

FACT SHEET: VACCINE-DERIVED POLIOVIRUS

Global efforts to immunise children with the oral polio vaccine (OPV) have **reduced wild poliovirus cases by 99.9%** since 1988, and of the three strains of wild poliovirus, only one remains in circulation – wild polio virus type 1 (WPV1). OPV is safe and effective and interrupts person-to-person spread of polio. However, on rare occasions, and only in under-immunised populations, the live weakened virus in OPV can circulate in a community for an extended period of time and mutate into a form that causes paralysis, known as circulating vaccine-derived poliovirus (cVDPV). cVDPVs are not related to, nor indicative of a re-emergence of wild poliovirus.

cVDPVs have emerged as a key challenge in the final stage of eradication efforts; however, outbreaks can be stopped using the same proven tactics that stop wild poliovirus: **strengthening polio surveillance systems and ensuring high vaccination coverage**. For example, despite protracted conflict and instability, a 2017 cVDPV outbreak in Syria was successfully stopped in a matter of months by utilizing these tactics. If a population continues to be fully immunized, it will be protected against the spread of both wild and vaccine-derived polio.



| TYPES OF POLIOVIRUS | DEFINITION | RISK FACTORS | TO STOP TRANSMISSION | STRAINS |
|---|---|---|--|--|
| WILD POLIOVIRUS (WPV) | Infectious virus that invades the nervous system. Can cause paralysis or death. | Low immunisation rates, poor sanitation, high population densities. | Vaccinate all children under five years of age with OPV. | Type 1: Causes 100% of current cases Type 2: Eradicated in 2015 Type 3: Eradicated in 2019 |
| CIRCULATING VACCINE-DERIVED POLIOVIRUS (cVDPV) | Rare, circulating virus mutated from the weakened virus contained in OPV, which can only emerge in under-immunised populations. | Low immunisation rates, poor sanitation, high population densities. | Vaccinate all children under five years of age with OPV. | There are three types of cVDPV – types 1, 2 and 3, with type 2 currently causing the vast majority of cases. |

ERADICATING POLIO FOR GOOD REQUIRES ELIMINATING BOTH WILD AND VACCINE-DERIVED POLIO

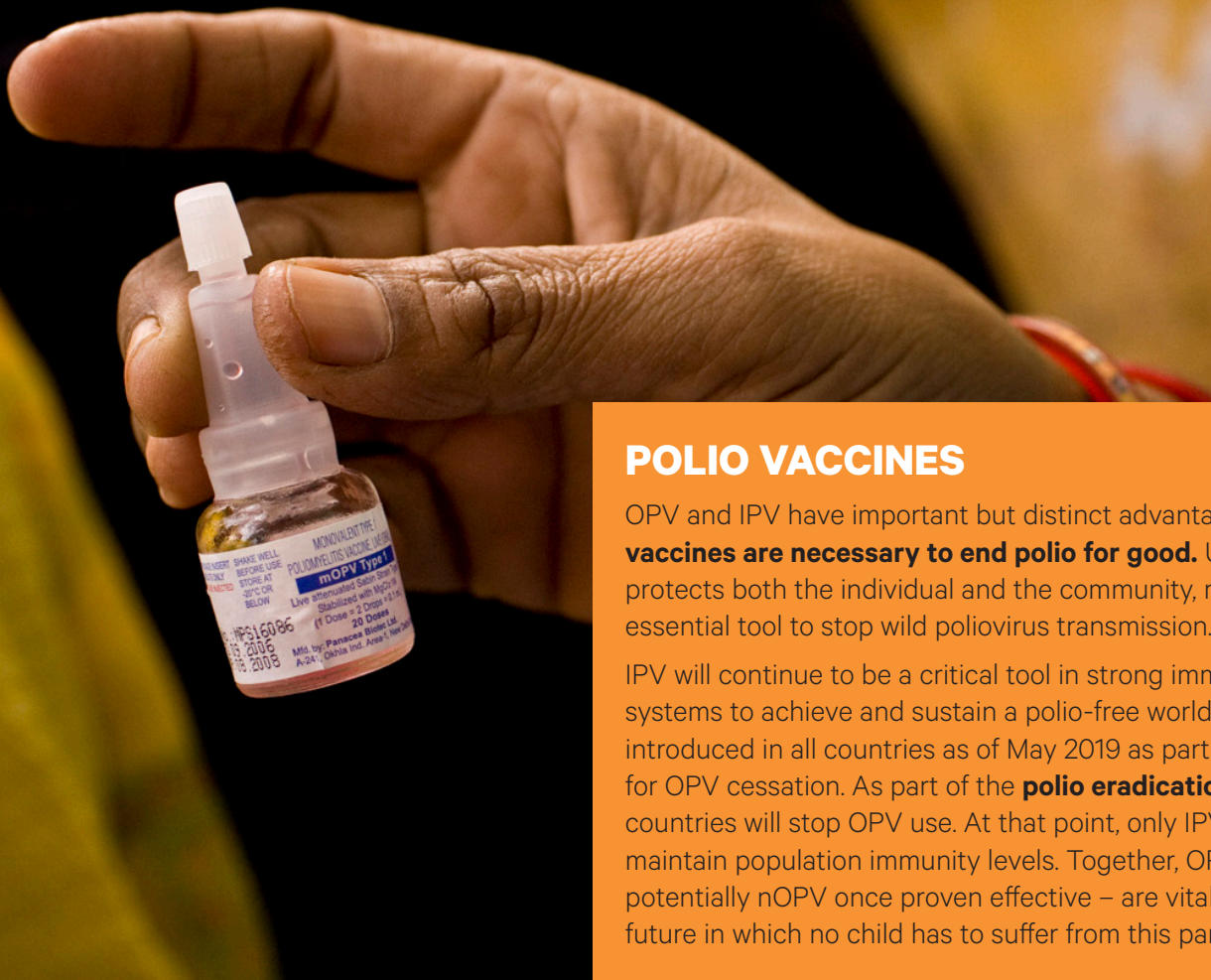
CURRENT

The Global Polio Eradication Initiative (GPEI) will continue working with countries to strengthen efforts to reach every child with OPV and improve virus surveillance—the same tactics used to stop WPV. The program has also unveiled a new **Endgame Strategy (2019-2023)** that includes tactics to address cVDPVs, focusing on preventing cases in high-risk communities with populations that may be under-immunized due to conflict, insecurity or weakened health infrastructure. This strategy continues to prioritize early case detection and timely outbreak response.

FUTURE

The program will phase out use of OPV after WPV transmission has been stopped. At that point, the inactivated polio vaccine (IPV) will be used to maintain population immunity levels.

Additionally, an innovative new tool, the novel oral polio vaccine (or nOPV), could potentially be used to address cVDPV outbreaks. nOPV is designed to provide children with the same protection as the current oral vaccine while having less risk of mutating and causing paralysis. Early trials for nOPV have shown positive results, and if further studies are successful, nOPV could be used as early as 2020 to prevent cVDPVs in communities with low immunity. nOPV could be kept in stockpiles and used in case of an outbreak in the near future or after eradication.



POLIO VACCINES

OPV and IPV have important but distinct advantages, and **both vaccines are necessary to end polio for good**. Unlike IPV, OPV protects both the individual and the community, making it an essential tool to stop wild poliovirus transmission.

IPV will continue to be a critical tool in strong immunization systems to achieve and sustain a polio-free world and has been introduced in all countries as of May 2019 as part of preparations for OPV cessation. As part of the **polio eradication endgame**, all countries will stop OPV use. At that point, only IPV will be used to maintain population immunity levels. Together, OPV and IPV – and potentially nOPV once proven effective – are vital to securing a future in which no child has to suffer from this paralyzing disease.

TYPES OF POLIO VACCINE

| | ORAL POLIO VACCINE (OPV) | INACTIVATED POLIO VACCINE (IPV) |
|----------------|---|---|
| CONTAINS | Mixture of live, weakened poliovirus strains. <i>Trivalent OPV*</i> : All three poliovirus types <i>Bivalent OPV</i> : Types 1 and 3 <i>Monovalent OPV</i> : Any one individual type <small>*No longer in use as of 2016 due to the eradication of type 2 wild poliovirus.</small> | Mixture of inactivated, killed strains of all three poliovirus types. |
| HOW IT WORKS | Body produces antibodies in the blood and gut in response to the weakened virus. Helps stop transmission by limiting the virus's ability to replicate in the gut and spread to infect others. | Body produces antibodies in the blood in response to the inactivated virus. Protects the individual, but induces a lower level of immunity in the gut than OPV. |
| ADMINISTRATION | Easy, oral administration can be conducted by volunteers and is part of many countries' routine immunisation programmes. Used extensively in immunisation campaigns to root out poliovirus. Costs less than US\$0.15 per dose. | Vaccine injection is administered primarily through routine immunisation programmes by trained health workers. Per-dose cost starting at US\$1 for low-income countries, through Gavi mechanisms. |
| USE | Extremely effective in protecting children from WPV and cVDPV. Nearly every country has used OPV to stop wild poliovirus transmission because it prevents person-to-person spread of the virus, protecting both the individual and the community. | Extremely effective in protecting children from polio disease due to WPV and cVDPV, but cannot stop spread of virus in a community. |
| CVDPV RISK | On rare occasions, in areas with under-immunised populations, the live weakened virus contained in OPV can mutate and spread, causing cVDPV. More than 10 billion doses of OPV have been given to nearly three billion children worldwide since 2000, and just over 1,000 cases of cVDPV paralysis have been registered during that period. | Cannot cause cVDPV. |
| VAPP RISK | For every million vaccinations with OPV, there are 3-4 children who experience vaccine-associated paralytic polio (VAPP) cases — which cause polio-like symptoms in the child vaccinated — per million births. VAPP cannot spread between individuals, so an outbreak response is not necessary. | Cannot cause VAPP. |