Vaccine-derived poliovirus outbreak
Factsheet and news

UPDATE OF 26 OCTOBER 2022

This document is composed of 3 different tabs: General information, Relevant news, and Scientific articles
The content and presentation of this document are subject to change as the situation evolves.
Every information presented comes from a valid and credible source.

Preparation of this document is coordinated by:
Erica Telford, Nicolas Pulik, Guia Carrara and Mario Delgado-Ortega (ANRS | Emerging Infectious Diseases)

The "General information" tab presents an overview, case definitions, guidelines, reported cases

Overview
https://www.who.int/health-topics/poliomyelitis#tab=tab_1

Timeline

- On 22 June 2022, the UK Health Security Agency announced detection of poliovirus in sewage samples from London, UK (a country declared polio-free in 2003). Several closely-related viruses were found in sewage samples taken between February and May. The virus has continued to evolve and is now classified as a 'vaccine-derived' poliovirus type 2 (VDPV2). The detection of a VDPV2 suggests it is likely there has been some spread between closely-linked individuals that are now shedding the type 2 poliovirus strain in their faeces. The virus has only been detected in sewage samples and no associated cases of paralysis have been reported.

- On July 18, 2022, the New York State Department of Health (NYSDOH) notified CDC of detection of poliovirus type 2 in stool specimens from an unvaccinated immunocompetent young adult from New York State, who was experiencing acute flaccid weakness. Since the discovery of this case, local wastewater surveillance has revealed evidence of cVDPV-2 in local counties, as well as in New York City (NYC), representing community transmission.

- VDPV2 was also detected recently in sewage samples in Jerusalem, Israel. Although outbreaks of polio in Israel have occurred in Israel in recent years, they were not of the VDPV of type 2, which is not included in the oral polio vaccine used by the country, suggesting the current detection derives from another country.
Poliomyelitis (polio) is a highly infectious viral disease that largely affects children under 5 years of age. It has an incubation period of 7-10 days but can range from 4-35 days. The virus is transmitted by person-to-person spread mainly through the faecal-oral route or, less frequently, by a common vehicle (e.g. contaminated water or food) and multiplies in the intestine, from where it can invade the nervous system and cause paralysis. Up to 90% of those infected experience no or mild symptoms and the disease usually goes unrecognized. In others, initial symptoms include fever, fatigue, headache, vomiting, stiffness in the neck, and pain in the limbs. These symptoms usually last for 2–10 days and most recovery is complete in almost all cases. However, in the remaining proportion of cases the virus causes paralysis, usually of the legs, which is most often permanent. Paralysis can occur as rapidly as within a few hours of infection. Of those paralysed, 5-10% die when their breathing muscles become immobilized.

In 1988, the World Health Assembly adopted a resolution for the worldwide eradication of polio, marking the launch of the Global Polio Eradication Initiative. Wild poliovirus cases have decreased by over 99% since 1988, from an estimated 350 000 cases in more than 125 endemic countries then to 175 reported cases in 2019. Of the 3 strains of wild poliovirus (type 1, type 2 and type 3), wild poliovirus type 2 was eradicated in 1999 and no case of wild poliovirus type 3 has been found since the last reported case in Nigeria in November 2012. Both strains have officially been certified as globally eradicated. As at 2020, wild poliovirus type 1 affects two countries: Pakistan and Afghanistan.

Two vaccines are available against polio, the oral polio vaccine (OPV) and the inactivated polio vaccine (IPV). OPV is more broadly used because it is cheaper and easier to administer. It protects both the individual and the community against infection thanks to excretion of the virus through faeces and exposure of a larger portion of the population. However, the vaccine contains the attenuated virus that can still replicate and, in extremely rare events, its enhanced transmission in undervaccinated populations can lead to accumulation of mutations that render the virus pathogenic again (vaccine-derived polio virus).

There is no cure for polio; it can only be prevented by immunization. The polio vaccine, given multiple times, can protect a child for life. Treatments for polio focus on limiting and alleviating symptoms.

**European Commission case definition of poliomyelitis (2008)**

**Clinical Criteria**
- Any person <15 years of age with Acute flaccid paralysis (AFP)
- OR
- Any person in whom polio is suspected by a physician

**Laboratory Criteria**
- At least one of the following three:
  - Isolation of a polio virus and intratypic differentiation– Wild polio virus (WPV)
  - Vaccine derived poliovirus (VDPV) (for the VDPV at least 85% similarity with vaccine virus in the nucleotide sequences in the VP1 section)
  - Sabin-like poliovirus: intratypic differentiation performed by a WHO-accredited polio laboratory (for the VDPV a >1% up to 15% VP1 sequence difference compared with vaccine virus of the same serotype)

**Epidemiological Criteria**
- At least one of the following two epidemiological links:
  - Human to human transmission
  - An history of travel to a polio-endemic area or an area with suspected or confirmed circulation of poliovirus

**Background information on Polio**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Santé publique France</td>
<td>Couverture vaccinale</td>
<td><a href="https://www.santepubliquefrance.fr/determinants-de-sante/vaccination/articles/donnees-de-couverture-vaccinale-diphterie-tetanos-poliomyelite-coqueluche-par-groupe-d-age">https://www.santepubliquefrance.fr/determinants-de-sante/vaccination/articles/donnees-de-couverture-vaccinale-diphterie-tetanos-poliomyelite-coqueluche-par-groupe-d-age</a></td>
</tr>
<tr>
<td>CDC</td>
<td>Page Poliomyélite</td>
<td><a href="https://www.cdc.gov/polio/what-is-polio/index.htm">https://www.cdc.gov/polio/what-is-polio/index.htm</a></td>
</tr>
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</table>
**Poliomyelitis - Factsheet and news**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
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<tr>
<td>WHO</td>
<td>Page Poliomyélite</td>
<td><a href="https://www.who.int/news-room/fact-sheets/detail/poliomyelitis">https://www.who.int/news-room/fact-sheets/detail/poliomyelitis</a></td>
</tr>
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**Protocol and guidelines from health authorities, ECDC, and WHO**

<table>
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<tr>
<th>Organization</th>
<th>Description</th>
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<th>Date</th>
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<tbody>
<tr>
<td>HAS</td>
<td>Vaccination Guidelines</td>
<td><a href="https://www.has-sante.fr/cms/p_3122554/fr/strategie-vaccinale-autour-d-un-cas-de-poliomyelite-ou-en-cas-de-detection-environnementale-de-poliovirus">https://www.has-sante.fr/cms/p_3122554/fr/strategie-vaccinale-autour-d-un-cas-de-poliomyelite-ou-en-cas-de-detection-environnementale-de-poliovirus</a></td>
<td>2019</td>
</tr>
<tr>
<td>WHO</td>
<td>Guidelines for environmental surveillance of poliovirus circulation</td>
<td><a href="https://apps.who.int/iris/handle/10665/67854">https://apps.who.int/iris/handle/10665/67854</a></td>
<td>2003</td>
</tr>
</tbody>
</table>
The “Relevant news” tab presents official reports from health agencies and rapidly reported information from reliable news sources.

### Preparation of this document is coordinated by:

Erica Telford, Nicolas Puliik, Guia Carrara and Mario Delgado-Ortega (ANRS | Emerging Infectious Diseases)

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<table>
<thead>
<tr>
<th>Date</th>
<th>Source</th>
<th>Type of publication</th>
<th>Title</th>
<th>Key facts</th>
<th>Link</th>
</tr>
</thead>
</table>
| 26/10/2022 | GEPI             | News                | Polio this week as of 26 October                                    | -Afghanistan: one WPV1 positive environmental sample  
- Algeria: two cVDPV2 positive environmental samples  
- DR Congo: one cVDPV1 case and six cVDPV2 cases  
- Niger: one cVDPV2 case  
| 24/10/2022 | WHO Europe       | News                | Statement – European Region 20 years polio-free: a celebratory moment but a fragile legacy | Opening remarks by Dr Hans Henri P. Kluge, WHO Regional Director for Europe, at the media briefing on World Polio Day                                                                                     | https://www.who.int/europe/news/item/24-10-2022-statement--europe-region-20-years-polio-free--a-celebratory-moment-but-a-fragile-legacy |
| 23/10/2022 | ECDC             | News                | World Polio Day 2022: Joint statement by Commissioners Stella Kyrtakides, Jutta Urpilainen, and Director of ECDC Dr Andrea Ammon | World Polio Day is commemorated on 24 October. Thanks to vaccination the EU has been polio-free for the past 20 years, but recent developments show that it remains an international health threat. | https://www.ecdc.europa.eu/en/news-events/world-polio-day-2022                                                           |
| 19/10/2022 | GEPI             | News                | Polio this week as of 19 October                                   | -Pakistan: two WPV1 positive environmental samples  
- Benin: One cVDPV2 case  
- DR Congo: 18 cVDPV1 cases and 17 cVDPV2 cases  
- Malawi: one cVDPV1 case  
- Niger: two cVDPV2 positive environmental samples  
- Senegal: one cVDPV2 positive environmental sample  
- Togo: one cVDPV2 positive environmental sample  
- Yemen: five cVDPV2 cases                                                                                         | https://polioeradication.org/polio-today/polio-now/this-week/                                                    |
| 18/10/2022 | WHO              | News                | Global leaders commit US$ 2.6 billion at World Health Summit to end polio | Global leaders confirmed US$ 2.6 billion in funding toward the Global Polio Eradication Initiative’s (GPEI) 2022-2026 Strategy to end polio at the World Health Summit in Berlin. The funding will support global efforts to overcome the final hurdles to polio eradication, vaccinate 370 million children annually over the next five years and continue disease surveillance across 50 countries. | https://www.who.int/news/item/18-10-2022-global-leaders-commit-usd-2-6-billion-at-world-health-summit-to-end-polio                        |
| 16/10/2022 | Gates Foundation | News                | With New Commitment, Gates Foundation Joins Call to Help End Polio | At the World Health Summit, the Bill & Melinda Gates Foundation announced it will commit $1.2 billion to support efforts to end all forms of polio globally.                                                  | https://www.gatesfoundation.org/ideas/media-center/press-releases/2022/10/world-health-summit-gates-foundation-commits-over-one-billion-to-end-polio |
| 12/10/2022 | GEPI             | News                | Polio this week as of 12 October                                    | - DR Congo: four cVDPV2 cases and one cVDPV2 positive environmental sample  
- Nigeria: three cVDPV2 cases                                                                                       | https://polioeradication.org/polio-today/polio-now/this-week/                                                      |
12/10/2022 WHO News En visite en RDC, une délégation de l’USAID se joint aux efforts de l'OMS et des autres partenaires pour accélérer l'éradication de la polio et la lutte contre les maladies évitables par la vaccination

10/10/2022 WHO Report Highlights from the Meeting of the Strategic Advisory Group of Experts (SAGE) on Immunization – 3-6 October 2022

SAGE recommendations on the current Monkeypox, Poliomyelitis, Respiratory Syncytial Virus, COVID-19, and the Sudan ebolavirus outbreak

05/10/2022 WHO News Zimbabwe intensifies polio surveillance

Health authorities in Zimbabwe with support of partners including Bill and Melinda Gates Foundation, UNICEF and WHO are implementing polio surveillance strengthening activities. Zimbabwe is currently using the AFP surveillance system to detect any potential Polio outbreaks.  

30/09/2022 UKHSA Promotional material Polio booster campaign resources

Information leaflet to support the polio booster campaign.

29/09/2022 PAHO/WHO News Health authorities commit to step up efforts to keep the Americas free of polio

Following declining levels of polio vaccination and surveillance across the region, and the importation of the poliovirus in the state of New York, health authorities in the Americas passed a resolution today to prioritize polio mitigation plans, including actions to increase vaccination and surveillance and to ensure adequate preparedness for a possible outbreak.

28/09/2022 Santé publique France News Virus de la polio détectés dans les eaux usées en Angleterre et aux Etats-Unis : Santé publique France maintient sa vigilance

Epidemiological and vaccination coverage update regarding the UK, USA, France and internationally, in particular regarding cases associated with VDPV2

28/09/2022 GEPI News Polio this week as of 28 September

- Afghanistan: one WPV1 positive environmental sample
- Pakistan: four positive environmental samples
- Algeria: five cVDPV2 positive environmental samples
- DR Congo: nine cVDPV2 cases
- Egypt: one cVDPV2 positive environmental sample
- Mozambique: one cVDPV1 case
- Nigeria: six cVDPV2 positive environmental sample
- Yemen: 12 cVDPV2 cases

25/09/2022 WHO News What it took to close a polio outbreak in Sudan

Sudan’s circulating vaccine-derived poliovirus (cVDPV) type 2 outbreak began with the importation of the virus from neighbouring Chad. Confirmed in August 2020, the outbreak affected and paralyzed 58 children in 42 districts of 15 states.

23/09/2022 ECDC Report Communicable disease threats report, 18-24 September 2022, week 38

Since the previous update on 16 August 2022, and as of 23 September 2022, 115 new cases of AFP caused by WPV1 or cVDPVs have been reported. In the US, the risk of additional cases related to the reported event persists, especially in areas with low polio vaccine coverage and in population groups with low polio vaccine uptake.

21/09/2022 GEPI News Polio this week as of 21 September

Six countries reported new polio cases this week; Afghanistan, Pakistan, Mozambique, Benin, DR Congo, Ghana, Madagascar, Malawi and Nigeria.

16/09/2022 ECDC Report Communicable disease threats report, 11-17 September 2022, week 37

This issue of the ECDC Communicable Disease Threats Report (CDTR) covers the period 11-17 September 2022 and includes updates on COVID-19, monkeypox, West Nile virus infection, dengue, and poliovirus.

15/09/2022 GEPI News Polio this week as of 14 September

- Virological and epidemiological analysis confirms circulation of VDPV2 in New York, USA. Ongoing response continues.
- A WPV1-positive environmental sample reported from greater Karachi, Sindh, with collection date on 23 August, linked to WPV1 from southern Khyber Pakhtunkhwa.
- In the DRC, circulating cVDPV1 has been confirmed. The country is also co-infected with cVDPV2 and is continuing to conduct response to urgently stop both strains.

14/09/2022 WHO News Detection of circulating vaccine derived polio virus 2 (cVDPV2) in environmental samples—the United Kingdom of Great Britain and Northern Ireland and the United States of America

Situation at a glance : as of 5 September, no human case associated with VDPV2 has been reported in the United Kingdom.


https://www.americansfreeofpolio.gov/news/virus-de-la-polio-detected-in-us-environmental-samples

https://www.afro.who.int/newsmedia/docs/default-source/actualites/2022/virus-de-la-polio-detected-in-us-environmental-samples-en-or-latin-amerique-amerique-du-nord-france-maintient-sa-vigilance

https://polioeradication.org/polio-today/polio-now/this-week/

https://polioeradication.org/polio-today/polio-now/this-week/

https://cdn.who.int/media/docs/default-source/immunization/sage/20-22/october/highlights_sage_oct_2022.pdf?sfvrsn=49f947c4_5

https://www.who.int/media/docs/default-source/immunization/sage/20-22/september/highlights_sage_sept_2022.pdf?sfvrsn=49f947c4_5


https://www.sagouk.org.uk/government/publications/polio-booster-campaign-resources

https://policoeration.nl/medialist/2022-10-05/527-3-2022/527-3-2022.html

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<th>Origin</th>
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<tr>
<td>13/09/2022</td>
<td>US CDC</td>
<td>News</td>
<td>United States confirmed as country with circulating vaccine-derived poliovirus CDC today announced that polioviruses found in New York, both from the case of paralytic polio in an unvaccinated adult in Rockland County and in several wastewater samples from communities near the patient’s residence, meet the World Health Organization (WHO)’s criteria for circulating vaccine-derived poliovirus (cVDPV) – meaning that poliovirus continues to be transmitted in Rockland County, NY, and surrounding areas.</td>
<td><a href="https://www.cdc.gov/media/releases/2022/s0913-polio.html">https://www.cdc.gov/media/releases/2022/s0913-polio.html</a></td>
</tr>
<tr>
<td>13/09/2022</td>
<td>PAHO/WHO</td>
<td>Epidemiological Update</td>
<td>Detection of a circulating vaccine-derived poliovirus type 2 (VDPV2) in the United States: Considerations for the Region of the Americas PAHO/WHO reiterates to Member States the need to continue efforts to achieve optimal levels of population immunity through high and homogeneous vaccination coverage, and through sensitive epidemiological surveillance of all acute flaccid paralysis (AFP) cases.</td>
<td><a href="https://www.paho.org/en/documents/epidemiological-update-detection-circulating-vaccine-derived-poliovirus-type-2-vdpv2">https://www.paho.org/en/documents/epidemiological-update-detection-circulating-vaccine-derived-poliovirus-type-2-vdpv2</a></td>
</tr>
<tr>
<td>02/09/2022</td>
<td>UKHSA</td>
<td>News</td>
<td>Expansion of polio sewage surveillance to areas outside London UKHSA and MHRA are expanding polio sewage surveillance to a range of areas outside of the capital.</td>
<td><a href="https://www.gov.uk/government/news/expansion-of-polio-sewage-surveillance-to-areas-outside-london">https://www.gov.uk/government/news/expansion-of-polio-sewage-surveillance-to-areas-outside-london</a></td>
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<tr>
<td>22/06/2022</td>
<td>WHO</td>
<td>News</td>
<td>Vaccine-derived poliovirus type 2 (VDPV2) detected in environmental samples in London, UK The Global Polio Laboratory Network (GPLN) has confirmed the isolation of type 2 vaccine-derived poliovirus (VDPV2) from environmental samples in London, United Kingdom (UK), as part of ongoing disease surveillance. Initially, vaccine-like type 2 poliovirus (SL2) had been isolated from samples taken from the same site between February and May 2022. Genetic analysis suggests that the new VDPV2 and previous SL2 isolates have a common origin, still to be identified, but the technical definition and criteria for ‘circulation’ of VDPV2 are not met at this time.</td>
<td><a href="https://www.who.int/news/item/22-06-2022-vaccine-derived-poliovirus-type-2-vdpv2-detected-in-environmental-samples-in-london-uk">https://www.who.int/news/item/22-06-2022-vaccine-derived-poliovirus-type-2-vdpv2-detected-in-environmental-samples-in-london-uk</a></td>
</tr>
<tr>
<td>22/06/2022</td>
<td>UKHSA</td>
<td>News</td>
<td>Poliovirus detected in sewage from North and East London The UKHSA and MHRA found vaccine-derived poliovirus type 2 (VDPV2) in sewage samples collected from the London as part of routine surveillance. This detection suggests it is likely there has been some spread between closely-linked individuals in North and East London and that they are now shedding the type 2 poliovirus strain in their faeces. The virus has only been detected in sewage samples and no associated cases of paralysis have been reported. Investigations will aim to establish if any community transmission is occurring.</td>
<td><a href="https://www.gov.uk/government/news/poliovirus-detected-in-sewage-from-north-and-east-london">https://www.gov.uk/government/news/poliovirus-detected-in-sewage-from-north-and-east-london</a></td>
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## Vaccine-derived poliovirus outbreak

**Factsheet and news**

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The "Scientific articles" tab presents relevant articles published on peer-reviewed scientific journals or pre-print platforms since June 2022

### Table of Scientific Articles

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<tr>
<td>16/10/2022</td>
<td>Vaccines</td>
<td>Research article</td>
<td>Poliovirus Immunity among Children Aged 6–11 and 36–48 Months in 14 Polio High-Risk Provinces of Afghanistan: A Health-Facility-Based Study</td>
<td>Afghanistan is one of two countries where wild poliovirus (WPV) type 1 remains endemic. The authors conducted a facility-based cross-sectional survey of antipoliovirus antibodies in children in 14 provinces of Afghanistan.</td>
<td><a href="https://doi.org/10.3390/vaccines10101726">https://doi.org/10.3390/vaccines10101726</a></td>
</tr>
<tr>
<td>13/10/2022</td>
<td>Ann J Epidem.</td>
<td>Review</td>
<td>Wastewater Surveillance for Infectious Disease: A Systematic Review.</td>
<td>Infectious diseases and pathogens were identified in 100 studies of wastewater surveillance across 38 countries. 25 separate pathogen families were identified in the included studies, with the majority of studies examining pathogens from the family Picornaviridae, including polio and non-polio enteroviruses. Wastewater surveillance studies can be improved by incorporating other measures of disease transmission at the population-level including disease incidence and hospitalizations.</td>
<td><a href="https://doi-org.proxy.insermbiblio.inist.fr/10.1093/aje/kwaq175">https://doi-org.proxy.insermbiblio.inist.fr/10.1093/aje/kwaq175</a></td>
</tr>
<tr>
<td>12/10/2022</td>
<td>The Lancet</td>
<td>Research article</td>
<td>Sustained detection of type 2 poliovirus in London sewage between February and July, 2022, by enhanced environmental surveillance</td>
<td>Environmental surveillance in London, UK, testing sewage samples using WHO recommended methods that include concentration, virus isolation in cell culture, and molecular characterisation. Whole-genome sequences generated through nanopore sequencing established linkage of isolates and confirmed transmission of a unique recombinant poliovirus lineage that has now been detected in Israel and the USA. 118 genetically linked poliovirus isolates related to the serotype 2 Sabin vaccine strain were detected in 21 of 52 sequential sewage samples collected in London between Feb 8 and July 4, 2022.</td>
<td><a href="https://doi.org/10.1016/S0140-6736(22)01804-9">https://doi.org/10.1016/S0140-6736(22)01804-9</a></td>
</tr>
<tr>
<td>10/10/2022</td>
<td>Nat. Comm.</td>
<td>Research article</td>
<td>Membrane-assisted assembly and selective secretory autophagy of enteroviruses</td>
<td>By using cryo-electron tomography of infected cells the authors show that poliovirus assembles directly on replication membranes. this data directly visualize a membrane-bound half-capsid as a prominent virion assembly intermediate. These findings provide an integrated structural framework for multiple stages of the poliovirus life cycle.</td>
<td><a href="https://doi.org/10.1038/s41467-022-33483-7">https://doi.org/10.1038/s41467-022-33483-7</a></td>
</tr>
<tr>
<td>07/10/2022</td>
<td>bioReiv</td>
<td>Preprint</td>
<td>Development of Enterovirus anti-viral agents that target the viral 2C protein</td>
<td>The authors describe a novel broad spectrum anti-viral compounds targeting the conserved non-structural viral protein 2C that have low micro-molar to nanomolar IC50 values. The selection of resistant mutants resulted in amino acid substitutions in the viral capsid protein, implying a role for 2C in capsid assembly, as has been seen in polioviruses.</td>
<td><a href="https://doi.org/10.1016/j.vaccine.2022.10.06.511132">https://doi.org/10.1016/j.vaccine.2022.10.06.511132</a></td>
</tr>
<tr>
<td>05/10/2022</td>
<td>NEJM</td>
<td>Editorial</td>
<td>Circulating Poliovirus in New York — New Instance of an Old Problem</td>
<td>The United States and the United Kingdom are experiencing outbreaks of imported poliovirus similar to those that have occurred elsewhere in recent years, and for the same reason: undervaccination.</td>
<td><a href="https://www.nejm.org/doi/full/10.1056/NEJMep2212115">https://www.nejm.org/doi/full/10.1056/NEJMep2212115</a></td>
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<tr>
<td>04/10/2022</td>
<td>BMJ</td>
<td>Opinion</td>
<td>The US needs to prepare to introduce the novel oral polio vaccine</td>
<td>The US was added to a WHO list of countries with circulating poliovirus, including Somalia, Democratic Republic of Congo, and Yemen. It may need to revise its polio vaccine programme and consider introducing the novel oral polio vaccine (nOPV) to its arsenal in order to gain control of transmission and prepare.</td>
<td><a href="https://doi.org/10.1136/bmj.o2388">https://doi.org/10.1136/bmj.o2388</a></td>
</tr>
<tr>
<td>01/10/2022</td>
<td>Ann Med Surg (Lond)</td>
<td>Comment</td>
<td>Detection of vaccine-derived poliovirus type 2 amid the burden of infectious diseases in the UK: A cause for alarm</td>
<td>The re-emergence of polio in the UK reminds us that the global threat of polio remains. Viruses know no borders or borders. COVID-19, Monkeypox, and polio are evidence of this.</td>
<td><a href="https://doi.org/10.1016/j.amsu.2022.104773">https://doi.org/10.1016/j.amsu.2022.104773</a></td>
</tr>
<tr>
<td>01/10/2022</td>
<td>Lancet</td>
<td>Editorial</td>
<td>Polio eradication: falling at the final hurdle?</td>
<td>COVID-19 temporarily halted the Global Polio Eradication Initiative (GPEI)’s immunisation campaigns. Consequently, outbreaks of circulating vaccine-derived poliovirus (cVDPV) tripled from 2019 to 2020, with over 1100 children paralysed. PAHO has warned that Brazil, Dominican Republic, Haiti, and Peru are at high risk for reintroduction of polio, following dwindling vaccination rates. Global polio immunisation rates fell to 80% in 2021, the lowest rate in 14 years.</td>
<td><a href="https://doi.org/10.1016/S0140-6736(22)01875-X">https://doi.org/10.1016/S0140-6736(22)01875-X</a></td>
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<tr>
<td>01/10/2022</td>
<td>Emerg Infect Dis</td>
<td>Research article</td>
<td>Importation and Circulation of Vaccine-Derived Poliovirus Serotype 2, Senegal, 2020–2021</td>
<td>Phylogenetic analysis revealed the circulation of 2 clusters and provided evidence on the virus introduction from Guinea. Because novel oral polio vaccine serotype 2 was used for response activities throughout Senegal, we recommend expanding environmental surveillance into other regions.</td>
<td><a href="https://doi.org/10.3326/10.3326/2021.200847">https://doi.org/10.3326/10.3326/2021.200847</a></td>
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The detection of people with paralytic cases of WPV1 in two African countries (i.e., Malawi in February, 2022 and Mozambique in May, 2022) outside endemic areas of WPV1 transmission (i.e., Pakistan and Afghanistan) will become a serious setback if low vaccination coverage and decreased surveillance of acute flaccid paralysis are not addressed with alacrity. Detection of VDPV outbreaks in new settings, including circulating vaccine-derived type 2 poliovirus (cVDPV2) in Ukraine in October, 2021, cVDPV3 in Israel in March, 2022, and cVDPV2 in the USA in July, 2022, and the environmental detection of VDPV in sewage systems in London, UK, in June, 2022, show the serious threat of polio re-emergence in settings that had previously interrupted polio transmission.

To prevent further epidemics in the UK, wastewater sampling remains crucial in evaluating, searching, and eradicating the spread of poliovirus. Further epidemiological surveillance in adjacent areas to the Beckton plant is crucial to filling any gaps in understanding the outbreak's extent and guiding the initiation of appropriate and timely public health measures.

The Global Polio Eradication Initiative's 2022–2026 strategy has sharpened its approach to overcoming the remaining hurdles to eradication in the highest risk communities around the world.

The successful development of nOPV2 has led to the deployment of approximately 450 million doses of nOPV2 for outbreak control in 21 countries. Monitoring the use of nOPV2 has confirmed it is more genetically stable and less likely to result in VDPV than the Sabin strain, suggesting that the target of the global eradication of poliomyelitis might be a little more attainable than previously believed.

The detection of people with paralytic cases of WPV1 in two countries of the European region are of utmost concern.

In the present study, the authors established a high-throughput pPNT (HTpPNT) for a large-scale serosurveillance. The HTpPNT system was evaluated with 600 human serum samples obtained from a broad range of age groups of healthy volunteers (ages of 0–89 years).

Vaccine co-administration has numerous advantages such as reduction in delivery costs and likely reduction in the numbers of visits in routine immunization schedule. Although immunological interference from co-administration of live and non-live vaccines is thought to be generally low. This study evaluated the safety and immunogenicity of bOPV and OCV administered simultaneously.

This article discusses the epidemiology of poliovirus by examining the aetiology of the disease and current mitigation policies implemented to prevent the spread of type 2 vaccine-deceived poliovirus in the UK. It also offers advice on particular therapies and tactics to avoid future polio outbreaks.

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To identify type 2 Sabin or Sabin-like sources and improve our ability to map viral sources to campaigns during the polio endgame, they investigated the feasibility of a new method for genetic sequence analysis (MMVC), as a complement to current phylogenetic tree approaches.

This JAMAPatientPage discusses #polio, including the epidemiology, prevention, and symptoms.

A genetic and epidemiological study of polio in Jerusalem, highlighting the importance of routine environmental/AFP surveillance as a means for outbreak control and rapid immunisation campaigns, not only in LICs, but also in HIC with high vaccination coverage.

New York state has declared an emergency, yet scientists say a big U.S. outbreak is unlikely.

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<th>Title</th>
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<tr>
<td>09/09/2022</td>
<td>MMWR</td>
<td>Report</td>
<td>Detection of a Highly Divergent Type 3 Vaccine-Derived Poliovirus in a Child with a Severe Primary Immunodeficiency Disorder — Chongqing, China, 2022</td>
<td>In March 2022, a type 3 VDPV was detected in stool specimens from an infant with primary immunodeficiency disorder (PID) who was hospitalized in Children’s Hospital of Chongqing Medical University, China. Surveillance for poliovirus in PID patients has increased detection of immunodeficiency-related (iVDPV) cases.</td>
<td><a href="https://doi-org.proxy.insermbiblio.inist.fr/10.15585/mmwr.mm7133e2_w">https://doi-org.proxy.insermbiblio.inist.fr/10.15585/mmwr.mm7133e2_w</a></td>
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<td>08/09/2022</td>
<td>bioRxiv</td>
<td>Preprint</td>
<td>A conserved glutathione binding site in poliovirus is a target for antivirals and vaccine stabilisation</td>
<td>Report of cryo-EM structures of glutathione (GSH) bound to poliovirus serotype 3 VLPs showing that it can enhance particle stability. This suggests GSH or an analogous tight-binding antiviral offers the potential for stabilizing VLP vaccines.</td>
<td><a href="https://www.biorxiv.org/content/10.1101/2022.09.09.507138v1">https://www.biorxiv.org/content/10.1101/2022.09.09.507138v1</a></td>
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<td>06/09/2022</td>
<td>Pediatr Infect Dis J</td>
<td>Article</td>
<td>Public Health Response to a Case of Paralytic Poliomyelitis in an Unvaccinated Person and Detection of Poliovirus in Wastewater—New York, June–August 2022</td>
<td>This report describes the second identification of community transmission of poliovirus in the USA since 1979. The occurrence of this case, combined with the identification of poliovirus in wastewater in neighboring Orange County, underscores the importance of maintaining high vaccination coverage to prevent paralytic polio in persons of all ages.</td>
<td><a href="https://doi.org/10.1097/INF.000000000003696">https://doi.org/10.1097/INF.000000000003696</a></td>
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<td>06/09/2022</td>
<td>Ann Med Surg</td>
<td>Short communication</td>
<td>Polio returns to the USA: An epidemiological alert</td>
<td>In light of the above-mentioned findings, this research further details future recommendations like cessation of the OPV, encouragement of inactivated polio vaccine (IPV) in vaccination schedules, sensitive epidemiological surveillance system and appropriate training for healthcare providers.</td>
<td><a href="https://www.sciencedirect.com/science/article/pii/S2049080122013521">https://www.sciencedirect.com/science/article/pii/S2049080122013521</a></td>
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<td>06/09/2022</td>
<td>Lancet Microbe</td>
<td>Comment</td>
<td>Rare recurrences of poliomyelitis in non-endemic countries after eradication: a call for global action</td>
<td>A comment on global action aiming to counteract growing anti-vaccine attitudes or hesitancy to vaccination, to reduce the spread of polio.</td>
<td><a href="https://doi.org/10.1016/S2666-5247(22)00253-1">https://doi.org/10.1016/S2666-5247(22)00253-1</a></td>
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<td>01/09/2022</td>
<td>Lancet Infect Dis</td>
<td>News</td>
<td>Linked global cases of poliovirus a cause of concern</td>
<td>Genetically linked vaccine-derived poliovirus type 2 has been detected in environmental samples in three countries and in a case of paralytic poliomyelitis.</td>
<td><a href="https://doi.org/10.1016/j.lindis.2022.15171">https://doi.org/10.1016/j.lindis.2022.15171</a></td>
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<td>25/08/2022</td>
<td>JAMA</td>
<td>News</td>
<td>What All Physicians Need to Know About the Polio Resurgence in New York State</td>
<td>Regarding the case of paralytic polio in a young adult in New York State, Genomic sequencing suggests that the virus has been circulating locally under the radar for up to a year, according to the Centers for Disease Control and Prevention (CDC).</td>
<td><a href="https://doi-org.proxy.insermbiblio.inist.fr/10.1001/jama.2022.15171">https://doi-org.proxy.insermbiblio.inist.fr/10.1001/jama.2022.15171</a></td>
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<td>22/08/2022</td>
<td>Nature</td>
<td>News</td>
<td>State of polio outbreaks worldwide puts scientists on alert</td>
<td>The discovery of poliovirus in New York state, London and Jerusalem this year has taken many by surprise — but public-health researchers say it was only a matter of time. Cases of paralysis in the US and Israel suggest vaccine-derived poliovirus has infected many people.</td>
<td><a href="https://www.nature.com/articles/doi:10.1038/s41586-022-02233-6">https://www.nature.com/articles/doi:10.1038/s41586-022-02233-6</a></td>
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<td>18/08/2022</td>
<td>Lancet</td>
<td>Comment</td>
<td>Emergence of vaccine-derived poliovirus in high-income settings in the absence of oral polio vaccine use</td>
<td>A comment on vaccine-derived poliovirus type 2 (VDPV2) detection in the UK, US, and Israel. Vaccine derived poliovirus has been detected from several sewage samples in north and east London, and officials warn that the virus may be circulating in the community.</td>
<td><a href="https://doi.org/10.1016/S0140-6736(22)01582-3">https://doi.org/10.1016/S0140-6736(22)01582-3</a></td>
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<td>23/06/2022</td>
<td>BMJ</td>
<td>News</td>
<td>Poliovirus is detected in sewage from north and east London</td>
<td>Vaccine derived poliovirus has been detected from several sewage samples in north and east London, and officials warn that the virus may be circulating in the community.</td>
<td><a href="https://doi.org/10.1136/bmj.g1546">https://doi.org/10.1136/bmj.g1546</a></td>
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<td>16/06/2022</td>
<td>MMWR</td>
<td>Report</td>
<td>Public Health Response to a Case of Paralytic Poliomyelitis in an Unvaccinated Person and Detection of Poliovirus in Wastewater — New York, June–August 2022</td>
<td>In June 2022, poliovirus was confirmed in an unvaccinated immunocompetent adult resident of New York hospitalized with flaccid lower limb weakness. Vaccine-derived poliovirus type 2 was isolated from the patient and identified from wastewater samples in two neighboring New York counties.</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/71/wr/mm7133e2.htm?s_cid=mm7133e2_w">https://www.cdc.gov/mmwr/volumes/71/wr/mm7133e2.htm?s_cid=mm7133e2_w</a></td>
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