



## Study showering boosts concentrations of potentially hazardous trihalomethanes

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CHAPEL HILL -- Trihalomethanes -- byproducts of interaction between chlorine used to disinfect water and organic matter found in raw water -- increase significantly in the bloodstream after showering, a new study shows. Public health experts suspect the chemicals may boost the risk of cancer and contribute to reproductive problems such as miscarriage.

The study, conducted by researchers at the University of North Carolina at Chapel Hill School of Public Health, involved 50 women living in Georgia and Texas. It showed that showering shifted the distribution of trihalomethanes (THMs) in blood toward that found in the tap water in volunteers' houses.

Another finding was that the distribution of trihalomethane species -- there are four chlorinated and brominated forms -- detected in the women's blood reflected differences of type and concentration in their respective local tap water.

A report on the research appeared in April in the journal *Environmental Science & Technology*. Primary authors are Amy M. Miles, a former public health graduate student at UNC and now an environmental engineer at Research Triangle Institute, and Dr. Philip C. Singer, professor of environmental sciences and engineering at UNC.

"Chlorination of tap water was one of the most important improvements made in public health, and it saves countless lives each year by reducing risk from bacterial contamination," Miles said. "Water-borne diseases used to be a major cause of death and illness, and they still are in some parts of the world without chlorination."

Despite its obvious benefits, if chlorination creates its own lesser but significant risks, as many scientists believe, it needs to be studied further, she said. Many water treatment plants are switching to alternative disinfectants to reduce trihalomethane concentrations in drinking water.

The new study aimed to evaluate whether health workers could use drinking water concentrations of THM to predict concentrations in people's blood, Miles said.

Researchers picked Corpus Christi, Texas, and Cobb County, Ga., to investigate, she said. That's because water supplies in the former showed moderately high levels of chloroform, the most highly chlorinated THM, and, in the latter, lower total THM concentrations but a higher proportion of brominated species, which are believed to be potentially more hazardous.

Through blood sample analysis, researchers measured THMs in the blood of 25 women at each site before and soon after they showered and compared those levels to concentrations found in tap water at their houses.

"Concentrations of THMs were about 1,000 times lower in blood than in tap water, but after the showers, median levels in blood increased by a factor of four," Miles said. "This showed THMs were getting into the blood as a result of water use. It could not address, however, whether the concentrations were harmful or were linked to any particular health problem."

Future studies by Singer and colleagues will examine various trihalomethane exposures more closely, including those caused by inhaling the compounds from air inside houses, she said.

Report co-authors are Drs. David L. Ashley and Michele C. Lynberg of the Centers for Disease Control and Prevention, Pauline Mendola of the U.S. Environmental Protection Agency, Peter H. Langlois of the Texas Department of Health and J.R. Nuckols of Colorado State University.

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