Notes from the Field

Circulating Vaccine-Derived Poliovirus Outbreaks — Five Countries, 2014–2015

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In 2015, wild poliovirus (WPV) transmission was identified in only Afghanistan and Pakistan (*1*). The widespread use of live, attenuated oral poliovirus vaccine (OPV) has been key in polio eradication efforts. However, OPV use, particularly in areas with low vaccination coverage, is associated with the low risk for emergence of vaccine-derived polioviruses (VDPV), which can cause paralysis (*2*). VDPVs vary genetically from vaccine viruses and can cause outbreaks in areas with low vaccination coverage. Circulating VDPVs (cVDPVs) are VDPVs in confirmed outbreaks. Single VDPVs for which the origin cannot be determined are classified as ambiguous (aVDPVs), which can also cause paralysis. Among the three types of WPV, type 2 has been declared to be eradicated. More than 90% of cVDPV cases have been caused by type 2 cVDPVs (cVDPV2). Therefore, in April 2016, all OPV-using countries of the world are discontinuing use of type 2 Sabin vaccine by simultaneously switching from trivalent OPV (types 1, 2, and 3) to bivalent OPV (types 1 and 3) for routine and supplementary immunization. The World Health Organization recently broadened the definition of cVDPVs to include any VDPV with genetic evidence of prolonged transmission (i.e., >1.5 years) and indicated that any single VDPV2 event (a case of paralysis caused by a VDPV or isolation of a VDPV from an environmental specimen) should elicit a detailed outbreak investigation and local immunization response. A confirmed cVDPV2 detection should elicit a full poliovirus outbreak response that includes multiple supplemental immunization activities (SIAs); an aVDPV designation should be made only after investigation and response (*3*). Since 2005, there have been 1–8 cVDPV outbreaks and 3–12 aVDPV events per year. There are currently five active cVDPV outbreaks in Guinea, Laos, Madagascar, Myanmar, and Ukraine, and four other active VDPV events.

The longest ongoing cVDPV outbreak, which began on September 29, 2014, is occurring in Madagascar, with a total of 11 cVDPV type 1 (cVDPV1) cases since the index patient developed symptoms in Sofia Region. The patient in the most recent case developed symptoms on August 22, 2015, in Sud-Ouest Province. Cases are widespread throughout the country; isolates have 20–27 nucleotide differences compared with the type 1 Sabin vaccine strain.* SIAs began in December 2014.

In Ukraine, two cVDPV1 cases in Zakarpattya Oblast have been identified. The first patient had symptom onset on June 30, 2015, and the second on July 07, 2015. The isolates from these patients had 20–26 nucleotide differences from the type 1 Sabin vaccine strain. Both patients fully recovered with no residual paralysis. SIAs began on October 21, 2015.

In Guinea, a child from Kankan Province developed symptoms on July 20, 2015. He traveled to Bamako, Mali, where cVDPV2 with 25 nucleotide differences from the type 2 Sabin vaccine strain was isolated from a stool specimen received on September 4, 2015. This was genetically linked to a cVDPV2 case in Guinea with onset in August, 2014. Subnational immunization days (SNIDs) began in Guinea on September 16, 2015. Mali has since conducted SNIDs and national immunization days (NIDs). Of note, most stool specimens from patients with acute flaccid paralysis collected during the peak of the Ebola epidemic in Guinea, Liberia, and Sierra Leone have not been tested. Testing of specimens from Guinea has resumed at the polio regional reference laboratory in Senegal, and three other cVDPV2 cases were subsequently identified, the latest with onset on October 2, 2015.

In Laos, nine cVDPV1 cases with up to 30 nucleotide differences from the type 1 Sabin vaccine strain have been identified. The patient in the first case, from Bolikhamxay Province, had symptom onset September 7, 2015. The last known case, from Vientiane Province, developed symptoms on January 11, 2016. SIAs began on October 9, 2015.

In Myanmar, a cVDPV2 with 15 nucleotide differences from the type 2 Sabin vaccine strain was isolated from a child who developed symptoms on October 5, 2015, in Rakhine Province. This case is genetically linked to a cVDPV2 case in the same province with symptom onset April 16, 2015. SIAs began on November 11, 2015.

Response to type 2 aVDPV events in the Democratic Republic of the Congo, Nigeria, Pakistan, and South Sudan has occurred or is ongoing. cVDPVs were also reported in Nigeria and Pakistan in the first half of 2015.

With eradication of WPV in sight, continued focus is needed to eliminate immunity gaps through high-quality SIAs and strong routine immunization programs (*4*). Additional cVDPV outbreaks might occur in areas with low routine OPV coverage. The risk for type 2 cVDPVs will change markedly after the global switch from trivalent OPV to bivalent OPV in April 2016; although the risk for cVDPV2 outbreaks will continue during the initial 12 months after the switch, the risk subsequently should fall to very low (*5*). CDC recommends that all international travelers ensure they are up to date on polio immunizations before traveling (*6*).

*When genomic sequencing of an isolate shows ≥1.5% (n≥14) nucleotide divergence in the VP1-coding region from Sabin poliovirus, this highlights prolonged undetected circulation and gaps in acute flaccid paralysis surveillance.

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