

# Filtering Multiple Tap Water Contaminants Could Prevent Over 50,000 Cancer Cases

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August 07, 2025

## STORY AT-A-GLANCE

- › Over 100 million Americans receive tap water with arsenic, nitrate, or chromium-6 at levels above health-based safety benchmarks. These chemicals put you at increased risk for cancer and other diseases
- › These three top contaminants frequently co-occur in groundwater and surface water, especially in states like California, Arizona, and Texas with high agricultural and industrial activity
- › Federal drinking water standards lag decades behind current science and don't account for how contaminants appear in mixtures. This leaves large gaps in protection for rural and urban communities alike
- › An Environmental Working Group (EWG) study found that filtering arsenic, nitrate, and chromium-6 will help prevent more than 50,000 cancer cases linked to long-term exposure through drinking water
- › One of the most effective ways to lower your exposure to water contaminants is to install a whole-house filtration system, ideally paired with a reverse osmosis unit at key point-of-use taps

Every day, millions of Americans turn on their taps and fill glasses, rinse produce, boil pasta, and bathe their children, rarely thinking twice about what's in the water. But for millions of households, especially those near farms, factories, or relying on groundwater, that water may carry chemicals that increase the risk of cancer over time.

Despite clear evidence from decades of research, the way drinking water is regulated in the U.S. still hasn't caught up. Most contaminants are reviewed one by one, with years between updates, and limits are based as much on economic feasibility as on public health, leaving many people at risk without knowing it.

These outdated standards have prompted researchers from the Environmental Working Group (EWG) to examine just how much cancer risk might be reduced if the problem were approached differently. Their findings suggest that a more realistic and protective approach is both possible and overdue.<sup>1,2</sup>

## What Are the Top 3 Contaminants in US Tap Water?

EWG's study, which was published in the journal *Environmental Research*, identified three contaminants that stand out both in terms of how commonly they appear and how strongly they are linked to increased cancer risk:<sup>3,4</sup>

- 1. Chromium-6** — Also known as hexavalent chromium, this chemical gained national attention when it was linked to a cluster of illnesses, including cancer, in the town of Hinkley, California,<sup>5</sup> where the chemical had leached into the local water supply. Subsequent studies confirmed that long-term exposure increases the risk of stomach cancer, damages the liver, and disrupts reproductive health.<sup>6</sup>

Animal studies also show increased intestinal tumors, and occupational exposure in humans has consistently been linked to higher cancer incidence.<sup>7</sup> Despite being classified as a carcinogen, chromium-6 remains unregulated as a standalone compound under federal law.

The U.S. Environmental Protection Agency (EPA) sets a limit only for total chromium to 100 parts per billion (ppb), which includes both toxic hexavalent and safer trivalent forms. As a result, water supplies meet federal standards while still containing unsafe levels of this known cancer-causing chemical.

**2. Arsenic** – This chemical enters water supplies from underground sources and human activities like agriculture and mining. It has been detected in all 50 states and is associated with cancers of the skin, lungs, and bladder, as well as cardiovascular disease and developmental problems.<sup>8</sup> A study published in PLOS Water<sup>9</sup> detected arsenic in 8% of household-treated tap water samples and 3% of untreated tap water samples.

While the EPA set a legal limit of 10 ppb, that decision was heavily influenced by economic and political considerations instead of health data. By contrast, California has set a much lower public health goal of 0.004 ppb, highlighting the disconnect between federal regulation and what's truly considered safe.

**3. Nitrate** – Nitrate contamination comes mainly from fertilizer runoff, livestock waste, and failing septic systems. It's widespread in both groundwater and surface water, especially in farming regions. Drinking water with nitrate has been linked to serious health risks, including colorectal and ovarian cancer, preterm birth, low birth weight, and neural tube defects.

The current federal nitrate limit of 10 parts per million was set to prevent “blue baby syndrome,” where excess nitrate in drinking water disrupts oxygen transport in the blood, causing the skin to appear blue.<sup>10</sup> However, European studies have found increased cancer risk at levels more than 10 times lower than that threshold.

Unfortunately, these aren't the only contaminants lurking in your drinking water. To learn what else could be in your glass, read [“Nearly 100 Million Americans Exposed to Contaminated Drinking Water.”](#)

## **A National Cancer Burden – and How Much of It Could Be Prevented**

To estimate how many cancer cases could be avoided with better water treatment, the researchers analyzed more than 10 years of testing data from U.S. community water systems, focusing on the three common carcinogens above. The dataset was drawn

from the EPA's Unregulated Contaminant Monitoring Rule and state testing records spanning 2011 to 2023. Together, these reflect actual exposure levels that affect Americans.<sup>11,12</sup>

- **Over 100 million Americans face unsafe contaminant levels** – Using data from more than 17,000 community water systems, the researchers identified widespread exposures to arsenic, chromium-6, and nitrate at levels exceeding health-based benchmarks.

The highest burdens are concentrated in California, Arizona, and Texas, which are states where groundwater reliance, industrial activity, and agriculture overlap. In California, nearly 80% of preventable cancer cases have been linked to arsenic exposure.

- **Top water contaminants frequently appear together** – While not every water system contains all three carcinogens at once, co-occurrence is common, particularly in the western and southwestern United States. For instance, nitrate runoff from agriculture often overlaps with arsenic in the soil and chromium-6 from industrial discharge or natural sources.
- **Reducing multiple contaminants at once yields the greatest benefit** – The analysis showed that addressing several pollutants together is far more effective than tackling them individually. In systems where both chromium-6 and arsenic were present, bringing both down to health-based targets could prevent more than 50,000 lifetime cancer cases.

In places already reducing chromium-6, modest arsenic reductions of just 27% to 42% would lead to substantially better outcomes, quadrupling the number of cancers avoided. Lowering nitrate by just 20% would prevent around 130 new cancer cases every year and save \$35 million annually in healthcare costs.

- **Federal regulation lags behind both science and state action** – National standards still evaluate drinking water contaminants one at a time, even though people are exposed to complex mixtures. Arsenic's federal limit hasn't changed since 2001.

Nitrate's hasn't changed since 1992.

Meanwhile, there is still no federal limit for hexavalent chromium, only for total chromium, which doesn't distinguish between toxic and nontoxic forms. According to Tasha Stoiber, Ph.D., a senior scientist at EWG and lead author of the study:

*"Drinking water is contaminated mostly in mixtures, but our regulatory system still acts like they appear one at a time. This research shows that treating multiple contaminants together could prevent tens of thousands of cancer cases."*<sup>13</sup>

- **A call for better water regulations** – Many rural water systems serve just a few hundred or a few thousand people. For these communities, installing and maintaining effective treatment infrastructure comes at a high cost per household. Even when the threat is clear and the solution exists, they often lack technical support and funding to make changes. David Andrews, Ph.D., acting chief science officer at the EWG, stated:

*"This is about more than clean water – it's about protecting health and advancing equity. We have the engineering solutions to fix the broken drinking water system in the U.S., but we need state and federal policies to reflect the reality people face when they turn on the tap."*<sup>14</sup>

For a deeper look at other harmful contaminants found not just in tap water but also in bottled water, check out "[Cancer-Causing Chemicals Found in Tap and Bottled Water](#)."

## **Invest in a High-Quality Filtration System to Reduce Your Exposure**

Protecting your household starts with controlling what flows from your own tap. Filtration systems designed to reduce contaminants like arsenic, nitrate, and chromium-6 are widely available and increasingly effective. While no single solution works for everyone, whole-house filtration remains the most comprehensive option.

- **Use a combination of point-of-entry and point-of-use filtration** — Ideally, water needs to be filtered at both the main supply line entering your home (point of entry) and again at key locations where it's consumed or used, such as the kitchen sink and showers (points of use). This dual approach ensures broader protection against a range of contaminants.
- **EWG recommends reverse osmosis systems for targeted protection** — Installed under the sink, these units remove a broad range of harmful chemicals by forcing water through a semi-permeable membrane and several layers of pre-filtration. Most certified systems are capable of reducing arsenic and nitrate to well below health-based targets, and many also remove chromium-6.

Ion exchange technology is another effective option. These systems remove charged contaminants like nitrate and chromium-6 using specialized resins and are especially helpful in areas with hard water or elevated ion levels.

- **Some households may benefit from combining filtration technologies** — For example, use activated carbon for chlorine and volatile organic compounds, along with reverse osmosis for heavy metals and carcinogens. One of the best water filters currently available is the Pure & Clear Whole House Water Filtration System, which uses a three-stage process to remove chlorine, detergent byproducts, and other common contaminants.
- **Filter performance depends on maintenance** — Regardless of system type, performance depends on proper installation, periodic testing, and routine maintenance. Filters degrade over time, and when they're overdue for replacement, they may allow contaminants to pass through unnoticed.
- **Know what you're dealing with before you choose a system** — To understand what's in your tap water, EWG's Tap Water Database<sup>15</sup> is a valuable starting point. By entering your ZIP code, you can view the latest testing data from your local water utility and compare contaminant levels against both federal legal limits and stricter health-based benchmarks.

Once you know your specific exposures, choose a filtration system that directly targets them. For detailed comparisons and product guidance, visit EWG's Water Filter Guide.<sup>16</sup>

## More Ways to Protect Your Water

Filtration is an essential line of defense, but it's not the only step you can take. There are additional ways to help reduce hidden exposures and give you more control over water quality from the source to the tap.

- **Flush stagnant water from your pipes** — If the tap hasn't been used for several hours, such as overnight or after returning from travel, let the water run for a minute or two before using it. This helps clear out water that may have absorbed metals or chemicals while sitting in the pipes.
- **Test private wells regularly** — If you live in an older home or your household relies on well water, periodic testing is essential. Unlike municipal systems, private wells are not routinely monitored by public agencies. Annual testing is the best way to catch emerging problems early.
- **Stay informed about your local water utility** — Public water systems are required to publish Consumer Confidence Reports each year. These documents list detected contaminants, explain any violations, and outline planned improvements. Reading these reports helps you understand whether your community is meeting safety benchmarks and where gaps still exist.
- **Engage with local and state decision-makers** — Infrastructure upgrades and water treatment projects depend on funding and policy support. Contacting your state representatives, attending water board meetings, or submitting public comments on proposed rules helps ensure your concerns are heard. When residents get involved, it becomes harder for decision-makers to overlook the public health cost of delay.

# **Frequently Asked Questions (FAQs) About Water Contaminants and Filtration**

**Q: What are the top cancer-causing contaminants in U.S. tap water?**

**A:** The most frequently detected cancer-linked contaminants in U.S. drinking water are hexavalent chromium (chromium-6), arsenic, and nitrate. These pollutants often appear together, especially in agricultural or industrial areas, and are associated with higher risks of stomach, bladder, lung, and ovarian cancers.

**Q: What states have the highest water contamination risk?**

**A:** California, Arizona, and Texas carry the greatest contamination burden. These states have widespread groundwater use, intensive agriculture, and industrial activity, all of which increase the likelihood of exposure to arsenic, nitrate, and chromium-6 above health-based benchmarks.

**Q: How can I find out what contaminants are in my tap water?**

**A:** Use the EWG Tap Water Database. By entering your ZIP code, you can view testing results from your local utility and see how contaminant levels compare to both federal legal limits and stricter health-based guidelines.

**Q: What kind of home water filter removes arsenic, nitrate, and chromium-6?**

**A:** The EWG recommends reverse osmosis systems, which use a semi-permeable membrane to reduce a wide range of contaminants, including heavy metals and carcinogens like arsenic and chromium-6. Ion exchange systems also target nitrate

and chromium-6. For broad protection, many households combine point-of-entry and point-of-use filters.

**Q: What can I do to improve water quality in my community?**

**A:** Beyond filtration, flush stagnant water after long periods of disuse, test private wells yearly, read your utility's Consumer Confidence Report, and advocate for local infrastructure upgrades and stricter standards. Public involvement can accelerate change where policy lags.

## Sources and References

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- <sup>1, 3, 11</sup> [Environmental Research Volume 284, 1 November 2025, 122125](#)
- <sup>2, 4, 12, 13, 14</sup> [EWG, July 8, 2025](#)
- <sup>5</sup> [Britannica, What Is Hexavalent Chromium?](#)
- <sup>6</sup> [EPA, Chromium Compounds](#)
- <sup>7</sup> [NTP, July 2008](#)
- <sup>8</sup> [WHO, Arsenic](#)
- <sup>9</sup> [PLOS Water 3\(9\): e0000272 doi: 10.1371/journal.pwat.0000272](#)
- <sup>10</sup> [California Department of Health Services, February 2000](#)
- <sup>15</sup> [EWG's Tap Water Database](#)
- <sup>16</sup> [EWG's Water Filter Guide](#)