

Policy Briefing

ORAL HEALTH: Community Water Fluoridation and Other Tooth Decay Prevention Measures

Policy: Enact legislation to decrease the incidence of dental caries and associated disease by
1.) creating financial incentives for communities to develop optimally fluoridated water systems and
2.) creating programs to increase the use of dental sealants and fluoride products through public and professional education and subsidized treatment.

Intended Outcome: The purpose of this policy is to decrease the incidence of dental decay, especially among children.

Burden Addressed: Eighty-four percent of children, 96 percent of adults, and 99.5 percent of older adults (age 65+) have experienced tooth decay.¹ Oral diseases and conditions afflict more persons than any other single disease in the United States, and can result in difficulty in speaking, chewing and/or swallowing; costly treatments; loss of self-esteem; and decreased economic productivity through lost work and school days.²

Although research shows that children born today can completely avoid cavities, dental decay is the single most common chronic disease among children in the United States.³ Dental disease and treatment leads to over 50 million missed school hours each year.⁴ Among children, dental caries occurs five to eight times as frequently as asthma, and unless it is arrested early, the damage from dental decay progresses until it is irreversible.²

In addition, significant disparities exist in the treatment of tooth decay. Among children 5 to 17 years old, 80 percent of cavities occur in a subgroup of fewer than 25 percent of children.^{4,2} Nearly half of all tooth decay in low-income children remains untreated.³

Background: Several means exist to improve oral health and prevent or reduce the incidence of tooth decay including community water fluoridation and school-based programs offering dental sealants and fluoride applications.

Water fluoridation is the most cost-effective means available of preventing cavities.² The benefits of fluoridation include reduced frequency and severity of tooth decay, decreased need for tooth extractions and fillings, and reduced pain and suffering associated with tooth decay.¹ Fluoridation works through direct contact with teeth and benefits people of all ages, but is particularly important during the years teeth enter the mouth. The current level of community water systems providing optimal levels of fluoride is 62 percent, covering over 144 million people in the United States.¹ More than 100 million Americans, including 38 percent of those on public water systems, do not have access to water with enough fluoride to prevent tooth decay.³

Other forms of fluoride delivery include toothpastes, mouthwashes and fluoride applications applied by dental professionals. Children can also be prescribed dietary fluoride supplements if their home water supplies contain a low concentration of fluoride. However, these forms of fluoride delivery are far more expensive than water fluoridation, and may be less effective since they require a conscious, continuing decision to use them.¹

Dental sealants are plastic coatings that are applied to the chewing surfaces of molars, where most tooth decay in young people occurs. They are highly effective in the prevention of tooth decay, especially when applied to permanent teeth soon after they erupt. Sealant application is a relatively painless procedure, and sealants last for 5 to 10 years before needing to be re-applied. Dental sealants work best in combination with fluoride: fluoride protects the smooth surfaces of teeth, and sealants protect the pits and fissures on the chewing surfaces of the back teeth.¹

Despite the effectiveness of dental sealants, less than 30 percent of American children have them.³ This is due to a variety of reasons, including low rates of recommendation by dentists and insufficient knowledge about the safety and efficacy of dental sealants by parents and some dental care providers. Data from the most recent National Health and Nutrition Examination Survey (NHANES-III) indicate that lower-income children are significantly less likely to have seen a dentist within the past year or to have dental sealants.² And while the overall percentage of school-aged children with dental sealants has risen in recent years, (from 11 percent of 8-year olds in 1986-87 to 23 percent in 1988-94)² there has been no increase among children at low income levels.²

Evidence/Effectiveness: Overwhelming evidence documents the effectiveness of water fluoridation in preventing tooth decay.⁵ Grand Rapids, Michigan was the first city in the world to fluoridate its water supply. In a landmark study of the program's effectiveness, children who consumed fluoridated water from birth were found to have 50 to 63 percent less tooth decay than children examined in the baseline survey.⁶ Review studies of water fluoridation in other communities have found reductions in tooth decay ranging from 35 to 63 percent.⁷

Dental sealants that are placed using appropriate techniques and that are retained are virtually 100% effective at preventing tooth decay in the areas to which they are applied. A proven strategy for reaching low-income children who are at higher risk for dental disease is through school-based programs supporting linkages with health care professionals and other dental partners in the community.

Legislative Context: Communities are largely responsible for water fluoridation programs in their local drinking water supplies. This is done with state and federal assistance. The only federal regulations on fluoride are the National Primary Drinking Water Regulations, administered by the EPA, that set maximum levels of fluoride allowed in drinking water.⁸

California has required drinking water fluoridation for communities of over 10,000 people since 1996.⁵ The law provides no funds for construction of new systems or their operation. This has substantially diminished the impact of the law. Delaware has very recently begun requiring fluoridation of all community water supplies; however, it is too early to assess any health benefits.

Currently one out of every four children in the United States is covered by the Medicaid program that mandates comprehensive dental care; however, one study found that fewer than 20 percent of eligible children receive any preventive dental service.⁷

Costs: An estimated \$50.6 billion was spent for dental services in the United States in 1997,² of which public dental expenditures were only \$2.3 billion, mostly to dentists who treat Medicaid patients. Expenditures for dental services represent less than 1 percent of the total Medicaid budget.²

On average, water fluoridation costs 51 cents per person per year.³ The Centers for Disease Control and Prevention has estimated that every \$1 expenditure for water fluoridation could result in a savings of up to \$80 in dental treatment costs.⁹

A study of Medicaid-eligible pre-school children in Louisiana found that for those in communities without fluoridated water, the cost of dental treatment per child was twice as high as for those in communities with fluoridated water.¹⁰ The study concludes that providing fluoridated water to the 39,000 Medicaid-eligible preschoolers in Louisiana would save \$1.4 million each year in the dental treatment costs of these children.¹⁰

The California Legislature estimated that it would cost \$45 million in capital costs to begin fluoridation in communities affected by the 1996 law requiring water fluoridation in all communities of more than 100,000

residents and \$15 million in annual operating costs.¹¹ The CDC's total oral health budget, which includes promotion of water fluoridation, is \$6 million for fiscal year 1999.³

References:

1. Centers for Disease Control and Prevention. Surgeon General's Statement on Community Water Fluoridation. Atlanta, GA: 1995. www.cdc.gov/nccdphp/oh/flintro.htm
2. U.S. Department of Health and Human Services. *Secretary's Council on National Disease Prevention and Health Promotion: Objectives for 2010. Volume II.* Washington, DC: April 23, 1999.
3. Centers for Disease Control and Prevention. *Improving Oral Health: Preventing Unnecessary Disease Among All Americans.* Atlanta, GA: 1999. www.cdc.gov/nccdphp/oh/ataglanc.htm
4. Edelstein BL. *Public Financing of Dental Coverage for Children: Medicaid, Medicaid Managed Care, and State Programs.* Reforming States Group/Milbank Fund, 1998.
5. Ripa LW. A half-century of community water fluoridation in the United States: review and commentary. *J Public Health Dent* 1993;53(1):17-4.
6. Arnold FA Jr., Likins RC, Russell AL, Scott DB. Fifteenth year of the Grand Rapids fluoridation study. *J Am Dent Assoc* 1962;65:780-54.
7. American Dental Association. *ADA Report Underscores Importance of Dental Sealant Use.* News Release January/February 1997. <http://www.ada.org/newsrel/9701/nr-02.html>
8. Environmental Protection Agency, Office of Ground Water and Drinking Water. *National Primary and Secondary Drinking Water Regulations.* Washington, DC: 1999. www.epa.gov/OGWDW/wot/appa.html
9. Centers for Disease Control and Prevention. Public Health Focus: Fluoridation of Community Water Systems. *MMWR* 1992; 41(21): 372-375,381.
10. CDC. Water Fluoridation and Costs of Medicaid Treatment for Dental Decay—Louisiana, 1995-1996. *MMWR* 1999. 48(34): 753-757.
11. California Legislature, Senate Rules Committee, Office of Senate Floor Analyses. *AB 733 Assembly Bill - Bill Analysis.* Sacramento:1996.

Updated June 13, 2000.