Adapted from: http://theconversation.com/can-citizen-science-empower-disenfranchised-communities-53625

Grave scientific questions in Flint

In April 2014, the city of Flint, Michigan switched its water supply to the Flint River in an effort to save money. But from the get-go, it was clear that there was something wrong. Residents rapidly started raising concerns over the smell, taste and appearance of the water. Yet despite their worries, they were repeatedly told by experts and city and state officials that the water was safe.

Tragically, toward the latter part of 2015, it became clear that the switch to what turned out to be a more corrosive water supply had led to high levels of lead leaching into the water. Flint's children were being poisoned by the very water parents had been repeatedly assured was safe to drink.

From the beginning of this public health crisis, Flint residents were ignored and marginalized by experts and civic leaders. At the time of the water switch, I was working at the University of Michigan in Ann Arbor, and clearly remember the near-daily news coverage of residents' concerns and their dismissal by officials.

Motivated by the stories coming out of Flint, a group of students and researchers at Virginia Tech (VT) – some 500 miles away from Flint – decided to take action. They reached out to residents and developed a partnership that would help those affected by the growing crisis find out for themselves what was in their water.

The result was the Flint Water Study – a citizen science project that empowered residents in the city to analyze and make sense of their water quality. The VT team provided residents with water test kits and worked with them on collecting, analyzing and using the results. The results were shocking.

The top 10 percent of measured lead levels were 10 times higher than those in neighboring Detroit, and nearly twice as high as the U.S. Environmental Protection Agency's (EPA) action level – the highest measured value was over 10 times the level at which the EPA recommends taking action.

National Guard members go door to door to deliver water, filters, replacement cartridges and water test kits to residents of Flint, Michigan on January 19, 2016. The National Guard, CC BY

Because of these findings and direct evidence of high blood levels in children – and despite repeated official claims that there wasn't a problem – the state and the federal government are finally taking action to address the situation. And on January 16, 2016 – 18 months after citizen concerns were first raised – President Obama signed an emergency declarationand orders for federal aid for Flint. The Flint water crisis is a story of both **disenfranchisement** and the ability of citizen-led science to **empower** communities. It's a stark testament to how ordinary people can use science to find a voice, and to impact decisions that directly affect them.

'Extreme citizen science' in action

The Flint Water Study is an example of what researchers at the University College London (UCL) Extreme Citizen Science (ExCiteS) program are calling Extreme Citizen Science.

This “extreme” citizen science is science that empowers citizens to deal with issues that directly concern them. It’s an approach that enables communities – regardless of their location, background, culture or literacy levels – to take the lead in research that’s directly relevant to them. At its core, this form of citizen-led science recognizes and validates the ability of citizens to “own” the scientific method – to formulate questions and do research that directly benefits them and their communities. And it underlines how science can empower the disempowered and disenfranchised.