children's dental health project

# **Q&A:** The Benefits & Safety of Community Water Fluoridation

**1. Why do we need to add fluoride to drinking water? Is tooth decay much of a problem anymore?**

Fluoride is a mineral that exists naturally in drinking water, but usually at a concentration too low for preventing tooth decay. This is why most U.S. communities fortify their water with additional fluoride. Although America's dental health has improved in recent decades, tooth decay remains the most common chronic childhood disease — five times more prevalent than asthma.[1] Toothaches and other dental problems can undermine a child's ability to eat, sleep, learn and socialize with other kids. Teens with dental pain are four times more likely to struggle academically.[2] Fluoridated water is the most cost-effective way to prevent cavities.

**2. What evidence shows that fluoridation is effective in preventing tooth decay?**

Scientists first demonstrated the cavity-reducing impact of fluoridated water in the 1950s.[3] Since then, dozens of studies have confirmed that fluoridated water safely reduces the rate of tooth decay. For example, a 2010 study revealed that low-income children in less fluoridated counties of New York needed 33 percent more fillings, root canals, and extractions than children from counties where fluoridated water was common.[4] Such solid research is the reason why the American Academy of Pediatrics, the American Dental Association, the Institute of Medicine and other respected medical and health organizations endorse the health benefits of fluoridation.[5] The U.S. Centers for Disease Control and Prevention (CDC) praised water fluoridation as one of "10 great public health achievements of the 20th century."[6]

**3. Since the 1980s, nearly all Americans have been brushing their teeth with fluoride toothpaste. Is fluoridated water still necessary?**

Yes. Numerous studies have been conducted since fluoride toothpaste became widely used, and they confirm that fluoridated water provides important added protection against tooth decay. Over the past several years, studies in Nevada, Alaska and New York demonstrate that children in fluoridated communities have better oral health.[7] The Nevada study found that living in a community *without* fluoridated water was one of the top three risk factors for teenagers' dental problems.[8] In addition, a 2002 research review concluded that water fluoridation is "the most effective and practical method" for reducing the gap in decay rates between low-income and upper-income Americans.[9] In 2013, a research paper concluded that water fluoridation "is still the optimal method" for providing fluoride's benefits.[10]

**4. What about adults? Do they benefit from drinking fluoridated water?**

Yes, adults benefit too. A study published in 2013 examined health data for 3,779 Australian adults and found that the longer people lived in fluoridated communities, the better their oral health. Adults who were born before fluoridation became widespread but who resided in

fluoridated areas for at least three-quarters of their lives had 30 percent less decay than those who resided in fluoridated communities for less than one-quarter of their lives.[11]

**5. Opponents of fluoridation say that tooth decay rates in Western Europe have fallen as fast as the U.S. rate without relying on community water fluoridation. Is this true?**

Tooth decay rates have fallen in Western Europe over the past several decades, but fluoride has played a significant role in this decline. Health officials in Europe provide fluoride in various ways. More than 13 million people in Britain, Spain and Ireland receive fluoridated water.[12] Drinking water, of course, is the most efficient way to provide fluoride to both children and adults. In parts of Italy, fluoridation is unnecessary because local water sources already have the optimal level of fluoride to prevent decay.[13] In addition, more than 70 million Europeans consume salt or milk that is fluoridated. Fluoridated salt reaches most of the population in Germany and Switzerland — two countries that have some of the lowest rates of tooth decay in Europe.[14] Fluoride varnish programs are used in Sweden and other countries to help prevent decay among children.[15] In 2012, a panel of European health experts recommended policies that "ensure access to fluoride for the whole population."[16]

**6. Is water fluoridation safe?**

Yes, water fluoridation is safe and has a positive effect on oral health. Fluoride and fluoridation have been thoroughly studied by researchers.[17] Although some anti-fluoride groups have created web pages attacking this public health practice, a close examination reveals that these sites often misrepresent what the research shows. CDC has summarized the scientific consensus: "For many years, panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective."[18] In 2012, a panel of European health experts endorsed fluoridated water, calling it a strategy that "is safe, cost-effective and has a demonstrable long term benefit" to people's oral health.[19] A scientific article co-written in 2004 by the World Health Organization's chief dental official concluded, "There is no credible evidence that water fluoridation is associated with any adverse health effects."[20]

**7. In December 2013, federal health officials finalized a recommendation that a different level of fluoride be used for water fluoridation. Why?**

The U.S. Department of Health and Human Services recommends that the optimal level of fluoride in public water systems should be 0.7 parts per million (PPM) in water. The previous recommendation called for optimal levels that vary based on a region's climate (average temperatures) within the range of 0.7 to 1.2 PPM. Researchers have since learned that people living in states with warmer climates consume similar amounts of tap water as those living in states with cooler climates and that Americans today receive fluoride from more sources.[21] Federal health officials periodically review research and rely on the best science to inform standards like this.

**8. What is dental fluorosis and how does it occur?**

Fluorosis is a mild cosmetic effect that occurs when a child is overly exposed to fluoride during the tooth-forming years, age 8 and younger.[22] Fluorosis leaves faint white spots on enamel, but does not cause pain or affect the health or function of teeth.[23] Many people with fluorosis do not

even notice it. Researchers who studied the effect of mild fluorosis — the type typically seen in the U.S. — on a person's quality of life found that it was not a concern. "In fact," they wrote, "sometimes it was associated with improved oral health-related quality of life, probably due to the public's greater emphasis on white teeth."[24]

**9. I read online that fluoridated water can lower IQ scores in children. Is that claim true?**

The IQ studies cited by anti-fluoride groups involve children living in areas of China, Mongolia and Iran. The U.S. researchers who reviewed those foreign IQ studies pointed out that each study suffered from some flaw and "in some cases rather serious ones that limit the conclusions that can be drawn."[25] Most of the studies tested fluoride levels that were far higher than the optimal level used to fluoridate public water systems in the U.S. In fact, these studies had concentrations of fluoride as 11.5 PPM, which is more than 10 times higher than the level used to fluoridate in the U.S. Many of these studies did not measure or report the actual fluoride level in the local water, making them unreliable.[26] The Harvard researchers who reviewed these foreign studies publicly distanced themselves from the way that anti-fluoride groups misrepresented the results.[27] It's also worth noting that between the 1940s and the 1990s, the average IQ scores of Americans improved 15 points. This gain — about three IQ points per decade — came during a period when fluoridation steadily grew to serve tens of millions of additional Americans.[28]

**10. Opponents say that the fluoride additives used to fluoridate water are a toxic by-product of the fertilizer industry. What about that claim?**

That is false. The quality and safety of fluoride additives are ensured by Standard 60, a set of guidelines developed by the National Sanitation Foundation (NSF).[29] These standards were created at the request of the Environmental Protection Agency to test and verify the health and safety of fluoride additives. The NSF is widely recognized for its scientific and technical expertise in the health and environmental sciences; hundreds of samples have been taken and tested under Standard 60 to confirm the quality and purity of fluoride additives.[30] In recent years, PolitiFact — an independent fact-checking service — examined the "toxic" by-product claim and two other common anti-fluoride arguments. All three claims were found to be deceptive.[31]

**11. Didn't the National Research Council (NRC) raise concern about the safety of water fluoridation in a 2006 report?**

No. The NRC committee's report raised the possibility of health concerns in U.S. communities where the existing fluoride levels in well water or aquifers are unusually high. These natural fluoride levels are significantly higher than the level used to fluoridate public water systems. The NRC itself explained that its report was *not* an evaluation of water fluoridation.[32] The Centers for Disease Control and Prevention wrote that the NRC's findings "are consistent with CDC's assessment that water is safe and healthy at the levels" used for water fluoridation.[33] In 2013, John Doull, the internationally respected toxicologist who chaired this NRC committee, stated that he did not see "any valid scientific reason for fearing adverse health conditions from the consumption of water fluoridated at the optimal level."[34]

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