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# Study of 14 Wisconsin communities shows viruses in drinking water samples

By Lee Bergquist of the Journal Sentinel

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A new study of 14 Wisconsin communities that do not disinfect their water revealed the presence of human viruses in drinking water in nearly one-quarter of all samples taken.

The results suggest that people in municipalities that don't treat their water systems may be exposed to waterborne viruses and potential health risks, the study concluded.

The authors calculated that water that isn't disinfected was responsible for 6% to 22% of gastrointestinal illnesses reported during the study period.

At one time during the study, when norovirus was commonly found in tap water, the researchers attributed up to 63% of the cause of illness to dirty drinking water in children younger than 5.

The likely virus source was leaking wastewater sewers, the study concluded. The viruses from human waste traveled through the soil and flowed into groundwater, which is the source of drinking water for the communities. In some cases viruses in the soil could have flowed into cracked water pipes of homes.

The work was conducted by researchers at the Marshfield Clinic Research Foundation and the University of California, Davis. It was published Friday in [Environmental Health Perspectives](#), a peer-reviewed journal of the National Institute of Environmental Health Sciences, and is one of the first to tie viruses in public water supplies to effects on human health.

The results of the study come in the wake of action a year ago in the state Legislature when lawmakers rejected regulations by the Department of Natural Resources that would have required all Wisconsin communities to disinfect their drinking systems.

The DNR, under the administration of former Gov. Jim Doyle, used the work of the study's lead author Mark A. Borchardt to advance the regulations. Borchardt is a microbiologist who works for the U.S. Agricultural Research Service in Marshfield.

In May 2011, the Legislature broke along party lines, with Democrats arguing that the regulations would protect public health, and Republicans contending that the decision should be left in the hands of the communities themselves.

There are [66 Wisconsin municipalities](#) with a total population of about 85,000 that do not disinfect water. Most are small, with many serving only a few hundred customers.

Rice Lake is the largest, with more than 8,000 users. In southeastern Wisconsin, Kewaskum in Washington County serves more than 4,000 users.

Nationally, the authors reported, there are 95,600 drinking water systems serving 20 million people that do not disinfect their water. The Environmental Protection Agency reported in 2006 that an estimated 57 million people drink treated groundwater that does not meet a federal goal of reducing viruses by nearly 100%.

The results of the Wisconsin findings, the authors of the study said, were 4,500 times higher than the EPA's acceptable risk.

The 14 Wisconsin communities in the study were: Crandon, Cumberland, Barron, Chetek, Ladysmith, Tomahawk, Prairie du Sac, Adams, Spring Green, Rice Lake, Cameron, Baldwin, Lake Hallie and Fall River.

Despite the rejection of the state regulations, the DNR says it still recommends to communities that they should disinfect their water systems.

In the spring of 2011, Borchardt testified before a legislative committee on earlier results of his work, saying that the benefits of disinfecting water outweigh the cost.

In an interview Thursday, Borchardt said that he believes that he has provided "all of the information available for making good policy decisions."

"This is not a question of gaps in knowledge anymore. It's a matter now for the policy-makers."

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Rep. Brett Hulseby (D-Madison) said Borchardt's work had important public health implications.

"I think the study is clear," Hulseby said. "The solution is disinfection."

### Disinfecting systems

There are several ways to disinfect water, but the most commonly used is adding chlorine to public systems.

Hulseby and seven other Democratic lawmakers asked the EPA in a letter on Friday to use the federal government's authority under the Safe Drinking Water Act to protect residents of communities that don't disinfect water.

Last month, the EPA [announced](#) it will require monitoring during 2013 to 2015 for various chemicals and the virus types found in the Wisconsin study in 6,000 public water systems as part of the government's unregulated contaminant monitoring program.

In the Legislature, others don't agree with a state mandate.

Rep. Erik Severson (R-Star Prairie), an emergency room physician, lauded the rigor of the study, but said the results shouldn't mean mandatory disinfection.

"It goes back to choice for the community," Severson said. "The communities have to make the decision."

In some cases, taxpayers might be willing to put up with an occasional day off from work or a case of diarrhea to avoid paying hundreds or thousands of dollars in costs in upgrades per household, he said.

In Kewaskum, Matt Heiser, the village administrator, said officials haven't conducted a poll of residents. But he thinks most prefer the way it is now. The village uses chlorine periodically when crews work on the system.

"We get calls from our residents who taste and smell it and complain they don't like it," Heiser said.

Kewaskum, he noted, must comply with the same state standards for drinking water systems as those that treat their water. The \$2.3 million study was funded by the EPA, and is part of the Wisconsin Water and Health Trial for Enteric Risks.

In the 14 communities, 621 households participated in the study, including 1,079 children and 580 adults.

Ultraviolet light, a disinfectant, was installed in the homes in eight communities in 2006. The next year, disinfection systems were installed in the remaining six communities.

Water samples were taken at the homes.

Also, an adult was required to complete a daily checklist recording gastrointestinal illness symptoms for every member of the household.

A total of 1,204 samples of tap water were included. A total of 287 samples, or 24%, tested positive for at least one type of virus and 41, or 3%, tested positive for two or more types of virus.

The most frequently detected types were adenoviruses, enteroviruses and noroviruses.

### STUDY LOCALES

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Crandon, Cumberland, Barron, Chetek, Ladysmith, Tomahawk, Prairie du Sac, Adams, Spring Green, Rice Lake, Cameron, Baldwin, Lake Hallie and Fall River.



#### About Lee Bergquist

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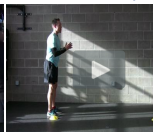
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