PFAS
at Environmental Health Laboratories

ABOUT PFAS

Per-and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that have been produced around the globe since the 1940s. PFAS are resistant to heat, water and oil, making them a useful material in many products such as carpeting, waterproof clothing, upholstery, food packaging and fire-fighting foam.

Their resistant nature can also make them a human and environmental health risk. The US Environmental Protection Agency (EPA) has named PFAS emerging contaminants of concern due to their ability to persist in the environment for an extended period of time and bioaccumulate in animals and humans with prolonged exposure.[1]

The historic use of PFAS has led to pervasive, low levels of the compounds in people, food and the environment throughout the United States and the world.[2] While the impacts of PFAS on human health are not yet fully understood, exposures should be limited whenever possible.

Health Effects of PFAS[4]

The health effects of PFAS exposure in humans are currently being evaluated. However, given the number of PFAS compounds and the time it may take for health effects to develop, this is challenging. Preliminary studies suggest that PFAS may:

- Interfere with the body's natural hormones
- Increase cholesterol levels
- Affect the immune system
- Increase the risk of some cancers
- Affect the growth, learning, and behavior of infants and children.

Protect Yourself from PFAS

One of the most important ways to protect human health is to assess your PFAS exposure risk. Visit the US Agency for Toxic Substances and Disease Registry's (ATSDR) website, and contact your local or state health department for assistance or more resources.

For those with increased exposure risk, the following precautions can help protect you from PFAS:

- Use water filters certified to remove PFAS for drinking and cooking water. Replace the filters at recommended times.
- Private well users should try to determine if their water drains from an area that has potential historic or current PFAS contamination sources such as military bases, airports or industrial facilities.
- While homeowners with private wells are not legally required to meet EPA drinking water standards, they should work with their local health departments and laboratories to regularly test their drinking water for contaminants, such as bacteria, lead and common PFAS compounds, and determine appropriate treatment strategies.

No matter your risk, talk to your government representatives about this issue and policies they can consider to protect public health.

Common Sources of PFAS Exposure

Today, contaminated drinking water is a significant source of PFAS exposure in some communities. Other sources of exposure include consuming fish from PFAS-contaminated water, food that was packaged with PFAS-containing materials, the accidental ingestion of contaminated soil or dust, and occupational exposure. Consumer products such as non-stick cookware, stain- or waterproof fabrics may also contribute to exposure.

Drinking Water | Fish Contamination | Fast Food Containers | Non-stick Cookware | Firefighting Foam

HOW DO ENVIRONMENTAL HEALTH LABORATORIES PROTECT YOU?

Environmental health laboratories are governmental laboratories that conduct testing to identify and monitor for environmental contaminants in water, air, soil, food and manufactured products. Some laboratories also conduct biomonitoring, testing blood, urine and other human specimens for contaminants. Without this testing, many environmental threats to people's health would go unidentified.

Environmental Testing

Environmental health laboratories may be able to test a variety of environmental sources—drinking, ground and surface water, fish, air, soil and dust—for PFAS to determine if they contain levels above safety thresholds. Results can help public health officials understand where PFAS contamination exists as well as places it might eventually affect. For example, sample results from one body of water can inform public health officials as to whether users might have been exposed during a certain time period. Such laboratory data can help support public health decision making, which may include expanded or targeted testing, biomonitoring, public health interventions, policy or regulation.

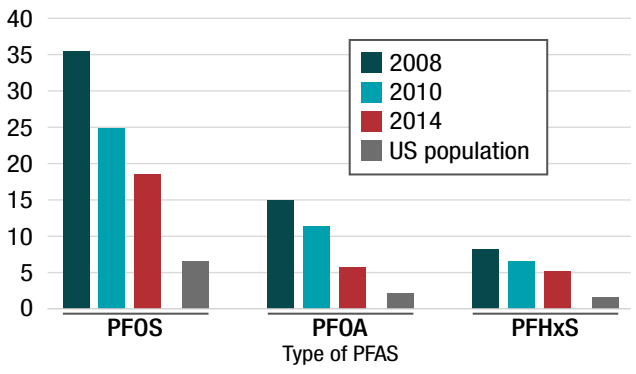
Biomonitoring

Biomonitoring measures the total amount of specific chemicals in a person's body at a given time. It can be used to determine the type of chemical exposure a person has experienced, but often not the exact source of contamination. For example, biomonitoring can detect PFAS in blood but may not indicate the exposure source. A number of states have initiated biomonitoring programs for PFAS contamination. One of the first states to test for PFAS, Biomonitoring California, began measuring maternal and infant PFAS levels in 2010, and, in subsequent years, has measured more than 30 different PFAS chemicals in teachers, firefighters and in the Asian/Pacific Islander community.

Success Story: Minnesota Groundwater Contamination

In 2002, concerns grew about PFAS contamination of the groundwater in the area surrounding a 3M industrial facility east of the Twin Cities—and its potential effects on the residents—after increased levels were detected in a waste disposal site. Over the next seven years, the Minnesota Department of Health (MN DOH) laboratory tested groundwater and performed population-based biomonitoring studies, finding elevated PFAS levels in the blood of the residents. Drinking water sources were changed or remediated and subsequent testing demonstrated significant decreases in affected residents' blood PFAS levels. MN DOH's laboratory testing helped identify the problem, demonstrated the treatments were effective (see graph, below) and supported the state's lawsuit against 3M, eventually leading to an $850 million settlement in 2018 for environmental remediation efforts.[5]

Figure: Blood PFAS levels in long-term East Metro residents.[6]



When samples are collected broadly and systematically, biomonitoring data can help identify and track trends, such as geographic regions with higher-than-normal-exposure levels, or exposures to emerging contaminants. It can also let us know when exposure is no longer a concern, perhaps as the result of a public health intervention.

1. US Environmental Protection Agency. Basic information on PFAS [Webpage; updated December 6, 2018; cited September 9, 2020]. Available from: https://www.epa.gov/pfas/basic-information-pfas
2. Michigan Department of Environment, Great Lakes and Energy. PFAS 101: Frequently asked questions [Webpage; cited September 9, 2020]. Available from: https://www.michigan.gov/pfasresponse/0,9038,7-365-86704_86677---,00.html
3. US Agency for Toxic Substances and Disease Registry (ATSDR). PFAS chemical exposure [Webpage; updated June 24, 2020; cited September 9, 2020]. Available from: https://www.atsdr.cdc.gov/pfas/health-effects/exposure.html
4. ATSDR. Potential health effects of PFAS chemicals [Webpage; updated June 24, 2020; cited September 9, 2020]. Available from: https://www.atsdr.cdc.gov/pfas/health-effects/index.html
5. Minnesota Department of Health. History of perfluoroalkyl substances (PFAS) in Minnesota. [Webpage; updated June 5, 2019; cited September 9, 2020]. Available from: https://www.health.state.mn.us/communities/environment/hazardous/topics/history.html
6. Minnesota Department of Health. PFAS biomonitoring in the East Metro. [Webpage; cited September 22, 2020]. Available from: https://www.health.state.mn.us/communities/environment/biomonitoring/projects/pfas.html