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AVOIDING THE ROAD TO FLINT

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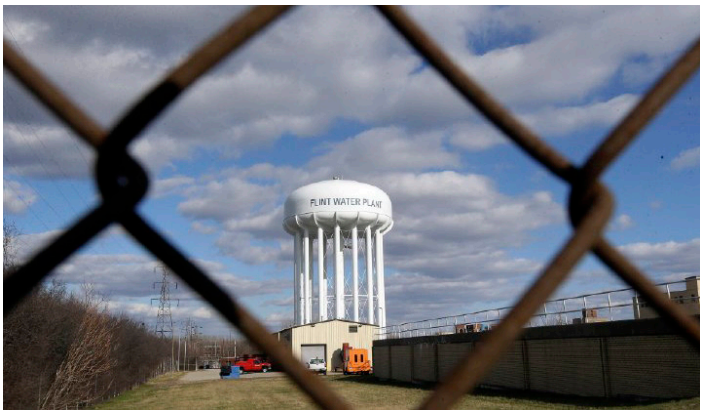

Few recent events have been more disheartening than the sight of Flint, Mich. — once a bastion of blue-collar pride — being reduced to a veritable beggar, unable even to provide its dwindling number of residents with drinkable water.

It would be tempting to write off the presence of lead, a potent neurotoxin, in the beleaguered city's water system as just another Rust Belt horror story. But the problems plaguing Flint's decaying underground iron and lead water pipes can be found throughout the U.S. Indeed, the decrepit condition of many of our nation's underground water networks is an open invitation to contamination and water-borne disease.

A recent investigation by The Guardian found that water departments in at least 33 cities in 17 states used testing methods over the past decade that could underestimate the presence of lead in drinking water. On the list are cities with a well-documented history of underground iron pipe failures, including Chicago, Detroit, Philadelphia, Boston and Milwaukee.

At the heart of the problem are thousands of miles of corroded iron pipes that lie beneath hundreds of U.S. cities. Cash-strapped municipal water utilities are forced to use their limited resources in an increasingly futile effort to combat corrosion at a price that will keep water safe and affordable for ratepayers. Timothy Ford, a microbiologist and water researcher at Montana State University, points out that, as pipes corrode and break, not only does water escape, but diseases enter the system.

Calling the situation in Flint "the worst lead in water I'd seen in 25 years," professor Marc Edwards of Virginia Tech's Environmental and Water Resources Research program attributes the city's disaster to "out of control corrosion of its water distribution system."

Edwards describes corrosion control as "the most expensive environmental engineering problem in the country."

Dealing with corrosion is expensive, because leaking iron pipes need to be treated with chemicals that build up a protective coating inside the pipes to keep water safe enough to drink. But funds utilities spend on anti-corrosion chemicals come at the expense of the more important task of replacing worn-out, leaking pipes.

What's more, anti-corrosion chemicals create their own environmental and health hazards. Utility operators typically add orthophosphates, a corrosion-control agent, to chlorinated water. However, as the National Drinking Water Clearinghouse points out, phosphate-laden drinking water can lead to conflicts with phosphorous discharge limits at wastewater treatment plants and with allowable phosphorous runoff levels into nearby lakes and streams. Elevated levels of phosphorous in waterways contribute to excessive growth of algae. In addition to making lakes and streams deficient in oxygen, algae can form near drinking water intakes. Blue-green algal blooms are common in the Great Lakes and can produce a wide array of neurotoxins, liver toxins, and skin irritants.

Even more troubling are other health risks uncovered in decaying iron pipes around the country. In 2013, officials in St. Bernard Parish, La. (near New Orleans), targeted 31 old cast-iron pipe segments, identified as having "a history of failures," for replacement in an effort to rid the local water system of a deadly, brain-eating amoeba. Action became urgent after a four-year-old child died of encephalitis, swelling of the brain, after contracting the amoeba in St. Bernard Parish water.

A May 2016 report by the Chicago Tribune found that 200 public water systems in Illinois — serving 800,000 people — exceeded federal lead standards during at least one year since 2004. Hoping to avoid the disaster that befell Flint, state and local officials in Illinois are scrambling to rehabilitate their deteriorating, predominantly iron pipes. They have reason to do so. Once lead is exposed to the nervous system, it cannot be removed. The impact of lead poisoning on the neurological system is permanent.

Another threat that surfaced in Flint is of growing concern to water system operators around the country: Legionnaires' disease. Public health officials are still trying to figure out whether Flint's tainted water supply provided a home for the deadly legionella bacteria. Was it a mere coincidence that the outbreak of Legionnaires' disease in the city, which led to 91 illnesses and 12 deaths, occurred at the same time that Flint was confronted with its corrosion-driven water crisis?

Virginia Tech's Edwards notes that iron causes the leaching of lead into water. High levels of iron in water also can remove disinfectants like chlorine, allowing harmful bacteria to grow. This, Edwards believes, may have included the legionella bacteria in Flint.

There is also growing concern about high levels of iron and manganese in water carried by iron pipe systems. A test sample recently taken in St. Joseph, La., found more than 230 times EPA's recommended level for iron in drinking water.

The nation's corroded iron piping systems have become too risky to operate safely. They are a breeding ground for pathogens. Water systems are capital-intensive operations, where every dollar spent on plugging leaks and fighting a losing war against corrosion is a dollar not invested in upgrading life-sustaining water networks. One way municipalities can lessen the financial burdens facing them is to remove the barriers many of them, including Flint, have that keep providers of cost-effective, innovative technologies and products from participating in the competitive bidding process for pipe replacement.

Water system operators want to avoid the road to Flint. The urgency of the crisis beneath our feet makes it imperative that they have what they need to provide clean water and protect public health.

Bonner R. Cohen, Ph. D., is author of "Fixing America's Crumbling Underground Infrastructure," published by the Competitive Enterprise Institute.