Parasitic infections common in kids in low-resource US communities, study finds

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New WashU research finds 38% of children sampled from a rural Mississippi Delta community have parasitic infections. Credit: Theresa Gildner

Most Americans view parasitic infections as a problem of the past or one that only impacts low-income countries. However, new research from Washington University in St. Louis finds evidence that the problem is likely widespread in low-resource communities throughout southern United States where environmental conditions combined with infrastructural neglect and inadequate access to health care create the perfect breeding ground for these infections.

In a small, preliminary study published on March 2 in the *American Journal of Human Biology*, 38% of children sampled from a rural Mississippi Delta community were found to have either parasitic worms or protist infections—a single-cell parasitic organisms that can negatively impact intestinal health.

Parasitic infections are a neglected health issue in low-resource communities, according to Theresa Gildner, study co-author and assistant professor of biological anthropology in Arts & Sciences at WashU. School-age children are especially at risk for these infections due to increased exposure through play, poor hand hygiene and their still-developing immune systems.

Left untreated, the infections can lead to nutritional deficiencies and lifelong health consequences. Gildner said many of the community members they worked with during this project expressed frustration with state and federal governments that do not listen to their concerns related to these issues.

"This is a failure of all levels of government to provide basic services to vulnerable citizens. Health conditions—including parasitic and intestinal infections—linked with poor sanitation will likely worsen in coming years as climate change and associated extreme weather events further strain already weak infrastructure systems," said Gildner, an expert on parasitic disease and health disparities.

According to Gildner, President Biden's infrastructure bill is a step in the right direction, but more work is needed in the near future to invest in crumbling infrastructure.

"I do not know if President Biden's infrastructure bill will directly help the communities where we have worked—we haven't heard anything from our community partners—but I think there could be indirect benefits. For instance, drawing more attention to the immediate need for investment in failing infrastructure may lead to more localized projects that benefit these communities," she said.

But any efforts to address these infrastructure needs should start with direct and respectful community engagement by locally elected officials. After all, she said, "Individuals living in these communities have the best sense of what the issues are through their lived experiences and may have ideas for what is most needed to improve conditions in their specific community."

About the research

Understanding U.S. infection patterns—including the current extent of parasitic infections and key sources of exposure—is critical to improving health outcomes, Gildner said. Previous studies in the U.S. have been case-based or focused exclusively on immigrant populations. Very few surveys have been conducted in regions with the most risk factors for exposure.

In the summer of 2019, members of the Rural Embodiment and Community Health (REACH) research team—led by Gildner and Tara J. Cepon-Robins, associate professor of anthropology at the University of Colorado Colorado Springs (UCCS), and including WashU biologist Elizabeth K. Mallott and former UCCS undergraduate student Isabella C. Recca—traveled to the rural Mississippi Delta to conduct preliminary

research in the community.

They chose to direct their focus on a small, predominantly Black, rural community that is frequently affected by flooding and sewage backups due to community-reported infrastructural neglect.

In total, 24 children—including 12 boys and 12 girls ranging in age from infant to 14 years old—from 12 households participated in the study. Altogether, 38% of the children were found to have one or both types of parasitic infections.

Contrary to expectations, they found no significant differences in infection status based on age, sex or household size, although Gildner acknowledges that could be due to the relatively small sample size. She hopes ongoing research with a larger dataset will allow the team to better test these patterns in the near future.

Last summer, the team collected additional samples from adults and in the same Mississippi community, as well as in East St. Louis in a community facing similar issues related to failing infrastructure, persistent flooding and sewage backups, Gildner said. The team also is analyzing soil samples collected from various shared community spaces during the 2022 trip to better examine these patterns. And plans are underway to collect additional data in other Mississippi Delta communities this summer.

Education is key

Lack of education is one of the reasons why parasitic infections often go undetected.

"One interesting thing that we noticed during our 2019 visit to Mississippi is that some of the grandparents we spoke to were aware of

the threat posed by parasite infections locally because they had heard of these issues as children," Gildner said. "One grandparent told us they remembered public health educational programs that discussed the risks posed by hookworm infection and encouraged community members to wear shoes outdoors to prevent infection.

"However, that messaging stopped after their early childhood and they had always wondered why no one talked about these infections anymore. This kind of messaging could be relatively straightforward to implement, although basic information on key parasite infections would have to be provided since many people are no longer aware of these diseases."

Even health care providers often assume that parasitic infection risk is greatest for Americans traveling abroad. Educating health care providers about the threat posed by parasitic infections in the U.S., how to recognize symptoms and test appropriately is key.

"Without this basic medical knowledge, diagnoses may be missed and treatment delayed," Gildner said. "For instance, one participant this past summer had been diagnosed with Helicobacter pylori, a bacterium we have recently started studying that can cause stomach ulcers and certain gastric cancers in severe cases. However, she told us it took months and visits to multiple doctors before she was properly tested and diagnosed, in large part due to the assumption that symptomatic cases of this bacterial infection aren't a significant concern in the U.S."

Although it is an option for regions suffering from heavy parasitic infection rates, preventative mass drug administration is not a practical first step to addressing the problem, Gildner explained. There's not enough public awareness of the conditions and the safe effective drugs used to treat common parasite infections are incredibly expensive in the U.S., she said.

However, Gildner would like to see more government investment in research at other locations across the U.S. to help clarify the current extent of parasite infections and identify key sources of exposure that could be targeted to improve health outcomes.

More information: Tara J. Cepon-Robins et al, Evidence and potential drivers of neglected parasitic helminth and protist infections among a small preliminary sample of children from rural Mississippi, *American Journal of Human Biology* (2023). DOI: 10.1002/ajhb.23889

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