

# Scientists create framework for using demographic data to evaluate cumulative cancer risk from tap water contamination

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A peer-reviewed Environmental Working Group study shows how water quality data, community water system maps and demographic data such

as race and ethnicity can help identify where cumulative cancer risks from polluted tap water plague communities already threatened by other environmental injustices.

The study, just published in the *International Journal of Environmental Research and Public Health*, bolsters EWG's August request that the Environmental Protection Agency adopt drinking [water](#) as a metric in its environmental justice mapping tools, to create more equitable water quality policies and actions.

"EWG's analysis provides a framework for how policymakers can make safe drinking water part of the equation when analyzing the effects of new and existing [public health policies](#)," said Uloma Uche, Ph.D., EWG environmental [health](#) science fellow and one of the study's authors.

EWG's framework is designed to demonstrate to the EPA, the agency's National Environmental Justice Advisory Council and other decisionmakers that it is both feasible and important to consider drinking water quality data when identifying communities with significant, urgent environmental quality issues.

The framework fills a gap in the capacity of the EPA's Environmental Justice Screening and Mapping Tool to identify communities facing multiple [environmental injustices](#). The tool, known as EJSCREEN, aggregates and evaluates 11 environmental indicators—such as the presence of lead paint, proximity to Superfund sites and existence of nearby wastewater discharges—but not drinking water quality.

EWG researchers applied the new framework to evaluate the [cancer risk](#) posed by toxic cocktails of tap water contaminants in California and Texas, where more than one in five U.S. residents lives. They combined data from three sources: the U.S. Census Bureau's American Community Survey, the boundaries of the service areas for more than 7,000

community tap water systems and the results of federally mandated tests conducted by those systems.

EWG scientists calculated the cumulative effects, over a lifetime of exposure, of 30 carcinogenic tap water contaminants found across over 7,000 tap water systems in the two states. They found communities that skewed more Hispanic and/or Black, according to the American Community Survey 5-Year Estimates for 2019, had a statistically significant increase in risk from cancer due to exposure to tap [water contamination](#), compared to communities with lower ratios of these populations.

The contaminants included 21 that are federally regulated, such as arsenic, nitrate, radium and disinfection byproducts, and nine that are not, including hexavalent chromium and 1,4-dioxane.

The new study builds on earlier EWG peer-reviewed research, published in 2019 in the journal *Heliyon*, finding that cumulative exposure to mixtures of toxic chemicals commonly found in U.S. tap water could result in more than 100,000 cancer cases.

The EPA's public health goal for tap water contamination—the level of a chemical contaminant in drinking water that does not pose a significant risk to health—is a one-in-one-million lifetime risk of cancer.

The agency has not amended its list of regulated water contaminants [since 2000](#), and it rarely revisits the maximum levels it sets for regulated contaminants, even when the latest science shows a clear risk to public health from cancer or other serious illnesses at amounts far lower than legal limits.

"Drinking water rarely, if ever, contains only one contaminant, yet federal regulators assess the public health risks of tap water pollutants

one at a time," said EWG Science Analyst Sydney Evans, who worked on both studies.

"With our newest research, EWG continues to shine a light on the need for policymakers to evaluate the actual threat posed by the combinations of carcinogens so many people have no choice but to drink," she said.

U.S. drinking water infrastructure is long overdue for large investments that could significantly reduce contamination and better protect public health. Some water quality issues can be addressed with in-home water filters, but no filter can remove all contaminants. The most effective filters are unaffordable for many people facing the worst contamination.

"Everyone should have access to affordable, safe [drinking](#) water in the U.S., regardless of where they live," Evans said. "Safe water has become a privilege when it should be a right."

EWG's study didn't evaluate the levels of or risks from carcinogenic contaminants in private wells, which are not tracked by any government entity.

**More information:** Uloma Igara Uche et al, Community-Level Analysis of Drinking Water Data Highlights the Importance of Drinking Water Metrics for the State, Federal Environmental Health Justice Priorities in the United States, *International Journal of Environmental Research and Public Health* (2021). [DOI: 10.3390/ijerph181910401](https://doi.org/10.3390/ijerph181910401)

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