

Dental Disparities and Access to Fluoridation in Massachusetts

Background

Disparities in oral health exist for the children of Massachusetts¹ and for children across the United States.² National data consistently demonstrates that children living in poverty are disproportionately affected by poor oral health.² Locally, this is supported by results from a recent survey of Massachusetts 3rd graders indicating that 48% of all children and 65 % of children on MassHealth (low-income children) have a history of dental decay.¹

Dental decay is a bacterial infection and is the most widespread chronic childhood disease, 5 times more common than asthma. The health and social consequences of poor oral health are significant and costly, including children living in pain, or with infection which can then inhibit learning, speech, and eating, ultimately leading to problems in school, negative self-image, and poor nutrition.

Community water fluoridation is the best and most cost effective way to prevent dental decay. Living in a fluoridated community from birth reduces tooth decay as much as 40 percent.² According to the federal Centers for Disease Control and Prevention, every dollar spent on fluoridation saves an estimated \$38 in treatment costs.³ Not surprisingly, it is also evident that children from non-fluoridated communities in Massachusetts experience a larger proportion of severe, untreated dental decay than those from fluoridated communities.¹

Objectives

The purpose of this project is to determine if poorer communities and/or communities that have higher numbers of racial and ethnic minorities are more likely also to be communities that lack fluoridation. Therefore, these disparities in lack of fluoridation is not just a public health issue, which has a significant impact on the oral health of underserved populations, but also an issue of equity and social justice, whereby minority and disadvantaged groups are disproportionately affected in regards to their health from lack of access to community water fluoridation, one of the 10 greatest public health achievements of the 20th century.³

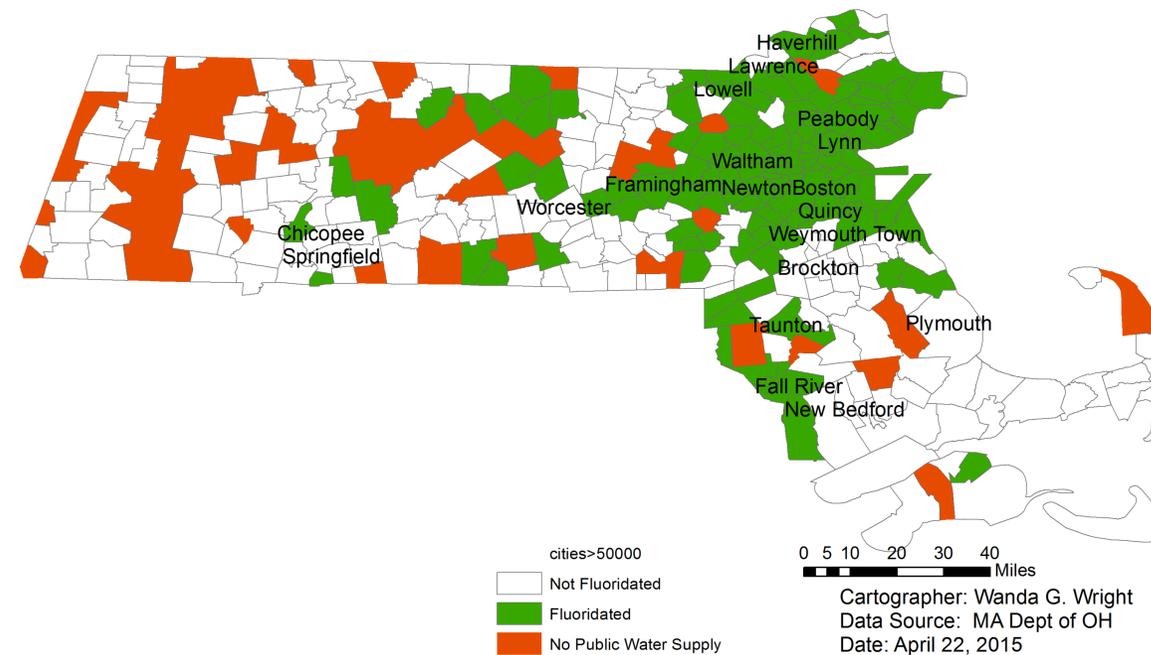
Methods

Data on the fluoridation status of MA communities were obtained from the MA Department of Public Health, Office of Oral Health and joined to the Massachusetts cities/towns layer. Data on the percentages of African-Americans, Hispanics and poverty levels were extracted from the 2010 Census to assess if there were racial disparities relating to the existing fluoridation status of communities. Symbology through graduated symbols was used to represent higher populations of each race.

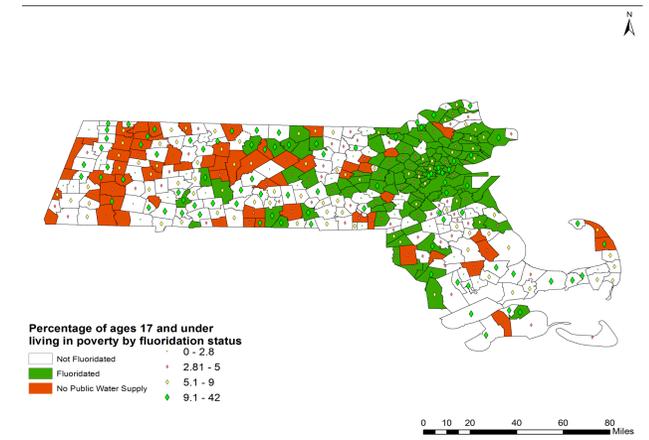
The Joins with Excel files was utilized to compare the demographics of fluoridated and non-fluoridated communities in the state. Thematic, symbology over choropleth maps were used to determine if communities with higher proportions of minorities and low-income individuals were more likely to live in areas without fluoridated water.

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Fluoridation status of Massachusetts cities and towns



Percentage of ages 17 and under living in poverty

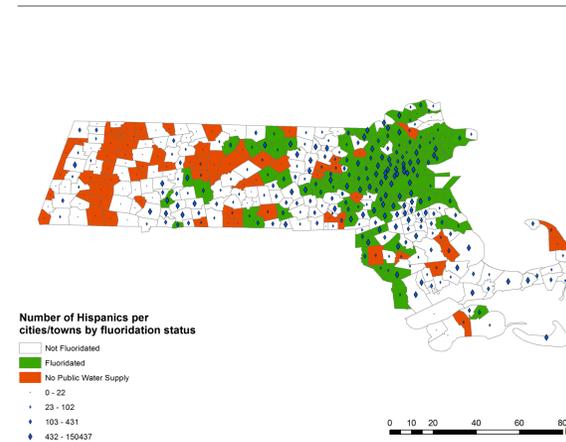


Discussion

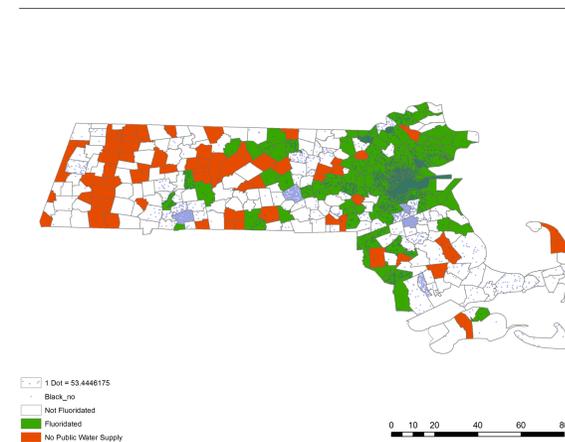
Community water fluoridation is a proven, safe, cost effective method to prevent dental decay. However despite the proven benefits and cost-effectiveness of fluoridation, Massachusetts lags behind other states in implementing fluoridation. The lack of access exist because individuals and groups opposed to fluoridation have been effective at turning fluoridation from a public health issue to a political issue. Massachusetts law gives local boards of health authority to investigate and order CWF. Residents can force a binding referendum on the issue by delivering a petition signed by 10% of the registered voters to the town election official within 90 days. The people of Massachusetts have traditionally held a strong belief in home rule and local autonomy. When the issue of fluoridation requires a vote, opponents can highlight issues such as loss of individual rights, misrepresented costs of fluoridation, and emotional charges of the dangers of fluoridation to steer voters away from the health issues that could be helped by fluoridation. Proponents, on the other hand, are forced to respond to the political campaign as well as educate the public about a complex scientific health measure. When voters receive conflicting complex information they often vote in favor of the status quo. There is evidence, however, that when the public is well informed about the benefits of fluoridation, especially with local information, they will accept community water fluoridation. Up to date scientific information that continues to link community water fluoridation with cavity prevention with an increased focus on cost effectiveness and safety is becoming the most important tool in the promotion of this essential public health measure.

The strength of this project is that it addresses an area that has not been previously studied in Massachusetts. One of the limitations is that data on oral health status was not included. Suggested next steps are to assess demographics at the zip code level and to also conduct a secondary analysis of oral health data to determine if the disparity in caries between low income children is worse in non-fluoridated communities than in fluoridated communities. Additionally, logistic regression will be conducted to examine associations

Number of Hispanics per cities/towns by fluoridation status



Number of Blacks per cities/towns by fluoridation status



Results

Over three million residents living in 136 of Massachusetts' 351 communities receive community water fluoridation, representing 63% of the population served by a public water supply. There are 154 communities in the state that could be fluoridated but are not, including Worcester and Springfield. Sixty-two communities in Massachusetts do not have public water systems and do not have the capacity to fluoridate.

This study examined communities with higher proportions of racial and ethnic minorities and communities with higher

proportions of low income individuals to determine if these communities were more likely to lack fluoridation. Visual inspection did not suggest an association between race/ethnicity/low income and fluoridation status.

References

- ¹The Oral Health Collaborative. Oral Health Foundation of Massachusetts. The Massachusetts Oral Health Report. 2004:7-19
- ²United States Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD; U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000
- ³Centers for Disease Control and Prevention. Fact Sheet. Fluoridation Statistics 2000: Status of Water Fluoridation by State. Available at <http://www.cdc.gov/OralHealth/factsheets/fl-stats-states2000.htm>

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