

Secure access to food and water is decreasing for US children, research finds

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Between 2005 and 2020, the number of children facing simultaneous water and food insecurity in the United States more than doubled. Additionally, Black and Hispanic children were several times more likely

than white children to experience food and water insecurity at the same time.

This is according to new research by Asher Rosinger, associate professor of biobehavioral health and anthropology at Penn State, and Sera Young, associate professor of anthropology at Northwestern University.

In a study [published](#) in *Nature Water*, the researchers examined water insecurity, food insecurity and their simultaneous occurrence among children in the United States.

The researchers analyzed data from 18,252 children using the [National Health and Nutrition Examination Survey \(NHANES\)](#), a nationally representative assessment of health and nutrition conducted annually since 1999 and sporadically since the 1960s.

Water insecurity or food insecurity—the lack of consistent, safe access to food or water—can be devastating to healthy growth, according to the researchers. Water insecurity has been linked to problems with [mental health](#), physical health, nutrition and economic well-being. Food insecurity has been associated with poor mental health, diabetes, poor nutrition, obesity, cardiovascular disease and premature death.

Around the world, food and water insecurity are often driven by poverty, inadequate access to resources and climate-related issues, according to the researchers.

In high-income nations like the U.S., food and water insecurity can be triggered by a range of circumstances, including sudden income loss, familial instability or infrastructure problems. Though much more common at lower income levels, the researchers said that water and food insecurity occur far more often than expected in the U.S.

A growing concern

In 2005–06, 4.6% of all children in the United States experienced both water and food insecurity. By the 2017–2020 survey cycle, the researchers found that the percentage of children nationwide who faced both problems rose to 10.3%.

Over the course of the 20th century, rates of both food insecurity and water insecurity have improved overall, according to Rosinger, who leads the Penn State College of Health and Human Development Environmental Health Sciences Program and directs the Water, Health and Nutrition Lab. During the period of this study, however, the researchers found a steady, gradual increase in any amount of household food insecurity.

Water insecurity fluctuated between 2005 and 2013. Then the 2013 [water crisis](#) in Flint, Michigan, made national news. Between 2013 and 2020, the odds of water insecurity—as measured by whether children avoided drinking their [tap water](#)—rose by 88%.

Water and food problems are inherently connected, according to the researchers. The authors' previous work demonstrated the connection between water and food insecurity in adults, and this paper demonstrated that children who avoided tap water had a higher probability of experiencing food insecurity as well.

Avoiding tap water is associated with other problems that can negatively affect food and water intake, Rosinger said. People who avoid tap water are less likely to cook nutritious food for their children because they lack a trusted water source in the kitchen taps. People who avoid tap water also consume higher levels of sugary beverages. Additionally, they may have less money for nutritious food because they are purchasing bottled water, which is far more expensive.

"Nearly one in 10 children were experiencing household food insecurity and avoiding their tap water by 2020, and we know that the COVID-19 pandemic only made food insecurity more pervasive," Rosinger said. "That means millions of children in this country are facing potential negative consequences for their mental health, physical health and economic futures."

Large racial disparities

Compared to the national average, the numbers among Hispanic children are much higher, according to the researchers. Their results showed that Black children were 3.5 times more likely than [white children](#) to experience simultaneous food and water insecurity. Hispanic children, meanwhile, were over seven times more likely than white children to experience simultaneous food and water insecurity.

Though availability of safe, reliable water access is a critical part of water security, trust of tap water is also a factor, both for children and their parents. The researchers said that when parents do not trust the water, they are less likely to give it to their children for fear it will make them sick.

"Most people are aware that Flint, Michigan, experienced a crisis related to unsafe tap water, and Flint is a majority Black community," Rosinger said.

"Since then, there have been other highly visible problems with [water systems](#) in majority-minority communities like Newark in New Jersey and Jackson in Mississippi. When you see on the news that people who look like you are getting sick from tap water, it can amplify mistrust. Additionally, minoritized populations often have poorer access to services, especially people who live in low-income communities."

Rosinger described reports that people with brown water coming out of their taps were told it was safe to drink. "But smell, taste and color affect whether people trust their water," he said. "This mistrust is rational and needs to be addressed."

Understanding water insecurity

The NHANES data included measures of food insecurity, but water insecurity was not directly assessed in the survey. To understand when children faced water insecurity, the researchers found a variable that functioned as a proxy for water insecurity—tap water avoidance.

Rosinger's [previous research](#) demonstrated that tap water avoidance can provide a window into understanding water insecurity.

"At all income levels except the very lowest, children were more likely to experience food insecurity when they did not drink tap water," Rosinger said.

"We saw the biggest effect for children in low-income and lower-middle income households, but even in households that earned incomes several times the national poverty level, children were more likely to face food insecurity if they did not drink tap water."

Children in households below the poverty line had very high probability of experiencing food insecurity whether they drank tap water or not, according to the analyses.

The researchers said that worldwide water insecurity is expected to increase in the coming years due to pressure from climate change, population growth and aging infrastructure. Though they said tap water avoidance data is useful, they believe that directly measuring water insecurity experiences is important.

"We cannot manage what we cannot measure," Young said. "The first step is to understand the extent of the problem. Tap water avoidance is a great proxy of water insecurity, but it is abundantly clear that we need a better understanding of who is experiencing hardships and the extent of those difficulties."

Young led the development of the Water Insecurity Experiences Scale (WISE), an innovative tool designed to measure universal experiences with water insecurity, and inform development action and policy implementation. The WISE scale surveys individuals on 12 experiences with access, use and reliability of water.

The tool has been used to collect nationally representative data on water insecurity from at least 40 low-, middle- and high-income countries, including among U.S. adults, but at the time of this publication has not yet been adopted by the U.S. National Health and Nutrition Examination Survey.

Moving forward

Despite the lack of a direct measure of water insecurity in the U.S., the researchers agreed that much can be done right now to address water and food security in the nation. They said that [government programs](#) like the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and Supplemental Nutrition Assistance Program (SNAP), which have been shown to reduce [food insecurity](#), could be expanded.

"Right now, many people in the U.S. equate the existence of water infrastructure with being water secure," Young said. "But piped water can be unaffordable, contaminated, dried up or otherwise not available. And let us not forget that there are millions of people in the U.S. living without piped water."

The researchers said that policy changes could reverse the trend of growing water insecurity. They said that providing water filters to Hispanic families has already been shown to reduce distrust of tap water, resulting in increased tap water consumption and reduced reliance on bottled water. The researchers also advocated for in-home water testing to assess water safety.

"While there are a couple million people without safe, reliable drinking water, 99% of U.S. households have access to water through a pipe in their home, and the vast majority of that water is clean and drinkable," Rosinger said, noting that the U.S. has one of the best water distribution systems in the world.

"To rebuild trust in this system, we should provide testing to show that water is safe. We should replace lead service lines and provide filters where water is not safe. These actions will help ensure that our nation's children have access to the clean water they need to grow and thrive and that their families do not suffer extra financial and mental stress because of uncertain water quality."

More information: Asher Y. Rosinger et al, Trends and disparities in concurrent tap water avoidance and household food insecurity among US children, *Nature Water* (2024). [DOI: 10.1038/s44221-024-00261-2](https://doi.org/10.1038/s44221-024-00261-2)

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