

## Something in the (expecting mother's) water

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Pregnant women living in areas with contaminated drinking water may be more likely to have babies that are premature or with low birth weights (considered less than 5.5 pounds), according to a study based at Princeton University's Woodrow Wilson School of Public and International Affairs.

Featured in the *Canadian Journal of Economics*, the study shows that the effects of contaminated [water](#)—which include numerous cognitive and developmental impairments—are particularly significant for babies born to less-educated [mothers](#). These mothers also are less likely to uproot from areas with [contaminated water](#), which, the authors note, suggests a need for serious improvement in terms of communicating with people living in such environs.

"Fetuses are vulnerable to all types of pollution, including water contamination caused by chemicals and bacteria," said Janet Currie, the Henry Putnam Professor of Economics and Public Affairs at the Woodrow Wilson School of Public and International Affairs and director of the Center for Health and Wellbeing. "This contamination can lead to a host of problems, including low-birth-weight babies who can have lifelong cognitive struggles. It's a particular problem for less-educated women who also presumably have less options in terms of housing."

While past studies have focused on the effects of air pollution on infant health, Currie's is one of the first to evaluate the effects of [water pollution](#) on infants. Together with researchers from Columbia

University and the University of California, San Diego, Currie examined ten years of New Jersey birth records and data on drinking-water quality collected from 1997 to 2007. All birth records contained information regarding the date of birth, an infant's health at birth and maternal characteristics such as race, education and marital status. To determine whether mothers relocated due to water contamination, the researchers studied sets of siblings and whether mothers moved between births.

Using data from the New Jersey Department of Environmental Protection (DEP), Currie and her team looked at violation records across 488 water districts in New Jersey and found that more than a quarter of districts had water contamination violations affecting more than 30,000 people. These violations included both chemical and bacterial contamination caused by such [contaminants](#) as dichloroethane—a solvent often used for plastics or as degreasers— as well as radon and coliform.

The researchers matched the birth records to the water systems that serve the infants' residences. Because weather can dictate the amount of water a person consumes, they also incorporated daily temperatures into their dataset.

"We found that infants exposed to contamination in utero tend to have mothers who are younger, less educated and less likely to be married than other mothers. They are also more likely to be African-American or Hispanic," Currie said. "The results also suggest that mothers who are less educated are less likely than other mothers to move in response to contamination, while older mothers are more likely to drink bottled water or move."

Currie notes that when a water district is affected, the DEP is required to send a notice to all residences. However, for renters, there may be routing difficulties.

"If someone puts something in your mailbox, do you even see it? Does your landlord pick it up?" said Currie. "Notices are being sent that people don't receive. There's an undercurrent here that the way information is sent isn't adequate. We need to get this information to people directly."

Currie suggests that health-care workers include literature about [water contamination](#) risks and hazards in clinics and exam rooms to reach more [pregnant women](#).

"If it's going to be harmful for some groups, we need to at least let those groups know about them, so they can avoid it," said Currie.

In the future, Currie plans to continue studying environmental impacts on child health while also pursuing the relationship between home foreclosures and health.

**More information:** The paper, "Something in the water: contaminated drinking water and infant health," was published in August 2013 in the *Canadian Journal of Economics*.

Provided by Princeton University

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