



your **Arsenic in** **water?**

Economists study perceptions of risks from drinking water high in arsenic

In several “hot spots” across the United States people may be drinking water with high levels of naturally occurring arsenic without understanding the associated risks, according to agricultural economists.

“Many households in arsenic ‘hot spots’ are in fact being exposed to harmful doses of arsenic,” said Dr. Douglass Shaw, professor of agricultural

economics at Texas A&M University. He recently investigated the perceptions of and exposure to arsenic in private and public drinking water through an Environmental Protection Agency (EPA) grant.

“Some people didn’t realize that they had an arsenic problem, but most did,” Shaw said. “We concluded that some households therefore ignore

the risks, or they did not fully understand that they were being exposed.”

For example, Shaw said, some people reported not drinking water from their tap, but making coffee or juice or cooking with tap water. This indicates they did not fully understand their arsenic exposure.



Earlier research has found that people who drink water containing arsenic levels of 50 parts per billion for 15 to 20 years have about a 1 in 100 risk of dying from lung or bladder cancer, and smokers have twice that risk. In 2001, EPA lowered the arsenic maximum contaminant level (MCL) for drinking water to 10 parts per billion, based on studies that suggested cancer risks decrease at lower levels. Drinking water suppliers had to comply with the new standard by 2006.

For his research, Shaw collaborated with Dr. Paul Jakus of Utah State University, Dr. Mary Riddel of the University of Nevada, Las Vegas, Dr. Mark Walker of the University of Nevada, Reno, and former Texas A&M doctorate students, To N. Nguyen and Yongxia Cai.

The group conducted telephone surveys and distributed an educational booklet about arsenic and its risks in drinking water; the research was carried out in Fernley, Nev.; Appleton, Wis.; Oklahoma City, Okla.; and Albuquerque, N.M. In the surveys and booklet, the group explained the human health risks and explained how these risks vary among individuals. Researchers then asked

participants to estimate their own risk levels.

“Once we had these estimates, we explored whether the risks are tied to behaviors that might reduce the risks, at least

than non-smokers are. This difference may be because of heightened awareness about these kinds of cancer as they relate to smoking, Shaw said.

Arsenic in Texas groundwater

Arsenic is a naturally occurring element in rocks, soils, and the waters in contact with them, and its contamination of groundwater is largely the result of minerals dissolving from weathered rocks and soils. Groundwater arsenic contamination is widespread in Texas, especially in South Texas and the Panhandle.

In a 2000 study, the U.S. Geological Survey (USGS) mapped potentially high-risk areas for naturally occurring arsenic in groundwater and identified South Texas as one of the highest concentrations in the United States.

According to a 2006 study by the Bureau of Economic Geology (BEG), a research unit of the University of Texas at Austin, about 6 percent of water wells in Texas exceed the maximum contaminant level (MCL) for drinking water to 10 parts per billion. Contamination is focused in the southern High Plains (32 percent of wells exceed the MCL) and the southwestern Gulf Coast (29 percent of wells exceed the MCL).

For more information, visit USGS’s Web site at <http://water.usgs.gov/nawqa/trace/arsenic/> and BEG’s report at http://www.beg.utexas.edu/staffinfo/pdf/Scanlon_As_r2005.pdf.

The research also showed that most adults understood that children face a higher risk than adults do, mostly because small children are less able to handle the levels of toxicity in their bodies and may be exposed for longer periods.

They also compared risk perceptions of arsenic to the consumption of bottled water, and found that general water quality and taste is the primary

factor in the decision to buy bottled water.

“But as their perceived mortality risks from arsenic in their drinking water rise, expenditures for bottled water significantly increase,” Shaw said. “In other words, the first trigger to get people buying bottled water has to do with overall water quality, but people who spend a lot more on it than others are paying attention to the arsenic risks in the manner that we would expect.”

To view journal articles from this study, visit Shaw’s Web site at <http://agecon2.tamu.edu/people/faculty/shaw-douglass/papers.htm>. 