

Fluoride in Water: Foundation of Cavity Prevention

Overview

Healthy teeth are essential for overall good health. However, tooth decay remains the most common chronic childhood disease in America. In New York State, one in four 3rd graders has untreated decay.¹ Children from low-income families are more likely to have untreated decay than their more affluent peers. Approximately 32% of low-income children had untreated tooth decay, while only 15% of children living in higher income settings had untreated decay.²

Tooth decay is a disease. Unless it is prevented, it must be treated or it can threaten a person's overall health. It is a disease with innumerable costs; in pain, in lost time away from school and work, and in health care spending. This is why the New York State Department of Health has made the reduction of tooth decay among children a centerpiece of its 2013-2017 Prevention Agenda.³

Prevention is crucial because children with dental problems are likely to enter adulthood with these problems. Last year, CNBC reported on one of the consequences for adults who have unhealthy or missing teeth: "In America most people—including employers—make instant judgments based on appearance, including someone's smile and teeth."⁴

More than sixty-five years of research and experience have yielded compelling results that prevention is the best way to avoid the pain, cost and other negative impacts of tooth decay. One effective, cost-effective, natural and safe way to prevent tooth decay is using fluoride.

Fluoride is Proven

Protecting and expanding access to fluoridated water is one proven strategy that benefits New Yorkers of all ages. Fluoridation, or the practice of adjusting the level of naturally occurring fluoride to the optimal level, is the single most effective and least expensive way to reduce decay for both children and adults. Fluoridated water has been shown to reduce tooth decay by about 25% over a person's

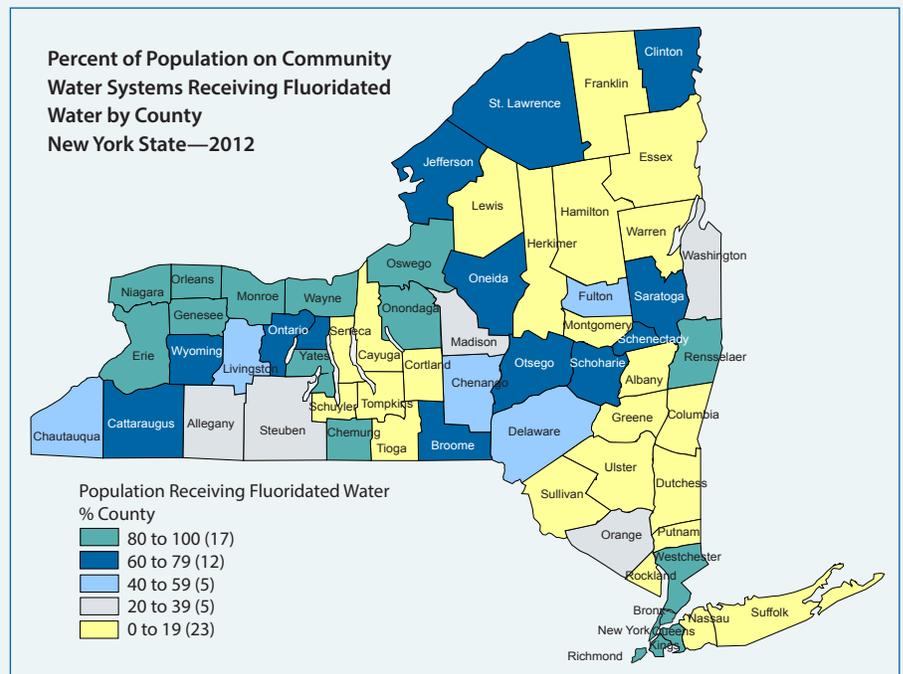


lifetime.⁵ The co-author of a recent study on fluoridation noted, "The more prolonged your exposure to drinking fluoridated water, the better."⁶ Even for people who regularly use fluoride toothpaste, fluoridated water provides crucial, added protection against decay.⁷ A study published in 1998 compared tooth decay rates in three Midwestern communities in which more than 90% of children were using fluoride toothpaste. This study revealed that those living in the community with fluoridated water had a tooth decay rate that was 45% lower than the rate for kids in the non-fluoridated communities.⁸

Fluoride is Cost Effective

A 2010 study revealed that low-income children in less fluoridated counties of New York needed 33% more fillings, root canals, and tooth extractions than those in counties where optimally fluoridated water was available.⁹ As a result, over the 12-month period of the study, the treatment costs per Medicaid recipient were \$23.65 higher per person for those living in less fluoridated counties.¹⁰ For example, Albany County with 26,076 children on Medicaid would save over \$200,000 in treatment costs over 12 months if the county water systems are optimally fluoridated. This estimate uses the current rate of dental visits for children on Medicaid, which is only 35%.¹¹ The estimate does not take into account the longer term and non-financial impacts, and savings accrued to adults.

As beneficial as community water fluoridation is, there are large areas of New York State that do not yet adjust fluoride to the optimal levels to prevent cavities. Outside of New York City, less than 50% of New Yorkers on community water systems are receiving fluoridated water. Currently, only 13 New York counties offer fluoridated water to 80% or more of their residents; in 27 counties of the state, less than 20% of residents have access to fluoridated water. This includes some of the New York's largest counties.



A recent study modeling practices in New York to prevent oral disease found that raising the share of children outside of New York City who have access to fluoridated water from 49 to 87% has the potential to save the State Medicaid program \$27.7 million over 10 years by reducing the need for fillings and other dental treatment. This strategy could save \$6.13 for every dollar spent.¹²

Fluoride is Natural

Fluoride is a mineral naturally present in all soils and plants, the air and in groundwater. Even the ocean naturally contains 1.2-1.5 parts per million (ppm) of fluoride (nearly double the concentration recommended for fluoridated drinking water).¹³ Adjusting fluoride in water for oral health benefits is similar to fortifying other foods with vitamins and minerals, such as iodine in salt, Vitamin D in milk, calcium in orange juice, and folic acid in breads or cereals.

Fluoride works by being absorbed onto the surface of a tooth, where demineralization (the formation of tooth decay) has taken place. The fluoride remineralizes tooth surfaces (replaces lost minerals), actually reversing the effects of decay. Fluoride also helps to make teeth stronger and more resistant to future decay. While there are other interventions that can help reduce decay, they are more costly¹⁴ than fluoridation and frequently do not reach the children and adults most in need of protection.¹⁵

Fluoride is Safe

New Yorkers can feel confident that the safety of fluoride in drinking water has been thoroughly researched. More than 3,000 studies have been published on the subject of fluoride or fluoridation. In New York State, researchers at the Department of Health have published more than 40 scientific reports addressing the issues related to benefits and risks of fluoridation. The weight of this research reinforces its safety. In addition, fluoride used in drinking water treatment meets all purity standards specified by NSF International.

In 1991 a special subcommittee of the U.S. Public Health Service (PHS) examined research on fluoride. Its report identified fluoridated water's benefits and found no valid evidence linking fluoride to serious health conditions.¹⁶ In 1993 and 2006, expert committees of the National Research Council did not find any harmful effects associated with fluoride in water at the levels promoted to prevent tooth decay (0.7-1.2 mg/L).¹⁷

For many years, panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective.¹⁸ A writer for Scientific American put the safety question in perspective. "When new medical treatments are implemented, when new drugs are introduced into the populace, there is always some hesitation," he noted, adding that "the long-term implications are often unclear. Water fluoridation

“Over 65 years of experience shows fluoridation to be safe and effective at reducing cavities for everyone, while saving health care dollars. Research here in New York documents better oral health and lower Medicaid expenditures on children’s dental procedures in communities with fluoridation.”

—Jason Helgerson, New York State Medicaid Director

doesn’t have this problem. For over 65 years, it has been rigorously tested as a public health measure, and considered one of the most successful measures” of the past 100 years.¹⁹

In March 2014, Public Health England—one of Britain’s leading health agencies—issued a report examining both the impact and safety of community water fluoridation. The agency reached this conclusion: “The report provides further reassurance that water fluoridation is a safe and effective public health measure.”

Most recently an extensive review of the scientific evidence regarding health effects of water fluoridation was completed by the New Zealand Prime Minister’s Chief Science Advisor and the Royal Society of New Zealand.²⁰ The review found “compelling evidence that fluoridation of the water at the established and recommended levels produces broad and continuing benefits for dental health. The public can be reassured on the basis of robust scientific data, that the implementation of this public health measure poses no risk of adverse health effects.”

Fluoride is Trusted

New Yorkers support fluoridation. Seventy percent of New Yorkers in a recent poll viewed fluoridation favorably.²¹ More than 125 national and international organizations recognize the benefits of fluoridation.²² Leading

health and medical organizations agree: optimally fluoridated water is effective in reducing decay, important for kids and adults of all ages. The American Academy of Pediatrics, the American Academy of Family Physicians, and many more medical and dental professional groups endorse water fluoridation. The U.S. Task Force on Community Preventive Services strongly recommends that community water fluoridation be included as part of any comprehensive strategy to prevent or control tooth decay. More than 80 organizations have signed on to the Campaign for Dental Health, a national coalition of organizations dedicated to sharing the facts about oral health and preventive strategies like fluoride.²³

Recommendations

New York should promote good oral health for children and adults by protecting and expanding the use of community water fluoridation. The state can provide science-based information and technical assistance to help communities that want to add fluoride. New York should explore funding strategies for fluoridation systems to assist new communities in adding fluoride and to help communities replace aging equipment.

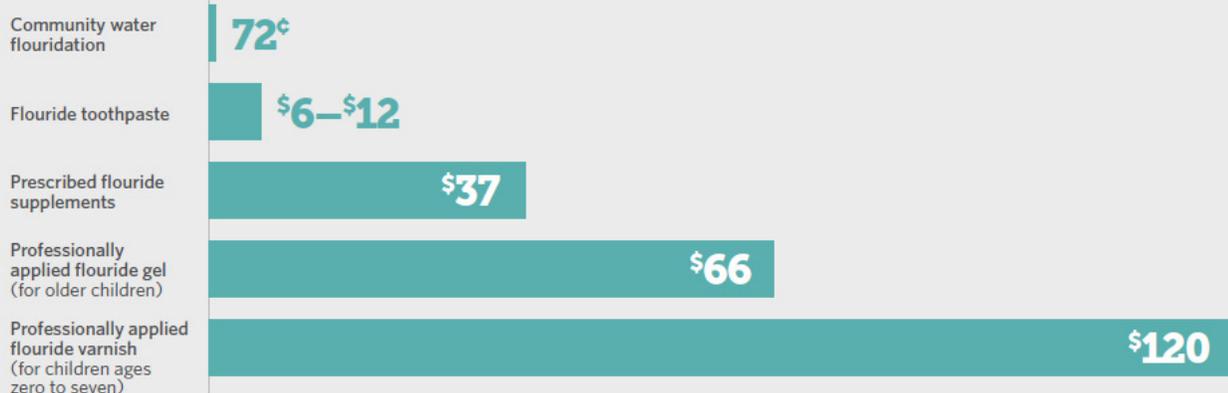
There are numerous preventive health strategies to help address the issue of tooth decay that can benefit the health of New Yorkers and save the state health care costs, but community water fluoridation is the most effective and offers the largest return-on-investment of any public health effort.²⁴ Water fluoridation benefits all residents served by community water systems regardless of socioeconomic status. By reducing the need for fillings and tooth extractions, fluoridation saves money for families and taxpayers.

All New Yorkers deserve good oral health. Community water fluoridation is the best foundation to keep New Yorkers smiling.



Solutions

Cost per child per year



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Endnotes

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- ¹⁰ The original figure (\$23.63) was corrected in a subsequent edition of this journal and clarified to be \$23.65. See: “Letters to the Editor,” *Public Health Reports* (November-December 2010), Vol. 125, 788.
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- ¹⁷ Centers for Disease Control and Prevention, CDC Statement on the 2006 National Research Council (NRC) Report on Fluoride in Drinking Water. Accessed at http://www.cdc.gov/fluoridation/safety/nrc_report.htm
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This is the third in a series of Issue Briefs on the prevention of dental disease in New York. To see our other reports, visit: www.scaany.org