NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division of the National Health Laboratory Service

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OUTBREAK RESPONSE
UNIT, DIVISION OF PUBLIC HEALTH SURVEILLANCE AND RESPONSE;
CENTRE FOR VACCINE AND IMMUNOLOGY

Poliomyelitis
Frequently Asked Questions

1. What is poliomyelitis?

Poliomyelitis is a viral infection caused by poliovirus, belonging to the *Enterovirus* genus. Poliovirus is highly infectious; it invades the nervous system and can cause total paralysis. Poliovirus cases have decreased by more than 99% since 1988, from an estimated 350 000 cases a year in 1988 to 5 reported cases in 2021, worldwide. In the WHO report issued in the third week of February 2022, only 4 cases of polio were identified in the preceding 12 months, all from Afghanistan. There are 3 strains of wild type poliovirus and all 3 types cause paralysis. Wild poliovirus type 1 causes epidemics most frequently. The wild poliovirus type 2 has not been detected since October 1999, and wild poliovirus type 3 has not been detected since November 2012; both types 2 and 3 have since been declared eradicated. The reduction in the number of annual poliovirus cases reported globally is the result of the global effort to eradicate the disease. Paralytic polio cases due to outbreaks caused by circulating vaccine-derived poliovirus (cVDPVs) types 1-3 have been reported. Most cVDPVs are caused by type 2 poliovirus.

2. Who can get poliomyelitis?

Poliomyelitis remains primarily a disease of infants and young children. It mainly affects children under 5 years of age. High risk groups are those who live in areas where cases have been detected and who are unvaccinated. Often, persons are unvaccinated because of regional or local social and political insecurity. The risk of contracting polio for persons elsewhere in the world including South Africa is incredibly low. Polio vaccination is fully effective and vaccinated persons are not at risk for contracting polio.

3. Where does poliomyelitis occur in South Africa?

The last confirmed case of wild type poliovirus in South Africa was in 1989. On the African continent, Nigeria reported three laboratory-confirmed wild poliovirus type 1 cases between July and August 2016 in children between 2-5 years of age Borno State. Based on a report submitted to the African Regional Certification Commission (ARCC) in August 2019, South Africa was certified polio-free in September 2019. The continent of Africa was certified polio-free in 2020. However, the risk of poliovirus importation still remains due to continued transmission in other countries, the high degree of movement and migration of people to Africa, including South Africa and the sub-optimal immunisation coverage in some districts. There are currently two countries where poliovirus transmission has never been successfully halted, namely Afghanistan and Pakistan.

4. How is poliomyelitis transmitted?

Poliovirus is transmitted primarily by person-to-person spread mainly through the faecal-oral route. On rare occasions, the virus may spread through contaminated water, food or other materials. The incubation period is commonly 7-14 days for paralytic cases but a range of 3-35 days has been reported. The virus multiplies in the

intestine and is shed in the faeces. Transmission is possible as long as the virusis excreted. The virus persists in the throat for approximately 1 week and in faeces for 3-6 weeks. Cases are most infectious during the days before and after onset of symptoms.

5. How does poliomyelitis affect animals?

Poliovirus is strictly a human pathogen, and does not naturally infect any other species (although chimpanzees and Old World monkeys can be experimentally infected).

6. What are the signs and symptoms of poliomyelitis in humans?

Initially, patients with poliomyelitis present with non-specific symptoms such as fever, fatigue, headache, vomiting, sore throat, lethargy. If the disease progress, severe muscle pain, stiffness of the neck and back, and pain in the limbs with flaccid paralysis may occur. Globally, 1 in 200 infections leads to irreversible flaccid paralysis, usually paralysis of the legs. The virus enters the central nervous system and replicates in the anterior horn cells of the spinal cord, which innervate skeletal muscles. An estimated 5-10% of those who are paralysed may die when the breathing muscles are immobilized. Paralysis of respiratory and swallowing muscles can be life threatening. The majority (about 72%) of patients are asymptomatic.

7. How is poliomyelitis diagnosed?

A definitive laboratory diagnosis requires isolation of poliovirus from patient stool samples, cerebrospinal fluid or oropharyngeal secretions. Specialised laboratory methods can be used to differentiate “wild” from “vaccine-derived” and vaccine virus strains. Rises in antibody levels (>4-fold) are less helpful in the diagnosis of wild poliomyelitis infection. In South Africa, the National Institute for Communicable Diseases conducts poliovirus testing on all stool samples submitted for investigation of children with acute flaccid paralysis (AFP). The NICD has been a WHO polioviorus collaborating centre since its foundation in the 1950s.

8. How is poliomyelitis treated?

Currently there is no cure for poliomyelitis but the disease can be prevented through vaccination. Treatment of poliovirus paralysis is supportive, and includes physiotherapy, and if necessary ventilator support in intensive care units. Ongoing physical therapy is used to attain maximum function after paralytic poliomyelitis and can prevent other deformities that occur as late manifestations of the illness. An experimental antiviral drug, pocapavir, has been found to have activity against poliovirus.

9. How is poliomyelitis prevented?

Poliomyelitis can be prevented by vaccination. South Africa provides routine vaccination for poliovirus in the Expanded Programme on Immunisation (EPI-SA). Prior to April 2009, the primary immunisation schedule for polio consisted of trivalent oral polio vaccine (tOPV), which is a live-attenuated poliovirus containing all 3 poliovirus serotypes, given at birth, 6, 10 and 14 weeks of age. In April 2009, a combined schedule of tOPV and trivalent inactivated polio vaccine (tIPV) was introduced into the EPI-SA schedule and consisted of tOPV at birth and 6 weeks of age, and tIPV at 6, 10 and 14 weeks of age. In the revised EPI-SA immunisation schedule from December 2015, tIPV is administered as a hexavalent vaccine (hexavalent vaccine contains DTaP-IPV-Hib-HBV). In April 2016, South Africa changed from a tOPV to a bivalent oral polio vaccine (bOPV) as part of the Global Polio Eradication Initiative Endgame Strategic Plan. The bOPV contains only serotypes 1 and 3. The current EPI-SA primary immunisation schedule for polio consists of bOPV at birth and at 6 weeks of age, and tIPV included in the hexavalent vaccine given at 6, 10 and 14 weeks of age. A booster dose of tIPV at 18 months of age.

10. Where can I find more information?

Medical/clinical related queries: NICD Hotline +27 82 883 9920 (for use by healthcare professionals only).
Laboratory related queries: Centre for Vaccines and Immunology Laboratory: +27 11 386 6536.
Results inquiries: NICD Specimen Receiving Laboratory: +27 11 386 6404. Or Centre for Vaccines and Immunology Laboratory: +27 11 386 6536.
Guidelines and other documents: NICD website at www.nicd.ac.za under the 'Diseases A-Z' tab.