

# Myths & Facts

## Responses to Common Claims about Community Water Fluoridation

THE TRUTH	FALSE CLAIMS	THE FACTS ABOUT COMMUNITY WATER FLUORIDATION (CWF)
<p>Fluoride occurs naturally in water, though rarely at the optimal level to protect teeth.</p>	<p><i>"Fluoride doesn't belong in drinking water."</i></p>	<ul style="list-style-type: none"> <li>• Fluoride exists naturally in virtually all water supplies and even in various brands of bottled water.<sup>1,2</sup></li> <li>• There are proven benefits for public health that come from having the optimal level of fluoride in the water — just enough to protect our teeth. In 2011, federal health officials offered a new recommended optimal level for water fluoridation: 0.7 parts per million.<sup>3</sup></li> </ul>
<p>Numerous scientific studies and reviews have recognized fluoride as an important nutrient for strong, healthy teeth.</p>	<p><i>"Adding fluoride is forced medication"</i></p>	<ul style="list-style-type: none"> <li>• Fluoride is not a medication. It is a mineral, and when present at the right level, fluoride in drinking water has two beneficial effects: preventing tooth decay and contributing to healthy bones.</li> <li>• U.S. court decisions have rejected the argument that fluoride is a medication that should not be allowed in water.<sup>4</sup> The American Journal of Public Health summarized one of these rulings, noting that "fluoride is not a medication, but rather a nutrient found naturally in some areas but deficient in others."</li> <li>• There are several examples of how everyday products are fortified to enhance the health of Americans — iodine is added to salt, folic acid is added to breads and cereals, and Vitamin D is added to milk.</li> </ul>
<p>Fluoridation is the most cost-effective way to prevent tooth decay and promote healthy communities.</p>	<p><i>"Our city council can save money by ending fluoridation of our water system."</i></p>	<ul style="list-style-type: none"> <li>• A community that stops fluoridating, or one that has never started, will find that local residents end up spending <i>more</i> money on decay-related dental problems. Evidence shows that for most cities, every \$1 invested in CWF saves \$38 in unnecessary treatment costs.<sup>5</sup></li> <li>• A Texas study confirmed that the state saved \$24 per child, per year in Medicaid expenditures because of the cavities that were prevented by drinking fluoridated water.<sup>6</sup></li> <li>• A Colorado study showed that water fluoridation saved the state nearly \$149 million by avoiding unnecessary treatment costs. The study found that the average savings were roughly \$61 per person.<sup>7</sup></li> </ul>
<p>Fluoridation is a public health measure, a modest community-wide investment that benefits everyone.</p>	<p><i>"Fluoridation is a 'freedom of choice' issue. People should choose when or if they have fluoride in their water."</i></p>	<ul style="list-style-type: none"> <li>• Fluoride exists naturally in virtually all water supplies, so it isn't a question of choosing, but a question of assuring that people receive the optimal amount to prevent tooth decay.</li> <li>• Maintaining an optimal amount of fluoride in water is based on the principle that decisions about public health should be based on what is healthy for the entire community and on what is backed by the scientific evidence.</li> <li>• Fluoridation is not a local issue. Every taxpayer in a state pays the price for the dental problems that result from tooth decay. A New York study found that Medicaid enrollees in counties where fluoridation was rare needed 33.4% more fillings, root canals, and extractions than those in counties where fluoridated water was much more prevalent.<sup>8</sup></li> </ul>

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<p>Fluoridated water is the best way to protect everyone's teeth from decay.</p>	<p><i>"We already can get fluoride in toothpaste, so we don't need it in our drinking water."</i></p>	<ul style="list-style-type: none"> <li>• The benefits of CWF build on those from fluoride in toothpaste. Studies conducted in communities that fluoridated water in the years after fluoride toothpastes became common have shown a lower rate of tooth decay than communities without fluoridated water. Fluoride toothpaste alone is not enough, which is why pediatricians and dentists often prescribe fluoride tablets to children living in non-fluoridated areas.<sup>9</sup></li> <li>• The U.S. Centers for Disease Control and Prevention (CDC) reviewed whether using toothpaste with fluoride alone was enough. After looking at all the ways we might get fluoride — including fluoride toothpaste — the CDC recommended that communities fluoridate water at 0.7 parts per million. Any less than that puts the health of our teeth at risk.<sup>10</sup></li> </ul>
<p>Very high fluoride concentrations can lead to a condition called fluorosis. Nearly all fluorosis in the U.S. is mild. This condition does not cause pain, and does not affect the health or function of the teeth.</p>	<p><i>"Fluoridation causes fluorosis, and fluorosis can make teeth brown and pitted."</i> and <i>"Forty percent of all children now have dental fluorosis."</i></p>	<ul style="list-style-type: none"> <li>• Nearly all cases of fluorosis are mild<sup>11</sup> — faint, white specks on teeth — that are usually so subtle that only a dentist will be able to identify them. Mild fluorosis does not cause pain, and it does not affect the health or function of the teeth.</li> <li>• The pictures of dark pitted teeth show <i>severe</i> cases of fluorosis, a condition that is almost unheard of in the U.S.</li> <li>• In 2011, the CDC proposed a new level for fluoridation — 0.7 parts per million — that is expected to reduce the likelihood of fluorosis while continuing to protect teeth from decay.<sup>12</sup></li> </ul>
<p>Getting enough fluoride in childhood is critical to strengthening our teeth over for an entire lifetime.</p>	<p><i>"Fluoride is especially unsafe for small children."</i></p>	<ul style="list-style-type: none"> <li>• According to the American Academy of Pediatrics (AAP), optimal exposure to fluoride is important to infants and children. The use of fluoride for the prevention and control of cavities is documented to be both safe and effective.<sup>13</sup></li> <li>• The American Academy of Family Physicians recommends that parents consider using dietary fluoride supplements for children at risk of tooth decay from ages 6 months through age 16 if their water isn't fluoridated.<sup>14</sup></li> <li>• Children who drink fluoridated water as their teeth grow will have stronger, more decay-resistant teeth over their lifetime. A 2010 study confirmed that the fluoridated water consumed as a young child makes the loss of teeth (due to decay) less likely 40 or 50 years later when that child is a middle-aged adult.<sup>15</sup></li> </ul>
<p>Children who swallow toothpaste are at increased risk of mild fluorosis.</p>	<p><i>"There's a warning label on fluoride toothpaste that tells you to 'keep out of reach of children', so fluoride in water must also be a danger."</i></p>	<ul style="list-style-type: none"> <li>• The warning label on toothpaste reflects the fact that it contains a higher concentration (roughly 1,000 times as much fluoride) per milligram as fluoridated water. Even so, the American Dental Association (ADA) believes the warning label on toothpaste exaggerates the potential for negative health effects from swallowing toothpaste. The ADA has stated that "a child could not absorb enough fluoride from toothpaste to cause a serious problem" and noted that fluoride toothpaste has an "excellent safety record."<sup>16 17</sup></li> </ul>

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<p>Fluoridated water is safe for babies and young children.</p>	<p><i>"Fluoridated water isn't safe to use for babies."</i></p>	<ul style="list-style-type: none"> <li>• The ADA states that "practitioners can suggest the continued use of powdered or liquid concentrate infant formulas reconstituted with optimally fluoridated drinking water."<sup>18</sup> Parents should discuss any questions they may have with their health care providers.</li> <li>• A 2010 study examined the issue of fluorosis and infant formula, and reached the conclusion that "no general recommendations to avoid use of fluoridated water in reconstituting infant formula are warranted." The researchers examined the condition's impact on children and concluded that "the effect of mild fluorosis was not adverse and could even be favorable."<sup>19</sup></li> </ul>
<p>Although Americans' teeth are healthier than they were several decades ago, many people still suffer from decay and the overall impact it has on their lives.</p>	<p><i>"Tooth decay is no longer a problem in the United States."</i></p>	<ul style="list-style-type: none"> <li>• Tooth decay is the most common chronic health problem affecting children in the U.S. It is five times more common than asthma. Tooth decay causes problems that often last long into adulthood — affecting kids' ability to sleep, speak, learn and grow into happy and healthy adults.</li> <li>• California children missed 874,000 school days in 2007 due to toothaches or other dental problems.<sup>20</sup> A study of seven Minneapolis-St. Paul hospitals showed that patients made over 10,000 trips to the emergency room because of dental health issues, costing more than \$4.7 million.<sup>21</sup></li> <li>• Poor dental health worsens a person's future job prospects. A 2008 study showed that people who are missing front teeth are viewed as less intelligent and less desirable by employers.<sup>22</sup></li> <li>• In a 2008 study of the armed forces, 52% of new recruits were categorized as Class 3 in "dental readiness" — meaning they had oral health problems that needed urgent attention and would delay overseas deployment.<sup>23</sup></li> </ul>

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<p>Leading health and medical organizations agree: fluoridated water is both safe and effective.</p>	<p><i>"Fluoridation causes cancer and other serious health problems."</i></p>	<ul style="list-style-type: none"> <li>• Leading health and medical authorities endorse water fluoridation as safe. The CDC reports that "panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective."<sup>24</sup></li> <li>• More than 3,200 studies or reports had been published on the subject of fluoridation.<sup>25</sup></li> <li>• According to the American Council on Science and Health, "Historically, anti-fluoride activists have claimed, with no evidence, that fluoridation causes everything from cancer to mental disease."<sup>26</sup></li> <li>• A 2011 Harvard study found no link between fluoride and bone cancer.<sup>27</sup> This study design, which was approved by the National Cancer Institute, reviewed hundreds of bone samples. This is significant because the National Research Council reported that <u>if</u> there were any type of cancer that fluoride might possibly be linked to, it would probably be bone cancer (because fluoride is drawn to bones). The fact that this study found no link to bone cancer strengthens confidence that fluoride is unlikely to cause any form of cancer.</li> <li>• Opponents frequently cite a 2006 study when they raise the cancer issue, but they neglect to point out that the study's author called it "an exploratory analysis." This study did not measure actual fluoride levels in bone samples but relied on <i>estimates</i> of fluoride exposures that could not be confirmed, undermining the reliability of the data.</li> </ul>
<p>Dozens of studies and 70 years of experience have repeatedly shown that fluoridation reduces tooth decay.</p>	<p><i>"Fluoridation doesn't reduce tooth decay."</i></p>	<ul style="list-style-type: none"> <li>• An independent panel of 15 experts from the fields of science and public health reviewed numerous studies and concluded that fluoridation reduces tooth decay by 29%.<sup>28</sup></li> <li>• An analysis of two similarly sized, adjacent communities in Arkansas showed that residents without access to fluoridated water had twice as many cavities as those with access to fluoridated water.<sup>29</sup></li> <li>• In New York, Medicaid recipients in less fluoridated counties required 33% more treatments for tooth decay than those in counties where fluoridated water was prevalent.<sup>30</sup></li> <li>• Adults benefit from fluoride, too. A 2007 review of studies found that fluoride prevents caries (tooth decay) among adults of all ages and that fluoridated water prevents decay by as much as 27%.<sup>31</sup></li> <li>• The CDC recognizes fluoridation's effectiveness in preventing tooth decay and cited fluoridated drinking water as one of the "10 great public health achievements of the 20th century."<sup>32</sup></li> <li>• The European Archives of Pediatric Dentistry published an analysis of 59 studies that concluded that "water fluoridation is effective at reducing [decay] in children and adults."<sup>33</sup></li> </ul>

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<p>Millions of people living in Europe are receiving the benefits of fluoride.</p>	<p><i>"European countries have rejected fluoridation."</i></p>	<ul style="list-style-type: none"> <li>• Europe has used a variety of programs to provide fluoride's benefits to the public. Water fluoridation is one of these programs. Fluoridated water reaches 12 million Europeans, mostly residents of Great Britain, Ireland and Spain. Fluoridated milk programs reach millions of additional Europeans, mostly in Eastern Europe.<sup>34</sup></li> <li>• Salt fluoridation is the most widely used approach in Europe. In fact, at least 70 million Europeans consume fluoridated salt, and this method of fluoridation reaches most of the population in Germany and Switzerland. These two countries have among the lowest rates of tooth decay in all of Europe.<sup>35</sup></li> <li>• Italy has not tried to create a national system of water fluoridation, but the main reasons are cultural and geological. First, many Italians regularly drink bottled water. Second, a number of areas in Italy have water supplies with natural fluoride levels that <i>already</i> reach the optimal level that prevents decay.<sup>36</sup></li> <li>• Technical challenges are a major reason why fluoridated water is not widespread in Europe. In France and Switzerland, for example, water fluoridation is logistically difficult because of the terrain and because there are tens of thousands of separate sources for drinking water. This is why Western Europe relies more on salt fluoridation, fluoride rinse programs and other means to get fluoride to the public. Salt fluoridation reflects the position of the World Health Organization, which has recommended that "salt fluoridation should be considered where water fluoridation is not feasible for technical, financial or sociocultural reasons."<sup>37</sup></li> </ul>
<p>Community water fluoridation is proven to reduce decay, but it isn't the only factor that affects the rate of tooth decay.</p>	<p><i>"There are states with a high rate of water fluoridation that have higher decay rates than states where water fluoridation is less common."</i></p>	<ul style="list-style-type: none"> <li>• CWF plays a critical role in decay prevention, but other factors also influence decay rates. Researchers often call these "confounding factors." Someone who ignores confounding factors is violating a key scientific principle. A person's income level is a confounding factor in tooth decay because low-income Americans are more at risk for decay than upper-income people. This makes sense because income status shapes how often a person visits a dentist, their diet and nutrition, and other factors.</li> <li>• Comparing different states based solely on fluoridation rates ignores key income differences. For example, according to 2012 data released by the CDC, West Virginia and Connecticut reach roughly the same percentage of their residents with fluoridated water — 91.1 percent and 90.3 percent, respectively.<sup>38</sup> Yet the percentage of West Virginians living below the poverty line is nearly double the percentage of those living in Connecticut. West Virginians are also more likely to get their drinking water from wells, which are not fluoridated to the optimal level.<sup>39</sup></li> <li>• It is misleading to compare states without considering other, confounding factors. A much more reliable approach is to compare residents of the <i>same</i> state who share similar traits, such as income levels. A 2010 study of New York counties did just this and found that people living in areas with fluoridated water needed fewer fillings and other corrective dental treatments.<sup>40</sup></li> </ul>

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Community water fluoridation is the most cost-effective way to protect oral health.	<i>"There are better ways of delivering fluoride than adding it to water."</i>	<ul style="list-style-type: none"> <li>• A 2003 study of fluoridation in Colorado concluded that "even in the current situation of widespread use of fluoride toothpaste," water fluoridation "remains effective and cost saving" at preventing cavities.<sup>41</sup></li> <li>• Studies conducted in communities that fluoridated water in the years after fluoride toothpastes were widely used have shown a lower rate of tooth decay than communities without fluoridated water.<sup>42</sup></li> <li>• The co-author of a 2010 study stated that research confirms the "the most effective source of fluoride to be water fluoridation."<sup>43</sup></li> <li>• Water fluoridation is inexpensive to maintain and saves money down the road. The typical cost of fluoridating a local water system is between 40 cents and \$2.70 per person, per year.<sup>44</sup></li> </ul>
Water fluoridation has been one of the most thoroughly studied subjects, and the evidence shows it is safe and effective.	<i>"The National Research Council's 2006 report said that fluoride can have harmful effects."</i>	<ul style="list-style-type: none"> <li>• The National Research Council (NRC) raised the possibility of health concerns about areas of the U.S. where the <i>natural</i> fluoride levels in well water or aquifers are unusually high. These natural fluoride levels are two to four times higher than the level used to fluoridate public water systems.<sup>45</sup></li> <li>• The NRC itself explained that its report was <u>not</u> an evaluation of the safety of water fluoridation.<sup>46</sup></li> <li>• The CDC reviewed the NRC report and stated, "The report addresses the safety of high levels of fluoride in water that occur naturally, and does not question the use of lower levels of fluoride to prevent tooth decay."<sup>47</sup></li> <li>• The toxicologist who chaired the NRC committee stated in 2013 that he does not see "any valid scientific reason for fearing adverse health conditions" from drinking fluoridated water.<sup>48</sup></li> </ul>
Anti-fluoride groups cite many "studies" that were poorly designed, gathered unreliable data, and were not peer-reviewed by independent scientists.	<i>"Studies show that fluoride is linked to lower IQ scores in children."</i>	<ul style="list-style-type: none"> <li>• The foreign studies that anti-fluoride activists cite involved fluoride levels that were at least double or triple the level used to fluoridate drinking water in the U.S.</li> <li>• British researchers who evaluated these studies from China and other countries found "basic errors."<sup>49</sup> These researchers pointed out that the lower IQs could be traced to other factors, such as arsenic exposure, the burning of high-fluoride coal inside homes and the eating of contaminated grain.</li> </ul>
Much of the fluoride used to fluoridate public water systems is extracted from phosphate rock.	<i>"Fluoride is a by-product from the phosphate fertilizer industry."</i>	<ul style="list-style-type: none"> <li>• Much of the fluoride used to fluoridate water is extracted from phosphate rock, and so is phosphoric acid—an ingredient in Coke and Pepsi. After fluoride is extracted from phosphate rock, much of that rock is later used to create fertilizers that will enrich soil. Opponents use this message a lot, maybe because they want to create the false impression that fluoride comes from fertilizer.<sup>50</sup></li> </ul>

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