

The lingering impact of the invisible lead crisis in Washington, D.C.

By Samuel Lee, Wen-Chin Lo and Taiya Jarrett

Upper northwest Washington neighborhoods have row houses priced over \$1 million and cars that cost around \$100,000 lining the streets. However, one issue that plagues many low-income households also plagues these affluent communities – lead pipes.

Lying underneath the ground are century-old pipes that have not been replaced for many residents. For couple Jessica Pic and Miles Plant, they could no longer postpone this \$3,000 replacement in anticipation of their newborn baby this past spring.

Unfortunately, not everyone in the city is either aware of the need for replacement or can afford to do so.

“We knew about it when we were looking at houses and stuff. But D.C. never (contacted us),” Plant said. “Our realtor didn’t tell us about it (either).”

While the city claims that its tap water is safe by federal regulations, multiple policy weaknesses call this statement into question. Inaccuracies with lead-in-water testing as well as non-compliance with blood lead screening in a majority of children has made it difficult to assess the impact of lead in the city.

In 2001, D.C. suffered the worst lead-in-water crisis in modern history when it changed its water treatment from chlorine to chloramine. This caused increased corrosion in lead pipes, allowing for large amounts of lead to be deposited into water.

While the city originally pledged to replace all lead pipes by 2010, that goal has remained unmet as there are still more than 25,000 lead and galvanized-iron pipes in use. And in 2019, DC Water launched a new service line replacement goal “Lead Free by 2030.”

However, in response to the 2001 water crisis, the Center for Disease Control and Prevention helped create a mantra that lead pipes posed a minimal risk to people.

“The CDC came out [in 2004] with a now-we-know fraudulent paper about a study that said that despite the two-and-a-half-year cover-up and the lead flowing out of people’s line taps, that nobody in DC, no child was harmed,” said Yanna Lambrinidou, advocate for the Campaign for Lead Free Water.

Marc Edwards, a professor in civil and environmental engineering at Virginia Tech, [debunked the CDC’s paper in 2009](#) and estimated that 1,000 kids were in fact harmed and had blood lead levels over 10 µg/dL. To simplify, this would be like putting 10 paper clips in half a cup of water per child.

This was followed by a string of lawsuits filed against DC Water by parents on behalf of children that had elevated blood lead levels. One being Dr. John Parkhurst, a single father of two who filed a class action lawsuit against the agency in 2009.

Parkhurst sought \$200 million in compensation and punitive damages for his children being exposed to lead by the age of two. Years later, the District’s Superior Court dismissed the case because of the public duty doctrine that protects government agencies from lawsuits when providing services to the general public.

Parkhurst declined to comment on the case when contacted due to a non-disclosure agreement.

In 1991, the Environmental Protection Agency announced the Lead and Copper Rule, or LCR, to mitigate lead contamination in drinking water by replacing seven percent of public lead pipes every year. Since the early 2000s, the district government has taken steps to protect residents, and Edwards found little lead in water in 2013.

After many revisions, the Lead and Copper Rule Revisions, LCRR, was implemented in 2022. Under the new rule, water samples are taken from at least 100 Tier One sites, which only includes single-family homes with a lead service line and not apartments or condos.

For a sample to be valid, collected water has to stagnate for at least 6 hours before collection and must be the fifth liter drawn from the tap. If 10% of the samples tested do not have a lead level greater than 15 parts per billion, or ppb, the city deems water safe.

This amount is similar to 15 seconds in almost 32 years. The highest result between 2018 and 2020 from [DC Water's LCR Compliance Data](#) was near 610 ppb. This would equate to about 10 minutes in 32 years.

“To actually really get to the average level of lead coming out of that tap, you would need to sample that tap over 1,200 times,” Lambrinidou said.

Unfortunately, such extensive testing is not done. Because the 100 samples are only collected from single-family homes every six months, not all 25,000 lead or galvanized-iron pipes are included as potential testing sites.

Some would argue that this is not a large enough sample size to represent the total population at risk.

“We sample every year. So it's again and again. And you watch your trends. If you're trending up, you're increasing over the years, you might be able to identify, oh, here's an issue,” said Maureen Schmelling, director of water quality and technology at DC Water.

Another flaw of the rule is that lead leaching occurs at random and is dependent on multiple factors. This can include how hot the water is when it flows through the pipe, how long the water has been stagnant, and physical disturbances such as street work, renovations and heavy traffic.

This can lead to huge variances in lead levels when testing water, making it very likely to miss high-risk houses.

“We have a system where our water utility can legally, and with the EPA's blessing, make this grand announcement that the water is safe and they meet all federal requirements when in reality you can have hundreds and thousands of homes dispensing astronomical levels of lead,” Lambrinidou said.

What seemed to be a reasonable action level may not be reliable to discern the next hidden crisis

“Lead crises have been discovered due to blood lead testing because the LCR doesn't always capture things... So even if you're not having any action level of exceedances, blood lead levels are a useful way of finding out if there's actually children who are being exposed,” Stanmyer said.

However, using blood lead levels may not necessarily be trustworthy. DC law requires all children to be [tested twice by the age of two](#), once between 6 and 14 months and again between 22 and 26 months. Parents are also required to provide a [Certificate of Testing for Lead Poisoning](#) for children under six before they start early childhood schooling.

Unfortunately, according to CDC's most recent [Blood Lead Surveillance Data](#) for the District, only 29% of the children under 6 years old were screened in 2017. Of the children screened, 0.8% or 115 had a blood lead level greater than 5 µg/dL. This could have meant that more than 400 children in the city suffered from lead poisoning.

Enrique Gutierrez, press secretary of the District of Columbia Public Schools was stated that there is a different Lead compliance from DOEE and the agency reports that to DCH. Lead is a question on the Universal Health Certificates, which is owned by DC Health.

"DC code requires the annual submission of a Universal Health Certificate and a certificate of testing for lead poisoning for all students under six years of age," said Gutierrez.

However, Gutierrez also stated that a student cannot be excluded from school because of a failure to provide a completed Universal Health Certificate.

While some of this non-compliance can be attributed to a lack of awareness from parents, healthcare providers need to understand that lead screening is important. Yet, many healthcare providers find it difficult to justify screening for lead.

"Oftentimes when [a healthcare provider] gets a blood lead result, it's not actionable and it's extremely difficult to explain to parents what that means for that specific child," said Dr. Jerome Paulson, emeritus professor in environmental and occupational health and in pediatrics at George Washington University.

According to the World Health Organization, there is no safe level of lead exposure for children. Children are particularly vulnerable to lead poisoning because they absorb four to five times as much lead as adults from a given source.

Affected children can have various symptoms such as antisocial behavior to reduced IQ and lower educational attainment.

While the CDC lowered the blood reference value from 5.0 µg/dL to 3.5 µg/dL in 2021, the current challenge is that blood lead testing is not accurate enough to test elevated levels this low. In addition, lead can only be detected by tests for about 30 days after ingestion.

"You could rerun that same blood sample and get a different result, or you could check the child one day later and get a different result, and it's not because there's a change in the child's blood level," Paulson said.

Paulson also pointed out the difficulties of identifying those kids affected by lead poisoning since many of them will seem normal and have no identifiable symptoms. For example, most parents and clinicians wouldn't be able to recognize an IQ change from 102 to 100.

"So we have a surveillance system if you will, both in terms of how we test for lead in drinking water in the homes of children with elevated lead levels and in terms of how we test lead in blood and what we're able to do with that, that (system) has very big holes in it," Lambrinidou said.

With the slightly elevated lead levels, treatment only entails removing the source of lead exposure. Chelating treatments to remove lead from the body would only be used with incredibly high blood lead levels such as above 45 µg/dL.

When asked if they plan to screen their newborn baby for lead, Pic and Plant answered with a resolute no. “If she had any cognitive problems, we would think about it. There isn’t any reason to think,” they said.

Challenges of lead service line replacement

A few steps away from Pic and Plant’s residence lies another million-dollar premise built in the late 1920s. Robert Carrico is the new owner of the house and has lived there for about a year.

A first-time home buyer and father of two children less than one-year-old, Carrico was as informed as Pic and Plant. On the [DC Water map](#), Carrico’s house is identified as one possibly having a lead service line.

However, even after Carrico reached out to the government and got a lead test kit, he has not submitted his results to DC Water. As for replacing his pipe, the high cost prompted him to use filters instead.

“I know there's a program to replace all the pipes in the city, but this area at least is the tail end of that. It'll be a while before the city does it. It was my impression,” Carrico said.

What Carrico referenced was part of the city’s new [lead pipe replacement plan](#) launched in 2019. When [DC water decides to replace all lead pipes in a certain block](#), construction on the private side is free regardless of residents’ income. Without capital improvement projects, DC Water will pay for public work while homeowners are responsible for the private space.

For lead pipe replacements occurring on private property, the District’s [Lead Pipe Replacement Assistance Program](#) will offer either a 50%, 80%, or 100% discount based on income.

If people who own houses valued at over \$1 million find replacing pipes financially difficult even with government assistance, lower-income neighborhoods will have even greater difficulty paying for replacements.

“This being DC, wealth is correlated with race and other demographic factors. But I think it's more of an income story,” said Marquise McGraw, professor of public policy at American University who has dedicated his research to the link between infrastructure and development.

McGraw continued to say that it was no surprise to see that individuals who were white, wealthy and highly educated could afford to replace lead pipes and were more likely to be informed about the existence and danger of these pipes.

In addition, these factors have compounded the effects of lead poisoning more prominently in certain populations as past replacement programs have disproportionately overlooked communities of color.

Also, lead service line replacements did not take place on private properties in these communities as often as those in wealthier neighborhoods. These partial lead pipe replacements threatened kids in these communities even more for elevated blood lead levels than had the lead pipe been left completely intact.

“In addition to whatever exposure [a population] may have from lead, if they're being exposed to certain components of air pollution, if they are in a family that is impacted by systemic racism, presumably all of these things are cumulative,” said Paulson.

The Lead Pipe Replacement Assistance Program in addition to DC Water's [new equity approach](#) can curb some of these disparities. The area deprivation index locates challenged areas based on income levels, child population and eventually will include blood lead levels.

Nevertheless, McGraw said the best way to ensure equity is to guarantee full funding from the government.

“Even though we are talking about to some degree using public funds to upgrade private property, given that these pipes do go to people's homes that are privately owned, it's a public health issue to get this fixed and get it fixed right,” McGraw said.

Beyond race and income disparities, city residents are not agreeing to have their lead pipes replaced. This has greatly hindered DC Water's initiative to replace all lead pipes by 2030.

“I think it's a combination of they've been using the water for decades. And they don't want the disruption of their yard and in their house. And then a number of them already filter their water or use bottled water,” said Schmelling.

While the city struggles to remove lead pipes, understanding that it is the best way to ensure the safety of drinking water, help is coming. The EPA is making improvements to the LCRR, called the Lead and Copper Rule Improvements, that is expected to be in effect by 2024.

“We don't know for sure, but there's a couple of different focus areas. One of them is, as I mentioned, to strengthen tap sampling requirements. Another one is to replace lead service lines faster and more efficiently,” said Stanmyer.

In addition, the Biden Administration assigned \$15 billion as part of the new trillion-dollar infrastructure bill last year. The DOEE will then allocate the funds among various programs and agencies, including DC Water.

While both federal and District governments tried to mitigate the effects of lead pipes and lead-contaminated water early on, weaknesses in policies failed to provide an all-encompassing safety net. The Lead and Copper Rule has gone through multiple revisions, but it is still not a perfect solution.

Furthermore, blood lead screening is not done in children as often as required and the tests are not accurate enough to be reliable. Previous pipe replacement programs also exposed the long-existing issues of racial and income disparities.

And though there has been a recent emphasis on a more equitable solution, getting everyone on board continues to present a great challenge. People are slowly coming to realize the dangers of lead pipes and lead-contaminated water, but many are still hesitant to replace their pipes.

“I think society is getting to the point where we're increasingly saying, even a very small risk of exposure to lead, is unacceptable,” McGraw said. But even for people as affluent as Pic and Plant, the one-day replacement was still a significant amount of work and money.