

A public-minded researcher discovers serious contamination of drinking water. His efforts to alert local officials are rebuffed. Concerned over how this will affect their reputation and the town's economy, the authorities sit on the evidence and deny any problems. All the while, trusting people continue to drink unsafe water.

While the setting may call to mind recent events in Flint, Michigan, this is actually the plot from Henrik Ibsen's classic 1882 play, *An Enemy of the People*. The places and dates have changed, but the challenges of providing drinking water remain. Just how safe really is our water and how can we make it safer?

We marked the fortieth anniversary of the Safe Drinking Water Act in 2014. In many respects, it was a date well worth celebrating. Most Americans take tap water for granted. We enjoy some of the safest and most reliable drinking water in the world. More than 90 percent of customers receive water that meets all standards all the time. This is a far cry from a century ago, when waterborne illnesses and deaths were commonplace. The famed aviator brother, Wilbur Wright, died of typhoid in 1914. The 1916 polio epidemic required quarantines in New York City, where 9,000 cases were reported. Today, these and other waterborne diseases have virtually disappeared in America. Glass half full.

Yet the glass remains half empty. Just ask the residents in Charlestown, West Virginia, where two years ago a chemical spill shut down water supplies, or in Toledo, Ohio, where seven months later an algal bloom closed their water system. The threats in those cases were due to causes beyond the reach of the Safe Drinking Water Act - a breach in a chemical storage tank atop a river bank in Charlestown, and excessive nutrients from agriculture flowing into Lake Erie in Toledo. These incidents made clear that action to ensure safe drinking water needs to start well upstream of the water treatment plant.

The Flint case is different and more disturbing.

We, as water drinkers, must ultimately rely on the actions of regulators and water authorities, trusting that the water coming out of our tap is in fact safe to drink. Few consumers have the technological savvy or means to test their water for arsenic, *Cryptosporidium*, lead, or the myriad other potential threats, much less at concentrations of parts per million. One can use the popular water filters, which will remove some pollutants but not lead and many others. Ultimately, we have no choice but to trust the experts.

That's why Flint is so particularly damaging. Local, state, and federal regulators' failure to act in a timely manner harmed not only Flint residents but undermined the public's confidence in our water supply management more generally. In California, the ongoing

drought has water suppliers looking closely at directing highly treated waste water back into the mains for household use. Will consumers trust the authorities to treat the water sufficiently?

Many Americans are already wary of government when it comes to drinking water. In a 2009 survey of environmental problems, water came out on top - 59 percent worried "a great deal" about pollution of drinking water. An additional 25 percent worried "a fair amount." This explains in part the popularity of bottled water and its marketing. The label on Aquafina, Pepsi's successful bottled water brand, could not make this clearer - "Purity Guaranteed" - spelled out in big letters. Keep in mind, though, that regulatory standards for bottled water are less demanding than those for tap water and tests have demonstrated that bottled water may sometimes be less safe than tap water (leaving aside the many times it simply is tap water).

Beyond eroding trust in the reliability of our water systems, the Flint crisis raises the separate concern over how much we are willing to pay. While lead is easy to shape and has long been the material of choice for pipes (the Latin for lead is "plumbum"), distributing water through lead pipes is risky. The Romans were lucky because the local hard water formed a secure limestone layer inside the pipe, preventing lead from leaching.

Lead pipes and solder were banned in U.S. public water systems in 1986 but millions of homes still have lead service lines connecting to the mains. If water is properly pre-treated, lead will not leach out. But mistakes happen. In Flint, water suppliers did not adequately treat the corrosive water. Elevated lead levels in drinking water have also been reported in Washington D.C., Seattle, Philadelphia, and San Francisco among many cities.

EPA estimates that it would cost \$275 billion to make our piping lead free. Should this be paid for by the government, by water rate payers, by home owners whose houses contain lead? In many cases, these same home owners have limited means. Washington D.C. offered a replacement program for residential lead pipes in the early 2000s, and only 15 percent of owners fully replaced their piping.

And that \$275 billion is part of the estimated \$384 billion in water infrastructure investments required through 2030.* Why so high? Consider that, in our nation's capital, water mains are on average about 80 years old. Some were buried before the Civil War. In an era of shrinking budgets, where will the money come from?

The crisis in Flint should push us to confront openly some hard choices. As a society, we need to realize that providing safe water requires funding to pay for it. This means

rebuilding our aging water infrastructure. It means increasing funding for enforcement of the Safe Drinking Water Act. It means making the tough political calls to sue local authorities that are violating the Act and holding officials accountable who fail to protect the public's health.

The safety and reliability of our drinking water system is truly a modern marvel, and we should not lose sight of that. But vigilance is required. We need to shift our expectations from "water consumers" to "water citizens." Until we start using our political process to demand the necessary funding and accountability for provision of safe drinking water, the next Flint will be waiting, farther down the pipeline.

** An earlier version stated that the \$275 billion is in addition to the \$384 billion estimate. The error has been corrected in the current text.*