

Oral Health Community Profile: Worcester

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Executive Summary

Part I: Introducing the Issue

Poor oral health is an important healthcare and health equity issue, especially for low-income children of color.

Poor oral health is a health problem that disproportionately impacts certain communities. The differences in oral health outcomes are particularly stark when comparing low-income children of color and other special populations (such as children with disabilities, or recently-immigrated children) to their White or more affluent counterparts. Without early intervention and care, non-White children have a greater chance of developing oral health and whole-body health issues later in life. Data from national reports consistently indicates that Black/African American and Hispanic subpopulations have a higher prevalence of dental caries (tooth decay) and lower annual rates of dental service utilization. Differences in oral health outcomes also exacerbate health disparities across populations, like low-income people of color. Addressing the oral health and health equity needs of children is an important part of preventing more serious health complications in the future.

Part II: Health in Worcester

Similar to national trends, Worcester's communities – especially its low-income, under-18, Hispanic and Black populations – need specific resources to address poor oral health.

In order to address complex oral health issues in the city of Worcester, it is important to target programming towards those who face greater health access challenges, like low-income people of color or new U.S. immigrants. Because of Worcester's modest Hispanic (20%, in 2015) and Black (11%, in 2015) populations, above-average poverty level (30.5% in Worcester versus 15.3% state-wide, in 2013) and high infant mortality rate – 8.0, compared to 4.7 state-wide – Worcester needs oral health resources that best meet the needs of these children. When planning oral health interventions for children in Worcester, oral health experts and community leaders must also create programming that best suits the needs of non-English speaking children and children with disabilities.

Part III: Understanding the Current Oral Healthcare Landscape

With thanks to previous programs and legislative changes, Massachusetts has a strong foundation to address some oral health issues.

- **Central Massachusetts Oral Health Initiative (CMOHI):** With thanks to philanthropic foundation funding, the UMass Medical School's CMOHI created a series of multi-year pilot projects to increase the number of MassHealth-accepting oral health professionals, increase school based preventive oral health services and connect Worcester-area children to community health center resources for affordable oral healthcare. Between 2000 and 2009, the collaborative received nearly \$3.6M to achieve these goals. The CMOHI initiative in

Worcester provided valuable lessons and strategies for other central Massachusetts cities and towns to duplicate. CMOHI's pilot programs provided valuable direction and impetus for legislative changes made during the same time frame.

- **State and national reforms:** In the same timeframe as the CMOHI pilot programs, state and national reforms provided legislative support and additional funding for better health insurance coverage and more oral health providers in the state. However, these changes – both at the state and national level – do not entirely eradicate oral health disparities for low-income children of color in Massachusetts.

Seal, Educate, Advocate for Learning (SEAL) Program Data: The Department of Public Health (DPH) SEAL program aims to increase access to preventative oral health services for children attending schools across the state while also referring children to community dentists in order to establish a dental home. Between 2008 and 2015, DPH SEAL program staff provided 2,925 oral health screenings, 11,039 sealants and 2,875 fluoride treatments to students in Worcester.

- **Edward M. Kennedy Community Health Center Internal Review:** The Edward M. Kennedy Community Health Center conducted an 11-month internal review to best understand why parents of children who scheduled dental health visits did not show for their appointments. Through informal, qualitative interviews conducted between January and December 2015, health center staff learned more about appointment barriers and potential factors to consider when designing the Worcester-area community health intervention. The insights gleaned from those interviewed will inform the forthcoming intervention.

However, areas of improvement for children of color, low-income children and other special populations in Worcester still remain.

- **DPH Maternal Oral Health Data:** Previous programming by DPH aimed to measure how many mothers went to the dentist for a dental cleaning during pregnancy. In Worcester, Hispanic (47.3%) and other, non-Hispanic mothers (47.1%) had the highest rates of dental cleanings during pregnancy compared to their Black (41.7%) and Asian/Pacific Islander (44.5%) counterparts.
- **DentaQuest Provider Access Data:** When compared to the number of children in Worcester, the city has a limited number of oral health providers who accept MassHealth insurance coverage. In 2015, Worcester had 181,045 total residents; 21,456 of those households had at least one child under 18 years old during the same time period. However, only 324 oral health professionals in Worcester accepted MassHealth insurance during the same year. In order to best address the oral health disparities in Worcester, additional oral health providers, especially those that accept MassHealth insurance, are needed.
- **Fluoridated Water Access:** Fluoride is an important additive to prevent tooth decay, especially in the teeth of young children. However, only a limited number of Worcester

residents have access to fluoridated water. Expanding access to fluoridated water in Worcester is another important element of improving oral health for children in that city. There were four referendums on fluoridating Worcester's water, the most recent was in the early 2000s. All four failed.

Part IV: Informing New Solutions

Through the Oral Health Equity Project, DPH and its partners have taken steps to collect meaningful information to help shape the upcoming community intervention in Worcester.

- **Community Events:** DPH and UMMS staff have completed community events and feedback surveys to best understand what parents of children between 0 and 14 children understand about oral health. Based on the findings from events and surveys, the forthcoming community intervention should focus on:
 - Creating age-appropriate health education materials for parents of children between 0 and 14 years old;
 - Continuing to use area dentists as a primary source of information for oral health questions;
 - Modify access to area dental health services by extending office hours and increasing transportation to dental offices;
 - Increase the number of dentists that accept MassHealth and other dental health insurance plans; and
 - Increase the number of dentists that speak more than one language.
- **Key Informant Interviews:** UMMS staff conducted eight qualitative interviews with dental health professionals and experts across Massachusetts to research oral health barriers and potential solution features for low-income children in the Worcester area. Qualitative interviews conducted over a three –month period highlighted financial, educational, delivery system and linguistic barriers for parents of children who want to use available oral health services. The key informant interviews also highlighted potential areas of improvement and solutions to oral healthcare challenges in the Worcester area, including expanding the role of community health workers, offer more health education for parents, diversify the oral health workforce and increase the availability of oral health services. The insights and suggestions made by those interviewed will also inform the forthcoming intervention.

DPH and their community partners will take past and future information to design an intervention that fits the community in the coming year. The intervention will not only utilize current data, but will provide new opportunities to collect information for the multi-year intervention.

I. Background

The Worcester Oral Health Profile is a view of the oral health challenges and potential solutions facing families of children between 0 and 14 years old in the Worcester area. Utilizing best practice summaries from previous and ongoing oral health projects, internal data reviews, key informant qualitative interviews and publicly-available background data, the resulting Worcester profile serves as a vital component of the strategic program intervention that is to be designed in the coming months.

A. Key Definitions and Terms

Before describing the communities impacted by poor oral health, it is essential to define the terms and principles that guide the work ahead for Worcester residents:

“Oral health” is best described as *“a functional, structural, aesthetic, physiologic and psychosocial state of well-being and is essential to an individual’s general health and quality of life.”*¹ Done well, strategic interventions targeted towards child oral health can promote “access to dental care and prevention measures for pregnant women and children.”²

“Social determinants of health” are defined as *“the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.”*³

In order to address the social determinants of oral health for young children, both health access and health disparities (“types of health difference that is closely linked with social or economic disadvantage” based on demographic, geographic, resource, physical and other classifying factors⁴) must be addressed – especially for vulnerable under-18 populations like those in Worcester. Through the reduction of health disparities, individual children and larger communities are better poised to achieve “health equity” or optimal, value-driven health for all⁵. By improving oral health equity for children in need, entire communities can prevent health complications in their adulthood; achieve improved, short-term health outcomes and bolster their overall quality of life.

¹ American Dental Association, “ADA Policy - Definition of Oral Health”, accessed online at <http://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/ada-policy-definition-of-oral-health>

² Massachusetts Department of Public Health, *What are government agencies and “Blueprints” for action doing around health? (PPT Presentation)* (November 24th, 2015), slide 15.

³ World Health Organization, “Social Determinants of Health”, accessed online at http://www.who.int/social_determinants/en/

⁴ The Secretary’s Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, *Phase I Report Recommendations for the Framework and Format of Healthy People 2020* (Oct. 2008), 29.

⁵ Healthy People 2020, “Disparities”, accessed online at <http://www.healthypeople.gov/2020/about/foundation-health-measures/Disparities>

B. Overview of the Community Health Need: Improve Oral Health Outcomes for Vulnerable Populations

Oral health is an integral component of whole-person health. When periodic oral examinations are forgone and childhood oral disease is left untreated, the consequent poor oral health status can lead to other adverse health conditions and complications such as dental abscesses (potentially life-threatening infections that can spread to other parts of the body) and cancers of the oral cavity and pharynx (throat)⁶.

Poor oral health status can also impact the treatment of over 125 other health conditions and diseases, such as diabetes, osteoporosis and HIV/AIDS⁷. Oral health complications impact more than disease pathology; they can also affect an individual's nutrition, digestion, speech, social mobility, employability, self-image, self-esteem and overall quality of life. Because of the severity and extensive nature of oral health disease – even in light of recent oral health initiatives – “not enough has been done to address the ‘silent epidemic’ the surgeon general described.”⁸ The social determinants of health (such as income, built environment, even self-esteem) significantly impact how professionals and communities address oral health disparities. The impact of the social determinants of health are particularly evident among children from vulnerable populations (such as those with limited incomes, low health education and few advocates to navigate the oral health delivery system), as they experience a disproportionate burden of oral disease. Best described by the Institute of Medicine's 2011, “[r]acial and ethnic minorities experience significant disparities in oral health status and access to oral health care compared to the U.S. population as a whole. These disparities can be attributed to a number of complex societal factors.”⁹

Massachusetts leadership has a long history of addressing social determinants of health through community resources, healthcare and health access innovation. Legislation passed over the last decade has expanded health insurance coverage options and benefits for adult and children residents. As a direct result of those efforts, Massachusetts reports the lowest rates of uninsured residents in the nation – only 4% of the state's population remains uninsured¹⁰. However, increased health insurance access is only one step to reducing oral health disparities in Massachusetts. The state still faces significant oral health care challenges, especially for its low-income residents. More than 250,000 children enrolled in MassHealth (the state's Medicaid program) – nearly one-third of the

⁶ Healthy People 2020, “Oral Health”, accessed online at <http://www.healthypeople.gov/2020/topics-objectives/topic/oral-health>

⁷ American Dental Association, *Action for Dental Health: Bringing Disease Prevention into Communities* (Dec. 2013), 3.

⁸ Committee on an Oral Health Initiative, Board on Health Care Services, Institute of Medicine of the National Academies, *Addressing Oral Health in America* (2011), 16.

⁹ Committee on Oral Health Access to Services, Board on Health Care Services, Board on Children, Youth and Families, Institute of Medicine and National Research Council of the National Academies, *Improving Access to Oral Health Care for Vulnerable and Underserved Populations* (2011), 57.

¹⁰ The Henry J. Kaiser Family Foundation State Health Facts, “Health Insurance Coverage of the Total Population”, accessed online at <http://kff.org/other/state-indicator/total-population/>

state's child population – have never had a dental visit.¹¹ Such information illustrates a key point: in order to improve oral health in Massachusetts, officials must invest in essential, key measures that can lead to good oral health outcomes. Oral health equity for the state's most vulnerable individuals requires improved provider access, health education, support services for challenged groups, and increased access to preventive services.

Other states, such as Wisconsin, have provided valuable program recommendations to improve oral health for all its residents. The recommendations include creating high-quality “dental homes” (an interdisciplinary, team-based approach to providing comprehensive oral health services) for residents; providing prenatal and ongoing oral health education and preventive services; and investing in preventive services such as fluoride varnishes for vulnerable populations who often face challenges accessing dental services¹². Interviews with subject matter experts, data review, and continual feedback from community members will help inform and guide the development of programs customized to address the specific barriers and needs of Massachusetts' diverse communities.

In order to improve child oral health access in Worcester, the community-based intervention must be grounded by the following principles:

- Promote health and well-being of maternal/child health (MCH) populations;
- Eliminate disparities by targeting the increasingly diverse MCH populations in MA;
- Ensure community engagement through essential allies and other stakeholders;
- Ensure parental involvement (including fathers); and
- Target interventions as early as possible and focu[s] on teachable moments.¹³

C. Oral Health in Massachusetts: A Primer

Oral health achievements in Massachusetts stem from a history of investment in preventive and cost-effective programs for all residents. In order to understand recent legislative changes, it is important to note the programmatic and advocacy history that made state policy changes possible. After the release of the 2003 “A National Call to Action to Promote Oral Health” report and *Healthy People 2010* national profile, oral health advocates and multidisciplinary coalitions campaigned for additional services and programs for citizens with oral health needs. Between 2000 and 2009, the Central Massachusetts Oral Health Initiative (CMOHI, a coalition between the Massachusetts Department of Public Health, the University of Massachusetts Medical School, the Worcester District Dental Society, Quinsigamond Community College and Worcester County health centers) received over \$3.6M to implement and measure new innovative programs in Worcester City and

¹¹ Massachusetts Department of Public Health, *What are government agencies and “Blueprints” for action doing around health?* (PPT Presentation) (November 24th, 2015), slide 53.

¹² Wisconsin Department of Health Services, *Wisconsin Oral Health (Focus Area Profile)* (Jul. 2010), 1.

¹³ Massachusetts Department of Public Health, *What are government agencies and “Blueprints” for action doing around health?* (PPT Presentation) (November 24th, 2015), slide 20.

southern Worcester County. Because of CMOHI's work, by 2009, the coalition served over 4,500 children under the age of 15, added over 180 new dentists that accepted MassHealth insurance coverage and expanded the post-doctoral dental residency program at the University of Massachusetts Medical School campus in Worcester¹⁴. The work from the Central Massachusetts Oral Health Initiatives also supported key legislative changes over the past decade.

Recent state and federal legislation efforts have focused on promoting health care access and cost-reducing services. After the 2006 passage and 2010 amendment of Chapter 58 of the Acts of 2006, residents from all socioeconomic backgrounds were able to access health insurance including a required "minimum coverage" list of services and benefits. Building on the success of previous reforms, legislators passed Chapter 224 of the Acts of 2012 – a law that improved health care quality and access, increased consumer transparency around services, and aimed to contain rising health service costs. State health care reforms both guided and mirrored national health reform efforts to improve healthcare for the country's most vulnerable. In March 2010, the Obama administration passed the Patient Protection and Affordable Care Act (PPACA). Similar to Massachusetts' health reform efforts, PPACA aimed to increase each patient's access to affordable health insurance coverage, comprehensive insurance benefits and preventative services to improve overall health. As a result of PPACA, community health centers that provided oral health services received a portion of \$11B in additional funding, created new oral health education campaigns, providing funding for health-center-based fluoride sealant programs and required dental health insurance coverage for specific insurance plans¹⁵. State health reform efforts have steadily increased the number of practicing dentists over the past decade in Massachusetts. By 2013, only 3% of the state's population remained uninsured¹⁶ and 78 dentists (per 100,000 Massachusetts residents) practiced in the state compared to 76.6 dentists (per 100,000 residents) in 2001¹⁷.

In 2014, Medicaid programs in 44 different states, including Massachusetts, reimbursed medical providers who administered fluoride varnishes to children, and 42 states allowed those providers to delegate fluoride varnishes to other medical and non-medical staff¹⁸. In Massachusetts, recent programs like the work done by the Central Massachusetts Oral Health Initiative aimed to increase the number of MassHealth-providing dentists in the Worcester area. However, increases in health insurance access and oral health providers have not translated into improved health outcomes for vulnerable populations. Over the past decade, Massachusetts has made modest increases to the number of child-serving dentists that accept MassHealth insurance coverage. In 2014, 39% of the state's MassHealth-accepting dentists provided child dental services¹⁹. Similarly, 24% of

¹⁴ Health Foundation of Central Massachusetts, "2009 Oral Health Impact Report", accessed online at <http://www.hfcm.org/2009-Oral-Health-Impact-Report/599>

¹⁵ Office of Oral Health, Massachusetts Department of Public Health, *The Affordable Care Act and Its Impact on Oral Health*, 1.

¹⁶ The Henry J. Kaiser Family Foundation, "Health Insurance Coverage of the Total Population", accessed online at <http://kff.org/other/state-indicator/total-population/>

¹⁷ Health Policy Institute, American Dental Association, *Oral Health Care System: Massachusetts* (2015), 1.

¹⁸ Qualis Health, *Oral Health: An Essential Component of Primary Care*, (Jun. 2015), 41.

¹⁹ Health Policy Institute, American Dental Association, *Oral Health Care System: Massachusetts* (2015), 1.

MassHealth-enrolled children between ages 6-14 received a molar sealant in 2013²⁰. Most concerning, the number of people who have dental visits has declined since the early years of Massachusetts' expanded access. Based on Healthy People 2020's Leading Health indicator data from 2011, 41.8% of people above two years old saw a dentist within the past year; this number is a decline from the 2007 baseline measurement (44.5%) and remains an area of improvement for the state²¹. As Massachusetts aims to improve overall health for its residents, programming and initiatives must target the particular social, contextual and financial barriers facing children from vulnerable populations.

D. Linking the Social Determinants of Health to Oral Health for Children, Young Adults, and the Maternal Population

Health disparity, created by unequal access to health-promoting resources, has been a longstanding issue in the United States. Available data suggests that several demographic groups face complex reasons for ongoing health disparities. Unserved and underserved populations are impacted by general health disparities for a variety of reasons, including limited access to health care services, inadequate health insurance coverage, low health literacy, complex comorbidities and challenging socioeconomic factors that impact scheduling and affording appointments. Groups at highest risk for oral health disparities both statewide and nationally include racial, ethnic, and linguistic minorities – they consequently share a disproportionate burden of oral disease. To achieve parity for any health issue, especially to address oral health, it is essential that a customized approach is developed to address the specific barriers faced by different underserved subpopulations.

The Surgeon General's report on Oral Health in America highlighted racial/ethnic minorities (especially Black/African American and Hispanic populations) and individuals of low socioeconomic status as some of the groups that are most vulnerable to oral disease²². Data consistently indicates that Black/African American and Hispanic subpopulations have a higher prevalence of dental caries (tooth decay) and lower annual rates of dental service utilization²³. Oral health disparities also impact other, important populations nationally. Research has also shown that developmentally delayed individuals²⁴ and children from immigrant families²⁵ often face unique

²⁰ Ibid.

²¹ Massachusetts Department of Public Health, *What are government agencies and "Blueprints" for action doing around health? (PPT Presentation)* (November 24th, 2015), slide 52.

²² U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, *Oral Health in America: A Report of the Surgeon General* (2000),7.

²³ Centers for Disease Control and Prevention, Division of Oral Health, "Disparities in Oral Health", accessed online at http://www.cdc.gov/oralhealth/oral_health_disparities/

²⁴ Norwood, Kenneth and R. Slayton, "Oral Health Care for Children With Developmental Disabilities", *American Academy of Pediatrics* 131 (Mar. 2013), 615.

²⁵ Committee on Community Health Services, "Health Care for Children of Immigrant Families", *American Academy of Pediatrics* 100 (Jul. 1997), 155.

challenges when attempting to access oral health providers and services that are appropriate for their needs. Children with disabilities or from recent immigrant families can not only face health literacy, access and financial barriers, but they also need supportive services that may not be available during an oral health appointment. As progress is made towards eliminating the “artificial separation of oral and systemic health”²⁶ through oral health awareness initiatives, there is now an impetus to form health policy and programs that supports such awareness. Furthermore, the dental and medical workforce is reminded of the need for collaborative health care efforts, as there is an opportunity to collectively help reduce risk for adverse health outcomes and consequently improve overall health.

The vulnerability of such populations to oral disease (among other health conditions) is a complex issue that warrants continued research. Exploration and action upon the social determinants of health is an issue that needs persistent attention, as it influences every aspect of health and quality of life among the underserved. As socioeconomic factors such as education level, income, quality of housing/built environment and race/ethnicity are all inextricably linked to health outcomes, evidence-informed policies must be developed to address such social determinants of health.

II. Preliminary Data and Research

A. Worcester-Specific MassHealth Data

The evaluation team is exploring the feasibility of incorporating MassHealth administrative data as part of our evaluation design. The MassHealth Dental Program (part of the MassHealth system) provides oral health services to its members. By using Current Dental Terminology (CDT) codes (for dentists as well as public health dental hygienists) and Current Procedural Terminology (CPT) codes (for specialists covered by MassHealth), it is possible to identify provided oral health services. It is important to note that there are some limitations to the available MassHealth data – specifically regarding missing data on race/ethnicity variables and an estimated one-year time lag on data availability. The evaluation team will also need to secure approval from the Executive Office of Health and Human Services (EOHHS) to use MassHealth data for the purpose of evaluating the DPH Oral Health Initiative. If approved, a data use agreement with MassHealth will need to be executed. Despite the noted data limitations, we recommend pursuing this option with EOHHS.

B. Worcester Oral Health Community Data

Before describing the current status of oral health in Worcester, it is important to understand additional background demographics that impact young children and families in the city. In 2015, 69% of the city’s population identified as White non-Hispanic, compared to 20% who identified as

²⁶ Qualis Health, *Oral Health: An Essential Component of Primary Care*, (Jun. 2015), 2.

Hispanic and 11% who identified as Black non-Hispanic²⁷. While racial demographic data for Worcester's under-18 population is not available, over 30,000 children under 18 lived in Worcester in 2015²⁸. In 2013, 30.5% of the city's total population lived under the federal poverty level²⁹ (at the time that meant that a household of four earned up to \$23,550 annually³⁰). Because of the populations' financial and health needs, Worcester City is home to three federally-qualified community health centers that provides valuable oral health services to children and adults in the community³¹. Oral health programming must be designed to fit the socio-contextual needs of children within these racial and social populations.

Maternal oral health is also an important aspect of health equity for young children. The high infant mortality rate in Worcester, a staggering 8.0 compared to 4.7 statewide in 2010³² strongly indicates a need for increased perinatal education and support services. National studies suggest a relationship between poor maternal oral health and adverse birth outcomes. In recent years there is growing support for medical and dental providers to simultaneously promote oral and overall health best practices to expecting mothers. Previous research by the state's Office of Oral Health indicates strong correlation between a mother's oral hygiene/maintenance habits and the oral health status of her children. However, oral health behaviors across subpopulations vary greatly. Department of Public Health data on maternal teeth cleaning during pregnancy by race/ethnicity is listed below. Provision of child oral hygiene instruction and anticipatory guidance must be part of maternal health education efforts, as a guardian's health literacy significantly influences the pursuit of oral health services and consequently impacts the health of their children.

²⁷ Suburban Stats, "Population Demographics for Worcester, Massachusetts in 2016 and 2015", accessed online at <https://suburbanstats.org/population/massachusetts/how-many-people-live-in-worcester>

²⁸ Ibid.

²⁹ City-Data.com, "Worcester, Massachusetts (MA) Poverty Rate Data", accessed online at <http://www.city-data.com/poverty/poverty-Worcester-Massachusetts.html>

³⁰ Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, "2013 Poverty Guidelines", accessed online at <https://aspe.hhs.gov/2013-poverty-guidelines>

³¹ Office of Oral Health, Massachusetts Department of Public Health, *Massachusetts Community Health Center Dental Program Directory*, 37 – 39.

³² Massachusetts Community Health Information Profile, "Worcester", accessed online at <http://www.mass.gov/eohhs/docs/dph/masschip/perinatal-trends/perinataltrendscity-townworcester.rtf>

³³ Ibid.

TABLE 1.1: Percent of Pregnant Woman Who received Preventative Dental Care, by Race/Ethnicity

Worcester: 2014	
White (non-Hispanic)	46.48%
Black (non-Hispanic)	41.72%
Hispanic	47.29%
Asian/PI (non-Hispanic)	44.52%
Other (non-Hispanic)	47.06%

Data source: MDPH Bureau of Family Health and Nutrition

C. MassHealth Worcester Provider Access Data

Access to providers is an important health indicator for vulnerable populations, especially those who rely heavily on public health insurance. Like other cities and towns in Massachusetts, Worcester faces a low provider-to-resident ratio. An estimated 81,910 residents (45% of Worcester's total population in 2015³⁴) actively used MassHealth insurance³⁵. Although the end-of-year number of MassHealth-enrolled children is currently unavailable, approximately 21,456 households had at least one child under 18 in 2015³⁶. In the same year, 292 pediatric and general dentists, 28 orthodontists and four oral surgeons accepted MassHealth insurance for provided oral health services³⁷. Providing timely health care service for MassHealth members is important to increasing oral health equity and decreasing downstream dental costs. In order to improve oral health outcomes for Worcester residents, additional dentists that accept all insurance types, including MassHealth, are needed. Also enhanced utilization of community-based dental providers would increase delivery of basic dental services and create an accessible portal to a dental home offering comprehensive care.

D. Data Addressing Oral Health in Special Subpopulations

Children with varying social and physical challenges need additional support in order to achieve optimal oral health. Approximately 8,855 (35.1%) children in the Worcester public school district were "English language learners" between 2014 and 2015³⁸. During that time period, there was also an estimated 4,957 (19.3%) children requiring special needs support. Specialty dental providers in the Worcester area, like the Tufts Dental Facilities Serving Individuals with Disabilities, have

³⁴ Suburban Stats, "Population Demographics for Worcester, Massachusetts in 2016 and 2015", accessed at <https://suburbanstats.org/population/massachusetts/how-many-people-live-in-worcester>

³⁵ DentaQuest, *Worcester Provider Summary Report – 2015 Profile*, 1 – 3

³⁶ Ibid.

³⁷ DentaQuest, *Worcester Provider Summary Report – 2015 Profile*, 1 – 3.

³⁸ Massachusetts Department of Elementary and Secondary Education, "Selected Populations – 2015", accessed at http://profiles.doe.mass.edu/state_report/selectedpopulations.aspx

focused on specialized care for those with disabilities since 1976. However, additional dental health professionals with this unique skill set may be needed. New immigrants, undocumented immigrants, and developmentally delayed children often rely upon public services and low-cost resources, such as free clinics and MassHealth insurance coverage. As health professionals design new programs and provide additional resources for children facing challenging social factors, the unique needs of these subpopulations must be kept in mind.

E. Fluoridated Water Access Data

Fluoride is a naturally occurring nutrient that is beneficial for long-lasting oral health. Community water fluoridation (the “controlled addition of a fluoride compound to a public water supply to achieve a concentration optimal for dental caries prevention”) according to current national guidelines put forth by the Centers for Disease Control and Prevention, is an important part of preventing oral disease³⁹. When the fluoride level of the community water supply is adjusted to the optimal recommended level (0.7ppm), fluoridated water provides cost-effective protection against the development of dental caries. Reports from other public health professionals also suggest an important correlation between preventive fluoridation and oral healthcare costs; data indicates that every \$1 invested into community water fluoridation results in saving \$38 of downstream dental treatment costs⁴⁰.

Massachusetts is one of several states that do not mandate community water fluoridation. However, many cities and towns across Massachusetts have fluoride in their water supply, and some have added or increased the current level of fluoride. After referendums and previous attempts to fluoridate water in Worcester, a small portion of the city’s population now has access to fluoridated water. Worcester mainly draws water from two reservoir sources, the local Lynde Brooke Reservoir and a neighboring reservoir in Holden⁴¹. Based on Department of Oral Health personnel anecdotes, the Holden reservoir is fluoridated, but only supplies 430 Worcester residents living in one apartment complex (comprised of 150 units) and 81 homes; this number is an increase from the 250 residents⁴² who received fluoridated water in 1995. As of 2016, Worcester’s local water supply is largely unfluoridated.

³⁹ Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, *Community Water Fluoridation*, 1.

⁴⁰ National Center for Chronic Disease Prevention and Health Promotion, Division of Oral Health, Centers for Disease Control and Prevention, “Cost Savings of Community Water Fluoridation”, accessed online at <http://www.cdc.gov/fluoridation/factsheets/cost.htm>

⁴¹ City of Worcester, MA, “Water Treatment Plant”, accessed online at <http://www.worcesterma.gov/dpw/water-sewer-operations/water-treatment-plant>

⁴² Office of Oral Health, Massachusetts Department of Public Health, *140 Massachusetts Public Water Systems Receiving Fluoridation*, 1.

F. SEAL Program Data

In 2007, The Massachusetts Department of Public Health (MDPH), Office of Oral Health developed the MDPH SEAL (Seal, Educate, Advocate for Learning) Program. The goal of the program is to improve the oral health of high-risk children by providing preventative dental services to children at risk for tooth decay and poor overall health⁴³. Since the 2008-2009 school year, the SEAL program has successfully provided preventive services for underserved children. See Table 1.2 for the latest figures.

TABLE 1.2: Comparative SEAL Program Data for Worcester

School Year	# of Schools	# Students Screened	# Students Sealed	Total # Sealants Placed	# Students Fluoride Treatment
2008-2009	6	313	243	1883	313
2009-2010	0	0	0	0	0
2010-2011	10	668	585	4673	645
2011-2012	8	722	529	1802	717
2012-2013	13	813	525	1687	809
2013-2014	4	77	50	271	77
2014-2015	6	332	174	723	314

Data Source: MDPH Office of Oral Health SEAL Program

III. Supporting Qualitative Research

A. Edward M. Kennedy Community Health Center Internal Review Update

As part of the broader Oral Health Equity project, the Edward M. Kennedy Community Health Center conducted an internal review of why children missed scheduled dental visits at the health center. Between January and December 2015, health center staff conducted over 130 informal qualitative interviews with parents of selected children. Staff from Edward M. Kennedy Community Health Center also conducted informal interviews during this time to better understand perceived health disparities across different subsets of their service population. The preliminary results of the internal review provide valuable information about what to include in the upcoming intervention for

⁴³ Association of State and Territorial Dental Directories, *Dental Public Health Activities and Practices: Massachusetts Department of Public Health SEAL Program*, 4.

low-income children in Worcester. As staff from the Edward M. Kennedy Community Health Center and Department of Public Health further analyzes findings from the informal interviews, more information will be available to Oral Health Equity Project review team. We recommend including insights gleaned from the Edward M. Kennedy Community Health Center's interviews into the broader, forthcoming intervention.

B. Community Event Survey Results: Trend Summaries and Suggestions for Intervention Design

Similar to the Edward M. Kennedy Community Health Center's internal review, staff from the Department of Public Health and UMass Medical School's Commonwealth Medicine conducted a series of feedback surveys and community forum events to engage and learn from specific parents in the Worcester and Holyoke areas. Between April and June, Department of Public Health staff outreached to nearly 150 parents at local community events, meetings and after-school programs. Through these initial findings, Department of Public Health staff learned that the forthcoming community intervention must focus on:

- Creating age-appropriate health education materials for parents of children between 0 and 14 years old;
- Continuing to use area dentists as a primary source of information for oral health questions;
- Modify access to area dental health services by extending office hours and increasing transportation to dental offices;
- Increase the number of dentists that accept MassHealth and other dental health insurance plans; and
- Increase the number of dentists that speak more than one language.

A full summary of the community event findings is available in the separate Appendix II.

C. Key Informant Interviews: Comment Themes and Suggestions

Key Informant Interview Approach

Eight qualitative interviews with identified Subject Matter Experts (practicing dentists in various communities across Massachusetts) were conducted by staff from the Center for Health Policy and Research. Dr. Deborah Gurewich, PhD and Ms. Linda Cabral organized and facilitated the informational interviews, with suggestions from staff from the Department of

Public Health. Interviews were conducted via telephone over a four week period by staff from the Center for Health Policy and Research.

I. Preliminary Introduction

The U.S. Office of Minority Health (OMH) awarded a grant to the Massachusetts Department of Public Health (MDPH) to develop and implement community interventions aimed at increasing the number of children who visit the dentist/dentist hygienist each year. These interventions will be designed to target low-income racial and ethnic minority children up to age 14 in the communities of Worcester and Holyoke. To inform the development of these community-based interventions, MDPH contracted with the Center for Health Policy and Research (CHPR) at the University of Massachusetts Medical School (UMMS) to complete a series of interviews with oral health experts in Massachusetts. The objectives of these interviews were to collect information about attitudes and knowledge about child oral health among racial and ethnic minorities; barriers to oral health care for these populations, and; strategies for enhancing oral health access.

II. Interview Methods

The study sample consisted of eight individuals. Seven were dentists with experience providing services to children from low-income communities and one was an individual responsible for coordinating a coalition to promote increased oral health access for children. MDPH identified the respondents and provided contact information to the CHPR. Key informants were contacted via email to participate in a phone interview. A draft semi-structured interview guide was developed by MDPH in collaboration with CHPR to guide data collection. Key domains of inquiry included: barriers to oral health care for children in minority communities; strategies to engage community members in oral health education and increase utilization of oral health services among children, and; the role of primary care providers in children's oral health.

Among the eight interviews conducted, MDPH conducted two and CHPR conducted six. Completed interviews were converted to Word files and these files were uploaded into Atlas ti, a qualitative data software manager. CHPR used content analysis to determine major themes present in the interviews. The interview guide determined the preliminary coding scheme, which was further refined as the data were analyzed. Concepts and categories were then developed that reflected salient and recurring themes in the data.

III. Findings

Among the seven informants that practiced dentistry, two were employed at community health centers and five worked in private practice. Additional background information collected from these key informants indicated that four of them participated in professional organizations that promote access to oral health care for underserved populations. These organizations included: the Massachusetts Dental Society's Access, Prevention, and Interprofessional Relations Committee; the Better Oral Health Massachusetts Coalition; the Central Massachusetts Oral Health Initiative, and; ForsythKids, an outreach program of the Forsyth Institute.

Findings are organized around two major domains of inquiry – barriers to obtaining oral health care and strategies for increasing utilization of oral health services. Within each of these sections, major themes are presented that arose from the data analysis.

A. Barriers to Obtaining Oral Health Care

The Key informants identified the main barriers to dental care. These included barriers related to education, delivery system, finances, and language/literacy.

- i. **Education barriers:** Key informants indicated that a significant barrier reported to oral health care among low income minority populations was lack of education among parents/guardians regarding the importance of oral health for young children. This lack of education reportedly comes in many forms; including not understanding that risks from childhood cavities can carry into adulthood, confusion about the risks and benefits of fluoride, lack of knowledge about the importance of primary (baby) teeth and the need to care for them. Some are misinformed on how to seek oral health care for their children; and there is a general misunderstanding of the value of preventive oral health care. Also, the net effect of low oral health literacy is that some parents/guardians only seek oral health treatment for their children during emergency situations.
- ii. **Financial barriers:** Cost barriers were also noted and reportedly can arise for several reasons. For example, for families without dental insurance, the out-of-pocket costs associated with oral health care are often unaffordable. However, even among families with dental insurance, cost can still be a barrier. Not all dentists accept MassHealth insurance. For families with oral health coverage through MassHealth, finding a dental provider who accepts MassHealth patients can be a challenge. Further, not all MassHealth plans cover indicated preventive oral health services care. (Health Safety Net, for example, only covers emergency dental care). Finally, it was also noted that some families may not be aware that their MassHealth plan insurance covers preventive dental services; thus, they have a perception that oral health care is unaffordable for them and their children.
- iii. **Non-financial barriers:** Parents/guardians experience barriers in getting their children to appointments due to lack of transportation, getting time off from work or school, and finding dental offices with convenient appointment times and locations in acute situations. In addition to the lack of education among parents/guardians, respondents also noted a lack of school-based oral health education, meaning that at least some school-age children receive limited to no information about good oral hygiene practice.
- iv. **Delivery system barriers:** Key informants identified another set of barriers that concern the ability of parents/guardians to find dentists who are conveniently located and who offer weekend and/or evening appointment times. A long drive to the dental office or scheduling appointments during normal business hours can affect parent/guardian work schedules; it can also result in lost time from school for children. In turn, these adverse employment and school implications can act as a deterrent for parents/guardians seeking oral health care for their children. Respondents noted that the geographic

accessibility of dental providers may be especially challenging for parents/guardians who live in more rural parts of the state or who do not have their own transportation and are dependent on public transportation or rides from others.

- v. **Language and literacy barriers:** Lastly, key informants reported that parents/guardians may face language and literacy barriers to accessing oral health care. The supply of dentists that can serve patients in languages other than English or Spanish is limited throughout the state; thus, finding a dentist who speaks a patient's preferred language may be difficult. A related challenge is that few dental offices offer interpreter services. Children and their families with low English literacy skills may also face additional challenges. They may find the required pre-appointment paperwork intimidating, and thus difficult, to successfully complete. Lastly, completing required paperwork as part of a dental visit may also be a worry for some families with immigration issues, as family members may fear this paperwork will trigger a review of their immigration status.

B. Strategies for Increasing Utilization of Oral Health Care Services:

- **Increase availability of oral health services:** Dental offices should offer more appointments outside of standard operating hours such as evenings and weekends. Additionally, school-based oral health programs should expand the type of services they offer to include additional preventive and operative options. This would help to prevent the onset of dental disease in children. Furthermore, these oral health services should be structured so that parents must “opt-out” of a child receiving oral health care services instead of the current “opt-in” structure – this can address the paperwork barrier. Lastly, oral health services should be offered at other family service sites, such as at food banks, health fairs, churches, school events, WIC offices, etc. – this could occur with the utilization of mobile dental clinics.
- **Offer more oral health education:** Pediatricians, obstetricians, and other members of the medical team should be encouraged to educate families on the value of oral health, especially for young children (ages 0-5). For example, oral health education could occur at the 6-week post-partum visit. Additionally, oral health education geared towards parents should be offered in non-traditional settings such as schools, social services settings, and community-based organizations.

Thoughts on Oral Health Workforce Diversification:

- **Expand the role of Community Health Workers (CHWs):** CHWs could have an increased role in providing oral health education, particularly for non-English speaking families. This could include working with families at health centers as well as community events.
- **Maximize existing dental workforce:** School-based programs in the United States generally target low income, vulnerable populations less likely to receive private dental care; such as

children eligible for free and reduced lunch programs. Providing sealant programs in all eligible, high-risk schools could reduce or eliminate racial and economic disparities in the prevalence of dental sealants and yet they are underused.

- **Diversify oral health workforce:** Having individuals from different cultural/minority groups as dental providers could help increase access to care for members from these communities as well as improve patient compliance and health outcomes.
- **Increase the role of the primary care physicians/pediatricians:** Primary care physicians and pediatricians could have an increased role in providing oral health care services, but physician education and reimbursement would be needed. Interviewees wished that more pediatricians would be comfortable with providing fluoride varnish treatment in their office and conducting basic oral health screens. For those physicians not willing or able to provide oral health care, better referral and follow-up processes to dentists are needed.

Subsequent to the key informants identifying potential barriers to obtaining oral health care for children, they were asked to identify strategies for addressing these barriers. The four main themes that emerged surrounding successful strategies included providing in-person education and care navigation assistance, offering oral health resources and services in community and school settings, diversifying the oral health workforce, and increasing the role for medical providers.

1. **Provide in-person education and care navigation assistance:** Key informants identified strategies to educate families and facilitate care navigation, including the early and frequent counseling of parents/guardians and children by healthcare providers. Dentists, dental hygienists, and other health professionals (“anyone with a white coat”) were identified as families’ most trusted sources of oral health information. In addition, Community Health Workers (CHWs) were identified as another resource for oral health education. CHWs often have established relationships within immigrant and non-English speaking populations and are experienced at conveying health information in a culturally and linguistically appropriate manner. Key informants believed that expanded oral health training or certification in oral health would allow CHWs to provide counseling to families as well as help coordinate referrals and reminders for routine dental appointments.
2. **Offer oral health resources in community and school settings:** Key informants suggested that community and school settings can be leveraged as potential locations for expanding access to oral health services. Community-based organizations that families know and trust can serve as “dental sidewalks” that reduce “the distance between the child and a dental home.” These organizations may include family and youth outreach programs, preschools/daycare centers, churches, and neighborhood groups. One noted example was a community-based program run by ForsythKids that provides oral health services to children and their families at homeless shelters, food pantries, and other venues where social supports and wraparound services are offered, e.g., enrollment centers for MassHealth and WIC. Community events, such as street fairs, were also mentioned as opportunities for educating families about oral health and providing basic dental hygiene and screenings.

Schools were yet another setting identified where oral health services can be provided. According to some key informants, Worcester public schools have had some success in

implementing school-based oral health services. These services can take a number of forms ranging from basic education to direct care. For example, one end of this spectrum may include a school nurse conducting oral health education and distributing fluoride mouthrinse to strengthen teeth. A more intensive approach could include deploying dental hygienists in mobile clinics to provide basic services such as screenings, prophylaxis, fluoride treatments, and sealants to students with parental permission. Requiring parents to “opt-out” vs. “opt-in” would ensure that more students receive initial services. Follow-up treatment plans may then be sent home with students who require additional care recommending a subsequent visit with a dentist. Lastly, key informants noted that the success of school-based dental clinics hinges on the support of a school’s principal to allow time for the provision of oral health services within the school day as well as the involvement of the school’s nurse, who can ensure students are referred for follow-up dental care.

3. **Diversify the oral health workforce:** Another strategy identified by key informants to maximize access to oral health services was to increase the types of professionals who provide oral health education, screenings, treatments, and referrals. This can include training CHWs to offer oral health education to the communities they work with, as already noted. Additionally, the roles of dental hygienists and dental assistants can be expanded to work with more independence in various settings, such as schools and community-based events. Some key informants noted, however, that this care must be done under the close supervision of a dentist.
4. **Increase role for medical providers:** Key informants believed there are a variety of ways that medical providers, such as family physicians and pediatricians, could support better oral health care for children. Most notably, key informants wished that more medical providers were more knowledgeable and comfortable conducting basic oral health screenings and providing fluoride treatments for their patients. Alternatively, those providers choosing not to do this within their practice could instead provide referrals to dentists and follow-up to ensure that appointments are made. Some practice settings, notably community health centers in Worcester and Holyoke, have already created processes to make it easier to connect medical and dental providers. These processes include facilitating dental referrals and access to appointments within their health centers. Key informants also envisioned an expanded role for medical providers in oral health education, particularly as advocates for early dental care among their youngest patients. Obstetricians could educate their pregnant patients about the appropriate age to bring their child to a dentist, while pediatricians could promote the importance of healthy baby teeth and the need to establish a dental home within a child’s first year.

Informational Interview Conclusions

Children from low-income, racial and ethnic minority communities may face several barriers to accessing appropriate oral health services. Barriers such as the limited number of dental providers accepting MassHealth insurance coverage and dental practice limitations in offering evening and weekend appointments can potentially be minimized by improving access to oral health services in both traditional and non-traditional settings (e.g., schools, mobile units, and community-based

organizations). Access to oral health services can also be enhanced by expanding the types of professionals offering oral health education, screenings, and treatment. These individuals could be expanded beyond traditional dental providers to include CHWs, dental hygienists, and primary care providers and their office staff.

Within underserved communities such as Worcester and Holyoke, a multi-pronged educational approach is needed to provide accurate, culturally appropriate oral health information. Pediatricians, family physicians and even obstetricians can educate parents/guardians about the importance of child oral hygiene as well as the appropriate age to start oral health visits. Oral health education provided in schools and by community agencies serving families with young children can also provide key venues for disseminating dental information.

IV. Appendices

See Appendix I: “Exhibit A: Worcester Community Oral Health Fact Sheet” for the abbreviated community health profile to be used during future community engagement events. See Appendix II: “Community Events and Survey Results” for a detailed list of the results from the community events and survey results.

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