

Study finds viruses in untreated East Tennessee drinking water

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This picture shows microbiologist Trisha Johnson collecting water samples. Johnson and University of Tennessee scientist, Larry McKay, surveyed eight community water supply sources in East Tennessee and found concentrations of viruses and bacteria linked to human feces that could potentially cause waterborne disease. The findings are published in the electronic version of *Ground Water*. Credit: Larry McKay/ University of Tennessee, Knoxville

Do you know what is in your drinking water? A study by a University of Tennessee, Knoxville, professor may have you thinking twice the next time you fill up that glass of tap water.

Larry McKay, an earth and planetary sciences professor in the College of Arts and Sciences, sampled eight community water supply sources in East Tennessee and found concentrations of viruses and bacteria linked to human feces that could potentially cause waterborne disease.

The study, "Viruses and Bacteria in Karst and Fractured Rock Aquifers in East Tennessee, USA" is published in the electronic version of *Ground Water* and will appear in a special edition of the journal *Pathogens and Fecal Indicators in Ground Water* later this year.

McKay surveyed samples of raw water from eight wells or springs throughout East Tennessee. Half of the water sources were considered high-risk for [fecal contamination](#) and the other were considered low-risk, based on previous data. McKay primarily sampled wells and springs in karst aquifers, which are made of limestone, because they are commonly used as water sources in the region and have a reputation for carrying bacteria.

"Karst aquifers have long been recognized as having high susceptibility to fecal contamination because they have features, such as sinkholes and caverns, which act as pathways for rapid flow and transport of contaminants," McKay said.

The water samples were analyzed for [fecal bacteria](#), *E.coli* and coliforms, Bacteroides and infectious viruses.

All of the high-risk water sources contained *E.coli*, coliforms, Bacteroides and infectious viruses. One of the low-risk water sources had *E.coli* and coliforms; half had [Bacteroides](#); and three-quarters had infectious viruses.

All of the wells and springs sampled in the study are used for public water supply, but the water is treated before being distributed, so the contamination measured in the study doesn't represent a direct risk to consumers.

However, these results shed light on a potential health hazard for part of the Tennessee population.

"The real concern is for the numerous small non-community water systems and household wells, where local residents typically drink groundwater that hasn't been filtered or disinfected," McKay said. "It's likely that many of these residents are being exposed to waterborne fecal contamination, both bacterial and viral, but it isn't clear how big a health risk this represents. Local and regional research is needed to assess the health impacts."

McKay noted waterborne fecal contamination affects people in varying degrees; some people may have no symptoms while others may become seriously ill or even die.

Provided by University of Tennessee at Knoxville

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