

Unsafe levels of toxic chemicals found in drinking water for 6 million Americans

August 9 2016

Levels of a widely used class of industrial chemicals linked with cancer and other health problems—polyfluoroalkyl and perfluoroalkyl substances (PFASs)—exceed federally recommended safety levels in public drinking water supplies for six million people in the U.S., according to a new study led by researchers from Harvard T.H. Chan School of Public Health and the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS).

The study will be published August 9, 2016 in *Environmental Science & Technology Letters*.

"For many years, chemicals with unknown toxicities, such as PFASs, were allowed to be used and released to the environment, and we now have to face the severe consequences," said lead author Xindi Hu, a doctoral student in the Department of Environmental Health at Harvard Chan School and Environmental Science and Engineering at SEAS. "In addition, the actual number of people exposed may be even higher than our study found, because government data for levels of these compounds in [drinking water](#) is lacking for almost a third of the U.S. population—about 100 million people."

PFASs have been used over the past 60 years in industrial and commercial products ranging from food wrappers to clothing to pots and pans. They have been linked with cancer, hormone disruption, high cholesterol, and obesity. Although several major manufacturers have discontinued the use of some PFASs, the chemicals continue to persist in

people and wildlife. Drinking water is one of the main routes through which people can be exposed.

The researchers looked at concentrations of six types of PFASs in drinking water supplies, using data from more than 36,000 water samples collected nationwide by the U.S. Environmental Protection Agency (EPA) from 2013-2015. They also looked at industrial sites that manufacture or use PFASs; at military fire training sites and civilian airports where fire-fighting foam containing PFASs is used; and at wastewater treatment plants. Discharges from these plants—which are unable to remove PFASs from wastewater by standard treatment methods—could contaminate groundwater. So could the sludge that the plants generate and which is frequently used as fertilizer.

The study found that PFASs were detectable at the minimum reporting levels required by the EPA in 194 out of 4,864 water supplies in 33 states across the U.S. Drinking water from 13 states accounted for 75% of the detections, including, in order of frequency of detection, California, New Jersey, North Carolina, Alabama, Florida, Pennsylvania, Ohio, New York, Georgia, Minnesota, Arizona, Massachusetts, and Illinois.

Sixty-six of the public [water supplies](#) examined, serving six million people, had at least one water sample that measured at or above the EPA safety limit of 70 parts per trillion (ng/L) for two types of PFASs, perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). Concentrations ranged as high as 349 ng/L for PFOA (Warminster, PA) and 1,800 ng/L for PFOS (Newark, DE).

The highest levels of PFASs were detected in watersheds near industrial sites, military bases, and wastewater treatment plants—all places where these chemicals may be used or found.

"These compounds are potent immunotoxicants in children and recent work suggests drinking water safety levels should be much lower than the provisional guidelines established by EPA," said Elsie Sunderland, senior author of the study and associate professor in both the Harvard Chan School and SEAS.

More information: Xindi C. Hu et al., "Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants," *Environmental Science & Technology Letters* (2016). [DOI: 10.1021/acs.estlett.6b00260](https://doi.org/10.1021/acs.estlett.6b00260)

Provided by Harvard T.H. Chan School of Public Health

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