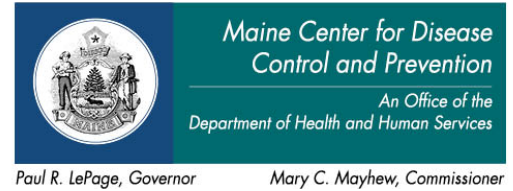


Article Summary

Assessing arsenic exposure in households using bottled water or point-of-use treatment systems to mitigate well water contamination



Smith AE, et al. *Science of the Total Environment*. Volume 544, 15 February 2016, Pages 701–710.

[doi:10.1016/j.scitotenv.2015.11.136](https://doi.org/10.1016/j.scitotenv.2015.11.136)

Background

More than half of Maine residents rely on a private well for their drinking water, and about 10% of those wells have too much arsenic. It is, therefore, important to understand what residents can do to reduce their exposure to arsenic. In fact, the Maine CDC receives about 1,000 phone calls each year from residents who have questions about their well water. What many of the callers want to know is what they can do to keep their families safe, and specifically, if it is safe to take a bath in water high in arsenic. With this context, the Maine CDC joined with colleagues from the US CDC to assess remaining arsenic exposure sources among families that have arsenic in their well water and that have switched to bottled water or installed an arsenic treatment system at the kitchen sink.

Methods

- Participants were children and adult volunteers from 167 Maine households with well water arsenic levels between 10 and 640 micrograms per liter, and where residents drank bottled water or water treated at the kitchen sink with a point-of-use treatment system.
- The study examined the amount of arsenic in individuals' urine in relation to their untreated water arsenic concentration, daily water and food consumption, and time spent bathing.
- Most ingested arsenic leaves the body through urine in just a few days. Study participants wrote down what they ate and drank, and the time they spent bathing for three days. At the end of the three days, we measured how much arsenic was present in each participant's urine. We also measured how much arsenic was present in the untreated and treated water in each home.
- We analyzed the relationship between time spent bathing and the amount of arsenic in the urine, as well as the relationship between untreated water arsenic and the amount of arsenic in the urine. We hypothesized that if bottled water or a point-of-use treatment system was very effective, there should be no relationship between urine arsenic and untreated water arsenic.

Key Findings

- Bathing in well water high in arsenic is not a significant arsenic exposure source for children or adults.
- The study did not find a relationship between arsenic in urine and untreated water consumption when arsenic levels are below 40 micrograms per liter.
- Reducing exposure is more complicated for people when their well has an arsenic level above 40 micrograms per liter, especially if there are young children in the home. For these residents, the study confirms the importance of using bottled or treated water not only for drinking, but also for all beverage and food preparation.

Significance

- Parents can be assured that bathing in well water high in arsenic is not a concern. This is currently the only study to directly examine the relationship between arsenic levels in well water and bathing.
- Switching to bottled water or installing a point-of-use arsenic treatment system at the kitchen sink are effective solutions for most people who have arsenic in their well water. These are usually the easiest, most affordable, and most used options for dealing with arsenic in well water. Less than 2% of Maine homes with wells have arsenic levels above 40 micrograms per liter.

For More Information

- For data about arsenic and other chemicals in Maine well water: data.mainepublichealth.gov/tracking
- For more on testing and treating well water, and well maintenance: wellwater.maine.gov