Rare recurrences of poliomyelitis in non-endemic countries after eradication: a call for global action

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Following the confirmation on July 21, 2022, of a case of poliomyelitis related to circulating vaccine-derived poliovirus (cVDPV) type 2 in an unvaccinated adult from Rockland County, NY, USA,[1] there has been a renewed global drive to strengthen surveillance for the detection of cases and increase vaccination coverage against polio. This is the first known case of polio with paralysis in nearly a decade in the USA, a country that no longer administers the oral polio vaccine, which suggests that the virus could have been imported. The US Centres for Disease Control and Prevention reported discovering the poliovirus in a New York suburb's wastewater in June, 2022, before detecting the case in July, which suggests that people were shedding the virus in their stool. In the UK, a national incident was declared in late June, 2022, following the discovery of related poliovirus strains with mutations in sewage samples collected from north London and east London,[2] signifying that the virus had also spread between individuals.

In March, 2022, cVDPV type 3 was confirmed in an unvaccinated child from Jerusalem, Israel. Laboratory tests revealed the viral strain in the patient in the USA and the sewage samples in the UK were genetically related to the strain found in Israel. Similarly, in October, 2021, Ukraine confirmed a case of polio in a child aged 18 months in Rivne Orblast, caused by cVDPV type 2, after almost 10 years of polio eradication in Europe.

The live-attenuated poliovirus received through vaccination can spread between people. In unvaccinated people, mutations can be produced that can lead to a manifestation of cVDPV disease. Additionally, polio outbreaks in non-endemic countries can arise from travelling and importation from endemic countries, as has occurred in Israel, Tajikistan (bordered by Afghanistan, China, and Uzbekistan), and in Malawi and Mozambique. It is important to underline that the patient with poliomyelitis in New York had not travelled to countries endemic for polio.

Poliovirus is highly infectious. Although faecal-oral transmission was assumed to be the most relevant route, it spreads mainly through respiratory droplets,[3] and affects the nervous system causing paralysis, which can lead to permanent disability and death. As a result of the vaccination and surveillance programmes led by the Global Polio Eradication Initiative (GPEI), the number of wild poliovirus cases has decreased by more than 99% since 1988. The Americas was the first region to be certified polio-free by WHO in 1994, followed by the Western Pacific (2000), Europe (2002), South-East Asia (2015), and finally Africa (2020).[4] Yet, despite the outstanding progress towards global eradication, the fight against poliovirus is far from over, given the continuing endemicity of the wild poliovirus (type 1) in Afghanistan and Pakistan. Additionally, cVDPV is a growing problem that threatens global eradication efforts.[5]

Outbreaks of cVDPV are usually reported in politically unstable countries, where inactivated poliovirus immunisation is interrupted and oral polio vaccine is administered to vulnerable populations with low immunity. This raises questions about cVDPV triggering rare reoccurrences of polio in politically stable non-endemic countries, such as the UK and USA. It is unclear to what extent the recurrence of polio in both countries are linked to COVID-19-related slowdown of polio vaccination and surveillance, which caused outbreaks of cVDPVs in 37 countries globally, 1412 detections of cVDPVs through environmental surveillance, and 1335 detections of cVDPVs in stool samples of patients with acute flaccid paralysis globally.[6] Other emergencies that increase the risk of polio spread include the ongoing war in Ukraine and instability in Israel, Afghanistan, Pakistan, and the African region. Moreover, a growing anti-vaccine movement is contributing to reducing vaccination rates in high-income countries.[7–9]

The strategy of deploying live-attenuated poliovirus-based vaccines instead of the inactivated poliovirus vaccines is being questioned, due to the rise in cVDPV transmission. In 2020, a modified polio vaccine, the type 2 novel oral polio vaccine (nOPV2), received emergency approval from WHO for preventing outbreaks of cVDPV in African and eastern Mediterranean countries. Since March, 2021, more than 300 million doses of nOPV2 have been administered in 15 countries globally.[10] It is time to increase production, distribution, and administration of nOPV2, to address the increasing rates

of cVDPV in both endemic and non-endemic countries, and promote a robust wastewater surveillance system. Polio eradication efforts in Pakistan, Afghanistan, and other politically unstable regions should be escalated to mitigate the untoward consequences of lower vaccination coverage. All counties should anticipate and aim to counteract growing anti-vaccine attitudes or hesitancy to vaccination, to reduce the spread of polio and other communicable diseases.

We declare no competing interests.

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