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Investigation Finds Toxic Chemicals in Water Across the US

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STORY AT-A-GLANCE

- One survey of 120 households representing a cross section of each of the EPA's 10 jurisdictional regions found 118 had detectable levels of arsenic, lead and PFAS
- The EPA set acceptable limits for arsenic at 10 parts per billion (ppb) to lower costs for water utilities despite knowing no level of exposure to the heavy metal is safe
- Over 18 million consumers are exposed to lead in their drinking water, but the EPA does not mandate water services lower lead levels until 10% of homes in the service area exceed 15 ppb
- PFAS are sometimes called Teflon chemicals or "forever chemicals" and are linked to ulcerative colitis, cancers, thyroid disease and pregnancy-induced high blood pressure
- Consider installing a filtration system in your home

Drinking water safety is not often top of mind unless it has made the news, like the lead crisis in Flint, Michigan.[1] However, the level of contamination in U.S. tap water is very concerning, whether your water supply is from the municipal water system or a well. Just because it looks clear and seems to taste normal does not mean it's safe or pure.

A recent survey analysis of water supplies across the U.S. found what other studies have also found — it's brimming with toxic chemicals.[2] Test results from the Environmental Working Group (EWG) on 50,000 water utilities in 50 states also found 267 different contaminants out of 500 they tested for.[3]

One of the problems with the water supply is an aging infrastructure that may be "nearing the end" of its useful life.[4] Water pollution from fire-fighting chemicals,[5] agrichemicals,[6] drugs and nerve toxins produced by freshwater cyanobacteria[7] add an additional toxic load to the water supply.

Because your body is mostly water, you require a constant supply of pure water to fuel your filtration system and ensure your body is free of toxins. Your blood, kidneys and liver all require a good source of clean water to detoxify from the toxic exposure it meets every day.

But, as a recent collaborative water survey from Consumer Reports[8] and The Guardian[9] has demonstrated, the water supply is in desperate need of detoxification.

Toxic Chemicals Found in Drinking Water Across the US

The team from Consumer Reports and The Guardian[10] asked readers for help investigating the nation's drinking water supply and more than 6,000 people held up their hands to be counted.

Statisticians from Consumer Reports whittled the group down to 120 households that represented a cross-section of each of the EPA's 10 jurisdictional regions. Within each region, the team chose a mix of locations in which they tested the water for multiple different contaminants.

The analysis showed that 118 of the 120 water samples collected had high levels of PFAS or arsenic as well as detectable levels of lead. The group acknowledged that the study had some limitations since water quality was tested in one day, which may not demonstrate the overall quality supplied throughout the system.[11]

According to the report from Consumer Reports, the challenges are not technological. In other words, they believe filtration systems exist that can clean the water of contaminants and "yet they are not being used uniformly by community water systems."[12]

Although the deputy director of Public Works in New Britain, Connecticut, told Consumer Reports that a single sample may not be representative of the overall toxic exposure, EPA spokesperson Andrea Drinkard said that "93% of the population supplied by community water systems gets water that meets 'all health-based standards all of the time.'"[13]

Drinking water contamination is a crisis. According to an analysis published in The Guardian[14] in February 2021, more than 140,000 water systems in the U.S. are affected. The same analysis demonstrated that clean drinking water is not distributed equally since systems that service rural counties and poor areas have a higher likelihood of violations.

EPA Balances Cost Against Health When Setting Arsenic Levels

One of the factors new homeowners don't often consider is the purity of their tap water supply. Consumer Reports[15] learned one of the participants in the study, Sandy and Scott Phillips from Texas, had built a custom home in a new development just north of Austin. After moving in they invested thousands in a reverse osmosis and water softening system to take care of the unusual odor in the water.

What the couple learned from a survey was their water supply was high in multiple chemicals, including arsenic. Arsenic is a heavy metal that's naturally present in groundwater and highly toxic.[16] The greatest public health threat from arsenic is when it is used in drinking water, food preparation and irrigation of food crops.

Long-term exposure increases the risk of several forms of cancer, including skin, lung and bladder cancers.[17] Other research has suggested there is an association with neurological effects, cardiovascular disease, diabetes and reproductive disorders.

The health impact of low-level exposure to arsenic does not occur immediately but happens over a long period of time.[18] Exposure to arsenic can also reduce children's IQ and increase the risk of skin discoloration and lesions. Arsenic can get into the drinking water supply from industrial processes and runoff from agricultural and mining concerns.[19]

The general manager for the Texas couple's water supplier told Consumer Reports that it “has complied with all federal and state minimum contaminant level standards for arsenic and lead for many years.”[20] He also commented that the results from the Consumer Report survey conflicted with their records.

The acceptable level set by the EPA for **arsenic** in drinking water in 1942 had been 50 parts per billion (ppb).[21] The level was reduced to 10 ppb in 2001, which was an amount the EPA felt would help water system operators balance the cost of filtering the water against health challenges.[22]

Yet, this level is still more than triple the 3-ppb level at which experts, including scientists at Consumer Reports[23] and the National Resources Defense Council (NRDC),[24] have long insisted it should be limited.

Nearly every water sample tested had measurable amounts of arsenic. A 2017 NRDC[25] study noted that the EPA had set a maximum contaminant level for arsenic at zero since no level is safe. However, it set the enforceable level at 10 ppb, which continues to present a “substantial cancer risk.”

The same report[26] showed there were 573 water systems across the U.S. that were delivering water with excessive arsenic to over 1.8 million people. One study[27] found exposure to arsenic at 5 ppb or greater in the drinking water lowered IQ scores in children approximately five to six points in most cognitive areas, including working memory, verbal comprehension and perceptual reasoning.

EPA: Wait Until 10% of Homes Have High Lead Levels

Survey results from the Phillips’ home in Texas also revealed their unfiltered water had 5.8 ppb of lead. In this instance, cost again has taken precedence over the potential health effects on consumers. Consumer Reports notes that while the EPA recognizes there is no safe **exposure to lead**, they do not require utility services to lower lead levels until 10% of the homes sampled in the area exceed 15 ppb.[28]

In the same NRDC report that surveyed violations of the Safe Drinking Water Act, the researchers found there were 5,367 water systems that were allowing high levels of lead and copper into the water system that affected over 18 million consumers.[29]

It wasn't until 1986 that using lead pipes to connect the water main in the street to buildings was banned. However, many of the previous water systems are still in use, affecting up to an estimated 6 million homes and businesses across the U.S.[30]

Many of the health effects from lead exposure are well-known,[31] including kidney and brain damage, anemia, weakness, neurological damage to a developing baby, lower IQ in children, and infertility in men and women.

Yet, despite the overwhelming costs to the community and individuals from exposure to lead, the EPA has not made significant changes to the maximum acceptable exposure levels for lead and many other toxins found in the drinking water supply.

The NRDC notes,[32] "Weaknesses in the current Lead and Copper Rule, and numerous deficiencies in other EPA drinking water rules, require strengthening changes for the sake of public health."

PFAS Are Forever Chemicals Found in Drinking Water

It may sometimes look like alphabet soup when scientists begin writing about perfluorinated chemicals, historically abbreviated PFC. To reduce confusion, the EPA made the move to use "PFAS" to refer to per- and polyfluoroalkyl substances that describe the chemicals, which are sometimes referred to as "The Teflon Chemicals"[33] or "forever chemicals."[34]

PFASs make products water-, oil-, grease- and stain-resistant and are also found in firefighting foam. PFOS and PFOA are two **PFAS chemicals** that were voluntarily phased out by manufacturers.[35] However, while they are no longer manufactured in the U.S., the EPA reveals "phased out" doesn't mean "not being used."[36]

The recent water survey confirmed the ubiquitous nature of **PFAS in the water** supply, finding 117 of the 120 water samples taken contained the chemical. Instead of enforceable legal limits, the EPA has established voluntary limits for PFOA and PFOS at 70 parts per trillion (ppt), which many experts believe is far too high.[37]

Harvard Environmental health expert Philippe Grandjean, Ph.D., believes research evidence suggests a lower limit of 1 ppt. The threshold is also supported by the Environmental Working Group and Consumer Reports chief scientific officer.

PFOA, commonly called C8, had been dumped from a plant in Parkersburg, West Virginia, beginning in the 1950s. The C8 Science Panel[38] assessed the links between exposure and several health conditions, finding probable links to high cholesterol levels, ulcerative colitis, thyroid disease, several types of cancer and pregnancy-induced high blood pressure.

The report from the NRDC[39] did not include PFAS chemicals as they are not regulated under the Safe Drinking Water Act. Instead, the EPA issued a health advisory establishing unenforceable levels that "inform" officials and water utilities of a level that may be safe.

An analysis published by the EWG[40] showed there were 2,337 sites in 49 states with known PFAS contamination. Unfortunately, while evidence continues to mount demonstrating forever chemicals are hazardous, the EPA is unwilling to protect consumer health. According to the EWG, the EPA:[41]

> *"... recently released a so-called PFAS action plan,[42] but it is woefully inadequate. The EPA plan will not address ongoing sources of PFAS pollution, will not clean up legacy pollution and will not even require reporting of toxic PFAS releases."*

Filtered Water Is a Health Priority

If you choose bottled water instead of tap water, you may only be slightly better off, depending on where you live. The purity of **bottled water** has been in question since at

least 2009 when the EWG released a scorecard showing most water brands failed to disclose contaminants contained in their water.[43]

Another survey in 2011[44] revealed that 18% of bottled water did not show where the water came from and 32% did not disclose how the water was treated or the purity. In 2020, Consumer Reports[45] tested 47 bottled water brands for heavy metals and 30 PFAS chemicals.

They found PFAS was detectable in most of the noncarbonated water brands and in all but one of the carbonated waters. For an objective analysis of your water quality, consider consulting the Tap Water Database[46] created by the EWG. Unless you can verify the purity of your water, seriously consider installing a high-quality water filtration system.

Ideally, the water can be filtered at the point of entry and the point of use. This means adding a filter where the water enters the home and then again at the sink and shower. There are a variety of options that have benefits and drawbacks. You can read more about water filtration systems in "**Properly Filter Your Water**."

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