

10 years on: the legacy of the Flint water crisis

The exposure of residents to lead in drinking water caused a national outcry, prompting requirements to update infrastructure and tighten water quality standards. Susan Jaffe reports.



A decade ago, the city of Flint, Michigan, USA, received international media attention after dangerous concentrations of lead were detected in its public drinking water and in tens of thousands of residents who drank it, including young children most vulnerable to the neurotoxin. While the water crisis spurred action to improve water quality regulations in the USA, the city's recovery is still a work in progress.

"One of the positive things that happened because of Flint is that we've really increased the nation's awareness of our drinking water safety, and the lack of child protective standards", said Mona Hanna-Attisha, a Flint paediatrician who collected data on children's lead blood levels in 2015. It would be another year before her findings persuaded the state of Michigan to declare an emergency in Flint and begin distributing bottled water to residents.

"We are doing the hard work of investing in infrastructure and strengthening regulation, so there's been some really wonderful positive ripple effects", said Hanna-Attisha, who is also an Associate Professor at Michigan State University (MSU) College of Human Medicine and director of the MSU-Hurley Children's Hospital Pediatric Public Health Initiative. However, since Flint, she said similar water crises have occurred throughout the USA. "We continue to use the bodies of kids as detectors of environmental contamination. We need to do a better job detecting lead in the environment and removing it before kids are exposed."

By revealing the health consequences of contaminated drinking water, the Flint debacle led to two major nationwide advances, said Elizabeth Southerland, a 33-year

veteran of the US Environmental Protection Agency (EPA) and former director of the Office of Science and Technology in the EPA National Water Program. In November, 2023, the Biden administration proposed a new EPA rule requiring all drinking water pipes containing lead throughout the USA to be replaced in 10 years, with additional time granted for some cities. Known as the lead and copper rule, it would also lower the threshold for remediation from 15 parts per billion to 10 parts per billion, and mandates a nationwide inventory of lead pipes, more rigorous water sampling, and more accurate contamination reports. It also closed some loopholes in a Trump administration water rule that allowed water systems to use workarounds to "misrepresent" sampling results, Southerland said.

Without Flint, "there would have been less pressure on the Biden administration to accelerate lead service line replacements", she said. The rule is expected to take effect in October, 2024. However, if former President Trump is elected president again in November, Biden's new lead rule could be in jeopardy. A Trump campaign spokesman did not respond to a request for comment.

The second development tied to the Flint water crisis was the funding in the 2021 Bipartisan Infrastructure Investment and Jobs Act to deal with lead pipes. The law provided "an unprecedented \$15 billion to jumpstart the replacement of these lead service lines", said Southerland. Although four times as much funding is likely to be needed to fully address the problem across the country, Southerland said that the law allows at least some of the work to begin.

However, in Flint, residents are still waiting for their share of a 2021 landmark \$626 million settlement of a lawsuit against the state of Michigan, the city of Flint, and some contractors for injuries and property damage related to the lead-contaminated drinking water. Claims for compensation filed by more than 40 000 residents are still pending, including 16 000 filed on behalf of children. Deborah Greenspan, a court-appointed lawyer who is overseeing the claims process, reported in a court filing that the first stage of claims review should be completed by the end of June, 2024, according to a Michigan Public radio news report.

In a separate lawsuit, the city of Flint agreed in 2017 to a \$97 million settlement that would help pay to replace its lead pipes, restore property damaged during the installation, and improve the operation of the city's water treatment system. In March, 2024, a federal judge ruled that the city had violated the agreement's deadlines for completing the work, "which is already many years behind schedule", said Sarah Tallman, a senior attorney at the Natural Resources Defense

For more on the EPA's proposed rule see https://www.epa.gov/system/files/documents/2023-11/lcri-fact-sheet-for-the-public_final.pdf



Mona Hanna-Attisha, who exposed high lead levels in Flint's water supply, testifies at a House Democratic Steering and Policy Committee hearing, February, 2016

For the Michigan Civil Rights Commission's report see <https://www.michigan.gov/mdcr/-/media/project/websites/mdcr/mrcr/reports/2017/flint-crisis-report-edited.pdf>

Council (NRDC), who represents Flint residents. The initial excavation work that was needed to identify lead pipes was supposed to be finished by August, 2023, she said. Although more than 10 000 service lines containing lead pipes have been replaced, residents in at least several dozen homes might still be at risk, Tallman said.

History of a disaster

The USA banned the use of lead pipes to deliver drinking water in new buildings in 1986, but many homes, schools, and public facilities built before then still use lead pipes, including in Flint. Experts say there is no safe concentration of lead and exposure to even low amounts of lead-contaminated drinking water can increase blood lead levels. According to the EPA, exposure to lead in adults can increase blood pressure, harm kidney function, and cause heart disease and cancer. In children, health effects of lead exposure include seriously impaired mental and physical development, brain damage, and neurological complications.

In 2014, Flint was teetering on bankruptcy and was under the supervision of a state-appointed emergency manager. On April 25, officials switched its drinking water source to the Flint River instead of the more expensive treated water from Detroit that originated from Lake Huron. The Flint River water was not properly treated with anti-corrosion chemicals, causing lead to leach into drinking water from the city's lead pipes and plumbing. After the switch, the incidence of elevated lead levels in blood for children younger than 5 years nearly doubled compared with 2013 according to a 2016 study published in the *American Journal of Public Health* by a research team led by Hanna-Attisha. A few months after the switch, a General Motors automobile factory stopped using the city's water because it damaged car parts. Yet, city and state officials insisted the water was safe to drink, ignoring health data from Hanna-Attisha.

By the end of 2015, officials reversed course and urged residents to stop drinking the water after state epidemiologists confirmed the doctors' findings. Flint reconnected its water supply to Detroit's system and finally added corrosion controls. In January, 2016, the Obama administration declared a state of emergency in Flint and provided up to \$5 million in aid. That December, Congress authorised \$170 million in funding for Flint as part of a larger water projects programme. Criminal charges against Governor Rick Snyder, then the highest-ranking elected official in Michigan, and eight others for failing to protect Flint residents were eventually dropped in 2022 due to a procedural issue.

Environmental racism

Since the Flint crisis, several other cities have addressed their lead-contaminated drinking water, although some were pressured by legal action. Lead pipes have been replaced in Newark, New Jersey—the largest city in the state, with more than 305 000 residents—under a 2018 court settlement of a lawsuit filed by the NRDC. In 2016, the NRDC and local advocacy groups sued the city of Pittsburgh after high concentrations of lead were found in its drinking water. Under a 2019 settlement, the city agreed to replace lead pipes.

Before the 1986 ban on lead pipes, the city of Chicago required the use of lead pipes. It still has an estimated 400 000 lead service lines, more than any other US city. As of 2022, only 280 had been replaced. Last month, a study published in *JAMA Pediatrics* found that more than an estimated two-thirds of children younger than 6 years in Chicago have been exposed to lead-contaminated drinking water, based on a city survey of nearly 34 000 homes. Researchers also found racial inequities in the results, said lead author Benjamin Huynh, assistant professor of

environmental health and engineering at the Johns Hopkins Bloomberg School of Public Health. "Black and Brown neighborhoods tend to have higher rates of lead exposure, yet, they also tend to be tested for lead less than other neighborhoods", he said.

A 2017 investigation by the Michigan Civil Rights Commission found "that racism played a significant role in creating the conditions that allowed the lead contamination to happen, and in the failure to recognize and address it in a timely fashion". The predominantly African American and under-served city of 80 000 people (as of 2020) has "been subjected to unprecedented harm and hardship, much of it caused by structural and systemic discrimination and racism that have corroded your city, your institutions, and your water pipes, for generations", the Commission concluded.

Replacing lead pipes is only part of the solution, said Hanna-Attisha. "As a community, we've been able to put in place things like new childcare centers, expanded Medicaid coverage, home visiting programs, trauma-informed care, literacy support, and nutrition services." The Flint Registry, funded by the US Centers for Disease Control and Prevention and led by Hanna-Attisha with over 20 000 participants, was used to connect residents to these and other resources. In January, 2024, she launched Rx Kids, a state and privately funded programme that gives \$7500 in cash assistance to every mother until her infant is aged 1 year.

Rx Kids "is another example of how Flint is making an impact beyond Flint", she said. "We're sharing those big lessons—the need to respect science, the need to invest in prevention, the need to pay attention to things like infrastructure and inequities, but also the really amazing lesson of doing something about it."

Susan Jaffe