A new report by the Global Polio Eradication Initiative (GPEI) has revealed that newly detected cases of vaccine-derived polio in the Democratic Republic of the Congo (DRC) and Burundi appear to be linked to the novel oral polio vaccine type 2 (nOPV2).

Seven children, six in the Democratic Republic of the Congo (DRC) and one in neighboring Burundi, had recently been paralyzed by poliovirus strains derived from a vaccine meant to prevent the disease.

GPEI said that isolates of vaccine-derived poliovirus type 2 (cVDPV2) were detected in stool samples of six children with acute flaccid paralysis in DRC and one in Burundi.

The virus was also isolated from five environmental samples in Burundi. All the reported isolates stem from two separate and new emergences of cVDPV2 linked with nOPV2 that originated in Tanganyika and South Kivu provinces in DRC.

Close to 600 million doses of nOPV2 have been administered in 28 countries since rollout of the vaccine began in March 2021. GPEI said these are the first two instances of cVDPV2 linked to the vaccine.

But there was a key difference, GPEI said in a March statement: These are the first cases linked to a new polio vaccine that was painstakingly designed to avoid just this problem.

Known as novel oral polio vaccine type 2 (nOPV2), it was rolled out 2 years ago this month, and public health experts have been closely monitoring whether its use could also spark outbreaks on rare occasions.

“While detection of these outbreaks is a tragedy for the families and communities affected, it is not unexpected with wider use of the vaccine,” the organization said in a statement.

“All available clinical and field evidence continues to demonstrate that nOPV2 is safe and effective and has a significantly lower risk of reverting to a form that cause paralysis in low immunity settings when compared to monovalent oral polio vaccine type 2.”

In a news release this last week, the World Health Organization (WHO) said cVDPV2 has been confirmed in two additional children in Burundi, leading the government to

declare an outbreak.

While detection of these outbreaks is a tragedy for the families and communities affected, it is not unexpected with wider use of the vaccine.

“It’s disappointing but not entirely unexpected,” says Aidan O’Leary, who heads GPEI.

To Simona Zipursky of the World Health Organization, who co-chairs GPEI’s nOPV2 working group, the question for the past 2 years has been when, not whether, such cases would occur.

“But you always hope you are wrong,” she says.

Ananda Bandyopadhyay, deputy director of technology, research, and policy for polio at the Bill & Melinda Gates Foundation and the other co-chair of the GPEI working group says that although the novel vaccine is not a magic bullet, the data from the initial rollout show it’s far better than the one it has largely replaced, monovalent OPV2 (mOPV2),

Zipursky and others say.  The risk of sparking outbreaks with nOPV2 is “much, much lower.

Authorities in both countries, with assistance from the WHO and GPEI, are investigating the cases, have stepped up polio surveillance in the areas of detection, and will launch initial vaccination campaigns in April. Subsequent campaigns may be expanded to include parts of neighboring countries.

In 2011, an international team of researchers, funded by the Gates foundation, began working on a technical fix.

Starting with the same type 2 Sabin vaccine virus, they tweaked its genome in several places to make it less likely to revert. The hope was that nOPV2 would not seed new outbreaks—or at least do so much less frequently than mOPV2.

Clinical and preclinical data looked good—the vaccine was just as safe and effective as mOPV2 and much more genetically stable, Bandyopadhyay says. But because these reversions are rare events, the new vaccine’s true worth could not be known until it was used widely under close scrutiny.

Vaccine experts are now weighing the relative merits of the two oral options, and that’s important, O’Leary says. But he stresses that the problem of low vaccination coverage should get equal or greater attention.

“If there is persistently poor immunization coverage in a community, there is always a risk that a live, attenuated vaccine virus will revert.” Bandyopadhyay agrees.

Both mOPV2 and nOPV2 have stopped many outbreaks where the vaccination campaigns are of high quality. But those can be hard to pull off in parts of the DRC and Burundi.

Indeed, GPEI has identified eastern DRC, where these paralytic viral variants arose, as one of seven places globally at highest risk for polio outbreaks—and where once they start, they can be extremely hard to stop.

The DRC is rocked by conflict and political instability, which makes it difficult to reach many children with vaccines. It has also been battling simultaneous disease outbreaks, all vying for priority. Routine vaccination rates are low.

“GPEI needs to dig deep and work through all the surveillance data in both countries to understand what is happening with the [nOPV2] vaccine,” O’Leary says. At the same time, he says, the program needs to intensify its efforts to reach all the children being missed by that vaccine.