

Polio in US, UK and Israel reveals rare risk of oral vaccine

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An Afghan health worker uses an oral polio vaccine on a child as part of a campaign to eliminate polio, on the outskirts of Kabul, Afghanistan, April 18, 2017. For years, global health officials have used billions of drops of an oral vaccine in a remarkably effective campaign aimed at wiping out polio in its last remaining strongholds — typically, poor, politically unstable corners of the world. Now, in a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. Credit:

AP Photo/Rahmat Gul, File

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Now, in a surprising twist in the decades-long effort to eradicate the [virus](#), authorities in Jerusalem, New York and London have discovered evidence that [polio](#) is spreading there.

The original source of the virus? The [oral vaccine](#) itself.

Scientists have long known about this extremely rare phenomenon. That is why some countries have switched to other polio vaccines. But these incidental infections from the oral formula are becoming more glaring as the world inches closer to eradication of the disease and the number of polio cases caused by the wild, or naturally circulating, virus plummets.

Since 2017, there have been 396 cases of polio caused by the wild virus, versus more than 2,600 linked to the oral vaccine, according to figures from the World Health Organization and its partners.

"We are basically replacing the wild virus with the virus in the vaccine, which is now leading to new outbreaks," said Scott Barrett, a Columbia University professor who has studied [polio eradication](#). "I would assume that countries like the U.K. and the U.S. will be able to stop transmission quite quickly, but we also thought that about monkeypox."



An auto rickshaw with a poster advertising an oral polio campaign, drives through a market in Peshawar, Pakistan in this 2020 photo. In a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. For years, global health officials have used an oral vaccine in an attempt to wipe out polio from its last remaining strongholds in countries including Afghanistan, Pakistan and Nigeria. Credit: AP Photo/Muhammad Sajjad, File

The latest incidents represent the first time in several years that vaccine-connected polio virus has turned up in [rich countries](#).

Earlier this year, officials in Israel [detected polio](#) in an unvaccinated

3-year-old, who suffered paralysis. Several other children, nearly all of them unvaccinated, were found to have the virus but no symptoms.

In June, British authorities reported finding evidence in sewage that the virus was spreading, though no infections in people were identified. Last week, the government said all children in London ages 1 to 9 would be [offered a booster shot](#).

In the U.S., an unvaccinated young adult suffered paralysis in his legs after being infected with polio, New York officials [revealed](#) last month. The virus has also shown up in New York sewers, suggesting it is spreading. But officials said they are not planning a booster campaign because they believe the state's high vaccination rate should offer enough protection.



An Afghan polio victim makes her way in a wheelchair in the International Committee of the Red Cross (ICRC) physical rehabilitation center in Kabul, Afghanistan, May 16, 2022. In a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. For years, global health officials have used an oral vaccine in an attempt to wipe out polio from its last remaining strongholds in countries including Afghanistan, Pakistan and Nigeria. Credit: AP Photo/Ebrahim Noroozi, File

Genetic analyses showed that the viruses in the three countries were all "vaccine-derived," meaning that they were mutated versions of a virus that originated in the oral vaccine.

The oral vaccine at issue has been used since 1988 because it is cheap, easy to administer—two drops are put directly into children's mouths—and better at protecting entire populations where polio is spreading. It contains a weakened form of the live virus.

But it can also cause polio in about two to four children per 2 million doses. (Four doses are required to be fully immunized.) In extremely rare cases, the weakened virus can also sometimes mutate into a more dangerous form and spark outbreaks, especially in places with [poor sanitation](#) and low vaccination levels.

These outbreaks typically begin when people who are vaccinated shed live virus from the vaccine in their feces. From there, the virus can spread within the community and, over time, turn into a form that can paralyze people and start new epidemics.



A baby receives an oral polio vaccine during the Malawi Polio Vaccination Campaign Launch in Lilongwe, Malawi, on March 20, 2022. For years, global health officials have used billions of drops of an oral vaccine in a remarkably effective campaign aimed at wiping out polio in its last remaining strongholds — typically, poor, politically unstable corners of the world. Now, in a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. Credit: AP Photo/Thoko Chikondi, File

Many countries that eliminated polio switched to injectable vaccines containing a killed virus decades ago to avoid such risks; the Nordic countries and the Netherlands never used the oral vaccine. The ultimate goal is to move the entire world to the shots once wild polio is eradicated, but some scientists argue that the switch should happen sooner.

"We probably could never have gotten on top of polio in the developing world without the (oral polio vaccine), but this is the price we're now paying," said Dr. Paul Offit, director of the Vaccine Education Center at the Children's Hospital of Philadelphia. "The only way we are going to eliminate polio is to eliminate the use of the oral vaccine."

Aidan O'Leary, director of WHO's polio department, described the discovery of polio spreading in London and New York as "a major surprise," saying that officials have been focused on eradicating the disease in Afghanistan and Pakistan, where health workers have been killed for immunizing children and where conflict has made access to some areas impossible.



A bloodied polio vaccine cooler is left on the ground after women working to administer the anti-polio vaccine were killed by gunmen in the city of Jalalabad

east of Kabul, Afghanistan, March 30, 2021. Aidan O'Leary, director of the World Health Organization's polio department, described the recent discovery of polio spreading in London and New York as "a major surprise," saying that officials have been focused on eradicating the disease in Afghanistan and Pakistan, where health workers have been killed for immunizing children and where conflict has made access to some areas impossible. Credit: AP Photo, File

Still, O'Leary said he is confident Israel, Britain and the U.S. will shut down their newly identified outbreaks quickly.

The oral vaccine is credited with dramatically reducing the number of children paralyzed by polio. When the global eradication effort began in 1988, there were about 350,000 cases of wild polio a year. So far this year, there have been 19 cases of wild polio, all in Pakistan, Afghanistan and Mozambique.

In 2020, the number of polio cases linked to the vaccine hit a peak of more than 1,100 spread out across dozens of countries. It has since declined to around 200 this year so far.

Last year, WHO and partners also began using a newer oral polio vaccine, which contains a live but weakened virus that scientists believe is less likely to mutate into a dangerous form. But supplies are limited.



A police officer escorts health workers arriving to administer polio vaccine in a slum area of Peshawar, Pakistan, Jan. 24, 2022. Aidan O'Leary, director of the World Health Organization's polio department, described the recent discovery of polio spreading in London and New York as "a major surprise," saying that officials have been focused on eradicating the disease in Afghanistan and Pakistan, where health workers have been killed for immunizing children and where conflict has made access to some areas impossible. Credit: AP Photo/Muhammad Sajjad, File



A child cries after she was administered with a polio vaccine during a house to house vaccination exercise in Maiduguri, Nigeria, Aug. 28, 2016. In a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. For years, global health officials have used an oral vaccine in an attempt to wipe out polio from its last remaining strongholds in countries including Afghanistan, Pakistan and Nigeria. Credit: AP Photo/Sunday Alamba, File



Then U.S. President Bill Clinton and First Lady Hillary Rodham Clinton watch as nurse Dorothy Sellers administers an oral polio vaccine to 20-month-old Danielle Bailey at an Arlington County health clinic in Arlington, Va., Feb. 13, 1993. The oral vaccine is credited with dramatically reducing the number of children paralyzed by polio. For years, global health officials have used an oral vaccine in an attempt to wipe out polio from its last remaining strongholds in countries including Afghanistan, Pakistan and Nigeria. In recent weeks, scientists have found evidence of polio spread within Israel, the U.S. and Britain and genetic analyses show the viruses are not only connected, but that the cases were triggered by viruses linked to the oral vaccine. Credit: AP Photo/Greg Gibson, File



A worker walks alongside the Newtown Creek Wastewater Treatment Plant's array of digester eggs, Aug. 12, 2022, in the Greenpoint neighborhood of the Brooklyn borough of New York. In the U.S., an unvaccinated young adult suffered paralysis in his legs after being infected with polio, New York officials revealed last month. The virus has also shown up in New York sewers, suggesting it is spreading. Credit: AP Photo/John Minchillo, File



A health worker gives an oral polio vaccine to a girl on a street in Lahore, Pakistan, June 27, 2022. For years, global health officials have used billions of drops of an oral vaccine in a remarkably effective campaign aimed at wiping out polio in its last remaining strongholds — typically, poor, politically unstable corners of the world. Now, in a surprising twist in the decades-long effort to eradicate the virus, authorities in Jerusalem, New York and London have discovered evidence that polio is spreading there. The source of the virus? The oral vaccine itself. Credit: AP Photo/K.M. Chaudary, File

To stop polio in Britain, the U.S. and Israel, what is needed is more vaccination, experts say. That is something Columbia University's Barrett worries could be challenging in the COVID-19 era.

"What's different now is a reduction in trust of authorities and the

political polarization in countries like the U.S. and the U.K.," Barrett said. "The presumption that we can quickly get vaccination numbers up quickly may be more challenging now."

Oyewale Tomori, a virologist who helped direct Nigeria's effort to eliminate polio, said that in the past, he and colleagues balked at describing outbreaks as "vaccine-derived," wary it would make people fearful of the vaccine.

"All we can do is explain how the vaccine works and hope that people understand that immunization is the best protection, but it's complicated," Tomori said. "In hindsight, maybe it would have been better not to use this [vaccine](#), but at that time, nobody knew it would turn out like this."

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