

Why is polio still a concern, also in Europe?

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Today, the prevailing belief among most healthcare professionals is that polio is a disease from the past. Whereas vaccines developed by Salk in 1955 (inactivated polio vaccine, IPV)¹ and Sabin in 1959 (oral polio vaccine, OPV)¹ both provide strong protection against polio disease, IPV does not provide mucosal immunity and thus shedding of poliovirus from infected individuals vaccinated with IPV is still possible. Although OPV provides strong mucosal immunity, it carries a risk of the virus reverting to neurovirulence, prolonged virus circulation and potential genetic reversion in areas with low polio vaccination coverage.

Since the introduction of vaccines, polio has indeed become rare, and its incidence has reduced by more than 99%. However, poliovirus is still circulating, and both wild-type as well as vaccine-derived polio cases occur every year. Also, other neurotrophic non-polio enteroviruses e.g., EV-D68, EV-A71, and EV-C105 have upsurged during the past decade. The non-polio enteroviruses can cause devastating diseases including meningitis, encephalitis, and flaccid paralysis. Ironically, during the same period the laboratory capacity to detect enteroviruses has been reduced worldwide as a knock-off effect of the recent upgraded WHO biosafety level 3+ requirements for handling potential poliovirus-containing diagnostic specimens.²

Despite significant progress in eradicating poliovirus, the virus remains endemic in countries like Afghanistan and Pakistan, with occasional outbreaks of vaccine-derived poliovirus (VDPV) in areas with low vaccination rates. Whereas major outbreaks of circulating VDPV type 1 (cVDPV1) and 2 (cVDPV2) recently have been confined to Sub-Saharan Africa, cases of VDPV are also seen in Europe. Thus, two unvaccinated children were paralyzed by poliovirus in Israel in 2023.³ Environmental virus surveillance in

London in May 2022 identified cVDPV2, indicating a persisting risk of importation of poliovirus in Europe.³ Between 2015 and 2022, 41 cVDPV-positive samples from acute flaccid paralysis (AFP) cases were reported in three countries (Israel, Ukraine, and Tajikistan).^{3,4}

In 2023, the European Regional Certification Commission (RCC) highlighted the increased circulation of cVDPV globally and in Europe, expressing concern about potential undetected circulation.⁵ The RCC called for high-quality surveillance and high vaccination coverage to prevent importation, virus circulation and transmission. To improve the safety of the OPV, a novel oral poliovirus vaccine for type 2 (nOPV2) with increased genetic stability has been developed.⁶ This vaccine aims to reduce the likelihood of mutations and recombination events that increase virulence while maintaining the benefits of OPV. Though the novel vaccine can revert to cVDPV2, the risk is ten times lower compared to OPV2.

In 2024, there is still a need for safer vaccines that cannot cause polio but can produce strong mucosal immunity needed to stop poliovirus transmission and enable poliovirus eradication.

Contributors

Thea K Fischer, Caroline Klint Johannesen, Natasa Berginc, Jean-Luc Bailly and Heli Harvala wrote the first manuscript draft and Kim Benschop has commented on all versions of the manuscript along with all authors.

Declaration of interests

None of the authors have worked in the poliovaccine producing industry or have stocks in poliovaccine companies.

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The Lancet Regional Health - Europe
2024;43: 100988

Published Online 25 June 2024

<https://doi.org/10.1016/j.lanep.2024.100988>

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