

# WHY POLIO VACCINE CONTAMINATION IS A WORRY?

Relevant for: Health, Education & Human Resources | Topic: Health & Sanitation and related issues

A child is administered polio vaccine in Kolkata. File | Photo Credit: [AP](#)

Since April 2016, all oral polio vaccines (OPV) across the world contain only two of the three polio serotypes — Type 1 and Type 3.

Type 2 is banned because the wild, disease-causing version of this virus was eradicated globally by 1999, and because OPV itself can cause polio in rare cases.

However, sometime in September, routine surveillance detected the Type 2 vaccine virus in stool samples from children in Uttar Pradesh, implying that someone was still making the vaccine. Further investigations revealed that the OPV, made by a Ghaziabad-based firm called Bio-Med, contained traces of the Type 2 vaccine virus.

Yes. There are two ways in which all three oral vaccine viruses can cause polio. The first is called Vaccine Associated Paralytic Polio (VAPP). Here, in extremely rare cases, the vaccine virus mutates into a virulent version of itself, causing disease in the child who received the vaccine, or in a person who came in contact with the child. VAPP causes isolated cases and not outbreaks, because it doesn't spread from person to person.

The second way in which the vaccine can cause polio is through Circulating Vaccine Derived Polio Virus (cVDPV). Here, too, the vaccine virus mutates into a virulent version, but spreads from person to person, causing outbreaks. For this to happen, though, the vaccine virus must circulate among people for at least around 12 months. During this transmission, the virus has a chance to mutate. This usually happens in communities where vaccination rates are low. cVDPV, too, is extremely rare.

It can, but the probability is small. According to T. Jacob John, a Vellore-based virologist, "The risk is virtually zero, but not absolutely zero."

Take VAPP for instance. The risk of VAPP is extremely low, in general. A 2002 study in the Bulletin of the World Health Organisation estimated that India saw one case of VAPP for every 4.1-4.6 million OPV doses administered in 1999. This was the combined risk from all three serotypes. The risk from the Type 2 virus alone is even smaller.

cVDPV, on the other hand, is a bigger worry, because the Type-2 vaccine virus is the most likely to turn cVDPV among all the three. But for this to happen, two conditions must be fulfilled. First, a large number of children must be unimmunised against Type-2. Second, the virus needs to circulate from person to person for several months.

Both these conditions don't seem to be met in Uttar Pradesh. Even though India stopped giving children OPV Type 2 in 2016, it has been giving them the Inactivated Polio Vaccine, which also protects against the Type-2 polio. After news of the contamination, mop-up rounds to give IPV to any children who had missed it earlier were conducted. All this drastically reduces the chance that the vaccine virus will stick around in the environment for long enough to turn into cVDPV.

Yes. The Central Drugs Standard Control Organisation ought to trace the source of the contamination, which it hasn't done yet. Unless this happens, we won't know how to prevent incidents of larger contamination in future. The two possible sources are Ghaziabad's Bio-Med

and PT Bio Farma, an Indonesian firm which supplied the vaccine raw material to Bio-Med and all other Indian OPV manufactures. Therefore, if Bio Farma was the source, the worry is bigger.

Second, Uttar Pradesh health authorities haven't made it clear how widespread the contamination was. Early media reports said 1.5 lakh vials were contaminated.

Assuming 20 doses per vial, this is around 3 million doses. The previous calculations of low risk are based on this number. If a substantially larger number of doses was administered, the risk would grow.

However, when asked for the final number of doses administered, Uttar Pradesh Expanded Programme for Immunisation Officer A.P. Chaturvedi told *The Hindu* that this number was unknown.

The end of the monsoons in India signal a welcome turn in the climate. While the drop in temperature brings relief, the spike in vector-borne diseases

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