



ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

Study Summary

Adverse Birth Outcomes May be Associated with Arsenic Levels in Public Drinking Water

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Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of the Director, National Institutes of Health supported this research.

Why was this study needed?

Regulated U.S. public drinking water is a source of exposure to arsenic. Because arsenic occurs naturally, water that comes in contact with certain rocks and soils may contain it. Contamination from various industrial processes also contributes to increased levels of arsenic in some areas. Prenatal exposure to arsenic has been associated with adverse birth outcomes, including preterm birth and low birthweight. Researchers studied how arsenic in public drinking water—at levels below the federal limit—may affect birth outcomes in the ECHO Cohort. Previous evidence has been limited to private well exposures, studies using urinary biomarkers, and single-site studies with limited racial, ethnic, and geographic diversity.

What were the study results?

The study found that when pregnant women lived in areas with publicly reported high levels of arsenic in public drinking water, even at levels below the current federal safety standard of 10 micrograms per liter, their babies were more likely to be born with low birthweight (weighing less than 5 lbs 8 oz) or are small for their gestational age (smaller than babies born at the same number of weeks of pregnancy). These patterns were seen across several racial and ethnic groups, including White, Black, and Hispanic/Latino families. For example, babies born to Hispanic/Latino parents were about 40% more likely to have low birthweight with just a 5 microgram-per-liter increase in water arsenic. The study also found that babies born to Black parents had higher risks of being born early, with low birthweight, or smaller for their gestational age. Similar risks were observed among babies born to American Indian, Alaskan Native, Native Hawaiian, and Pacific Islander parents.

What was the study's impact?

The study shows that even low levels of arsenic in public drinking water may increase the risk of babies being born too early, too small, or underweight.

Who was involved?

Participants included 13,998 birthing mother-infant pairs from the ECHO Cohort.

What happened during the study?

Researchers estimated how much arsenic people were exposed to through public drinking water during pregnancy by combining water quality data with where each person lived each month. They then looked at whether that exposure was linked to outcomes like being born early (preterm birth), having a low birthweight, or being small for their gestational age.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should not make changes to your health without first consulting your healthcare professional.

What happens next?

Future research could help researchers understand how current efforts to reduce arsenic in drinking water are working—whether those efforts happen across the country, in local communities, in homes, or for individuals. Studies could also help identify where arsenic levels are highest, which may support ongoing work to make sure communities have safe drinking water.

Where can I learn more?

Access the full journal article, titled “Public water arsenic and birth outcomes in the Environmental influences on Child Health Outcomes Cohort,” in [JAMA Network Open](#).

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