

Water crisis took toll on Flint adults' physical, mental health

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Since state austerity policies initiated a potable water crisis seven years ago in Flint, Michigan, public health monitoring has focused on potential developmental deficits associated with lead exposure in adolescents or fetuses exposed in utero.

New research from Cornell and the University of Michigan offers the first comprehensive evidence that the city's adult residents suffered a range of adverse physical and mental health symptoms potentially linked to the crisis in the years during and following it, with Black residents affected disproportionately.

In a survey of more than 300 residents, 10% reported having been diagnosed by a clinician with elevated [blood lead levels](#)—well above national averages—after a state-appointed city manager, as part of a cost-saving measure, switched the city's [water](#) source to one that became contaminated with lead and harmful bacteria on April 25, 2014.

Nearly half the [survey respondents](#) reported experiencing skin rashes and more than 40% experienced hair loss, among [physical symptoms](#) associated with elevated levels of bacteria and heavy metals in water. More than a quarter of respondents reported symptoms of depression or anxiety, and nearly a third had PTSD symptoms specifically related to the water crisis.

"If you don't trust your water and you actively avoid it over persistent concerns on its safety, that's a stark form of psychological trauma in and

of itself," said Jerel Ezell, assistant professor in the Africana Studies and Research Center in the College of Arts and Sciences.

Ezell and Elizabeth Chase, a doctoral student at the University of Michigan School of Public Health, are co-authors of "A Population-Based Assessment of Physical Symptoms and Mental Health Outcomes Among Adults Following the Flint Water Crisis," published March 31 in the *Journal of Urban Health*.

The researchers conducted surveys in late 2019 as part of the Flint Community Engagement Project, a longitudinal study started in 2017 for which Ezell, a native of the Flint area, serves as principal investigator. Even several years after the city switched back to its original [water source](#) in 2016, the researchers said, federal, state and local government guidance, and guidance from healthcare practitioners in the city, about tap water safety remained ambiguous and often contradictory.

The surveys were administered at nine public sites—including libraries, a laundromat, a café and a bus station—in an effort to capture the racial and socioeconomic diversity across the low-income, predominantly Black city.

Ezell and Chase found that more than half the respondents were never screened for elevated blood lead levels, but that Black residents were nearly twice as likely to seek screening as whites—possibly an indication that they perceived a higher threat level, Ezell said, similar to the gap in threat perception seen across race in relation to COVID-19's severity.

Nearly 60% of Black respondents reported skin rashes beyond what they considered normal before the crisis, compared with 33.9% of whites. Black residents also reported significantly higher percentages of hair loss, nausea and emotional agitation. The more physical symptoms one reported, the study determined, the more likely they were to report

psychological symptoms.

The study used validated surveys to measure feelings of depression or anxiety and of post-traumatic stress disorder, as was observed in New Orleans after Hurricane Katrina and more recently in Puerto Rico after Hurricane Maria. They asked, for example, if respondents had persistent and ongoing thoughts about the quality of their tap water, or if they blamed themselves or someone else for the city's water crisis.

The results—26.3% of residents exhibited depressive or anxious symptoms, and 29% met criteria for trauma—revealed "a steep and broad mental health toll," the researchers said.

The authors acknowledged limitations to the study, including that the survey sample was not randomly selected and that symptoms were self-reported and could have been affected by recall bias. Factors other than water contamination, they cautioned, could have contributed to elevated blood lead levels and other reported symptoms.

The data nonetheless suggests, Ezell said, that Flint's adult residents experienced significantly more adverse health symptoms during and in the years after the water crisis' initiation than would be expected from the city's population.

"Flint adults, particularly Blacks," Ezell and Chase concluded, "experienced deleterious physical and mental health outcomes following the city's [water crisis](#) that appear to represent a substantial burden of excess cases."

The findings, they said, point to the need for continued testing of Flint's water quality and any potential negative health impacts, and a broader imperative to restore civic trust by addressing "macrosocial forces, many of which have racist and classist antecedents," that contributed to the

crisis.

"It is these forces," they wrote, "that ultimately laid the groundwork for the devaluation of Flint's water and negligence towards residents' [health](#)."

More information: Jerel M. Ezell et al. A Population-Based Assessment of Physical Symptoms and Mental Health Outcomes Among Adults Following the Flint Water Crisis, *Journal of Urban Health* (2021). [DOI: 10.1007/s11524-021-00525-2](https://doi.org/10.1007/s11524-021-00525-2)

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