



America's dirty divide

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Infrastructure neglect and poverty lead to parasites in the Mississippi Delta

New research suggests parasitic infections in US south are far more widespread than previously acknowledged

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For years, Marecitta Dorsey’s four children - ages seven to 14 - suffered regular bouts of nausea, vomiting and sore stomachs. Their unexplained symptoms were bad enough to keep them out of school a few days each month.

“My eldest would tell me, ‘I feel like my tummy’s burning,’” recalled Dorsey. “Every week I was taking at least one kid to the doctor because of something with their stomach.”

She suspected their ailments had something to do with the water. Her children, she said, never had stomach problems before they moved to the Delta.

Dorsey and her family lived in Shaw, [Mississippi](#), a town of 1,400 people about 110 miles (175km) north of Jackson. The area is plagued by sanitation problems - residents in Bolivar county filed [half a dozen complaints](#) to state officials just last year about wastewater leaks and burst pipes that have exposed them to raw sewage.



📷 Abandoned buildings remain in downtown Shaw, Mississippi, on 24 September 2022. Photograph: The Washington Post/Getty Images

Now, researchers warn that these problems are probably contributing to widespread intestinal infections and parasites such as hookworm, roundworm and tapeworm.

“This is a real problem that the US has created that we have to fix,” said Marecitta Dorsey.

“There’s this whole idea that the US eradicated these things [parasites],” said Tara Cepon-Robins, an anthropologist at the University of Colorado, Colorado Springs. “But nobody actually eradicated anything.”

In fact, about **12 million Americans** are believed to have “neglected” parasitic infections - called neglected because of their prevalence, disabling symptoms and links to poverty. These illnesses can spread through contaminated water and contact with feces and tend to thrive in high poverty areas with poor sanitation systems.

Officials had previously believed that the US had rid itself of such parasites through investments in sanitation and public health, but in recent years research **has revealed** alarmingly high rates of infection, particularly in the south.

“These are chronic, debilitating conditions,” said Peter Hotez, dean for the National School of Tropical Medicine at Baylor College. Hotez, who has been studying neglected tropical diseases in the region since 2008, said Cepon-Robins and her colleagues’ findings were in line with what he expected. “It’s actually the poor living among the wealthy in G20 countries that account for most of the world’s neglected diseases,” he said.

Cepon-Robins and her team have been collecting blood and stool samples in Bolivar county since 2019 in an effort to show the impact of poor sanitation infrastructure on public health. The team’s results, **published** last year in the American Journal of Human Biology, were “concerning”, said Theresa Gildner, Cepon-Robins’s research partner.

The researchers found that 38% of the children in their initial sample had intestinal parasitic infections and 80% had high levels of intestinal inflammation, a common symptom of parasites. (The first sample was of 24 children; they have since collected samples from 150 more residents, whose results are pending.) Those figures are on par with a **landmark 2017 study**, led by Hotez and his colleague Rojelio Mejia, that found more than a third of residents in Alabama’s Lowndes county tested positive for traces of hookworm.

Hotez said there was “no question” that exposure to raw sewage was a factor in the infection rates that Cepon-Robins and Gildner found in Bolivar county.

The presence of parasites such as these “can shape how your body responds to things throughout your life”, said Cepon-Robins. “It can determine whether you have allergies or autoimmune disorders,” and cause nutrient deficiencies, stunting, developmental delays, a decreased ability to work or learn, and in serious cases, anemia and malnutrition. Cepon-Robins and Gildner also found the children with high levels of inflammation were more likely than their peers to be underweight.

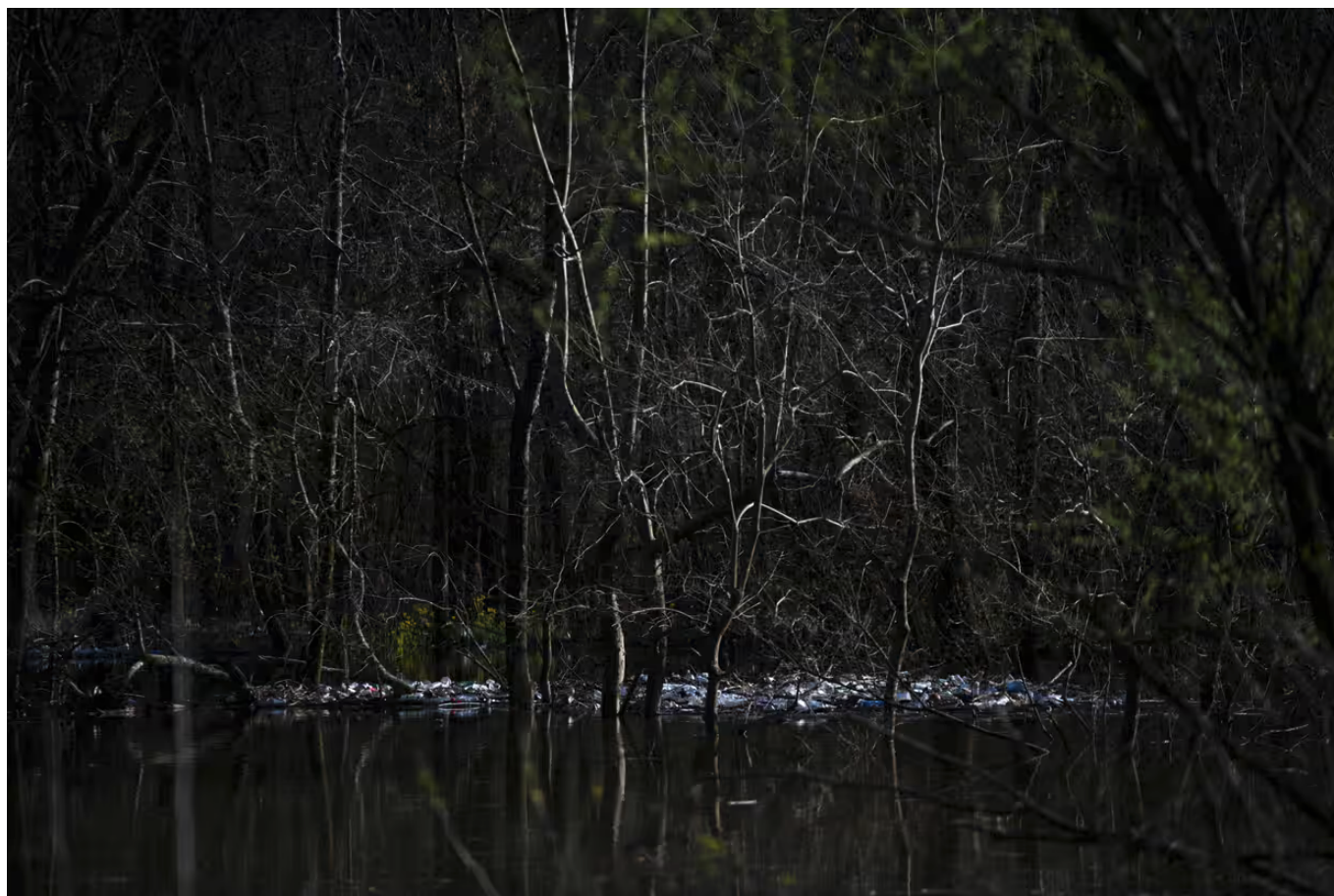
As the researchers expanded their study, they found that 73% of adults surveyed also had elevated rates of intestinal inflammation.

Few **US healthcare** providers are trained to recognize or treat parasitic infections, probably leading to many cases going undiagnosed, Gildner said. She was recently giving a talk on her research when a doctor in the audience said, “you’re not going to find anything,” she recalled, laughing incredulously at the memory.

‘The overall environment is brutal’

About 63% of Bolivar county residents are Black, many the descendants of enslaved people. Today, the county’s median household income is just under \$29,000 and the life expectancy is **six years shorter** than the US average.

“The overall environment is brutal,” said Dr Rev Jason Coker, the founder of Delta Hands for Hope, an education non-profit in Shaw that connected the researchers with residents.



Trash piles up on the Eubanks Creek, where sewage overflows have contaminated nearby waterways in Jackson, Mississippi, on 23 March 2022. Photograph: Mark Felix/AFP/Getty Images

Coker, who grew up in Shaw, said he “100%” expected the researchers to find the presence of parasites in residents’ test samples. He attributed the town’s decades of

water problems to white flight that started in the 1960s, and which left Shaw without the tax base to fund infrastructure maintenance.

In 1971, Black residents in Shaw [successfully argued](#) before a federal court that local officials practiced discrimination by not providing services like sewage, drainage and water in predominantly Black neighborhoods. The court ordered Shaw officials to submit a planned “program of improvements that will, within a reasonable time, remove the disparities that bear so heavily on the black citizens of Shaw”.

But more than 50 years later, Black communities across the south, including Shaw, have [worse access](#) to clean drinking water and functional sanitation systems than wealthier, whiter communities. “The water is brown, people don’t cook with it, they don’t drink it,” said Chiquikta Fountain, executive director of Delta Hands for Hope.

Shaw’s mayor, Evereth Stanton, denied any issues with the tapwater, noting that Shaw’s tested [water samples](#) were in compliance with the Safe Drinking Water Act, though he acknowledged: “You’ll get a smell when the chlorine runs out.” He added that Shaw officials were upgrading the town’s chlorination system.

The American Society of Civil Engineers gave Mississippi’s wastewater infrastructure a D- on its latest [Infrastructure Report Card](#), citing a \$2bn backlog in needed repairs or upgrades. “That increases the possibility of wastewater leaks into the environment, endangering the public,” the authors wrote.

In Bolivar county alone, with a population of 29,000, residents have filed 107 complaints since 2008. They have reported raw sewage flooding backyards, and sleeping away from home to avoid the stench, headaches and nausea related to the odor.

Charlene Gray, who lives in [Choctaw](#), about 4 miles (6km) from Shaw, said that every few months a county sewage pump near her property gets overwhelmed by debris, leading raw sewage to pool outside her home. “The sewage runs over,” she said, pointing to a field of brown-stalked cotton adjacent to her property. Sometimes it seeps into her yard, near her peach and plum trees. “And then the scent gets real strong.”

The [Mississippi](#) department of environmental quality oversees wastewater system operators across the state. “[The] MDEQ is aware of issues related to the sewage system servicing the Choctaw community,” said Jan Schaefer, MDEQ’s communications director, in response to emailed questions.

“We are having ongoing discussions with the Choctaw community, Bolivar county officials and their legal counsel to ensure long term operations and maintenance of a viable wastewater treatment system,” she said, adding: “Our efforts include working

to ensure that responsible parties are identified and held accountable for maintaining and operating wastewater systems.”

Schaefer did not respond to questions about whether infrastructure problems and the backlog in funding for needed repairs or upgrades might be contributing to parasitic infections in Bolivar county.

She directed queries about parasitic infections and their potential causes to the Mississippi state health department. Officials there declined to respond.

Coker, the local advocate, said he believed southern states’ “decades of water problems” would probably only be fixed with an influx of federal investment - but he was skeptical that the incoming [administration](#) of [Donald Trump](#), who has pledged huge spending cuts, would prioritize communities like his. “Trump does nothing for rural America when he’s president,” he said.

Last year, Dorsey decided she had had enough. She and her family moved to the outskirts of the county, where she said she no longer fears exposure. Now, “they haven’t had stomach [problems] in a while,” she said. “I just thought it was a stomach bug. But this water - it’s ridiculous.”

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