

To fluoridate or not to fluoridate: the saga continues

By Anthony King, freelance journalist based in Dublin

Water fluoridation is the second subject to be unpicked in our new series of columns delving into possible pseudoscience observed in the world of dentistry.

Why is water fluoridated?

It is a cost-effective way of reducing dental caries rates. The fluoride binds to enamel and makes it more resistant to acid attack from bacteria. The World Health Organisation supports water fluoridation and estimates 370 million people worldwide benefit from fluoridated water. Fluoridating public water is supported by the American Dental Association, the American Medical Association, and the British Dental Association.

What are the harms that fluoride is supposed to cause?

In 1976, a study linked fluoride intake to cancer; it has since been discredited. A 2012 Harvard study reported a link between high fluoride levels found in naturally occurring water in China and lower IQs;¹ many saw it as too much of a stretch to link it directly to public water supplies, since the concentration of fluoride was much higher. Deans of public health, dentistry and medicine responded in support of fluoridation.²

A 2016 Mexican study reported an association between maternal urinary fluoride levels and child cognitive development.³ The authors cautioned that further research was needed.

Campaigners for fluoridation are adamant that it is safe: 'Do residents of fluoridated Birmingham and Newcastle have lower IQs than residents of Manchester or Liverpool? Of course not, but they do have better dental health,' said Michael Foley, at Brisbane Dental Hospital, Queensland. The American Cancer Society offers advice to those who are concerned their families may be exposed to excessive fluoride.⁴

Is there any evidence that fluoridation causes harm?

There are studies looking into effects of fluoridation, but most medical, scientific and public health bodies view the intervention as safe. In Australia, Queensland allows communities to opt out of water fluoridation and there are no reported health discrepancies between opt-out communities and the rest of Australia. A 2015 study in New Zealand found no difference in IQs between those exposed to fluoride in water and those not.⁵ Nonetheless, there continues to be bona fide research looking at potential consequences of adding fluoride and fluoride intake levels. Evidence for harm is not there.



Are anti-fluoridation views disguised pseudoscience?

The most passionate anti-fluoridation campaigners cite experts from decades ago, claim fluoride is rat poison, or quote animal studies with extreme exposures to fluoride. It is well recognised that *high* doses of fluoride – in natural water sources or foodstuffs – is bad for you.

The Fluoride Action Network (<http://fluoridealert.org>) is a leader of anti-fluoridation campaigns and has promoted a 2017 position paper linking fluoride to Alzheimer's disease, cancer, diabetes, heart disease, infertility, and many other adverse health outcomes.⁶ Linking a public health measure to fatal and debilitating conditions requires solid scientific evidence; this is not there.

'Most of the listed references [in the position paper] are replicated or links to other position papers,' says Dr Poul Erik Petersen, WHO senior consultant of the Oral Health Programme, 'and the document avoids carefully making reference to the advanced population studies on the dental caries preventive effect published in recognised peer-reviewed scientific journals.'



◀◀ **Opt-out communities and ethical objections to fluoridation**

Many communities have opted out of fluoridation and proponents say the dental health of these populations is suffering as a consequence. There are valid ethical objects to compulsory treatment of citizens, however. Dr Philippe Grandjean, environmental scientist at Harvard (and author of the aforementioned 2012 study¹), says he prefers topical treatment over systemic, unless we can be certain that fluoride has no toxic effects. 'We also need to determine whether fluoridation is at all needed nowadays.' This is a valid question.

Is anti-fluoridation bad science?

Undoubtedly purposeful exaggeration has been used to frighten the public about water fluoridation. Anti-fluoridation campaigners have often misrepresented the evidence. This is bad science. Policy makers must follow current advice of public health experts: that fluoridation is safe and effective. 'Community water fluoridation is safe and cost-effective and should be introduced and maintained wherever

socially acceptable and feasible,' says Dr Petersen. It is not bad science to investigate concerns about fluoride effects, to argue the ethics of compulsory fluoridation or to investigate viable alternatives. ■

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2. Flier J S, Donoff R B, Frenk J. Letter from Deans of Harvard Medical School, Harvard School of Dental Medicine and the Harvard School of Public Health to Dr Myron Allukian, Jr, Immediate Past President, American Association for Community Dental Programs, in support of water fluoridation. 22 March 2013. Available at: <http://www.masscoalitionfororalhealth.org/files/2012/09/Harvard-Letter-3-Deans-March-2013.pdf> (accessed February 2018).
3. Bashash M, Thomas D, Hu H *et al*. Prenatal fluoride exposure and cognitive outcomes in children at 4 and 6–12 years of age in Mexico. *Environ Health Perspect* 2017; **125**: 097017.
4. American Cancer Society. What causes cancer? Water fluoridation and cancer risk. 24 July 2015. Available at: <https://www.cancer.org/cancer/cancer-causes/water-fluoridation-and-cancer-risk.html> (accessed February 2018).
5. Broadbent J M, Thomson W M, Ramrakha S *et al*. Community water fluoridation and intelligence: prospective study in New Zealand. *Am J Public Health* 2015; **105**: 72–76.
6. Kennedy D, Just A, Kall J, Cole G. International Academy of Oral Medicine and Toxicology (IAOMT) position paper against fluoride use in water, dental materials, and other products for dental and medical practitioners, dental and medical students, consumers, and policy makers. 22 September 2017. Available at: <https://iaomt.org/wp-content/uploads/IAOMT-Fluoride-Position-Paper.pdf> (accessed February 2018).