



Arsenic: In Small Doses

▶▶▶ Naturally occurring in the Earth's crust and widely dispersed in the environment, arsenic is the 20th most abundant element.

Why are we concerned about arsenic?

In the early 1990s, unprecedented arsenic poisoning in Bangladesh brought international attention to the toxic effects of naturally occurring arsenic in drinking water. In recent years, exposure to arsenic in drinking water has also been identified as a health concern in regions of the United States where bedrock contains unusually high levels of arsenic, such as areas of New Hampshire, Maine, Michigan and regions in the Southwest and Rockies. Arsenic is number one on the U.S. Environmental Protection Agency (EPA) list of hazardous substances and is commonly found in Superfund sites around the country.

Recent studies at Dartmouth tell us that at lower doses, long-term exposure to arsenic changes the way cells communicate and reduces the ability of cells to function properly, and may contribute to the development of diabetes, cancer, vascular disease, and lung disease.

Who is most at risk?

Private well owners are exposed to arsenic when underground water flowing over arsenic-rich rock may become contaminated with a toxic form of arsenic, which can make its way into private wells. Approximately 40 percent of the residents of New Hampshire use water from a private well, and approximately one-fifth of those wells contain water with arsenic levels above 10 parts per billion, the EPA standard for public water supplies.

The EPA does not regulate private well water or require states to do so, so people who draw their drinking water from private supplies are responsible for monitoring its quality and safety themselves.



Locations of bedrock aquifer wells and concentrations of arsenic in water.

Larger circles indicate higher concentrations.

Courtesy of Joe Ayotte, US Geological Survey





What can we do?



Private well owners should have their water tested for arsenic and other contaminants. Arsenic is now included in New Hampshire's standard well water test. If arsenic levels are over 10 parts per billion, homeowners can decide whether to install a system to remove arsenic or to switch to an alternative drinking water source. For more information, visit www.insmalldoses.org to watch a 10 minute video on arsenic in well water, and to find out how to test your well.

Is water the only means of exposure?

Arsenic has also been found at significant levels in some foods. For several years, Dartmouth scientists have been examining the uptake, transport and storage of arsenic in plants like rice, with the intent to learn how to make our food crops safer for human consumption. Populations who eat rice as a large part of their diet, and infants and very young children, may be at higher risk. For more information on arsenic in rice, visit



www.dartmouth.edu/~toxmetal/research-projects/5-plants.html,
www.dartmouth.edu/~toxmetal/research-projects/marketbasketpilot.html,
www.dartmouth.edu/~childrenshealth/Project_2.html.

TO ORDER WELL WATER TEST KITS

New Hampshire

Go to www2.des.state.nh.us/OneStop/Homeowner_Container_Request.asp ---Select "Other" under type of test and then type in Arsenic. The cost for Arsenic only is \$15.00.

For additional information, please contact the NH DES Drinking Water and Groundwater Bureau, http://des.nh.gov/organization/divisions/water/dwgb/well_testing/index.htm, or call (603) 271-2513, e-mail dwgbinfo@des.nh.gov, or contact the state lab at (603) 271-3445.

Maine

<http://www.informe.org/hetl/index2.html>---Go to "View All Test Kits" and scroll down to arsenic in water. The cost for Arsenic only is \$20.00.

For additional information, please contact the Maine Center for Disease Control and Prevention, Environmental and Occupational Health Program, <http://www.maine.gov/dhhs/eohp/wells/mewellwater.htm>, or call 1-866-292-3474 (toll free in Maine only).

Please visit our website at: <http://www.dartmouth.edu/~toxmetal>



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