

The Primary Victims of Toxic Drinking Water

A recent Columbia study reveals major racial disparities in access to clean public water.

By
David J. Craig
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Communities of color are likelier to have poor water quality, according to a new study. (Mari Maloney)

Every year, millions of Americans who rely on public utility systems for drinking water are exposed to potentially dangerous levels of arsenic, uranium, lead, pesticides, bacteria, and other contaminants, according to publicly available data

from the Environmental Protection Agency (EPA).

Efforts to identify and help communities at risk have been stymied because only a few in-depth, nationwide assessments of drinking-water quality in the United States have been conducted. One of [the first](#), coauthored by Columbia engineer and hydrologist [Upmanu Lall](#) in 2018, found that Americans who live in low-income rural areas are the likeliest to have tainted tap water. But that study did not explore the racial and ethnic makeup of these communities — key information sought by environmental-justice advocates.

Now a team of researchers led by [Anne Nigra](#) '20PH of Columbia's Mailman School of Public Health has dug more deeply into this issue, analyzing US census data against a decade's worth of EPA water-monitoring records to reveal the sociodemographic characteristics of communities routinely exposed to certain pollutants. In a forthcoming paper, Nigra and her colleagues paint a troubling picture of race-and-ethnicity-based inequalities in water access. They reveal that in regions of the country where arsenic and uranium are abundant underground, counties with large Hispanic, Native American, and Black populations are more likely to be served by public water systems that consistently fail to meet federal safety standards. At particular risk, the researchers found, are people of color who depend on water systems that draw from aquifers in California, Nevada, Oregon, Kansas, Nebraska, and Oklahoma.

"It seems apparent that structural racism is at play," says Nigra, an assistant professor of environmental-health policy. She notes that the association between racial and ethnic composition and water quality in US counties holds up even when controlling for residents' average income and other socioeconomic factors.

The Columbia researchers' new paper does not address how racial and ethnic biases may translate into poor water quality, but Nigra points to several possible mechanisms. She explains that state governments are primarily responsible for ensuring water quality and allocating infrastructure spending — undertakings that can create opportunities for the preferential treatment of white communities, whether such biases are conscious or not.

"States have wide latitude to decide how to allocate money for new water-treatment technologies and how aggressively to enforce violations with warning letters, site visits, or civil and criminal penalties, which can lead to selective enforcement," she

says. “White communities might be more politically connected to regulatory agencies, and individual regulators who know these communities may be more responsive to their advocacy efforts around water. As a result, communities of color can end up experiencing significant water disparities.”

Many questions about Americans’ vulnerability to water contaminants remain. The Columbia team’s new study examines only those EPA records pertaining to inorganic chemicals — one of six categories of water contaminants the agency regulates. While lead and copper are also inorganic, the study does not analyze these exposures, because of limitations in the agency’s data. Nor does the study address the health risks faced by the estimated twenty-three million Americans who get their water from private wells, which the EPA does not regulate and which are generally considered less safe than public water supplies.

But Nigra hopes that by showcasing the health risks faced by many Hispanic, Native American, and Black residents from chronic exposure to arsenic and uranium, she and her colleagues will help put pressure on federal and state authorities to devote more resources to improving water quality in their communities. Such efforts could save lives, since earlier [research](#) by Nigra and Ana Navas-Acien, a Columbia physician-epidemiologist and a coauthor of the forthcoming paper, has shown that even small reductions in water arsenic levels nationwide would prevent hundreds of cancer deaths annually; uranium, meanwhile, has been linked to lung cancer, heart disease, and kidney damage.

“Ongoing efforts to improve water quality in America ought to be targeting the most highly exposed communities, and race and ethnicity need to be a part of that conversation,” Nigra says.

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