

Poliolike illness tests an overstretched public health system

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The mysterious, poliolike disease that has struck 414 people—mostly young children—across the United States since 2014 comes at a time when the public health system already is overstretched.

Reported in 39 states and Washington, D.C., acute flaccid myelitis,

known as AFM, causes muscle weakness and in some cases paralysis in the arms or legs, terrifying parents and puzzling medical researchers.

The [disease](#) has flared while state and federal governments largely have stopped making new investments in public [health](#). While some infectious-disease experts think the CDC has taken too long to understand the cause of the disease, no high-profile critic has directly blamed the slow action on low public health funding.

Still, many public health experts argue that the lack of investment further strains a system already stretched thin as it faces multiple challenges, including sharp upticks in sexually transmitted diseases and hepatitis A and C, the opioid epidemic, seasonal flu viruses and frequent natural disasters such as hurricanes and wildfires.

The low spending has thrown the U.S. [public health system](#) into "crisis," according to the Trust for America's Health, a nonpartisan, Washington, D.C.-based research organization that promotes disease and injury prevention.

"Insufficient funding has hampered the ability of the Centers for Disease Control and Prevention (CDC) and state and local health departments to keep pace with the new and continuing threats to the health of the American people and to fully fund prevention initiatives," the group said in a report this year on public health financing.

State and local health departments must frequently shift personnel from one challenge to meet a new one, like AFM this year or the Zika virus a couple of years ago.

"When something unusual like this comes up, we don't have a pot of money to address that," said Kristen Ehresmann, Minnesota's director for infectious diseases. "And neither does the CDC. We have to put staff

on that new issue. You're constantly taking people off one thing in order to address another."

CDC funding, three-fourths of which makes its way to local and state health departments, and public and private partners, in the form of grants, has lagged behind inflation since 2009 and has been almost flat since 2014. Notably, the portion of the agency's budget that goes to states for controlling infectious diseases has also remained largely unchanged over the last four years.

The picture is similar if not worse at the state and local levels. State investment in public health funding ticked upward in the past decade only to fall below 2008 funding levels in 2015. According to the Trust for America's Health, 31 states reduced their spending on public health between fiscal 2016 and 2017.

Meanwhile, the National Association of County and City Health Officials estimates that since 2008, local health departments have lost 55,590 jobs through layoffs or attrition.

"There's so much work, it's easy to lose focus," said Laura Power, who teaches epidemiology and internal medicine at the University of Michigan in Ann Arbor. "Where do we put our effort? There's only so much money to go around."

AFM first drew attention in 2012 when the California Department of Public Health learned that a few children were suddenly afflicted with inexplicable weakness in their arms or legs. By the end of the year, 10 cases had been detected in the state.

Clinicians were not familiar with the disease; it was not one of the 120 illnesses that medical providers are required to report to their local or state health departments, which then report them to a disease

surveillance system housed at the CDC.

Those "notifiable diseases" include infectious diseases such as meningitis, Legionnaires' disease and HIV, foodborne illnesses such as E. coli and non-infectious diseases, including cancer and lead poisoning. By reporting them up the chain, state and federal officials are able to see whether outbreaks are localized or widespread.

By 2014, AFM had been detected in 34 states. The CDC announced Tuesday that the number of confirmed cases for 2018 has climbed from the 72 reported last month to 90 across 27 states. The agency said it is investigating an additional 162 cases of patients with similar symptoms.

At this point, all [states](#) require health practitioners to report suspected cases.

Epidemiological and clinical evidence gathered about the disease led the Council of State and Territorial Epidemiologists, a collection of public health epidemiologists working as technical advisers to the CDC, to issue a case definition of the new disease in 2015 to help clinicians across the country recognize it.

Even without knowing the cause of AFM, the CDC distributed information to local and state health departments and to clinicians on how to identify a possible case and what to look for in MRI tests. The agency also tentatively suggested ways to treat infected patients—mainly by quickly starting physical and rehabilitative therapy. The CDC said that about half of patients with AFM have recovered.

The agency also issued instructions on the type of specimens it needs to help understand the cause of the disease.

The CDC has research laboratories to investigate new diseases, as does

the National Institutes of Health and academic medical systems, often operating under federal grants.

To nail down a cause for AFM, officials are looking to researchers at institutions such as the University of Tennessee Medical Center, the University of Colorado and the Johns Hopkins Bloomberg School of Public Health.

Parents and clinicians have criticized the CDC for the time it's taken to respond to the disease. Even some of the CDC's own medical advisers have complained. "Frustrated and disappointed—I think that's exactly how most of us feel," Keith Van Haren, a neurologist at Stanford University Medical Center and a CDC medical adviser told CNN earlier this month.

Some parents have also bitterly complained that the CDC hasn't reported the deaths of some children from AFM. Nancy Messonnier, director of the agency's National Center for Immunization and Respiratory Diseases, in a conference call with reporters Tuesday said the CDC could not specify the number of deaths linked to AFM because of a lack of follow-up investigation that it is now trying to correct.

The CDC said one person confirmed to have had AFM in 2017 died, although a spokeswoman, Kate Fowlie, said in an email, "it is unclear what role AFM played in the death." She said no deaths among AFM patients have been reported to the agency this year.

Since it appeared six years ago, AFM has spiked every other year, in 2014, 2016 and 2018. Many patients tested positive for an enterovirus known as D68, which was previously associated with respiratory symptoms but not weakness in the arms and legs. The link has led to a supposition that the virus may have mutated.

But the enterovirus hasn't been present in all those with AFM, prompting some scientists to investigate whether environmental or genetic factors might be playing a role. Messonnier said the CDC is now also exploring the possibility that the symptoms may be caused by an aberrant immune response to an infection rather than the infection itself.

Some researchers also think that another virus might be a contributor. "It's very possible and maybe likely that there may be other enteroviruses that are causing similar symptoms," said Mike Osterholm, director of the Center for Infectious Disease Research and Policy at the University of Minnesota.

By the time the symptoms appear, those infected might already have rid their bodies of the virus. Or, as Messonnier said, a pathogen may be hiding undetected in the body.

"This is a tough disease," Osterholm said, "because it doesn't fit a model of strict cause and effect."

Osterholm isn't convinced that a retreat in public health funding has hampered progress in the case of AFM. Public health departments at all levels, he said, are used to dropping everything to meet new public health menaces when they must.

"Public health just takes on more with less," he said. "We don't have the luxury of dropping major efforts." He added, however, that "such a system can't go on forever."

John Auerbach, president and CEO of the Trust for America's Health, thinks insufficient funding is already consequential. While he pointed out that Congress eventually came up with additional funding to deal with outbreaks of Ebola and Zika in recent years, the money was not ongoing.

When the money runs out, he said, experts in diseases such as Ebola and Zika, including epidemiologists and laboratory staff, often are laid off, removing the very people who could best prevent future outbreaks.

"We know when permanent personnel are well trained in preparedness, they are able to anticipate a risk and take action before a crisis occurs," he said. "But if there aren't enough personnel, then you end up only being able to respond to an emergency, rather than prevent its appearance or reduce its impact."

As it is, he said, many health agencies can't do an adequate job to increase the rate of vaccinations or to eliminate mosquito breeding grounds, both of which would contribute greatly to reducing diseases, such as Zika and perhaps AFM, in the country, he said.

"Every health department would say, 'Yes, we could do more, but only if we had the resources,'" Auerbach said.

Instead, said Minnesota's Ehresmann, [public health](#) agencies often are confronted with vexing balancing acts. "Kids have died from AFM, but it's competing against a lot of other bad things that are happening too. That's where you get into this weighing things out, making choices, where nothing makes you feel good."

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