

Health advocates fighting myths about fluoridation with science: Misinformation endangers oral health

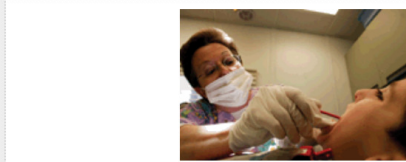
Charlotte Tucker

Dental advances over the past six decades mean that many Americans do not remember a time when tooth decay and disease was a major national public health problem.

But in the 1940s, more than 15 percent of World War II recruits were denied the ability to enlist in the Army because they lacked six pairs of opposing teeth.

The adult human mouth contains 32 teeth, and yet just 70 years ago a large number of 21- to 35-year-olds did not have even 12 good teeth.

Much of the credit for the nation's better oral health can be attributed to the decision in the 1940s to begin adding fluoride to public drinking water systems. According to the American Dental Association, fluoridation reduces tooth decay in all age groups by 20 percent to 40 percent "even in an era with widespread availability of fluoride from other sources, such as fluoride toothpaste."



Keri Thompson, a registered dental hygienist, applies fluoride to the teeth of a patient in 2007. Water fluoridation and preventive dental care have improved the oral health of Americans.

Photo by Seth McConnell, courtesy AP Images/Rapid City Journal

"We've come a long way," said Bill Bailey, PhD, director of oral health at the Centers for Disease Control and Prevention. "Fluoridation is the ideal public health measure. It's safe, it's effective and it reaches people of all ages."

In 1999, CDC named fluoridation of public drinking water one of 10 great public health achievements of the 20th century.



Drinking water fluoridation was named one of the 20th century's top public health achievements in 1999. Most U.S. homes connected to community water receive fluoride-adjusted water.

Photo by Nina Shannon, courtesy iStockphoto

From the early 1970s to the present, the prevalence of dental caries in at least one permanent tooth among adolescents ages 12-17 has decreased from 90 percent to 60 percent, and the average number of teeth affected by decay has decreased from 6.2 to 2.6.



Ana Beatriz Ramirez, a dental technician, works on a set of dentures at a lab in 2009. Statistics at the time showed that the number of Americans losing all of their teeth had declined by 60 percent since 1960. The reduction was attributed to fluoridation and preventive dental hygiene.

Photo by Joe Raedle, courtesy Getty Images

And yet today community water fluoridation is under fire from some who claim its health benefits are overblown and that fluoridation creates a higher risk for heart disease and cancer. There is no valid science supporting these claims, said public health officials who spoke with *The Nation's Health*, and yet they persist, kept afloat by Internet rumors and misinformation.

"People cannot differentiate between CDC and the American Dental Association and some quack outfit that's trying to scare people," said Myron Allukian Jr., DDS, MPH, president of the American Association for Community Dental Programs and a past president of APHA.

About 72 percent of American homes that are connected to community water supplies receive fluoride-adjusted water, according to CDC, and 12 states and the District of Columbia have laws designed to ensure access to fluoridated water.

Among states with such laws is Mississippi, which requires communities of 2,000 or more people to fluoridate their water systems and encourages fluoridation in smaller communities, said Nicholas Mosca, DDS, dental director of the state department of health. He said word seems to be getting through in many communities. For years communities along the state's Gulf coast were resistant to fluoridation, but more recently all systems have agreed to fluoridate, Mosca said.

While the overall movement is toward fluoridation, there are some communities that are backing away, said Bailey of CDC.

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That is the case in Holmen, Wis., which voted in a referendum in November 2008 to begin community water fluoridation. Fluoridation started in April, but stopped just eight days later after the town's board of trustees, composed of several recently elected members, voted 4-2 to discontinue fluoridating. The community, which approved fluoridation with 54 percent of the vote in the referendum, spent about \$82,000 on a fluoridation system, said village President Nancy Proctor.

While fluoridation supporters used a wealth of scientific evidence from sources including the state department of health and the American Dental Association to make their case, the decision to stop fluoridating was based on truncated information culled from the Web and was taken out of context, Proctor said.

Proctor told *The Nation's Health* that since the vote on April 26 to discontinue fluoridation, a number of community members have approached her about another binding referendum on the matter reversing the board's decision. She said she hopes to get the issue on the ballot in November.

Unfortunately, such setbacks have become more common, with news reports documenting challenges to community water fluoridation in other parts of the United States, Canada and New Zealand. However, there have also been significant fluoridation successes, such as in San Diego, which began fluoridating this spring. It was the last major city in the United States to begin fluoridating, Bailey said.

Some recent concerns about fluoridation in the United States stem from a notice published by HHS in January seeking comment on a change in its guidance on fluoridation. Previous guidance recommended fluoridation levels that ranged from 0.7-1.2 mg of fluoride per liter of water. HHS had determined that the range was not necessary and is poised to recommend the lower level of fluoridation, 0.7 mg/L. The new guidance is based on several considerations, the agency said, including scientific evidence related to effectiveness of water fluoridation on caries prevention, the availability of other sources of fluoride, trends in the prevalence and severity of a side effect known as fluorosis, and evidence that fluid intake does not vary depending on where a person lives.

Allukian said part of the reason HHS previously recommended a range of fluoride levels was the thinking that in warmer communities people drink more water, so less fluoride is necessary, whereas, the theory went, in colder communities people drink less water, so a higher concentration of fluoride is needed. Studies have shown, however, that water intake is not dependent on geographical location.

Furthermore, HHS said that because the likelihood of fluorosis — which is usually only a slight discoloring of the teeth — is greater with higher concentrations of fluoride, and a concentration of 0.7 mg/L has been shown to reduce dental caries, the range is not necessary.

Antifluoridation groups have seized on fluorosis as an argument against fluoridation, but oral health experts say that mild cases of fluorosis are cosmetic and do not pose a danger to health. The National Health and Nutrition Examination Survey of 1999-2004 assessed the prevalence and severity of dental fluorosis among people ages 6-49. It found that 23 percent had dental fluorosis, of which the vast majority was very mild or mild. About 3 percent had moderate or severe fluorosis, the study found.

In response to the HHS fluoridation guidance, APHA released a statement underscoring its support of fluoridated water, which the Association has long endorsed. In 2008, APHA reaffirmed that support through a policy statement that also emphasizes the critical role that public health practitioners, health care professionals, and policy-makers can play with respect to fluoridation.

That role includes educating people about the science of fluoride, such as the fact that it occurs naturally in all water, and, according to Allukian, can never be completely removed. Some communities have naturally occurring fluoride in their water — those were the communities where scientists first noticed the benefits of fluoride as it relates to tooth decay.

According to a report from the American Dental Association, "for generations, millions of people have lived in areas where fluoride is found naturally in drinking water in concentrations as high or higher than those recommended to prevent dental decay" without any evidence of health problems.

In communities where fluoride occurs naturally, Environmental Protection Agency regulations require monitoring to prevent excessive fluorosis. The agency recommends that fluoride levels not exceed 2.0 mg/L and it has an enforceable standard of 4.0 mg/L. If a community's fluoridation level exceeds 4.0 mg/L it may be subject to fines from EPA, though close monitoring prevents overfluoridation. States have the option to create their own maximum levels, many of which are lower than EPA's maximum.

Money invested in fluoridation pays off

According to the American Dental Association, the average cost for a community to fluoridate its water ranges from 50 cents per year per person in large communities to \$3 a year per person in small communities. In most cities, the association said, every \$1 invested in water fluoridation saves \$38 in dental treatment costs.

Public health professionals are so confident in the benefits of fluoride that they routinely prescribe it to families who live in communities that are unfluoridated.

James Gaskell, MD, health commissioner in the Athens City-County Health Department in Ohio and a retired pediatrician, said he always asked parents of new babies where they lived. Athens did not fluoridate its water supply until eight years ago, a fact that "surprised and appalled" Gaskell when he moved there. If new parents lived in an unfluoridated area of the county, he prescribed fluoride drops for their babies.

"In our nation we have a worry about adding chemicals to our food and water," he said. "But you don't have to look very far to see examples of benefits from food additives: vitamin D added to milk prevents rickets, iodine added to salt prevents goiters, folate added to bread prevents spinal cord disorders."

Nevertheless, said Howard Pollick, BDS, MPH, a clinical professor in the University of California San Francisco's School of Dentistry and an APHA member, sometimes fluoride is treated as the scapegoat for unexplained maladies.

"Science has eluded our efforts to find cures for certain diseases," he said. "So people will look for factors that they think might be causing their loved ones to have some kind of disease. In the absence of some other information, they will point to what is out there in the environment that could be causing this."

Pollick, Allukian and other public health professionals say the only counterargument to the antifluoridation groups is science.

"You go to the science," Pollick said. "You go to the evidence. You have to look at the evidence when reviewed by scientific bodies. Not by a city council."

In Mississippi, Mosca said the goal is to help people understand what fluoridation is and how it works.

"What we strive to communicate is that the adjustment of fluoride in water provides maximal benefit with minimal risk," he said.

For more information on fluoridation, visit www.cdc.gov/fluoridation.