some of the first symptoms of HIV infection.<sup>14</sup> Certain cancers, such as leukemia and lymphoma can also have oral manifestations.<sup>15</sup> Additionally, chemotherapy and radiation treatments may cause inflammation and infections in the mouth.<sup>2</sup> Medications used to treat chronic conditions can also result in the reduced flow of saliva, altered sense of taste, mobility of teeth, and dry mouth.<sup>7</sup> Furthermore, periodontal disease can be impacted by tobacco use and poor oral hygiene.<sup>2</sup>

Major oral health conditions include dental caries, early childhood caries, periodontal disease, oral cancer, cleft lip and cleft palate, and other craniofacial anomalies which significantly impact quality of life.<sup>15</sup> A detailed description of these conditions is included in Appendix I.

## **Progress in Massachusetts**

### ***The Special Legislative Commission on Oral Health***

Over the past decade, policymakers in Massachusetts have become increasingly committed to improving oral health. In 1998, a Special Legislative Commission on Oral Health was convened to assess the oral health status of the state and report on the prevalence of community prevention programs and access to oral health care services.<sup>15</sup> The Commission identified barriers to care for high-risk populations and compared alternatives for increasing dental services for at-risk children. They explored options to increase MassHealth participation among dental providers and to promote public health prevention programs.<sup>15</sup> The Commission compiled data on oral health from community-level studies, survey data from the Behavioral Risk Factor Surveillance System (BRFSS), statistics on cancer mortality, and other national data sets to assess the state of oral health and dental disease across the Commonwealth.

In 2000, the Commission released *The Oral Health Crisis in Massachusetts*, which found that the oral health care needs of the most vulnerable were not being met.<sup>15</sup> According to the Commission, “the strongest message of this report must be to alert the Legislature, Governor and other key stakeholders that the delivery system for oral health care for low-income residents—both those enrolled in MassHealth and those who are uninsured—is collapsing.”<sup>15</sup> At the core of the crisis was that MassHealth dentists were disenrolling from the program at the same time that the overall MassHealth population was increasing.<sup>15</sup> The report highlighted the following statistics:

- More than 2.3 million Massachusetts residents lacked dental insurance, compared to 636,000 without medical insurance.<sup>15</sup>
- MassHealth received 4,000 calls per month from members reporting that they were unable to find a dentist.<sup>15</sup>
- 86% of dentists practicing in Massachusetts were not active MassHealth providers.<sup>15</sup>
- Between 77% and 88% of schoolchildren did not have dental sealants.<sup>15</sup>
- 2.5 million Massachusetts residents lived in communities without fluoridated water, ranking Massachusetts 35<sup>th</sup> in the nation.<sup>15</sup>

The Commission’s report found that in 2000, there were approximately 4,692 dentists in 6,065 locations—a ratio of one dentist for every 1,304 Massachusetts residents.<sup>15</sup> Dentists were more heavily concentrated in the eastern part of the state. Moreover, Massachusetts lacked dental providers from minority communities which created cultural and language barriers for many residents trying to access services.<sup>15</sup>

Based on the findings, the Commission recommended:

- Improved access to public and private dental insurance.
- Improved access to oral health screening and treatment services by increasing provider capacity.
- The promotion of statewide population-based approaches to the prevention of dental disease with services targeted at high-risk populations.
- The development of a surveillance system to monitor the prevention and oral health status of Massachusetts residents.
- The establishment of a Special Advisory Committee on Oral Health to improve the oral health of Massachusetts residents.<sup>15</sup>

Since the release of this report, a strong stakeholder community has mobilized to improve oral health in the state. For example, the Oral Health Advocacy Task Force was established in 2002 after a series of budget cuts resulted in the elimination of adult dental benefits in Medicaid.<sup>16</sup> The task force is a broad-based coalition of advocates, health care professionals, consumers, policymakers, insurers and researchers. Working statewide, the task force partners with the leaders of the Legislative Oral Health Caucus to improve oral health through advocacy.<sup>16</sup> The task force took on many of the objectives outlined by the 2000 Commission report. The priorities of the task force are to: increase access to dental insurance, bolster the safety net of oral health providers in Massachusetts, increase the prevalence of community water fluoridation, and expand awareness of oral health issues.<sup>16</sup>

### ***The Impact of Massachusetts Health Reform on Oral Health***

Since 2007, Massachusetts requires that residents have health insurance, however dental benefits are not required across the board.<sup>17</sup> Dental benefits are available to children living at or below 300% FPL as well as adults under 100% FPL.<sup>17, 18</sup> However, dental benefits are not available through the state's Commonwealth Care program for adults with incomes over 100% FPL. Current bills in the Massachusetts legislature (HB 1101 and SB 1038) would require that medically necessary preventive and restorative oral health services be provided in all Commonwealth Care insurance plans.<sup>19, 20</sup> Due to the requirements for insurance, it is likely that more adults below 100% FPL and children below 300% FPL will enroll in state-sponsored health benefits, which will increase the number of residents with dental insurance, thus increasing demand for services.<sup>17</sup>

A recent analysis of the impact of Massachusetts health reform shows encouraging results with regard to improvements in adults' access to dental care between fall 2006 and fall 2008.

- The percentage of adults between 18 and 64 years of age who had a dental visit within the past twelve months increased from 67.8% to 75.5%.<sup>21</sup>
- The percentage of adults between 18 and 64 years of age, with incomes under 300% FPL

who had a dental visit within the past twelve months increased from 48.9% to 63.0%.<sup>21</sup> This increase is in part attributable to the restoration of adult dental benefits in 2006 as part of health reform.<sup>21</sup>

- The percentage of adults forgoing needed dental care because of cost has decreased since the start of reform, from 10.3% to 7.5% for all adults and from 17.4% to 11.5% for adults with incomes under 300% FPL.<sup>21</sup>

This suggests that increased coverage is translating into increased access to dental care for adults in Massachusetts. However, this progress may be at risk. The governor's latest budget recommendation for FY 2010 includes the elimination of adult dental benefits in the MassHealth program.<sup>22</sup>

### ***The Omnibus Oral Health Bill***

Oral health stakeholders in the Commonwealth have come together to improve oral health in the state. The recent passage of the Omnibus Oral Health Bill (SB2819) is one example of that collaboration. The final bill was a compromise between the Massachusetts Dental Hygienists' Association (MDHA), the Oral Health Advocacy Task Force, and the Massachusetts Dental Society (MDS). The Omnibus Oral Health Bill combined three previously independent oral health bills.<sup>23</sup>

At the beginning of the last legislative session, MDHA proposed allowing dental hygienists to work in public health settings without the supervision of a dentist. This was seen as a way to expand access to oral health services for people who would otherwise receive no oral health care. There was significant discussion about what specific procedures should be allowable, and what form of supervision should be required. Concurrently, MDS advocated the creation of a career ladder for dental assistants with defined qualifications and duties.<sup>24</sup> The Oral Health Advocacy Task Force proposed infrastructure changes by modifying the state dental director positions in both the Department of Public Health (DPH) and the MassHealth program.

Compromise led to the passage of the Omnibus Oral Health Bill in the final hours of the session on January 6, 2009.<sup>23</sup> Senator Harriette Chandler and Representative John Scibak, co-chairs of the Legislative Oral Health Caucus, were instrumental in achieving the bill's passage.<sup>23</sup> The bill was signed into law by the Governor on January 15, 2009<sup>25</sup> and will take effect on July 1, 2009.<sup>26</sup> The bill mandates that the DPH dental director be a licensed dentist, statutorily mandates an Office of Oral Health within DPH, creates a public health dental hygienist, establishes a career ladder for dental assistants, and establishes a full-time dental director in the Office of Medicaid. For a more detailed description of the components of this legislation see Appendix II. Some details remain to be worked out, but this legislative advance is a major first step in improving oral health throughout the Commonwealth.

### ***The Better Oral Health for Massachusetts Coalition***

To further these collaborative successes, the Better Oral Health for Massachusetts Coalition was launched in 2008 to create a state plan for oral health. This statewide coalition is made up of representatives from the following stakeholder groups: oral health care providers, programs, policymakers, state oral health officials, insurers, and advocates.<sup>27</sup> Leaders in this effort include the Oral Health Foundation (now the DentaQuest Foundation), Partners for a Healthier Community, Massachusetts Dental Society, Massachusetts Department of Public Health, Massachusetts Dental Hygienists' Association, and Delta Dental of Massachusetts.<sup>28</sup> The goal of the coalition is to generate a state oral health plan to improve oral health in Massachusetts by addressing access barriers, disparities, community prevention, and equity in dental care.<sup>27</sup> As of 2007, 25 states report having state oral health plans, 10 states report having a state oral health plan as a section of their Healthy People 2010 initiative, and three states report that their state oral health plan is being developed.<sup>29</sup> According to the Association of State and Territorial Dental Directors (ASTDD), there are five best practice criteria that should be considered when developing a state oral health plan:

1. **Impact/Effectiveness:** The state oral health plan should be based on an assessment and surveillance of oral health needs. The evaluation of identified, measurable outcomes should be included.<sup>29</sup>
2. **Efficiency:** Oral health stakeholders should commit time and resources to developing, executing, and sustaining the state plan.<sup>29</sup>
3. **Demonstrated Sustainability:** Monitoring, accountability, and progress reports should be built into the state plan.<sup>29</sup>
4. **Collaboration/Integration:** Collaboration with local communities and stakeholders should be fostered during the development of the plan. The plan should include core objectives that can be modified to meet the needs of specific communities.<sup>29</sup>
5. **Objectives/Rationale:** The objectives of the state oral health plan should reflect broader goals of the state and be operationalized in terms of oral health outcomes and overall health outcomes as appropriate.<sup>29</sup>

The development of a state oral health plan for Massachusetts will help align the goals of oral health stakeholders and improve oral health for all residents of the Commonwealth.

An examination of the current oral health status of children, adults, the elderly, people with special health care needs, and racial and ethnic minorities will provide a picture of where we stand today. Next, a detailed assessment of the distribution of MassHealth providers and the capacity of the dental safety net, current data on dentists and dental hygienists, the emerging role of physicians in oral health, and recent developments in alternative dental provider models will shed light on current workforce issues. This is followed by looking at the role of public health and prevention in improving oral health, with particular attention paid to government infrastructure, oral health education, community water fluoridation, and school-based sealant and fluoride varnish programs.

## The Current State of Oral Health in Massachusetts

### *Children*

Childhood caries is the most common chronic childhood disease occurring at a rate five times that of asthma.<sup>2</sup> Nationwide, children miss more than 51 million school hours each year due to dental disease.<sup>5,30</sup> Parents with lower educational attainment are more likely to have children who experience untreated dental decay.<sup>2</sup> Children living in families below the poverty level experience twice as much dental decay and have more severe decay compared to high income children.<sup>30</sup> Additionally, Black or Hispanic children are at greater risk for experiencing untreated oral health conditions than their White counterparts.<sup>2,30</sup>

A 2005 court case, *Health Care For All v. Governor Mitt Romney*, improved dental services available to low-income children under age 21 in the Commonwealth. The court ruled that Massachusetts was not meeting its federal statutory obligations under Early and Periodic Screening, Diagnosis and Treatment (EPSDT).<sup>31</sup> Because children enrolled in MassHealth were not able to access dental services, the plaintiffs argued that the Commonwealth was violating federal requirements. The U.S. District Court of Massachusetts ruled that the Commonwealth violated the federal EPSDT statute which requires state Medicaid programs to provide necessary medical services to children with “reasonable promptness.”<sup>32</sup> As a result, the court ordered a remediation process. Dr. Catherine Hayes, a public health dentist, is the court-appointed monitor and evaluator of the remediation activities.<sup>32</sup> Dr. Hayes oversees the changes to children’s dental services including improving access to the following services: sealants, periodic exams, comprehensive evaluations, prophylaxis, fluoride treatments, and restorative care.<sup>32</sup> In addition, Dr. Hayes reviews data provided by MassHealth on utilization, provider enrollment, provider participation, and provider network capacity.<sup>32</sup>

Enhancing the capacity of the provider network available to serve children participating in MassHealth was a key component of the judgment. The Commonwealth must contact any dental provider who withdraws from the MassHealth program to determine the reason for doing so, and attempt to convince the provider to remain enrolled in MassHealth.<sup>32</sup> To further increase access, the court ordered that MassHealth dental reimbursement rates for participants under 21 be increased by \$13.74 million for fiscal year 2007 starting July 1, 2006.<sup>32</sup> The state is required to annually assess MassHealth dental reimbursement rates for children and adjust them to adequately meet children’s dental needs.<sup>32</sup> To date, the Commonwealth has continued to raise MassHealth reimbursement for dental services provided to children under age 21 each year despite budget constraints.<sup>33</sup> While MassHealth reimbursement rates for dental services provided to children are still low, most providers recognize that children’s rates are much improved, particularly compared to reimbursement rates for dental services provided to adults.

Several additional changes have improved provider enrollment and administrative processes in MassHealth, particularly for children. In 2005, the legislature passed caseload capacity limits (Chapter 45, Section 14 of the Acts of 2005), allowing dentists participating in MassHealth to limit the number of MassHealth participants served by the practice.<sup>32</sup> Furthermore, the state implemented a Third Party Administrator (TPA) subject to funding and design requirements set by the Massachusetts legislature.<sup>32</sup> More assistance is now provided by the state to increase access to dental services for children under age 21. The Commonwealth must assist MassHealth

participants with making and keeping dental appointments, by offering transportation support and appointment follow-ups.<sup>32</sup> Additionally, MassHealth members under 21 must be provided with regular information regarding the importance of good oral health, reminders for dental appointments, and descriptions of the services available to them.<sup>32</sup> MassHealth must also identify any members under 21 that have not received dental services in the past 12 months, and target them with educational information about the need for dental check-ups and the availability of services.<sup>32</sup>

**The Mobile Access to Care (MAC) Van** travels to communities throughout Massachusetts with high levels of oral health needs and provides free screenings and comprehensive oral health care to low-income children.<sup>34</sup> The MAC Van offers care at many organizations, including the Boys and Girls Club, YMCA, Head Start programs, and schools.<sup>34</sup> According to Ellen Factor, MAC Van Program Manager, since the program was launched by the Massachusetts Dental Society Foundation in February 2007, the MAC Van has provided care to 3,753 individuals totaling \$864,320 worth of free care, and more than 500 dentists have volunteered their time (written communication, June 4, 2009).

In January 2008, the Catalyst Institute (now the DentaQuest Institute) released a report entitled, *The Oral Health of Massachusetts' Children*. This study, funded by Delta Dental,<sup>35</sup> builds on *The Massachusetts Oral Health Report* of 2004 which assessed the oral health status of third grade public school children throughout Massachusetts.<sup>36,37</sup> In addition to third graders, the recent study includes kindergarten children, and sixth graders in its examination of the prevalence of caries and other oral health conditions in Massachusetts.<sup>37</sup> The study offers a useful comparison to Healthy People 2010 targets. The data suggest that dental decay is common among children in Massachusetts.

- In 2007, more than a quarter of kindergarten children had a history of dental caries.<sup>37</sup>
- Between 2003 and 2007, the percentage of third graders with evidence of past dental caries decreased from 48.2% to 40.7%.<sup>37</sup> Thus, Massachusetts exceeded the national Healthy People 2010 target to reduce the percentage of children under the age of nine who have experienced dental decay to 42%.<sup>38</sup>
- The amount of untreated dental decay among third graders decreased from 25.8% in 2003 to 17.3% in 2007,<sup>37</sup> surpassing the Healthy People 2010 target of reducing the percentage of children between six and eight years old with untreated dental decay to 21%.<sup>37</sup>

Some improvements on preventive measures have also occurred, both among the overall child population and among MassHealth participants in particular.

- The percentage of Massachusetts teenagers over fourteen years who have dental sealants on their molars increased to 52%, beyond the Healthy People 2010 50% target.<sup>37</sup>

- However, the percentage of Massachusetts third graders with sealants on their molars decreased from 53.8% in 2003 to 45.5% in 2007.<sup>37</sup>
- In contrast, among MassHealth participants, the percentage of children receiving sealants between the ages of six to nine and 10 to 14 in 2008 range between 32 and 37%.<sup>33</sup>
- Between 2006 and 2008, the percentage of children participating in MassHealth receiving a dental examination increased from 39.8% to 49.4%.<sup>33</sup>
- The percentage of children participating in MassHealth receiving fluoride treatments increased from 38.8% in 2006 to 44.8% in 2008.<sup>33</sup>

New school-based dental sealant programs, targeted in areas of the state with the highest need, hold the possibility of increasing utilization of preventive dental care.<sup>33</sup>

**The BEST Oral Health Program** focuses on “Bringing early Education, Screening, and Treatment (BEST) to prevent dental decay among school-aged children.”<sup>39</sup> The aim of BEST is to provide oral health education and screening to children served by a variety of childcare organizations and schools; expand the use of portable dentistry and increase the number of children served by BEST; foster a community dental care system to ensure that vulnerable populations of all ages have access to a dental home; enhance the capacity of the existing oral health safety net; and engage pediatricians, obstetricians, family medicine physicians, and other health providers in understanding the relationship between oral health and overall health.<sup>40</sup> BEST is a partnership between the Tufts University Community Dental Program, Commonwealth Oral Health Mobile Services, Preschool Enrichment Team, and Partners for a Healthier Community.<sup>40</sup> Located in Hampden county, in western Massachusetts, this program provides education, dental screening, and fluoride varnish to low-income, at-risk infants, toddlers, and pre-school age children.<sup>39</sup> The child poverty rate in Hampden county is 47.8%, significantly higher than the state average of 12.4%.<sup>41</sup> The program uses portable dentistry to increase prevention and treatment in hard to reach areas.<sup>41</sup> Since its pilot year, BEST has worked in three counties, partnered with 30 organizations, trained 812 staff, and set up 200 service sites, providing 4,516 fluoride treatments, placing 1,234 sealants, and supplying 2,061 prophylaxis treatments to 5,751 enrolled students.<sup>40</sup> BEST recently expanded its service reach and capacity by implementing the BEST program in the Westfield and Springfield Public School systems, establishing a dental clinic at Springfield Technical Community College, and partnering with the Springfield College School of Social Work to conduct an oral health needs assessment of families with preschool age children.<sup>40</sup>

There are several bills currently in the legislature that aim to improve the oral health of children. For example, House Bill 444 would require that all students upon entering kindergarten or within 30 days of the start of the school year must show that they have received an oral health examination by a licensed dentists within the past 12 months.<sup>42</sup> The bill allows for some

exceptions in the case of undue financial burden, lack of access, or if the parent/guardian does not consent to the examination.<sup>42</sup> Senate Bill 805 would require the Massachusetts DPH to conduct a study on oral injuries resulting from sports in elementary, middle, and high school to assess the incidence and severity, identify the high-risk sports, and evaluate the long-term impact of these injuries.<sup>43</sup> The bill would require that DPH file a report with legislative recommendations by December 31, 2009.<sup>43</sup>

### *Adults, Age 21 to 64*

Financial barriers are one of the greatest impediments to accessing oral health services. Dental insurance is often excluded from employer coverage, and when offered typically requires significant out-of-pocket costs.<sup>44</sup> Even when coverage is provided, individuals may lack oral health literacy, fear going to the dentist, or not realize the importance of good oral health, and thus may not access their dental benefits.<sup>2</sup> Not surprisingly, low-income adults and those without dental insurance are more likely to postpone or forego necessary dental care.<sup>44</sup> Furthermore, adults with public coverage are more likely to report having difficulty accessing care compared to adults with private coverage.<sup>44</sup>

State Medicaid dental benefits significantly expand access to dental care for some of the most vulnerable, but coverage and access barriers remain. Because adult dental benefits are not a mandatory benefit required by the federal government,<sup>4, 45</sup> they are often targets for cuts during budgetary downturns.<sup>44, 46, 47</sup> Adult dental benefits were eliminated in Massachusetts during the last economic downturn in March 2002.<sup>46, 48</sup> More reductions were made in January 2003.<sup>46</sup> Adult dental benefits have once again been considered for elimination by both the legislature and the governor for FY 2010.<sup>22, 49</sup> Between FY 2001, prior to the cuts, and FY 2004 following the cuts, the proportion of adults on MassHealth who received dental services reimbursed by MassHealth decreased from 24% to 11%.<sup>46</sup> Furthermore, the number of providers participating in MassHealth decreased when reimbursement for dental services was no longer available.<sup>46</sup>

On July 1, 2006, as part of broader health reform, dental benefits were reinstated for adults over age 21 years in the MassHealth program.<sup>50</sup> This restored MassHealth eligibility for dental services to 540,000 adults.<sup>51</sup> However, the scope of adult dental benefits offered is more restrictive than covered services for children.<sup>50</sup> Furthermore, with the reinstatement of adult dental benefits, there is an increased need to expand the number of dental providers who accept MassHealth.<sup>48</sup> In 2008, the waiting time for a dental appointment at a community health center (CHC) clinic, a primary MassHealth provider, was three months and there is concern that this will increase as the demand for benefits increases.<sup>51</sup>

Adults have benefited from some of the more recent infrastructure improvements to the MassHealth program, but critical access barriers remain. Reimbursement for dental services continues to be a persistent barrier for adults accessing services and for dentists wishing to participate as providers. While children's reimbursement rates increased as a result of the court case, adult reimbursement lagged behind. For example, reimbursement for a comprehensive oral evaluation for individuals 21 and older is \$37, while reimbursement for the same service provided to a child is \$58.<sup>52</sup> Furthermore, when benefits are preserved with tight budgets, reducing provider

reimbursement can be a strategy to reduce the state budget.<sup>44</sup> According to providers, reimbursement for adult dental benefits covers only half of the cost of providing the care.<sup>51</sup> Evidence suggests that to increase provider participation through increased reimbursement, rates need to be set at least equal to the cost of providing the care, typically 60 to 65% of dentists' charges.<sup>53</sup> Currently, there is a bill in the Massachusetts legislature to index the child and adult fee schedule to the 75<sup>th</sup> percentile of the most current American Dental Association (ADA) Survey of Dental Fees of General Practitioners by January 1, 2013.<sup>54</sup>

### *Elderly/Aging Populations*

The elderly were identified in the U.S. Surgeon General's report on oral health as one of the most vulnerable populations with regard to poor dental care.<sup>55</sup> Traditional Medicare does not provide reimbursement for routine dental care.<sup>55, 56</sup> Instead, it only covers dental procedures if they are an integral part of another procedure – such as jaw reconstruction following an accident, extractions prior to radiation treatment, and oral examinations prior to kidney transplants and heart valve replacements.<sup>55, 57, 58</sup> In 2002, Medicare made up 20% of payments for physician services and only 1% of payments for dental services nationwide.<sup>59</sup> Furthermore, seniors covered only by traditional Medicare are less likely to visit a dentist than seniors with supplemental private coverage.<sup>57</sup> While Medicare Advantage programs are increasingly offering dental benefits to seniors who purchase them, plans typically provide preventive services rather than comprehensive services.<sup>60</sup> Other private dental plans available to elders include state retiree programs, Tricare Retiree Dental Program, and AARP Dental Insurance Program.<sup>59</sup> Still, the elderly have the lowest level of dental insurance and highest out-of-pocket costs of any age group.<sup>18</sup> Approximately 44% of the cost of dental care is paid out-of-pocket—this can be particularly burdensome for older adults living on fixed incomes.<sup>61</sup> Less than one-fifth of adults 75 years and older are covered by private dental insurance.<sup>47</sup> Additionally, of the 151,660 MassHealth members over age 60, only 27.4% used MassHealth dental services in 2007. Consequentially, older adults see physicians far more frequently than dentists.<sup>55</sup> Yet, many primary care physicians do not feel responsible for oral health, typically expecting that a dentist is taking care of the mouth.<sup>55</sup> Additionally, the dental workforce needs to be better prepared and better educated to appropriately serve this population.<sup>61</sup> The realities of living on fixed incomes, low rates of dental insurance, and suboptimal attitudes and practices of some health professionals all inhibit access to good oral health for older adults.<sup>55</sup>

As the baby boomers age, the oral health needs of seniors are changing. More than 40 million people in the U.S. will be age 65 and over by 2010, and that number will nearly double to 80 million by 2040.<sup>62</sup> There is no one-size-fits-all model of oral health care for this growing population. Elders can require dental care that looks very similar to that provided to adults at any age or may require specialized services that many dental providers do not have the capacity to provide.<sup>63</sup> Many seniors are keeping their natural teeth, which increases the likelihood of dental and periodontal disease.<sup>55, 57</sup> Still, dental disease compounds over time so older adults are more likely to experience missing teeth and loss of tooth support.<sup>6</sup> Elderly without teeth still require regular examinations of soft tissue and adjustments of prostheses.<sup>6</sup> Massachusetts lags behind the Healthy People 2010 goal of reducing the percentage of adults between ages 65 and 74 with six or more teeth missing to 20%. In 2006, the Massachusetts rate was 39.6%.<sup>38</sup> All of this increases the need for restorative care which puts a greater burden on the care system.<sup>15, 18</sup> Older adults are

more likely to have at least one chronic condition, take medications, and have greater risk for cognitive disabilities, all of which can increase the risk of dental disease.<sup>55, 61</sup>

When seniors move into nursing homes or become homebound, their access to oral health care often diminishes.<sup>55</sup> While 97% of nursing homes report that dental care is regularly available, clinical studies of nursing home residents suggests that unmet dental needs are ubiquitous.<sup>57</sup> The experience of the Hebrew Rehabilitation Center (HRC) a long-term care specialty hospital in Roslindale, suggests that, like seniors living in the community, residents in long-term care facilities are keeping their teeth longer. Specifically, between 1992 and 2002, the percentage of patients without their natural teeth decreased from 57.7% to 35.5%.<sup>65</sup> Despite this fact, residents of long-term care facilities struggle to access oral health services. Data from 2004, suggests that 40% of nursing homes nationwide have no contract for dental services for their residents, and only 26% of nursing home residents access dental services.<sup>61</sup> Additionally, 87% of homebound seniors had evidence of untreated dental decay.<sup>56</sup> A recent study suggests that extractions and dentures are the most common dental need among homebound seniors.<sup>62</sup> Furthermore, due to a lack of insurance coverage, approximately 90% of homebound seniors had to cover part or all of the cost of dental services themselves.<sup>62</sup>

**The Oral Health Equity Project (OHEP)** was established to address unmet oral health needs of elders in Boston. Specifically, in 2003, the Boston Public Health Commission (BPHC) organized a series of pilot oral health screenings in elderly and disabled housing developments.<sup>64</sup> Since then, the BPHC has partnered with: faculty and students from the Boston University Goldman School of Dental Medicine, the Massachusetts College of Pharmacy and Health Sciences, Forsythe School of Dental Hygiene, the Harvard School of Dental Medicine, and the Tufts University School of Dental Medicine; the Boston Housing Authority; the City of Boston Commission on Affairs of the Elderly; and Delta Dental of Massachusetts.<sup>64</sup> The aim of OHEP is to increase access to preventive and restorative oral health care services for low-income elders who live in public housing in Boston.<sup>64</sup> Services provided through the screenings include fluoride varnish, denture labeling, and oral health education and referral.<sup>64</sup> Referrals are made to dental school clinic partners when more complex and restorative care is required.<sup>64</sup> Lacking surveillance data for this vulnerable population, OHEP began to collect data on elders served by the screenings, providing documentation of the oral health needs of this population.<sup>64</sup> Between 2003 and 2007, 1,443 participants over age 60 were screened (81% of total OHEP participants).<sup>64</sup> Only six percent reported having dental insurance, compared to 79% with medical insurance.<sup>64</sup> The most common problems identified among seniors with teeth were untreated dental caries (28%) and soft tissue problems (28%).<sup>64</sup> Denture use was common in this population, with 63% having dentures.<sup>64</sup> Nearly half of the individuals with dentures had unsatisfactory denture stability (49%) and 41% were in need of new dentures.<sup>64</sup> Seventy-six percent of elders were referred for additional dental care, and of those, 79% made appointments.<sup>64</sup>

### *Individuals with Special Health Care Needs*

People with special health care needs are at a higher risk for dental decay. Oral hygiene is inconsistent since people with special health care needs often depend on others for their care.<sup>66</sup> Due to a lack of access to oral health care, people with mental retardation and/or developmental disabilities experience higher rates of dental decay.<sup>66</sup> Additionally, a recent national survey of persons living with HIV/AIDS identified dental care as the highest unmet need.<sup>67</sup>

Finding dental providers for Massachusetts residents with special health care needs is a challenge. Many dental practices are not capable of providing care in a setting that is safe and effective for a person with disabilities. Specifically, dentist offices may not be accessible for individuals who need physical accommodations.<sup>66</sup> Scheduling appointments can be complicated due to additional time requirements needed to deal with patients who may be uncooperative, or have behavioral problems requiring the administration of general anesthesia.<sup>66</sup> Furthermore, a lack of training among dental professionals for how to serve this population effectively makes the average provider ill-equipped to serve this diverse population.<sup>66</sup> Low MassHealth reimbursement rates for adults are particularly problematic with respect to treating the unique needs of this population.

**The Tufts Dental Facilities Serving Persons with Special Needs (TDF)** is a network of eight dental clinics that provides care to people with developmental disabilities and mental retardation statewide.<sup>66</sup> The TDF program was created in 1976 following a class action suit related to the oral health needs of people in institutions.<sup>66</sup> TDF is the primary provider of MassHealth dental services to people with disabilities in the Commonwealth.<sup>66</sup> The program provides comprehensive dental services including preventive, restorative, emergency, and hospital-based care.<sup>66</sup> Currently, six of the facilities are in developmental centers on sites of institutions, and two are in the community.<sup>66</sup> On average, the TDF program serves 16,700 patients through 34,000 patient visits annually.<sup>66</sup> Due to an increase in people with disabilities moving out of institutions and into communities, the majority of people served by the TDF program today live in the community.<sup>66</sup> In addition to the clinic sites, specially trained dental hygienists provide oral health evaluations, cleanings, fluoride treatments, sealants, and oral health education to people with mental retardation at 200 sites throughout the Commonwealth.<sup>66</sup>

The TDF program also serves as a unique training opportunity for dental students, residents, hygienists, and assistants. Each year, TDF offers significant educational opportunities to 150 dental students, 60 dental hygienists and assistants, and eight dental residents.<sup>66</sup> This training has a lasting impact. Among the residents who have graduated from the program since 1999, over 60% of them currently serve people with disabilities in their own practices.<sup>66</sup>

Funding for this critical program has historically been provided through MassHealth reimbursement and financial support by the Massachusetts DPH and the Department of Mental Retardation (DMR).<sup>66</sup> More recently, this program has been a target of state budget cuts. In the end of 2008, the TDF program was included in the 9c cuts, proposing a \$200,000 reduction in funding from DPH, which would reduce funding to lower than 1999 levels.<sup>68</sup> There have been numerous advocacy efforts to maintain funding for this program.

People with disabilities who are eligible for MassHealth may require additional time and resources for dental care, yet the reimbursement is inadequate to cover the costs.<sup>66</sup> This further burdens access for people with special health care needs.

### ***Racial, Ethnic, and Income Disparities***

The burden of dental disease falls disproportionately on individuals with low-incomes, racial and ethnic minorities, and people with chronic health conditions such as diabetes and HIV/AIDS.<sup>69</sup> Blacks, Hispanics, and American Indian/Alaska Natives experience poorer oral health than any other groups in the U.S, and these disparities cut across all age groups.<sup>69</sup> Evidence of oral health disparities in Massachusetts include:

- The prevalence of dental caries among Black and Hispanic kindergarten students is 1.7 and 1.8 times that of their White peers, respectively.<sup>37</sup>
- Low-income sixth graders are twice as likely as their higher income peers to have untreated dental decay.<sup>37</sup>
- Hispanic and Black children are less likely to have dental sealants than their White peers.<sup>37</sup>

Furthermore, nationwide data suggests that these disparities persist among adults.

- Low-income adults experience severe periodontal disease at three times the rate of middle and high-income adults.<sup>69</sup>
- Blacks are more likely than Whites to report delaying or forgoing dental care.<sup>70</sup>
- Blacks are more likely to be diagnosed with oral and pharyngeal cancer at a younger age, but a later stage, and experience higher mortality rates as compared to Whites.<sup>69</sup>

Health disparities may result from a number of factors: biology, individual behavior, environment and community, and health care systems.<sup>69</sup> Understanding the intersection of these factors may help to eliminate oral health disparities. The National Institute of Dental and Craniofacial Research (NIDCR) at the National Institutes of Health (NIH) has developed a plan to eliminate oral health disparities through a commitment to research, collaboration, and promotion of best practices.<sup>69</sup> As part of this research, NIDCR has five research centers devoted to reducing disparities in oral health, one of which is in Massachusetts at the Center for Research to Evaluate and Eliminate Dental Disparities (CREEDD) at the Boston University Goldman School of Dental Medicine.<sup>71</sup>

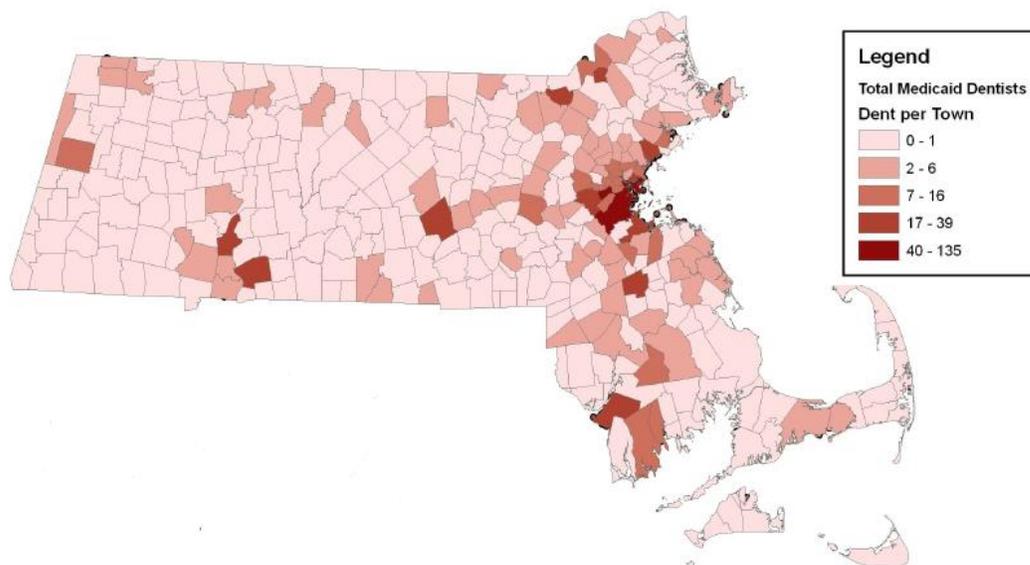
## Providers

The distribution of dental providers and the capacity of the oral health safety net play an important role in providing adequate access to oral health services. As of June 2009, there are 4,157 Dental Health Professional Shortage Areas (DHPSAs) in the United States, in which approximately 49 million people live.<sup>72</sup> Workforce issues such as education and scope of practice for all members of the dental team including dentists, dental hygienists, and dental assistants impact how care is delivered. Increasingly, the role of physicians in oral health is expanding. Enhancing provider capacity and strengthening the dental team will improve access to good oral health for all Massachusetts residents.

### *Distribution of Dental Providers*

A recent study by the Kaiser Family Foundation suggests that Massachusetts has 1.1 dentists per every 1,000 residents, a ratio second only to the District of Columbia.<sup>73</sup> However, that does not take account of the distribution of dentists across the state. According to a Catalyst Institute study in 2006, most dentists in Massachusetts are clustered in the eastern part of the state, around urban areas, and many rural areas do not have access to dental providers.<sup>48</sup> Thirty percent of cities and towns in Massachusetts do not have enough dentists to care for their residents.<sup>48</sup> Sixty-nine cities and towns in Massachusetts have no dentist in the community.<sup>48</sup> Throughout all of Massachusetts, minorities, low-income, uninsured, and persons with poor health are the most likely to experience barriers to accessing oral health care.<sup>48</sup> Access for these populations is closely linked to the distribution and availability of dentists who accept MassHealth.<sup>48</sup> Greater than half (187) of the cities and towns throughout Massachusetts have no dentist that accepts MassHealth.<sup>48</sup>

Figure 1. Number of MassHealth Dentists by City/Town



Source: Catalyst Institute. *Massachusetts oral health report: Mapping access to oral health care in Massachusetts. A report of the oral health collaborative of Massachusetts.* Boston: Catalyst Institute; 2006.

## ***The Oral Health Safety Net***

Community health center (CHC) dental programs are a critical provider of dental services to individuals with MassHealth or no dental insurance. Currently, there are 52 CHCs with 184 access sites across the Commonwealth,<sup>74</sup> but not all CHCs offer dental services. However, as a result of the Special Legislative Commission's recommendations in 2000 and efforts by oral health stakeholders, the number and geographic distribution of dental facilities in CHCs has improved. In 2007, there were 33 CHC dental programs at 47 service sites, with 234 dental chairs.<sup>75</sup> This safety net provides one of the only places for people without dental insurance to access oral health services.<sup>46</sup>

According to a recent survey of CHC Dental Directors in Massachusetts, CHC dental programs are unique and experience several challenges.<sup>75</sup> They are often open longer hours and more days than most private dental practices.<sup>75</sup> In the majority of dental programs, greater than 20% of patients do not keep appointments.<sup>75</sup> As a result, providers often have more appointments scheduled per day than they actually see.<sup>75</sup> Additionally, one-third of CHC dental programs have waiting periods of more than three months for new patients.<sup>75</sup> Dental programs also rely more heavily on limited-license general dentists for the provision of dental care.<sup>75</sup> Due to fewer available resources, CHC dental programs may not be equipped to provide more complex dental care, such as oral surgery.<sup>75</sup>

Stakeholders continue to work to expand the oral health safety net. For example, between 2006 and 2007, the Oral Health Foundation (now the DentaQuest Foundation) funded the creation of five new dental clinics, and supported the expansion of four existing dental clinics.<sup>76</sup> Still, these clinics do not have the capacity to serve all the patients that need their care, and there are often long waiting lists.<sup>17</sup> When the number of people without dental insurance increases, safety net providers become more essential and more crowded. The Massachusetts League of Community Health Centers is working with the DentaQuest Foundation and MDS to enhance the capacity of CHC dental clinics through increased funding and encouraging dentists, hygienists, and assistants to practice in these settings.<sup>24, 77</sup>

## ***MassHealth Providers***

Nationwide and in Massachusetts, dentists provide three main reasons for not enrolling in Medicaid: low reimbursement rates, onerous administrative requirements, and challenging patient behavior.<sup>53, 78</sup> Dentists report that they often provide services to MassHealth participants and individuals who cannot pay for free, rather than submit a claim to MassHealth. As stated previously, reimbursement rates have increased significantly for children but remain low for adults. Administrative processes have improved as a result of the new Third Party Administrator (TPA), Doral. However educating providers about these programmatic changes remains a challenge.<sup>33</sup> To address this issue, the creation of a Joint Committee—with representatives from MassHealth, Doral, MDS, and additional oral health stakeholders—to develop a comprehensive plan for increasing enrollment of dentists in MassHealth was recently recommended.<sup>33</sup> Doral provides technical assistance and outreach to private practices that are interested in integrating Medicaid into their practices.<sup>79</sup>

There has been some improvement in the number of dentists participating in MassHealth. Currently there are 495,355 children enrolled in MassHealth.<sup>33</sup> While there is some debate over the number of active dentists in Massachusetts and the percent of dentists participating in MassHealth, according to a recent report, in the first half of FY 2009, 1,417 out of 6,500, or 22% of active dentists in Massachusetts, filed a MassHealth claim for children under 21 years.<sup>33</sup> This is an improvement over 851 providers filing claims for children under 21 years in 2006.<sup>33</sup> This increase in provider participation is consistent across all counties throughout the Commonwealth. However, the ratio of MassHealth participants under age 21 to providers varies from 245:1 in Middlesex County to 1749:1 in Dukes and Nantucket.<sup>33</sup> In the latter case, only one provider made a claim for MassHealth in FY 2008.<sup>33</sup> MDS has made MassHealth participation a priority in their recent *Call to Action* by establishing a goal of having 65% of their members participating in MassHealth by 2013.<sup>24</sup> Thus, while enrollment overall has been slow, increased attention by oral health stakeholders may help speed the process of MassHealth enrollment by dental providers.

The change in caseload capacity requirements has also increased providers' willingness to participate in MassHealth.<sup>79</sup> In 2005, the MassHealth regulations changed, allowing individual dentists and dental practices to establish caseload capacity.<sup>32</sup> Caseload capacity is defined as a pre-established number of MassHealth members that the individual dentist or dental practice can serve.<sup>50</sup> This change aimed to alleviate dentists' concern that if they became a MassHealth provider their practice would be overwhelmed with MassHealth participants. Of the dentists who submitted claims to MassHealth for individuals under 21 in the first half of FY 2009, 84% of providers submitted fewer than 500 claims, and 27% providers submitted fewer than 100 claims.<sup>33</sup> Providing support to private practices for how to effectively integrate Medicaid into their practices will be critical to ensure sufficient access to dental care for MassHealth participants.

### ***Dentists***

There are not enough dentists to provide dental care to everyone who needs it. There are several reasons for this mismatch between the provider workforce and oral health care needs. First, as the baby boomers who entered dentistry start to retire, the overall number of dentists graduating from dental school will be less than the number of dentists retiring from the workforce.<sup>1, 80</sup> The total number of students graduating from dental school increased from 4,041 to 4,714 between 1998 and 2007, an increase of 16.7%.<sup>81</sup> Similarly, for that same time period, the number of students graduating from Massachusetts dental schools increased 16.0%, from 318 to 369.<sup>81</sup> At the same time, the overall population in need of dental services continues to grow.

Massachusetts has three dental schools, all located in Boston: Boston University Henry M. Goldman School of Dental Medicine (est. 1963), Harvard School of Dental Medicine (est. 1867), and Tufts University School of Dental Medicine (est. 1868). All three schools are private institutions offering the degree of D.M.D.<sup>81</sup> The University of Connecticut School of Dental Medicine is the only other dental school in New England.<sup>81</sup> However, the University of New England in Portland, Maine is exploring opening a dental school.<sup>82, 83</sup> First-year enrollment for the 2007-08 school year at Boston University, Harvard, and Tufts was 115, 35, and 167 respectively.<sup>81</sup> Total enrollment at Boston University, Harvard, and Tufts for the same year was 602, 148, and 688 respectively.<sup>81</sup> Over the past ten years, Harvard's enrollment has remained the

same, while both Boston University and Tufts have increased their first year enrollments by approximately 20 students.<sup>81</sup> Nationwide, in 2007-08, total first-year enrollment in dental schools was 4,770, an increase of about 500 students since the 1998-99 schoolyear.<sup>81</sup>

The diversity of students in dental education has increased over the years. The number of female first-year students is increasing at a faster rate than the number of male first-year students. Nationwide, between 1998-99 and 2007-08, the number of female first-year students increased 36.3%, while the number of male first-year students decreased by 1.9%.<sup>81</sup> Nationally, females are increasingly making up a larger percentage of the total student body—44.6% of current dental students in 2007-08.<sup>81</sup> Massachusetts dental schools have a higher percentage of female dental students compared to the national average with 50.3% at Boston University, 57.4% at Harvard, and 49.0% at Tufts.<sup>81</sup> While, the percentage of current female dental students is significantly higher than the percentage of female dentists practicing, between 1993 and 2006, the percentage of active female dentists increased from 10.1% to 19.7%.<sup>81</sup>

Over the past ten years, there has only been a marginal increase in the percentage of minorities enrolled in dental schools nationally.<sup>81</sup> Black and Hispanic students are underrepresented in dental schools.<sup>81</sup> For a breakdown of current dental students by race and ethnicity nationwide and in Massachusetts see Appendix III. Greater ethnic and racial diversity of dentists will lead to increased access for these underserved populations, since people tend to choose providers of their own racial group when given the choice.<sup>80</sup> Cultural competence of dental providers is critical as well.<sup>2, 84</sup>

Dental school is a significant financial investment. For the 2007-08 academic year, the national average total cost of tuition for four years of dental school was \$104,066 for resident students and \$157,908 for non-residents.<sup>85</sup> Massachusetts schools cost more, in part because there are no state-resident discounts. Tuition for four years at Massachusetts dental schools are: \$198,056 at Boston University; \$154,400 at Harvard; and \$193,200 at Tufts.<sup>85</sup> Massachusetts schools are among the most costly in the nation.<sup>85</sup> However, the majority of students in Massachusetts dental schools receive some financial assistance.<sup>81</sup>

A survey conducted in 2002, by the ADA reported that the average net income of dentists who own their own private practice or a share of a private practice was \$174,350 for a general practitioner and \$291,250 for a specialist—an overall average of \$193,980.<sup>86</sup> In New England, the average net income of independent dentists in private practice is higher than all other regions of the country at \$252,220.<sup>86</sup> In contrast, 46% of Dental Directors at CHC dental clinics in Massachusetts report that their annual income is less than \$100,000, and 83% report that their annual income is less than \$120,000.<sup>75</sup>

In part due to the high cost of education, there is a lack of dentists pursuing careers in community-based dentistry. To assist with this problem, Massachusetts has two tuition reimbursement and loan repayment programs for dental professionals, but the funds are limited. The Massachusetts State Loan Repayment Program (MSLRP) has two components. Part A offers loan repayment if dentists and dental hygienists commit to practicing in a CHC within a Dental Health Professional Shortage Area (DHPSA) for two or more years.<sup>87</sup> As of 2008, there are 24 DHPSAs across Massachusetts, in which over one million people live.<sup>72, 128</sup> Part B provides loan repayment for dentists who practice at least part time serving individuals with mental retardation or

developmental disabilities.<sup>87</sup> Total program funding includes \$250,000 from the state, plus an equivalent federal match.<sup>24</sup> Additionally, the National Health Service Corps provides reimbursement for dentists and dental hygienists who work in DHPSAs for at least two years.<sup>87</sup> However, dental professionals must compete for funding with other health professionals who work in Health Professional Shortage Areas (HPSAs).<sup>24</sup> Increasing state funding for scholarships, tuition reimbursement, and loan repayment to support dental professionals who practice in CHCs and DHPSAs would ease the financial burden of pursuing community-based dentistry. However, funding for these programs was not included in the most recent House or Senate budgets (L. Bethel, RDH, MPH, written communication, May 14, 2009).

Similarly, there are not enough dentists going into public health dentistry. Public health dentists promote oral health through the community rather than the individual, focusing on health policy, program management, research, disease prevention, and delivery systems.<sup>88, 89</sup> In 2007, nationwide, there were only 2,032 dentists working in public health.<sup>4</sup> Opportunities for advanced education in dental public health are limited. Only six dental schools offer advanced dental education programs in dental public health, two of which are in Massachusetts, at Harvard and Boston University.<sup>81</sup> Only 12 students nationwide graduated from these advanced education in dental public health programs in 2007.<sup>81</sup>

### ***Dental Hygienists***

The dental hygiene profession was established in 1913 to improve the poor oral health of children in Bridgeport, Connecticut.<sup>17</sup> While its origins were in preventing dental disease in the public schools, today, most dental hygienists practice in private dental offices.<sup>17</sup> In 2008, 5,019 dental hygienists were licensed by the Commonwealth.<sup>90</sup> There are eight dental hygiene schools in the state. Seven grant an associate's degree and one confers a baccalaureate degree.<sup>17</sup> Across all schools, the total possible enrollment is 233 first-year students.<sup>17</sup>

According to a 2007 survey by the Massachusetts DPH, most dental hygienists in the Commonwealth (58.2%) have been in practice for at least 15 years.<sup>17</sup> One-fifth of active dental hygienists have been practicing for over 30 years, while only 3.7% have been practicing for less than one year.<sup>17</sup> The majority (63%) of dental hygienists licensed in Massachusetts are over 40 years of age.<sup>17</sup> Seventy-five percent of dental hygienists' highest level of education is an associate's degree, 18% have a bachelor's degree, 3% have a graduate degree, and 3% have a dental hygiene certificate.<sup>17</sup> The majority of dental hygienists (81.7%) primarily work in private practice settings.<sup>17</sup> Typically, hygienists in Massachusetts work between 31 and 40 hours per week and earn between \$35 and \$39 per hour.<sup>17</sup>

The majority of dental hygienists (60.3%) report previous experience working with people with developmental disabilities, mental illnesses, behavioral disorders, or sensory loss.<sup>17</sup> Furthermore, 31% report a desire to work with special needs populations, and of those 29.4% would be interested in receiving direct reimbursement for that work.<sup>17</sup> Very few dental hygienists (11.7%) reported that their primary workplace accepts MassHealth.<sup>17</sup> However, 30.1% of hygienists whose practices accept MassHealth reported that they would be interested in direct reimbursement. Overall, 17% of dental hygienists in Massachusetts expressed an interest in direct reimbursement

through Medicaid or other third-party payors.<sup>17</sup> This subset tends to be younger, more highly educated, and more likely to work in practices that accept MassHealth.<sup>17</sup>

Based on the survey results, DPH made several recommendations for expanding access to oral health services through dental hygienists. They called for using dental hygienists in public health settings to increase access to preventive services, particularly for those residents at high risk of dental disease, such as MassHealth participants, the elderly, low-income, children, and people with developmental disabilities.<sup>17</sup> DPH recommended that additional efforts be undertaken to expand MassHealth provider status to interested licensed dental professionals to increase access to services.<sup>17</sup> Furthermore, DPH emphasized that oral health services should be integrated into primary care settings.<sup>17</sup> These recommendations informed the dental hygienists' component of the 2009 Omnibus Oral Health Bill.

Dental Hygiene Practice Acts differ from state to state. Twenty-nine states have Dental Hygiene Practice Acts that permit dental hygienists to have direct access to patients, meaning that they can initiate treatment and maintain a provider-patient relationships without the specific authorization of a dentist.<sup>91</sup> This is an increase from 22 states in 2007.<sup>4, 17</sup> Fifteen states authorize dental hygienists to be directly reimbursed by Medicaid.<sup>92</sup> Permitted functions and supervision levels in Dental Hygiene Practice Acts vary significantly from state to state.<sup>93</sup> Direct supervision requires that a dentist be present when the service is performed, while general supervision requires only that a dentist authorize the service, but need not be present.<sup>94</sup> As of May 2008, 18 states allow dental hygienists to practice with minimal direct dental supervision, however, there are several restrictions in place regarding what procedures can be performed and the practice environment.<sup>95</sup> Forty-five states permit hygienists to practice with general supervision.<sup>4</sup> California, Colorado, Connecticut, Maine, Michigan and Oregon are among the states with the most lenient supervision requirements for dental hygienists.<sup>93</sup> Several states are exploring new levels of dental providers. Connecticut, Maine, New Hampshire, and New Mexico are exploring options for advanced dental hygiene practitioners.<sup>83, 96, 97</sup>

### ***Dental Assistants***

The effective use of dental assistants can expand the capacity of a private dental practice.<sup>98</sup> Dental assistants typically have one year of training following high school.<sup>98</sup> Dental assistants often perform tasks such as recording patient histories, sterilizing instruments, and taking x-rays.<sup>98</sup> However, scopes of practice have been expanding for dental assistants in many states.<sup>78</sup> Dental assistants are increasingly performing tasks that were once reserved for dental hygienists, however no state allows dental assistants to perform the full range of dental hygiene services.<sup>78</sup> For example, in some states, dental assistants can apply fluoride varnish and sealants under general supervision.<sup>78</sup> Additionally, some states, such as Pennsylvania, have established Expanded Function Dental Assistants (EFDAs) with the aim of making dental practices more productive.<sup>78</sup> Massachusetts has recently elaborated on the role of dental assistants. The recent Omnibus Oral Health Bill requires that dental assistants register with the Board of Registration in Dentistry and creates a formalized career ladder.<sup>26</sup>

## ***The Role of Physicians in Oral Health***

The mouth and teeth have generally been outside the scope of physician duties. However, physicians are increasingly paying more attention to the oral health of patients. In particular, the administration of oral health screening and assessments has been increasing in physicians' offices. According to Yellowitz, oral health assessments provided by a primary health care provider require less than two minutes to complete and are noninvasive.<sup>55</sup> Training for medical professionals on how to conduct oral health assessments should be incorporated into professional education programs and continuing education.<sup>55</sup> Oral health trainings should cover the scope of an oral health assessment, including how to complete the following activities: identify the date of the last oral health exam; discuss the need to have routine dental exams; incorporate an oral health

**The Healthy Teeth for Tots** program at the Dorchester House Multi-Service Center in Dorchester, Massachusetts was established to increase access to preventive and restorative dental services to children at a young age, and to integrate oral health into the child's medical home.<sup>105</sup> This program has three main objectives: Incorporate caries risk assessment, oral screenings, and anticipatory guidance for oral health into pediatric visits for children from birth to three years of age; incorporate fluoride varnish application into services provided to children from birth to three years of age; and improve access to necessary dental services and facilitate a seamless transition to a dental home by age three.<sup>105</sup> The Healthy Teeth for Tots program works to achieve these objectives through five primary program components:

- 1) Use of Cavity Risk Assessment and Oral Health Findings forms with an electronic medical records system.
- 2) Creation of oral health color charts to provide a reference for physicians and to use as informational tools for parents.
- 3) Provision of oral health information materials on how to care for young children's teeth and the benefits of community fluoridated water.
- 4) Access to a dental suite for the sole use of pediatric patients on site at the clinic.
- 5) Ability to refer patients with unique needs—such as extensive dental decay, young age, or behavioral challenges—to an extensive network of hospital-based dental clinics.<sup>105</sup>

According to a recent program report, 43.7% of parents reported that their child had received a fluoride varnish in the last year.<sup>105</sup> 51.2% of parents reported that their pediatrician had discussed oral health with them, and 38% of parents found the oral health education provided by pediatricians was helpful in changing the way they care for their children's teeth.<sup>105</sup> Dental disease was identified in 48.3% of the children screened and 53% of children were referred to a dental clinic during their well child check-up at age three.<sup>105</sup> Research suggests that the application of fluoride varnish to high-risk children is cost-effective. Treatment for ECC costs about \$4,000 per child due to the need for operating rooms and the use of general anesthesia.<sup>105</sup> In contrast, it costs \$40 to apply three fluoride varnish treatments per year per child.<sup>105</sup> Based on these costs, the Healthy Teeth for Tots program estimates that they have saved \$760,320 in future dental treatment services.<sup>105</sup>

assessment into a physician assessment; review signs and symptoms of common oral health conditions; advise the patient to report on changes in the oral health cavity; refer unusual findings; and recommend a complete oral health exam by their dentist in addition to the physician's oral health assessment.<sup>55</sup>

A recent policy statement by the American Academy of Pediatrics (AAP) highlights the role that pediatricians can play in preventing, intervening, and collaborating with dental professionals to prevent dental disease.<sup>99</sup> While 89% of infants visit a pediatrician in the first year of life, only 1.5% visit a dentist.<sup>99</sup> Thus, it is essential that pediatricians be knowledgeable about the prevention of dental caries to support parental education and children's healthy tooth development from an early age.<sup>99</sup> Recently, the AAP has launched an Oral Health Initiative to educate pediatricians about the role oral health plays in overall health.<sup>100</sup>

Since October 1, 2008, MassHealth now reimburses physicians \$26 for the provision of fluoride varnish to children at moderate and high risk for developing dental caries.<sup>52, 101, 102</sup> Physicians are permitted to delegate the procedure to nurse practitioners, physician assistants, registered nurses, and licensed practical nurses.<sup>101</sup> A risk assessment and anticipatory guidance must accompany the provision of fluoride varnish.<sup>101, 102</sup> Before being approved for reimbursement, health care providers must complete a MassHealth-approved training on how to apply fluoride varnish.<sup>103</sup> Two web-based training programs, Smiles for Life and the AAP's Oral Health Risk Assessment Training, are available to providers, and additional in-person group training sessions took place throughout the state (Taunton, Springfield, Danvers, and Shrewsbury).<sup>33, 103</sup> According to UMASS consultant Ellen Sachs Leicher, to date, approximately 50 health professionals have been trained through four group training sessions and additional lunch and learn training sessions are being offered on-site at group practices (oral communication, June 9, 2009). The DentaQuest Foundation has provided UMASS Medical School with a grant to evaluate the relative effectiveness of these training programs (R. Fuccillo, DentaQuest Foundation, oral communication, May 29, 2009; E. Leicher, oral communication, June 9, 2009).<sup>33</sup> Additionally, the BLOCK Oral Disease program, an in-person training targeted at CHCs, is used by the Massachusetts DPH and supports CHC providers in applying fluoride varnish treatments and learning about oral health more broadly.<sup>103, 104</sup> As of April 27, 2009, 278 pediatric medical providers (including physicians, nurse practitioners, and registered nurses) have completed the BLOCK Oral Disease program (L. Bethel, RDH, MPH, written communication, June 5, 2009).

**BLOCK** stands for,

“**B**ridge systemic health status with oral disease risk,

**L**earn about parent/family access to dental care,

**O**bserve mouth for oral disease risk and disease indicators,

**C**alculate oral disease risk and communicate results to parent, and

**K**now the next step: guidance, prevention and/or referral.”<sup>104</sup>

There is a significant opportunity to integrate oral health services with physician services at all ages. Integrating oral health services into primary care for adults will improve patients' access to care and increase awareness of oral health needs across the life span.<sup>55</sup> However, most physicians do not routinely examine their patients' oral cavities, nor do they know what to look for if they do look inside the mouth. In addition to a lack of adequate oral health training, according to health care providers, there are several reasons why they do not inspect the oral cavity: patients are seeing dentists; the oral cavity is not the responsibility of the physician; and dentists are responsible for taking care of oral health.<sup>55</sup> Many health history forms do not include information about oral health.<sup>55</sup> Furthermore, the typical physician visit is brief, so adding another assessment can be overwhelming to already overworked primary care providers. Recently, there has been movement toward the integration of oral health into primary care. For example, the Society of Teachers of Family Medicine have developed an oral health curriculum available online for primary care physicians.<sup>106</sup>

### ***New Provider Models***

New models of dental providers are being considered by some states as ways to increase access, particularly for hard to reach rural communities and underserved populations.<sup>95</sup> New providers would serve at a level above a dental hygienist, but below a dentist. For many years, the ADHA has advocated for the creation of the Advanced Dental Hygiene Practitioner (ADHP), a master's level professional who could practice independently in public health settings and in the community, and perform simple extractions and restorations in addition to preventive and educational services.<sup>78</sup> The ADA has developed an alternative model, the Community Dental Health Coordinator (CDHC). This provider type could perform public health services, direct patient care under direct and indirect supervision, and preventive services including fluoride varnish and sealants under general supervision.<sup>78</sup> However, the CDHC would not be permitted to perform restorative care.<sup>78</sup>

One model, dental therapists, has existed in Canada, New Zealand, Australia, and Great Britain for many years.<sup>96</sup> In general, the difference between a dental hygienist and a dental therapist is that dental hygienists work outside the tooth to improve the tooth and gum tissue and prevent dental decay, while dental therapists cut into the tooth to remove cavities, place fillings, and extract teeth.<sup>107</sup> While Massachusetts has not yet developed a new level of provider, some states are moving in this direction. There is ongoing discussion throughout the country about whether a new level of provider is a safe and effective way to increase access to oral health care, and what such a provider should look like, including whether providers other than dentists should be permitted to perform irreversible procedures like restorations and extractions and supervision requirements.<sup>96</sup> The recent experience in Minnesota sheds some light on these new oral health provider models.

Minnesota is the first state to pass legislation establishing a "mid-level" oral health provider in state statute.<sup>108</sup> The bill, passed by the legislature on May 13, 2009 and signed by the Governor on May 16, 2009, created the dental therapist and the advanced dental therapist.<sup>108</sup> The dental therapist must work under a collaborative agreement with a Minnesota-licensed dentist; serve low-income, uninsured, and underserved populations; and may provide oral health care services

including preventive, oral evaluation and assessment, educational, palliative, therapeutic, and restorative services.<sup>109</sup> Dental therapists must hold a bachelor's or masters degree from an accredited dental therapy education program.<sup>109</sup> Advanced dental therapists must graduate from a master's advanced dental therapy program and complete 2,000 hours of clinical dental therapy practice under direct or indirect supervision by a dentist.<sup>109</sup> Additionally, advanced dental therapists have a moderately expanded scope of practice as compared to the dental therapist, such as certain non-surgical extractions of permanent teeth.

Alaska created dental health aide therapists (DHATs) in 2007, after long opposition by the ADA and the Alaska Dental Society.<sup>96</sup> DHATs are based on the long-standing New Zealand dental therapist model.<sup>78</sup> DHATs provide oral health education, fluorides, sealants, cleaning, drilling, filling, and simple extractions.<sup>98</sup> DHATs work on Indian Reservations in remote parts of Alaska and practice under general supervision of dentists, seeking consultation electronically and over the phone.<sup>78</sup>

## **Public Health and Prevention**

### ***Office of Oral Health***

The Office of Oral Health within the Massachusetts DPH aims to prevent and control dental disease and improve overall oral health throughout the Commonwealth.<sup>110</sup> The office promotes the use of evidence-based prevention strategies such as fluorides and sealants and seeks to improve access to dental services, particularly among historically underserved populations.<sup>110</sup> The primary goal of the office is to eliminate dental disease in the state.<sup>110</sup> Three main strategies are used to reach these goals: education about preventing dental disease, community water fluoridation, and school-based sealant and fluoride mouth rinse programs.<sup>110</sup> Due to state budget constraints, the latest senate budget proposal for FY 2010 will put funding for DPH below FY 2009 levels.<sup>49</sup>

### ***Education and Awareness***

Educating the public about the importance of oral health is an important step in the prevention of dental disease. The Watch Your Mouth Campaign is one example of an effective oral health education program. Initiated by Health Care for All in 2005 with funding from the Oral Health Foundation (now the DentaQuest Foundation)<sup>76, 111</sup> and Dental Services of Massachusetts,<sup>111</sup> the primary goal of the Watch Your Mouth Campaign is to educate the public about the realities of tooth decay, the links between oral health and school performance, and the connection between oral health and overall health.<sup>112</sup> The campaign works closely with the Oral Health Advocacy Task Force to promote increased access to preventive services including dental sealants, community water fluoridation, and dental exams for all children, and encourages citizens to advocate for good oral health for children.<sup>16, 112</sup>

## *Community Water Fluoridation*

Community water fluoridation has reduced the number of caries found in permanent teeth of children since 1945. Fluoridation works in two ways: systemically, and topically.<sup>113</sup> Ingesting fluoride through public water systems allows fluoride to be incorporated into the developing tooth structure, which strengthens the tooth. Additionally, the presence of fluoride in saliva coats and protects the teeth.<sup>113</sup> Topical fluorides—such as toothpastes, varnishes, foams, and gels—strengthen teeth by coating the smooth surfaces and in between the teeth to protect against dental decay.<sup>113</sup> The optimal fluoridation level recommended by the U.S. Public Health Service for public water systems is between 0.7 and 1.2 parts per million (ppm).<sup>113</sup> In Massachusetts, the recommended fluoridation level is 1ppm.<sup>104, 114</sup> Community water fluoridation is effective for several reasons: its benefits can reach the entire community, regardless of socioeconomic status; it does not require individuals to change behavior to receive the benefits; repeated exposures to small amounts of fluoride are beneficial over the lifespan; and it is the most cost effective way to improve oral health.<sup>113</sup>

Community water fluoridation offers both oral health benefits and cost savings. Research suggests that community water fluoridation reduces the incidence of dental decay by between 20 and 40%.<sup>113</sup> The average cost of community water fluoridation is \$0.72 per person per year.<sup>98</sup> In most cities, for every dollar spent on community water fluoridation, \$38 can be saved in treatment of dental decay.<sup>30, 38, 113</sup> Put another way, the estimated total life costs of community water fluoridation is less than the cost of one filling per person.<sup>115</sup> Maps showing the number of MassHealth participants under age 21 (Figure 2) and the status of community water fluoridation by cities and towns (Figure 3) can be found in Appendix IV. This comparison offers insight into where the state could save the most money from community water fluoridation efforts.

According to the Centers for Disease Control and Prevention (CDC), in 2008, 59.1% of Massachusetts residents benefit from fluoridated public water systems.<sup>38, 90</sup> This is an increase from 56.7% in 2004,<sup>116</sup> but this is well below the national average of 69%.<sup>90</sup> Furthermore, both Massachusetts and the U.S overall have not yet met the Healthy People 2010 target of fluoridated public water systems in 75% of communities.<sup>38</sup> As of December 2008, 140 out of 351 Massachusetts communities and towns are fluoridated.<sup>114, 115</sup> Thus, 3.9 out of 6.5 million Massachusetts residents have access to fluoridated water.<sup>90, 114</sup> Additionally, there are 62 communities in Massachusetts that are unable to fluoridate because they lack access to a public water supply (L. Bethel, RDH, MPH, oral communication, March 26, 2009).<sup>117</sup> Currently, Massachusetts ranks 36<sup>th</sup> in the nation with regard to community water fluoridation.<sup>118</sup> While work remains to improve the prevalence of community water fluoridation, Massachusetts continues to receive recognition for its quality and monitoring efforts. Each year, since 2006, Massachusetts has received a State Fluoridation Quality Award granted jointly by the CDC, the ADA, and ASTDD.<sup>119, 120</sup>

The process and politics surrounding community water fluoridation are complicated. In Massachusetts, the fluoridation process takes place at the local level. Additionally, the Oral Health Advocacy Task Force and the Office of Oral Health provide support and assistance to communities establishing fluoridation programs.<sup>16, 110</sup> The Office of Oral Health also monitors and evaluates existing systems.<sup>110</sup> To initiate the community water fluoridation process, the State Commissioner of Public Health must recommend fluoridation of the community and then the local

Board of Health can order fluoridation.<sup>115, 121</sup> Following public notice of the order, citizens have 90 days to gather signatures from 10% of registered voters to bring the issue to a referendum.<sup>115</sup> Between 1968 and 1997, there were 135 orders for fluoridation in Massachusetts, 67 (49.6%) of which went to referendum.<sup>121</sup> Of those, 30 (45%) won.<sup>121</sup> If the majority of votes are in opposition to fluoridation, the town will not be fluoridated.<sup>122</sup> In total during that time period, 78 (58%) fluoridation orders were implemented.<sup>121</sup>

Despite the ADA's continued endorsement of the safety and effectiveness of community water fluoridation, a vocal minority opposition remains. Historically, opponents' arguments against fluoridation have ranged from a Communist conspiracy to toxicity. One of the most common arguments against fluoridation is that it limits freedom of choice, by forcing people to ingest a chemical through the public water system.<sup>113</sup> Additionally, some opponents claim that fluoride is toxic, and can result in harmful health effects such as fluorosis. Fluorosis is defined as the disruption or change in enamel when higher than optimal amounts of fluoride are ingested during early childhood.<sup>113</sup> When fluorosis occurs it appears as white flecks on the teeth.<sup>104</sup> The ADA acknowledges the low risk of fluorosis but advises that if recommended levels are used, community water fluoridation can both prevent dental decay and avoid fluorosis.<sup>113</sup> Furthermore, the ADA argues that these supposed science-based claims are unfounded and cautions readers to be wary of "junk science."<sup>113</sup>

Despite complicated politics, communities can be successful with fluoridation efforts. Between 1998 and 2007, seven Massachusetts communities have fluoridated their water supply, including Wayland (2000), Northborough (2001), North Attleboro (2002), New Bedford (2007), Acushnet (2007), Dartmouth (2007), and Woburn (2008),<sup>114, 115, 123</sup> providing fluoridated public water to an additional 226,109 Massachusetts residents.<sup>114</sup> A recent analysis by Robyn Olson, Ph.D. compares the failed outcome of a fluoridation campaign in Worcester in 2001 with the success of community water fluoridation in New Bedford in 2006 (implemented in 2007).<sup>115</sup> Olson's assessment suggests that in both cases, the proponents and opponents framed their positions in similar ways; however, public perceptions about what the controversy was about helped frame the debates.<sup>115</sup> In Worcester, the Central Massachusetts Health Foundation was portrayed as "big business" trying to force their views on the citizens of Worcester.<sup>115</sup> According to Olson, this sentiment may have resonated with Worcester citizens and reinforced a negative view of big business in the community. Thus, the opposition weaved this theme through its campaign and was able to convince Worcester residents that fluoridation was not in the community's best interest.<sup>115</sup> Alternatively, in New Bedford, unusual circumstances over the firing of the Commissioner of the Board of Health who supported fluoridation, by a new mayor who opposed fluoridation, changed the discourse.<sup>115</sup> The conflict became more about the unfair firing of the Commissioner, with less attention focused on the controversial issue of fluoridation.<sup>115</sup>

In part because there is no one explanation for why fluoridation efforts succeed or fail, it is very difficult to predict whether a referendum on fluoridation will pass in any given community. Thus, there is an ongoing debate about how much to focus on community water fluoridation. On the one hand, studies have shown that fluoridation is very effective at preventing dental decay and can provide significant cost savings on later dental care. However, because of the fluoridation authorization process and the power of the opposition, initiatives are often unsuccessful. Experts debate whether local community water fluoridation efforts should continue as is or whether there

should be a push for statewide mandatory fluoridation. Currently, eleven states including California, Connecticut, Delaware, Georgia, Kentucky, Illinois, Michigan, Minnesota, Nebraska, Ohio, and South Dakota, plus the District of Columbia mandate community water fluoridation.<sup>115</sup> Even with state mandates, variation in process, enforcement, and funding results in fluoridation rates between 27.7% and 100%.<sup>115</sup> However, nine out of the 12 entities that mandate fluoridation have surpassed the Healthy People 2010 goal of 75% fluoridation.<sup>115</sup> Although mandatory fluoridation may be the most cost-effective way to improve oral health, many politicians are hesitant to support a mandate. Alternatively, some experts suggest a strategy of targeting community fluoridation efforts at those communities identified as having the highest chances for success.

### *Topical Fluoride and Sealants*

While fluoridation in the water supply is efficient and effective, providing fluoride topically can also confer important preventive benefits. Topical fluoride can be applied in the form of gels, foam, or varnish.<sup>124</sup> Using Evidence-Based Dentistry (EBD), the ADA Council on Scientific Affairs determined that applied every six months, fluoride varnish prevents caries in children and adolescents. Fluoride varnish may also be efficacious in elderly patients.<sup>125</sup> It takes less time and results in less discomfort than fluoride gels.<sup>124</sup> Because fluoride varnish will stick on surfaces even when there is some saliva present—posing less risk of ingestion—it can be used effectively with very young children.<sup>126</sup> Additionally, four-minute fluoride foam applications are effective at prevention of caries with the eruption of the first molars.<sup>124</sup> It is up to the practitioner to decide whether and what type of fluoride is an appropriate course of treatment for each individual patient.<sup>124</sup> The provision of fluoride varnish by physicians and other qualified health care professionals is now reimbursable by MassHealth for participants under age 21.<sup>102</sup> Additionally, there is a bill (HB1032) in the Massachusetts House of Representatives to require all private health insurers to cover the administration of fluoride varnish by qualified health professionals to individuals at moderate and high risk of developing dental caries.<sup>127</sup>

**Evidence-Based Dentistry (EBD)** is defined as, “An approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.”<sup>124</sup> Evidence-based dentistry does not provide a standard of care, but rather serves as guidelines for making clinical decisions based on specific needs and preferences of the individual patient and judgment of the practitioner.<sup>124</sup>

To assess the best mode of treatment, the ADA recommends that dentists conduct a caries risk assessment to determine whether the use of fluoride varnish will be effective.<sup>124</sup> The Caries-Risk Assessment Tool (CAT) can identify children at moderate to high risk of developing caries and target them for the application of fluoride varnish.<sup>104</sup> In general, children at high risk should

receive fluoride varnish or gel at three to six month intervals, while children with moderate risk of future caries should receive fluoride varnish every six months.<sup>124</sup> Children and adolescents at low risk may not receive any additional benefits from fluoride varnish.<sup>124</sup> Rather, fluoridated water and toothpaste may provide sufficient protection for low-risk populations.<sup>124</sup>

One effective way to target children for the prevention of dental disease is to meet them where they are: Schools. There are several sealant programs operating throughout the state. For example, the Office of Oral Health supports fluoride rinse programs in 267 schools serving more than 52,000 students living in non-fluoridated communities.<sup>128</sup> Educational materials highlighting the importance of dental sealants are distributed and available to parents and schools.<sup>110</sup> Sealants protect pits and fissures in the teeth—easy targets for bacteria.<sup>104</sup> Resin-based sealants fill the grooves of permanent molars and prevent cavities from developing in the areas that can be hard to reach with a toothbrush.<sup>104</sup> As part of the remediation program of the Health Care for All court case, Dr. Hayes is working with the Office of Oral Health to develop a statewide plan for school-based dental programs. The pilot program, targets communities with the greatest level of need—those with a high number of MassHealth participants under 21 and a low number of MassHealth providers.<sup>33</sup> Springfield, Massachusetts was selected as the first pilot site. Springfield has the second highest number of MassHealth participants, next to Boston.<sup>33</sup> However, Boston has several school-based initiatives underway and thus had less need for the pilot.<sup>33</sup> Between October and December 2008, 942 dental sealants were placed, and at least one fluoride varnish treatment per child was conducted, in the mouths of 243 Springfield public school students.<sup>33</sup>

**The Division of Community Health Programs** at the Boston University Goldman School of Dental Medicine aims to improve oral health through effective partnerships, health promotion and education, and public health initiatives.<sup>129</sup> In 2007-08, through three city-wide sealant programs and 56 school-based sealant programs, 4,756 sealants were placed in 1,560 kids across Massachusetts (M. Henshaw, DDS, MPH, written communication, June 8, 2009). These programs offer sealants to second and/or third graders through the Smart Smiles program in the Boston Public Schools as well as schools in communities such as Chelsea, Framingham, Lawrence, and Natick.<sup>129</sup>

## **Oral Health and National Health Reform**

### ***Children’s Health Insurance Program (CHIP)***

The Children’s Health Insurance Program (CHIP) Reauthorization Act of 2009 was signed into law by President Obama on February 4, 2009.<sup>130</sup> The reauthorization expands coverage to nearly 4.1 million children, provides enhanced funding to the states and includes several important oral health provisions.<sup>130, 131</sup> When CHIP was established in 1997, dental benefits were deemed “optional.”<sup>132</sup> Over time, all states implemented dental benefits in their CHIP programs, but the benefit packages vary from state to state, and are often subject to reductions under budgetary pressures.<sup>132</sup> Reauthorization requires states to include dental benefits as part of the CHIP benefit

package starting October 1, 2009.<sup>130</sup> The benchmark dental benefit package must be equal to or better than the dental benefits offered as part of the most commonly selected Federal Employees Health Benefit Plan, the most commonly selected state employee benefit plan, or a commercial benefit plan with the largest portion of non-Medicaid dependents.<sup>130</sup> Additionally, starting April 1, 2009, states may use CHIP funds to provide wraparound dental benefits for children who have employer-sponsored health insurance, but no dental benefits.<sup>130</sup> States can establish their own income eligibility for this benefit, but it cannot be higher than overall eligibility for CHIP.<sup>130</sup>

As part of the new law, states are required to report on the performance of CHIP dental plans.<sup>132</sup> Additionally, dental professionals must participate in quality improvement efforts.<sup>132</sup> The law also requires that the Department of Health and Human Services post information on providers and dental services as well as oral health educational materials on their *Insure Kids Now* website.<sup>130-132</sup> Education regarding proper oral health care for children must be made available to new parents.<sup>132</sup> Federally Qualified Health Centers can contract with dentists in private practice to expand their capacity to serve CHIP participants.<sup>132</sup> By August 4, 2010, the GAO will conduct a study on access to preventive and restorative oral health services through Medicaid and CHIP.<sup>130</sup> Specifically, the study must address:

- Access to dental care in underserved areas.
- The extent that providers are willing to provide services to Medicaid and CHIP participants, the adequacy of networks to serve children with special health care needs, and the availability of services geographically.
- The feasibility and appropriateness of using new levels of providers to expand access to oral health services for children and improve public health overall.<sup>132</sup>

It remains to be seen how the changes to CHIP will impact Massachusetts. While Massachusetts already provides dental coverage for children up to 300% FPL, the availability of wraparound benefits may offer increased access to oral health care for children in families with employer-sponsored insurance, but no dental benefits.

### ***National Health Reform***

National health reform is currently on the agenda of the new administration. While the mandatory inclusion of dental benefits in CHIP was a significant first step in including oral health in health reform, policymakers must consider oral health needs when formulating reform proposals. Any changes at the national level should include ways to improve access to good oral health for all Americans, both at the community and individual level.

## **Conclusion**

While Massachusetts has made significant progress over the past few years, significant challenges remain to ensure that every resident has access to appropriate oral health care. Children consistently receive the most attention and several preventive activities are underway to target children at highest risk of dental decay, including low-income and racial and ethnic minorities. Improvements to the MassHealth program have eased the administrative burden of provider participation and increased reimbursement rates for services provided to children. However, the infrastructure to serve adults, seniors, and individuals with special health care needs lags behind. MassHealth reimbursements are not sufficient to cover the cost of care provided to adults and Medicare does not cover most dental services. Furthermore, enrolling providers in the MassHealth program is an ongoing challenge. The current state fiscal crisis exacerbates these problems.

The current distribution of dental providers in Massachusetts is not sufficient to adequately provide care to those who need it. Dental providers are not distributed evenly throughout the Commonwealth. The cost of dental education and lack of opportunities to support public health dentistry further impede access for vulnerable populations. New efforts are underway to integrate oral health care into primary care and to expand the capacity of the dental team. Current workforce debates about how to expand access to dental services and new levels of providers are occurring at both the state and national level. However, more work is needed to address scope of practice and supervision issues.

Since the Massachusetts legislative commission report in 2000, there has been increased awareness of the importance of dental disease and the need for good oral health. Massachusetts has made significant progress in targeting high-risk populations and working to improve oral health across the Commonwealth. Adult dental benefits were reinstated for low-income adults as part of Massachusetts health reform. Recent collaborative efforts have expanded the capacity of advocates and stakeholders to work together and foster mutually agreed upon solutions. Massachusetts should continue to evaluate new initiatives and best practices from other states and work to improve oral health for all its residents. There is significant work to be done across the Commonwealth. With Massachusetts' rich network of oral health practitioners, experts, and advocates, Massachusetts can continue to lead the way in the promotion of good oral health and overall health.

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## **Appendix I: Oral Health Conditions**

### ***Dental Caries***

Dental caries is an infectious disease that results from the fermentation of dietary carbohydrates by the “oral flora” on the surface of the tooth.<sup>99</sup> This process creates plaque and produces acid that collect on the teeth.<sup>133, 134</sup> Over time demineralization of the tooth occurs.<sup>134</sup> Dental caries is a process, and the final step in the process is the cavity formation.<sup>99</sup> Early childhood caries (ECC) is defined as the presence of dental decay in one or more primary teeth in children between the ages of one and six years.<sup>2, 135</sup> Treatment of ECC can be very expensive, costing between \$3,000 and \$8,000 per child because general anesthesia and operating rooms are often needed.<sup>98</sup> Several factors may contribute to the emergence of ECC. Bacteria in parents’ mouths can be transmitted to young children.<sup>135</sup> Research suggests that human breast milk by itself does not lead to tooth decay,<sup>136</sup> however breast milk in combination with other carbohydrates or poor oral hygiene can lead to ECC.<sup>133, 134</sup> While, “baby bottle tooth decay” is no longer considered the only cause of ECC,<sup>134</sup> evidence suggests that putting infants to bed with infant formula, milk, juice, or sweetened pacifiers may contribute to the development of ECC.<sup>2, 98, 137</sup> Experts recommend cleaning the gums and teeth after feedings and before bedtime and using bottles with only water in them at bedtime.<sup>99, 137</sup>

Proper nutrition is also critical to protect all individuals, regardless of age, against dental disease.<sup>7, 135</sup> The consumption of juice and sugary beverages has been linked to both childhood obesity and the development of childhood and adult caries.<sup>7, 99</sup> Reducing the consumption of fruit juices, carbonated beverages, and drinks with high fructose corn syrup, as well as encouraging proper nutrition based on the U.S. Department of Agriculture’s My Pyramid guidelines can help encourage good oral health.<sup>99</sup>

### ***Periodontal Disease***

Periodontal disease is a chronic bacterial infection that impacts gums and bones that support the teeth.<sup>8</sup> The mildest form of periodontal disease is gingivitis—a localized condition that does not affect the bone and connective tissue.<sup>104</sup> Severe periodontal disease is defined as the loss of attachment between the teeth and the gums greater than or equal to five millimeters.<sup>8</sup> Periodontal disease is one of the primary causes of tooth loss in adults.<sup>104</sup> Several factors are associated with higher rates of periodontal disease: age, being male, tobacco use, stress, mouth breathing, poor oral hygiene, and overcrowded teeth.<sup>2, 104</sup> Additionally, many conditions are associated with a higher risk of gingivitis and periodontal disease including diabetes,<sup>1, 8</sup> pregnancy,<sup>9</sup> and HIV.<sup>14</sup>

### ***Oral and Pharyngeal Cancers***

Oral and pharyngeal cancers are often caused by smoking, chewing tobacco, or alcohol use, however 25% of people with oral cancer have no risk factors.<sup>98, 138, 139</sup> Additionally, as the number of people who smoke has decreased, the human papillomavirus (HPV) has increasingly been identified as a risk factor for oral cancer.<sup>140</sup> Oral cancers can start anywhere in the mouth, and initially appear as tiny white or red spots.<sup>138</sup> Pharyngeal cancer is when malignant tumors form on

the pharynx (part of the neck and throat located directly behind the mouth).<sup>2</sup> Oral and pharyngeal cancers are more common among men than women and are more likely to strike after age 40.<sup>138</sup> Black males have the highest risk for oral and pharyngeal cancer, with a 20% higher incidence rate, and a 82% higher mortality rate as compared to white males between 1975 and 2002.<sup>141</sup> Similar to the nation, in Massachusetts oral cancer was the 9<sup>th</sup> most commonly diagnosed cancer among men, and the 14<sup>th</sup> most commonly diagnosed cancer among women between 2001 and 2005.<sup>7</sup> Often these cancers are diagnosed at a later stage, resulting in a 53% five-year survival rate.<sup>2</sup> Studies suggest that avoiding alcohol use and all forms of tobacco, and regularly consuming nutritious fruits and vegetables may reduce the risk of developing oral cancer.<sup>138</sup>

### ***Cleft Lip and Palate***

Cleft lips and cleft palates are some of the most common birth defects in the U.S., occurring at a rate of one per 1,000 live births.<sup>2</sup> Children born with cleft lip and palate may experience problems with proper nutrition, speech challenges, orthodontic abnormalities, middle ear disease, and psychological and social adjustment problems.<sup>104</sup> Research suggests that there is a higher incidence of caries development, gingivitis, and malocclusion (poorly aligned teeth) among children with cleft lip and palate.<sup>104</sup> Good oral hygiene and education are particularly critical for children with these conditions.<sup>104</sup>

## Appendix II: Omnibus Oral Health Bill

The Omnibus Oral Health Bill (SB2819) does several things:

- Creates a Dental Director in the Department of Public Health.<sup>26</sup>
  - Subject to appropriation, the commissioner shall appoint a dental director. The dental director shall serve at the pleasure of the commissioner and shall be a dentist licensed in the commonwealth with public health experience. The department may establish additional qualifications for the position of dental director by regulation. The dental director shall oversee the department of public health dental program to increase access to oral health services, oral health prevention activities and other initiatives to address oral health disparities.<sup>26</sup>
- Statutorily mandates an Office of Oral Health within the Department of Public Health.<sup>26</sup>
- Establishes the public health dental hygienist, defined as a registered dental hygienist with at least three years of full-time clinical experience who is practicing at least part time in a public health setting and has fulfilled appropriate training requirements as established by the Department of Public Health.<sup>26</sup>
  - Public health dental hygienists may perform in a public health setting, without the supervision or direction of a dentist.<sup>26</sup>
  - Public health dental hygienists must have a written collaborative agreement with a local or state government agency or with a licensed dentist who will provide consultation to the dental hygienist to ensure patient health and safety prior to performing a procedure or providing a service.
  - Public health dental hygienists shall be directly reimbursed for services administered in a public health setting by MassHealth or Commonwealth Care, but no reimbursement is permitted by other third party payors.<sup>26</sup>
  - Public health dental hygienists shall not operate independently of a dentist, except for a dental hygienist working for a local or state government agency or institution or practicing in a mobile or portable prevention program licensed or certified by the Department of Public Health.<sup>26</sup>
- Requires dental assistants to register with the Board of Registration in Dentistry (BORID). Establishes a distinct career ladder for dental assistants.<sup>26</sup>
  - The board may adopt rules and regulations governing the registration and practice of dental assistants to protect public health, safety and welfare such as, rules and regulations that define the services and delegated procedures that may be performed by dental assistants, the level of supervision required by a registered

dentist, tiered classes or levels of practice and certification requirements for each established class or level, education and training requirements, registration and registration renewal procedures and requirements for the display of registration certificates.<sup>26</sup>

- Establishes a full-time director of dental services in the Office of Medicaid.
  - The director of dental services shall be a dentist licensed in the commonwealth who has public health experience and shall oversee the MassHealth dental program and collaborate with the dental director at the Department of Public Health and the Office of Oral Health on dental public health programs for MassHealth recipients to increase access to oral health services, oral health prevention activities and other initiatives to address oral health disparities including, but not limited to, workforce shortages.

### Appendix III: Race and Ethnicity of Current Dental Students

Table 1. Number and percentage of current dental students by Race and Ethnicity, 2007-08, Nationwide and Massachusetts.<sup>81</sup>

	White	Black	Hispanic	American Indian	Asian	Not Specified	Total
<b>Nationwide</b>	11,723	1,147	1,214	118	4,387	753	19,342
	60.6%	5.9%	6.3%	0.6%	22.7%	3.9%	100.0%
<b>Boston University</b>	193	16	28	2	294	69	602
	32.1%	2.7%	4.7%	0.3%	48.8%	11.5%	100.0%
<b>Harvard University</b>	81	7	7	0	46	7	148
	54.7%	4.7%	4.7%	0.0%	31.1%	4.7%	100.0%
<b>Tufts University</b>	390	34	38	0	226	0	688
	56.7%	4.9%	5.5%	0.0%	32.8%	0.0%	100.0%

## Appendix IV: MassHealth Participants and Fluoridation Maps

Figure 2. MassHealth Recipients under 21 years by Massachusetts City and Town (FY07)

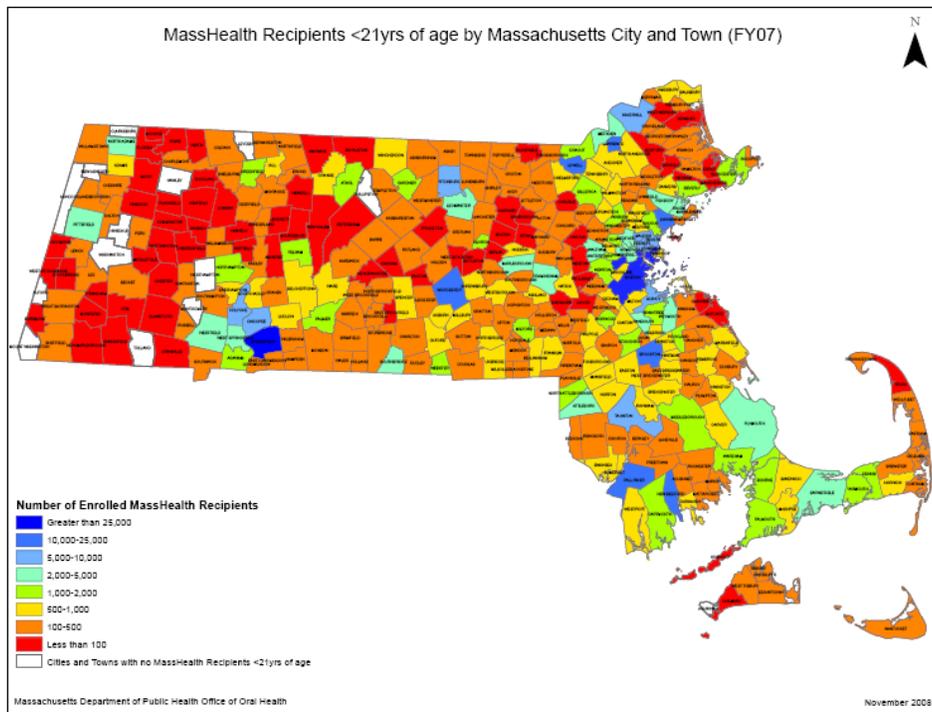


Figure 3. Fluoridation Status of Massachusetts Cities and Towns (2008)

