Fluoridation of community water and the politics of disinformation

First of two parts

Benjamin Mateus
6 December 2024

This is the first part of a two-part analysis. Part two can be accessed here.

The Centers for Disease Control and Prevention (CDC) has called the fluoridation of public drinking water one of the 10 greatest public health achievements, ranking with vaccination, control of infectious diseases, safer and healthier foods and contraception. All of these social gains, based on the development of science and technology, have been severely impacted in recent years as a consequence of the crisis of capitalism. And now fluoridation of drinking water is on the chopping block.

Donald Trump's presumptive health czar Robert F. Kennedy Jr., the anti-vaccine zealot and serial purveyor of disinformation about public health and science, has unequivocally stated that he would advise water districts on Inauguration Day to remove fluoride, which he has described as "an industrial waste associated with arthritis, bone fractures, bone cancer, IQ loss, neurodevelopmental disorders, and thyroid disease."

Although every principled scientist and science-based medical organization has called these claims unfounded, the reemergence of anti-fluoridation as a political campaign led by fascistic and right-wing organizations is a dangerous development. These reactionary forces intend to sow mistrust in science and, by extension, all social programs that provide any even modest benefits to communities across the country.

Unsurprisingly, Florida's right-wing surgeon general, Dr. Joseph Ladapo, has openly endorsed RFK Jr.'s quackery and called for the immediate ending of water fluoridation in the state, falsely asserting that fluoride poses a considerable risk to developing brains. Ladapo was previously exposed for altering the findings of a state-led study to support his claims that COVID vaccines are harmful.

Perhaps most revealing has been the rapid adaptation made by the leading corporate newspapers—the *New York Times* and *Washington Post*—to RFK Jr.'s fanatical distortions and deceit. Their in-house public health columnists, economist Emily Oster and Dr. Leana Wen, COVID minimizers *par excellence*, who promoted the opening of schools at the height of the pandemic and supported Biden's policy of "learning to live with the coronavirus," are now applying the same techniques to the attack against fluoridation.

They do not directly address RFK Jr.'s bald assertions or the dangers posed by the call for a total war on public health, especially in the context of the threat posed by the emerging bird flu pandemic. Instead, they call for reasonable accommodations to RFK Jr.'s anti-science position, even going as far as declaring, as Wen does, that his call to remove fluoride from public drinking water is "not an entirely crazy idea, " providing legitimacy to RFK Jr.'s fringe conspiracy theories.

Oster asks her readers to assume a more nuanced approach to issues of vaccination, drinking raw milk and fluoridation, where these can be discussed in a more "balanced" way with right-wing forces. She argues, "It also requires health authorities to recognize that prioritizing this messaging means making trade-offs. If health experts share a more balanced message about raw milk, more people might drink raw milk. And, yes, that does entail some increased risk." But her hope is that possibly this strategy may convince people to take vaccines and save some lives.

This argument is a death sentence for science, and, literally, for those who will become the victims of diseases whose spread is assisted by the conspiracy theorists. The Flat Earth Society is based on a "not entirely crazy idea," Dr. Wen might argue, because the earth appears flat to the uninformed gaze. Science should make no compromises with a person like RFK Jr. who opposes medical progress and willfully misrepresents it to promote his own career, with catastrophic consequences for the entire public health system.

The National Toxicity Program study on fluoride

In response to criticism from her readers, Dr. Wen cites the discredited National Toxicity Program (NTP) monograph on the state of the science concerning fluoride exposure and neurodevelopment and cognition, a CDC meta-analysis (an overview of other studies rather than independent direct research) which had concluded with "moderate confidence" that fluoride in drinking water is *linked* with lower IQ in children.

There are defects in this study too numerous to detail exhaustively, but its significance has been dismissed by the American Dental Association, and it deals with naturally occurring fluoride in drinking water outside the United States, mainly in China, at levels 10 times or more higher than the fluoride added to some US water systems. Wen seems unconcerned by these critical issues, or by the severe limitations of the NTP conclusions cited by many who have reviewed the lengthy document.

Instead, she opts to support her fringe position by employing another oft-used false dichotomy, using a purported association between fluoride and lower IQ to suggest an actual causal connection, though none is known. She writes, "If given the choice of what is more important to their kids—preventing cavities or saving IQ points—many people would probably choose the latter. Cavities can be treated, but effects on the brain are often irreversible."

Her argument effectively declares fluoride a neurotoxin, which has never been established, especially at the recommended levels of fluoride in US drinking water.

First, the current recommended level of 0.7 milligrams per liter (mg/L) is far lower than the more than 1.5 mg/L associated with what has been

cited in the NTP as levels that are linked to loss in “IQ points.” The study did not reach any conclusions about US drinking water, nor have large trials addressing this question been conducted.

A 2019 Canadian study on maternal fluoride exposure during pregnancy that Wen also cited was dismissed by WHO’s water quality standards expert, John Fawell, professor at Cranfield University, who pointed out, “There’s not a real mechanism to explain the association, so one has to be a little cautious about [their] conclusions.” One of the limitations of that study cited by experts was conducting IQ tests at ages three and four, before such tests could be deemed reliable, since most children do not read by that age.

But if Wen is so concerned about neurodevelopmental problems in children, then why does she not call for elimination of COVID, where multiple studies have demonstrated Long COVID’s impact on the brain’s cognitive functions. Even in patients who had recovered from SARS-CoV-2 infection, a 3-point IQ loss was seen on neurocognitive testing. Among those with lingering Long-COVID symptoms, an equivalent to a 6-point IQ loss was reported. And among those who had been hospitalized in the ICU, they experienced a 9-point IQ drop.

Furthermore, a recent study found Long COVID rates among children can range from 14 to 20 percent. Another study found that a significant proportion of kids showed inability in maintaining sustained or divided attention. More than half suffered from cognitive regulation and almost all had anxiety and/or depression. And while COVID and Long COVID remain an ongoing public health threat, there is no evidence for fluoridation of drinking water and the impact of IQ drop in US children.

On the inconsistencies of the NTP fluoride monograph, it bears mentioning the following report—“Fluoride and Children’s IQ: evidence of causation lacking”—that reviewed the NTP’s meta-analysis and highlighted many of its methodological inconsistencies. The study found “selection bias” in the monograph, which used studies that had low participation rates and high IQ loss to follow up. Serious questions about the validity of the fluoride and IQ measurements used in these studies were raised. The authors of the critique concluded, “[The] current evidence base related to IQ is insufficient to draw conclusions, and further high-quality research is needed.”

What the American Dental Association said

The American Dental Association’s (ADA) committee reviewing the NTP document said that the NTP monograph provided no new conclusive evidence that would necessitate any changes in the current practice of community water fluoridation.

Dr. Scott Tomar, professor and associate dean at the University of Illinois at Chicago College of Dentistry, who is a member of the National Fluoridation Advisory Committee, said, “The bottom line is that the National Toxicology Program report and other recent systematic reviews indicate that the level of fluoride used in community water fluoridation is effective for preventing tooth decay and is not associated with any change in people’s IQ or neurological development.”

Dr. Howard Pollick, ADA spokesperson on fluoridation, said during a panel hearing convened by the National Toxicology Program in 2023 to determine if the organization had resolved the methodological concerns expressed by the report’s original peer reviewer, the National Academies of Sciences, Engineering and Medicine, several federal agencies, the ADA and others:

> After the [National Academies of Sciences, Engineering and Medicine] committee reported the first two drafts would not survive scientific scrutiny without major revision, [the National Toxicology Program] abandoned that course of peer review and, instead, hand-picked its own panel to review the draft before you. [The National Toxicology Program] also has not resolved what [the National Academies of Sciences, Engineering and Medicine] identified as “worrisome inconsistencies” in its risk-of-bias determinations. That is not consistent with the spirit of a truly independent peer review.

Dr. Jayanth Kumar, DDS, MPH, former California state dental director and NFAC (National Fluoridation Advisory Committee) member, explained that the NTP fluoride report had failed to reveal the biases inherent in the existing studies used to arrive at its conclusion. He also found quite problematic that the authors of the fluoride report had not addressed the concerns raised by the National Academies review, not once, but twice, and which had persisted in their latest draft. The National Academies wrote in 2021:

> [The] committee is still concerned about the presentation of the data, the methods, and the analyses in the revised monograph and finds that the monograph falls short of providing a clear and convincing argument that supports its assessment. The committee urges NTP to improve the clarity of the document. The monograph has great importance in the discussion about effects of fluoride on neurodevelopmental and cognitive health effects and will likely influence exposure guidelines or regulations. Thus, it is extremely important for it to be able to withstand scientific scrutiny by those who have vastly different opinions on the risks and benefits associated with fluoride exposure. The committee strongly recommends that NTP improve the revised monograph by seriously considering the suggestions that are provided in this letter report to improve its clarity and transparency.

Kumar, furthermore, said that the report had relied heavily on the use of spot urinary fluoride to assess exposure despite a scientific consensus that such tests are invalid in addressing long-term fluoride exposure. The NTP report had also previously stated that fluoride was a “presumed cognitive neurodevelopmental hazard to humans” irrespective of exposure levels. The NTP had to remove this after the National Academies took issue with it. In the second review linked above, they wrote, “The monograph falls short of providing a clear and convincing argument that supports its assessment. While the final NTP report, released on August 21, 2024, has removed the previous assertion that fluoride is a presumed neurodevelopmental hazard, the study failed to complete the peer review process recognized as confirmation of its conclusions.

The report failed to arrive at any conclusions about water fluoridation in the US. Nearly two-thirds of the studies cited in the meta-analysis were published in less reputable journals that the National Library of Medicine does not index. Many of the studies referenced in the final monograph relied on spot urine samples considered unreliable. Other deficits included problems with how the IQ tests were administered that weakened the reliability of the scores.

Critics have pointed out that the NTP monograph omitted studies from community water fluoridation in Australia, New Zealand and Spain that showed no links between fluoride exposure and cognitive deficits. Instead, the studies reviewed in the NTP report had much higher levels than those in the US water fluoridation program. None of the 19 studies that the NTP

selected were from the US, and 17 were in regions with naturally high levels of fluoride, making its generalization difficult.

Steven Novella, a clinical neurologist at the Yale University School of Medicine, who has reviewed fluoride studies extensively, provided context to these discussions that have been seized on as anti-fluoride talking points. He wrote in 2023:

> Recent anti-fluoride activism has been focusing on studies showing that high enough fluoride levels can be a neurotoxin. This tactic took off with a Harvard study back in 2012. The Harvard study still gets prominent mention in anti-fluoride posts, as if it's still news, or somehow is being suppressed. The study was a meta-analysis of studies, mostly occurring in China. These were ecological studies comparing measures of IQ in children to see if there is a statistical correlation with fluoride exposure from drinking water. The study found a positive correlation, making it a permanent member of the anti-fluoride rhetoric.
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> However, details matter. The studies involved naturally-occurring fluoride in drinking water, not communities where the levels of fluoride were controlled (which is why they took place in China, that largely does not control fluoride levels). They found that communities with high levels of fluoride in the drinking water had lower IQs on average than communities with low levels of fluoride. But here is the critical point missed in a lot of reporting and in anti-fluoride propaganda—the low-level communities had fluoride levels in their drinking water in the same range as fluoridated water in the US and other Western nations. Fluoridated water was the low-level control group that had the higher IQs.

Additionally, he also pointed out that the association with lower IQs and very high levels of fluoride have not been established as there are many confounding variables in observational studies that require considerable statistical manipulation to assess small statistical effects. In a 2023 systematic review of 30 studies, the one and only study from New Zealand with a strong quality of evidence, found no adverse effects between fluoride exposure and IQ.

Novella concluded with the following observation:

> Of course, all potential neurotoxicity to the developing brain should be taken very seriously. Every IQ point is a precious human resource. For this reason, we should err on the side of caution when it comes to potential toxicity. What the current data shows is that there is a potential of neurotoxicity from fluoride at high levels, significantly higher than in the drinking water. But the same data shows, if anything, the managed drinking water levels are safe. Further, the best quality evidence does not show any clinical effect.

Continued in part two.