

[Español](#)

Per- and Polyfluoroalkyl Substances (PFAS) and Your Health

[Per- and Polyfluoroalkyl Substances \(PFAS\) and Your Health Home](#)

PFAS Progress Newsletter — February 2024



Welcome to the February 2024 edition of the *PFAS Progress* newsletter!

This summer, I reached out to a physician colleague of mine in Maine who has been working to address concerns about per- and polyfluoroalkyl substances (PFAS) in the community she serves. What she told me about her experiences was probably not so different from many other medical providers from around the country—more and more people are becoming aware of PFAS and potential exposures and their healthcare providers aren't always sure how to address their concerns.

The work that the Centers for Disease Control and Prevention (CDC), Agency for Toxic Substances and Disease Registry (ATSDR), and National Center for Environmental Health (NCEH) have led over many years—well documented through these newsletters—has been at the forefront of moving us towards filling these gaps.

Whether in the form of seminal lab assays to detect PFAS, original epidemiology to better understand how PFAS exposure may contribute to health outcomes, or guidance to clinicians and communities on how to manage the uncertainty that surrounds PFAS exposures, our work has helped pave a path forward that we can be proud of and that the communities around the country we serve deserve. I am eager to continue to support our work on PFAS and ensure that we continue to do whatever we can to prevent harm to people and their communities from PFAS.

Aaron Bernstein, MD, MPH
NCEH/ATSDR Director

New Releases

CDC/ATSDR Updates PFAS Information for Clinicians

On January 18, 2024, CDC/ATSDR released [PFAS Information for Clinicians](#). This document provides updated information for clinicians to consider when seeing patients who have concerns about per- and polyfluoroalkyl substances (PFAS) exposure or possible health effects. This update incorporates the evolving science and emphasizes the importance of a shared decision-making process, with patients and clinicians working together to address patients' concerns and reduce PFAS exposures.

To support discussions with patients, the update provides information for clinicians on

- exposure sources and routes,
- health effects associated with PFAS exposures and factors that impact the risk of health effects,
- considerations for clinical evaluation and management, including information on the benefits and risks of PFAS blood testing, and
- considerations for certain populations, such as children and those that are pregnant or breastfeeding.

The document also includes links to additional clinical resources and information to assist providers and patients.

As the science of PFAS exposure and associated health effects evolves, ATSDR will continue to review the science and periodically update this information for clinicians.

CDC/ATSDR Releases First Report on the Pease Study

On January 12, 2024, CDC/ATSDR published the first report on the Pease Study, the first site in the national PFAS Multi-site Study that looks at the human health effects of PFAS exposure through drinking contaminated water.

This first report describes the Pease Study methods and shares information about demographics of the Pease Study participant cohort, PFAS blood levels, and descriptive data from self-reported health outcomes and health outcomes reported by healthcare providers. Additional analyses from the Pease Study are ongoing.

Key Findings in the Report:

- Pease Study adult participants that consumed PFAS-contaminated water had significantly higher serum levels of PFOS, PFOA, PFNA, and PFHxS compared to the general U.S. population.
- Pease Study child participants had significantly higher serum levels of PFOS, PFOA, and PFHxS compared to the general U.S. population.
- Average PFAS serum levels among Pease Study participants were lower than New Hampshire Biomonitoring Program participants, who had their serum PFAS levels measured closer to the time that exposure was reduced by taking PFAS-contaminated wells offline. This decrease may be due to the expected breakdown of the chemicals in the body over time.
- For both NHANES and the Pease Study cohort, males had higher serum levels of PFOS, PFOA, PFNA, and PFHxS than females. Sex-related differences in PFAS serum concentrations were no longer apparent for the oldest age group (60 years and older), with the exception of PFOS.
- The most self-reported health conditions among adult participants were allergies (48.1%), high cholesterol (33.2%), and high blood pressure (27.8%).
- Among children, the most frequently reported health conditions were allergies (35.6%), atopic dermatitis

(16.7%), attention deficit hyperactivity disorder (ADHD) or attention deficit disorder (ADD) (15.0%), and other neurodevelopmental disorders besides ADD/ADHD and autism that can affect learning or behavior (16.7%).

The link to the report can be found here: <https://www.atsdr.cdc.gov/pfas/docs/pease/Pease-Study-Report-508.pdf> .

Activities Updates

Exposure Assessments (EAs)

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) conducted Exposure Assessments (EAs) in 10 communities known to have had per- and polyfluoroalkyl substances (PFAS) in their drinking water. The 10 communities include two pilot EAs conducted in partnership with the Association of State and Territorial Health Officials, the Pennsylvania Department of Health, the New York State Department of Health, and eight ATSDR-led EAs.

The EAs have concluded and, in September 2022, CDC/ATSDR released a final, aggregate report that summarizes the findings of analysis of data from all 10 EA sites.

For more information, please visit the [ATSDR EA website](#) and view the [final report](#).

Pease Study

The Pease Study is the first site of the PFAS [Multi-site Study \(MSS\)](#), which looks at human health effects experienced by residents exposed to PFAS-contaminated drinking water in 11 communities across eight states. The MSS aims to expand the scientific understanding of PFAS by looking at the association between certain health outcomes and PFAS exposure from drinking water.

CDC and ATSDR are continuing to study health effects from drinking PFAS-contaminated water at the Pease International Tradeport and from its supply wells in the Portsmouth area of New Hampshire.

As we mentioned above, the first Pease Study report, which describes the study design, methods, and cohort, and contains some statistical analysis, has been released publicly on [ATSDR's website](#). The second Pease Study report, which contains extensive analysis of health-related data, will be released once complete. Additional analyses of study data are also in process and will be made available in peer-reviewed scientific journals.

The Pease Study report was released Jan 12, 2024. The [Pease Study website](#) will be updated with additional information on Pease Study results as they become available.

Multi-site Study (MSS)

The PFAS Multi-site Study (MSS) was authorized by the National Defense Authorization Act of 2018. The study will provide information to communities about the health effects of exposure to PFAS. Information learned from the MSS will help all communities in the United States who have been exposed to PFAS through drinking water.

As of September 30, 2023, all sites have concluded recruitment and enrollment efforts. Also, more than 5,200 study enrollees have completed all MSS activities, including more than 4,880 adults and 300 children. The sites will continue to work on medical and school record abstraction, pharmacokinetic modeling, and historical reconstruction activities.

Additional information on the study partners' activities may be found on their respective websites:

- [Colorado School of Public Health](#) 
- [Silent Spring Institute](#) 
- [Michigan Department of Health and Human Services](#) 
- [Rutgers School of Public Health](#) 
- [University at Albany, SUNY, & New York State Department of Health](#) 
- [RTI & Pennsylvania Department of Health](#) 
- [University of California – Irvine](#) 

Updates regarding the MSS and additional information may be found on the [ATSDR MSS website](#).

Other CDC/ATSDR Activities

PFAS Environmental Sampling

As part of an interagency agreement between CDC, ATSDR, and the U.S. Environmental Protection Agency (EPA), environmental sampling for PFAS was conducted to assess non-drinking water exposure to PFAS in the environment. Two of the PFAS Exposure Assessment locations—Hampden County, MA, and New Castle County, DE,—were chosen for the environmental sampling, and sampling was conducted during the summer of 2022. The goal of the sampling was to investigate and provide a better understanding of key exposure pathways to PFAS in the environment while advancing exposure measurement methodologies.

This effort included the administration of a questionnaire and the collection of indoor dust samples at all participants' homes (79 homes across two sites) and community samples of outdoor air and produce. In 35 percent of the homes, samples of bulk dust, surface wipes, indoor air, and soil were collected, in addition to the filtered dust sample. A participant at each of the households was also asked to wear a silicone wristband for a week to evaluate personal exposure. Individual results letters have been sent to participants.

ATSDR and EPA are now working on data analysis and will prepare appropriate reports to document the results and conclusions of the sampling.

New Resources

Multi-site Study Maps

The [PFAS Multi-site Study \(MSS\)](#) provides information to communities about the health effects of exposure to PFAS. In 2019, CDC and ATSDR announced partnerships with seven study teams to carry out the MSS in communities across the nation. Detailed [study area maps](#) have been developed for each of the MSS locations:

- Orange County, CA
- El Paso County, CO
- Ayer, MA
- Hyannis, MA
- Belmont/Rockford area, MI
- Parchment/Cooper Township, MI
- Gloucester County, NJ
- Montgomery and Bucks Counties, PA
- Hoosick Falls, NY
- Newburgh, NY

The maps show the site of interest and the estimated sample population size. The Ayer, MA, and Hyannis, MA, study area maps have been updated to reflect changes to the estimated sample population sizes. The Orange County, CA, study area map was updated to reflect the expansion of the study area borders.

New PFAS Blood Level Estimation Tool Fact Sheet

CDC and ATSDR developed the [PFAS Blood Level Estimation Tool](#) for community members with exposure to PFAS through drinking water who would like more information about possible levels of perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), and perfluorononanoic acid (PFNA) in their blood. The tool uses modeling to predict how much PFAS in blood would result from exposure to PFAS in drinking water.

Use the new [PFAS Blood Level Estimation Tool Fact Sheet](#)  to help answer questions such as the following:

- Why was the PFAS Blood Level Estimation Tool developed?
- What are pharmacokinetic (PK) models and how are they used?
- What information is needed to use the PFAS Blood Level Estimation Tool?

New PFAS Toxicokinetic Modeling Publication

Scientists at NCEH and ATSDR are using unique tools such as toxicokinetic models to better understand exposure to PFAS from drinking water. Toxicokinetic models are mathematical tools that simulate how a chemical moves throughout the body. In the absence of biomonitoring data, information from these model types can supplement existing exposure data and may inform potential recommendations for assessing and reducing exposure.

The [PFAS Blood Level Estimation Tool](#), for example, uses toxicokinetic models to provide users of the tool with a personalized estimate of potential PFAS concentrations in their blood. The models used to build the PFAS Blood Level Estimation Tool have been extensively peer reviewed and are considered a reasonable prediction of potential PFAS blood levels for community members who have been previously exposed to PFAS through drinking water.

Modeling PFAS exposures is an effective resource for toxicologists, scientists, researchers, and other public health professionals for estimating potential health risks from a specific substance and exposure pathway. The techniques used for the creation of the PFAS Blood Level Estimation Tool serve as a stepping stone for expanding our understanding of PFAS and human health. We hope the work behind the PFAS Blood Level Estimation Tool inspires future tools the public and officials can use to inform, educate, and protect communities from environmental hazards.

Read more about the modeling used for the PFAS Blood Level Estimation Tool at [Community-facing toxicokinetic models to estimate PFAS serum levels based on life history and drinking water exposures – ScienceDirect](#) [↗](#).

Science Corner

Fifth Unregulated Contaminant Monitoring Rule (UCMR5) Data Release

The Safe Drinking Water Act requires EPA to issue a list of unregulated contaminants to be monitored in public water systems once every five years. This nationwide testing is known as the Fifth Unregulated Contaminant Monitoring Rule (UCMR5). For UCMR5, EPA will monitor 29 PFAS compounds, as well as lithium, in municipal water systems. EPA began sharing the results of the drinking water testing in summer 2023 and will continue to roll out the results through 2025. Please keep the following in mind.

- If your public water system is not part of the UCMR5 testing program, they may not be able to provide residents with information about PFAS levels in their drinking water.
- Private wells are not included in UCMR5 because private wells are not associated with a water system. If you are interested in having your water tested, please contact your local or state public health agency for more information.

For more information, please visit the [EPA UCMR5 website](#) [↗](#).

Public Health Corner

Addressing Data Gaps Through Exposure Investigations (EIs)

ATSDR serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. ATSDR responds to community concerns about hazardous substances and chemicals in the environment by conducting public health assessments, public health consultations, and exposure investigations, and by issuing public health advisories.

ATSDR relies on environmental data, provided by other environmental agencies, to help determine if people living near a hazardous waste site are being exposed to toxic substances and if that exposure is harmful. Sometimes, critical data needed for a public health conclusion is missing or not available. To help fill this data gap, ATSDR may conduct an [exposure investigation \(EI\)](#).

EIs are designed for a specific community and site and may involve the collection and analysis of environmental contamination data and biologic tests (such as urine and blood samples, when appropriate). Community participation throughout the EI is essential to ensure the investigation addresses exposure data gaps and meets community concerns. ATSDR conducts EIs for a range of environmental concerns, including community exposure to lead, arsenic, and even [PFAS](#).

To learn how EIs are conducted, read the April 2023 edition of “[Direct from ATSDR: Exposure Investigations Conducted by the Agency for Toxic Substances and Disease Registry](#)”  .

Contact Us

Email	Website	Phone
pfas@cdc.gov	www.atsdr.cdc.gov/pfas	1-800-CDC-INFO (232-4636)
Email Form (English and Spanish)		TTY 888-232-6348 Monday–Friday 8:00 a.m.–8:00 p.m. ET
www.cdc.gov/DCS/ContactUs/Form		

Received this newsletter from a friend? [Sign up now](#)

Last Reviewed: February 21, 2024
Source: [Agency for Toxic Substances and Disease Registry](#)