

Urgently needed: New way to combat vaccine-derived poliovirus

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A team of researchers from the U.K., Switzerland, the U.S., and the Congo has found that there is an urgent need to combat a vaccine-derived poliovirus. In their paper published in the journal *Science*, the group describes their study of the vaccine-derived virus and what they found.

Polio in the wild comes in three varieties, type 1, 2 and 3. Type 2 was eradicated in the wild approximately five years ago, but the [vaccine](#) caused a lingering problem—a vaccine-derived mutant virus that spreads like a wild type polio virus and can also paralyze infected people. The vaccine, called OPV2, was withdrawn from use soon after it was found that its use caused a [mutant virus](#), but the vaccine-derived poliovirus lives on. And the only way to prevent people from being infected with it is by vaccinating them with OPV2—but reintroducing it will lead to the development of more mutant viruses. For this reason, the researchers note, a new vaccine is needed. Their work showed just how urgent that need is.

The study involved running statistical models to show how the mutant poliovirus is likely to spread if a new vaccine is not developed and put into use soon. They found that the virus first appeared sometime between 2016 and 2019. Since that time, the Global Polio Laboratory Network has identified 859 instances of the virus infecting people in 26 countries. They further found that approximately 65.5 percent of the infections occurred after a time that has come to be called the Switch—when [health workers](#) switched from using two different vaccines to inoculate people against Type 1 and Type 3 polio, to a single vaccine that was effective against both types. Altogether, they identified 62 post-Switch events and 41 outbreaks of the mutant polio. Health officials fought those outbreaks by reintroducing OPV2, which resulted in setting off more mutant polio outbreaks.

The researchers suggest it is possible that the [polio vaccine](#) currently used for Types 1 and 2 also poses a risk of instigating mutant polio outbreaks, and a new type of vaccine is therefore needed—one that is not so easily able to mutate. They note that a new OPV2 vaccine is currently undergoing phase II [clinical trials](#)—and while it is based on the same idea of introducing a mild form of the virus to force the body to build up an immunity, it is more genetically stable and thus less apt to

mutate.

More information: G. R. Macklin et al. Evolving epidemiology of poliovirus serotype 2 following withdrawal of the type 2 oral poliovirus vaccine, *Science* (2020). [DOI: 10.1126/science.aba1238](https://doi.org/10.1126/science.aba1238)

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