

Summary of the “Polio vaccines: WHO position paper – March, 2016”

Background

This position paper on polio vaccines published in the 25 March 2016 WHO Weekly Epidemiological Record (Vol. 91, 12), replaces the previous 2014 WHO polio position paper, and summarizes recent developments in the field. It integrates new information related to the addition of a dose of IPV for countries currently using exclusively OPV, in the context of the global switch from trivalent to bivalent OPV.

Poliomyelitis is an acute communicable disease caused by any of 3 poliovirus serotypes (types 1, 2 or 3). In the pre-vaccine era when poliovirus was the leading cause of permanent disability in children, almost all children became infected by polioviruses, with on average 1 in 200 susceptible individuals developing paralytic poliomyelitis.

Two types of poliovirus vaccines are available, inactivated poliovirus vaccine (IPV) introduced in 1955 and the live attenuated oral poliovirus vaccine (OPV) introduced in the early 1960s. Worldwide, sustained use of polio vaccines since 1988 has led to a precipitous drop in the global incidence of poliomyelitis by >99% and the number of countries with endemic polio from 125 to just 2 in 2015 (Afghanistan and Pakistan). Globally, the last case of poliomyelitis caused by naturally circulating wild-strain polio viruses type 2 (WPV2) occurred in India in 1999. No case due to wild-strain polio viruses type 3 (WPV3) has been detected since 10 November 2012. In 2015, 73 polio cases were reported, all due to WPV1, which represents the lowest number for any calendar year on record.

The effectiveness of OPV in controlling poliomyelitis and eliminating the circulation of wild polioviruses is amply demonstrated by the sharp decline in the number of poliomyelitis cases following the introduction of OPV in both industrialized and developing countries. The only rare serious adverse events associated with OPV are the occurrence of vaccine-associated paralytic poliomyelitis (VAPP) and the emergence of vaccine-derived polioviruses (VDPVs). The eradication of indigenous WPV2 in 1999, coupled with the continuing emergence of neurovirulent circulating type 2 vaccine-derived polioviruses (cVDPV2s) as well as vaccine-associated paralytic poliomyelitis (VAPP), led to the recommendation that there should be coordinated global cessation of use of the type 2 component of OPV and a switch from tOPV to bOPV.

WHO position

In the current position paper, WHO recommends that all children worldwide should be fully vaccinated against polio, and every country should seek to achieve and maintain high levels of coverage with polio vaccine in support of the global commitment to eradicate polio.

WHO no longer recommends an OPV-only vaccination schedule. For all countries currently using OPV only, at least 1 dose of IPV should be added to the schedule. In polio-endemic countries and in countries at high risk for importation and subsequent spread, WHO recommends a bOPV birth dose (a zero dose) followed by a primary series of 3 bOPV doses and at least 1 IPV dose.

The primary series consisting of 3 bOPV doses plus 1 IPV dose can be initiated from the age of 6 weeks with a minimum interval of 4 weeks between the bOPV doses. If 1 dose of IPV is used, it should be given from 14 weeks of age (when maternal antibodies have diminished and immunogenicity is significantly higher) and can be co-administered with a bOPV dose. The primary

series can administered according to the regular schedules of national immunization programmes, for example at 6, 10, and 14 weeks (bOPV1, bOPV2, bOPV3+IPV), or at 2, 4, and 6 months (bOPV1, bOPV2+IPV, bOPV3 or bOPV1, bOPV2, bOPV3+IPV). Both OPV and IPV may be co-administered with other infant vaccines.

For infants starting the routine immunization schedule late (age >3 months) the IPV dose should be administered at the first immunization contact along with bOPV and the other routinely recommended vaccines. In countries with high vaccination coverage (e.g. 90%–95%) and low importation risk (neighbouring countries and major population movement all having similarly high coverage) an IPV–bOPV sequential schedule can be used when VAPP is a significant concern.

Where a sequential IPV–bOPV schedule is used, the initial administration of 1 or 2 doses of IPV should be followed by ≥ 2 doses of bOPV to ensure both sufficient levels of protection in the intestinal mucosa and a decrease in the burden of VAPP. For sequential IPV–bOPV schedules, WHO recommends that IPV be given at 2 months of age (e.g. a 3-dose IPV–bOPV–bOPV schedule), or at 2 months and 3–4 months of age (e.g. a 4-dose IPV–IPV–bOPV–bOPV schedule) followed by at least 2 doses of bOPV.

An IPV-only schedule may be considered in countries with both sustained high immunization coverage and the lowest risk of both WPV importation and transmission. A primary series of 3 doses of IPV should be administered beginning at 2 months of age. If the primary series begins earlier (e.g. with a 6, 10 and 14-week schedule) then a booster dose should be given after an interval of ≥ 6 months (for a 4-dose schedule).

To mitigate the risk of undetected transmission, WHO recommends that endemic countries and countries with a high risk of WPV importation should not switch to an IPV-only or a sequential IPV–bOPV schedule at this time. The 3 bOPV+1 IPV schedule as currently recommended should be adopted and supplemental immunization activities should continue to support intensive efforts to eliminate poliovirus transmission. A sequential IPV–bOPV schedule or IPV-only schedule can be considered in order to minimize the risk of VAPP, but only after a thorough review of local epidemiology.

Polio vaccine (IPV or bOPV) may be administered safely to asymptomatic HIV-infected infants. HIV testing is not a prerequisite for vaccination. bOPV is contraindicated in severely immunocompromised patients. These populations can safely receive IPV. Before travelling abroad, persons residing in countries with active transmission of a wild or vaccine-derived poliovirus should have completed a full course of polio vaccination in compliance with the national schedule, and received one dose of IPV or bOPV within 4 weeks to 12 months of travel, in order to boost intestinal mucosal immunity and reduce the risk of poliovirus shedding. Travellers to infected areas should be vaccinated according to their national schedules.

All health-care workers worldwide should have completed a full course of primary vaccination against poliomyelitis.