

WHAT YOU NEED TO KNOW ABOUT THE CONTAINMENT OF POLIOVIRUSES 04 JULY 2016

Why the world needs to contain the poliovirus

- There are three wild poliovirus types, type 1, type 2 and type 3. Each of them can cause paralysis or death.
- Two types of vaccines have been used to eradicate polio: the inactivated polio vaccine (IPV) (composed of inactivated, 'dead' forms of the three poliovirus types) and the oral polio vaccine (OPV) (composed of attenuated, 'live' strains of the poliovirus types).
- After 28 years of polio eradication efforts and massive global investments, wild poliovirus type 2 was declared eradicated by the Global Commission for the Certification of Poliomyelitis Eradication (GCC) in September 2015.
- Occasionally, the oral polio vaccine causes vaccine-associated polio paralysis in vaccine recipients, and in areas of low vaccination coverage, the attenuated OPV strains (called Sabin polioviruses) may revert back to virulent forms and give rise to vaccine-derived poliovirus cases.
- As the risks associated with the use of type 2 containing OPV were outweighing the benefits, in April 2016, a successful global switch from trivalent to bivalent OPV (bOPV is composed of live, attenuated strains of poliovirus type 1 and 3 only) was carried out, associated with the introduction of a dose of IPV to maintain immunity against poliovirus type 2.
- The eradication of wild poliovirus type 2 means it does not circulate in human populations any longer and it is not detected in environmental samples either. However, the virus is still present in a number of facilities, including research laboratories and vaccine production sites.
- The identification and destruction of any unneeded type 2 polioviruses or appropriate containment of needed type 2 polioviruses is now critical to sustain polio eradication efforts.
- Safe and secure containment aims at preventing accidental or malicious release of these viruses from facilities and their subsequent transmission to people.

Could there be poliovirus in your specimens?

- Many specimens collected for surveillance and diagnosis of diseases other than polio are likely to be contaminated with polioviruses, especially Sabin strains, from the oral polio vaccine.
- Attenuated Sabin strains are transmitted from person to person through the faecal-oral route. These strains may also circulate in IPV-using countries.
- Because of the wide use of the oral polio vaccine, Sabin and Sabin-like polioviruses are ubiquitous and present in a number of specimen collections held in facilities worldwide. Some of these facilities may not yet be aware that the materials they store and handle are potentially contaminated with polioviruses.
- A guidance document to help identify, destroy or contain Sabin and Sabin-like polioviruses in facilities is being finalized.

Breaches of containment can have major consequences

- A release of the only other eradicated human pathogen, smallpox virus, from a laboratory in the United Kingdom in 1978 resulted in a person dying from the disease. This triggered countries to further reduce the number of facilities retaining smallpox virus to the two official repositories that remain today.
- Learning from the smallpox experience, the polio eradication programme is engaging stakeholders in the implementation of substantial containment efforts.

Risk mitigation after the switch to bivalent oral polio vaccine

- Safe and secure containment of type 2 poliovirus will help reduce the likelihood of a type 2 outbreak resulting from a breach. As immunity levels to type 2 polioviruses may fall, it will become increasingly important to reduce the risk of release and subsequent transmission of poliovirus to people, now that all countries have switched from trivalent to bivalent OPV.

The global action plan for containment

- The containment requirements that are recommended for facilities retaining polioviruses are described in the [“WHO Global Action Plan to minimize poliovirus facility-associated risk after the type-specific eradication of wild polioviruses and sequential cessation of oral polio vaccine use \(GAPIII\)”](#) published in December 2014.
- GAPIII was endorsed by the World Health Assembly in May 2015 ([resolution WHA68.3](#)).
- Destruction or containment activities involve all materials contaminated or potentially contaminated with wild poliovirus (WPV), vaccine-derived poliovirus (VDPV), oral polio vaccine (OPV) or Sabin virus, starting with type 2 polioviruses.

Towards the destruction or containment of all polioviruses

Phase I: Reducing the number of facilities retaining poliovirus type 2 materials

- The only effective way to prevent these viruses from being released is to destroy them.
- WHO is strongly encouraging Member States to destroy all unneeded poliovirus type 2. Polioviruses type 2 that are needed for critical functions, such as vaccine production or research, are expected to be properly contained.
- Responsibilities for appropriate containment will be shared between the facilities retaining concerned viruses (facility safeguards) and the countries hosting these facilities (high population immunization levels and secondary sewage treatment at facility locations).
- The retention of polioviruses is expected to require significant investments to meet and maintain the containment requirements described in GAPIII.

Phase I part 1: Wild or vaccine-derived type 2 poliovirus (WPV2/VDPV2)

- By end-2015, WHO requested Member States to:
 - identify facilities that handle or store materials contaminated or potentially contaminated with WPV2 or VDPV2;
 - destroy unneeded materials; and
 - designate poliovirus-essential facilities to retain needed materials.
- As of 25 May 2016:
 - 169 countries and territories have reported to WHO that they no longer hold any WPV2 or VDPV2;
 - 17 countries and territories have designated poliovirus-essential facilities to retain poliovirus type 2 materials (wild, vaccine-derived or Sabin);
 - 13 countries and territories have submitted incomplete reports that require finalization; and
 - 6 countries still have to submit their reports.

Phase I part 2: Oral polio vaccine type 2 and Sabin2 viruses (OPV2/Sabin2)

- By end-July 2016, three months after the last use of trivalent OPV, WHO requested Member States to:

- identify facilities that handle or store materials contaminated or potentially contaminated with Sabin2 polioviruses;
- destroy unneeded materials; and
- designate poliovirus-essential facilities to retain needed materials.

Phase II: Reducing the risk of poliovirus release in the remaining facilities

- Only poliovirus-essential facilities with a valid certificate can retain poliovirus type 2 materials according to GAPIII.
- To minimize the risk of poliovirus release, facilities are expected to comply with requirements set out in GAPIII ([Annex 2 or 3](#)). Containment certification of these facilities is a national responsibility. WHO is developing a containment certification scheme (CCS, described below) to harmonize global certification activities.
- Facilities that will not retain materials contaminated with type 2 poliovirus, but will investigate new faecal and respiratory samples where poliovirus type 2 may be present, are strongly encouraged to implement the biorisk management system requirements described in [Annex 6 of GAPIII](#).

Phase III: Containment of all types of poliovirus

- Containment will enter a new phase and its efforts will focus on all poliovirus types when the eradication of wild poliovirus type 1 and 3 is declared. The conditions for containment will then be more stringent in view of the global discontinuation of the use of bivalent OPV.
- WPV1 is still circulating in Pakistan and Afghanistan. The last case of WPV3 occurred in Nigeria in 2012.

The GAPIII containment certification scheme (CCS)

- WHO is finalizing the “GAPIII containment certification scheme” (CCS) to help countries enact robust, transparent and equitable mechanisms to certify facilities against GAPIII and ensure appropriate containment of polioviruses.
- The CCS introduces a period of interim containment certification (ICC) to allow activities including vaccine production and critical research to continue while the complete set of containment measures is being implemented.

More information

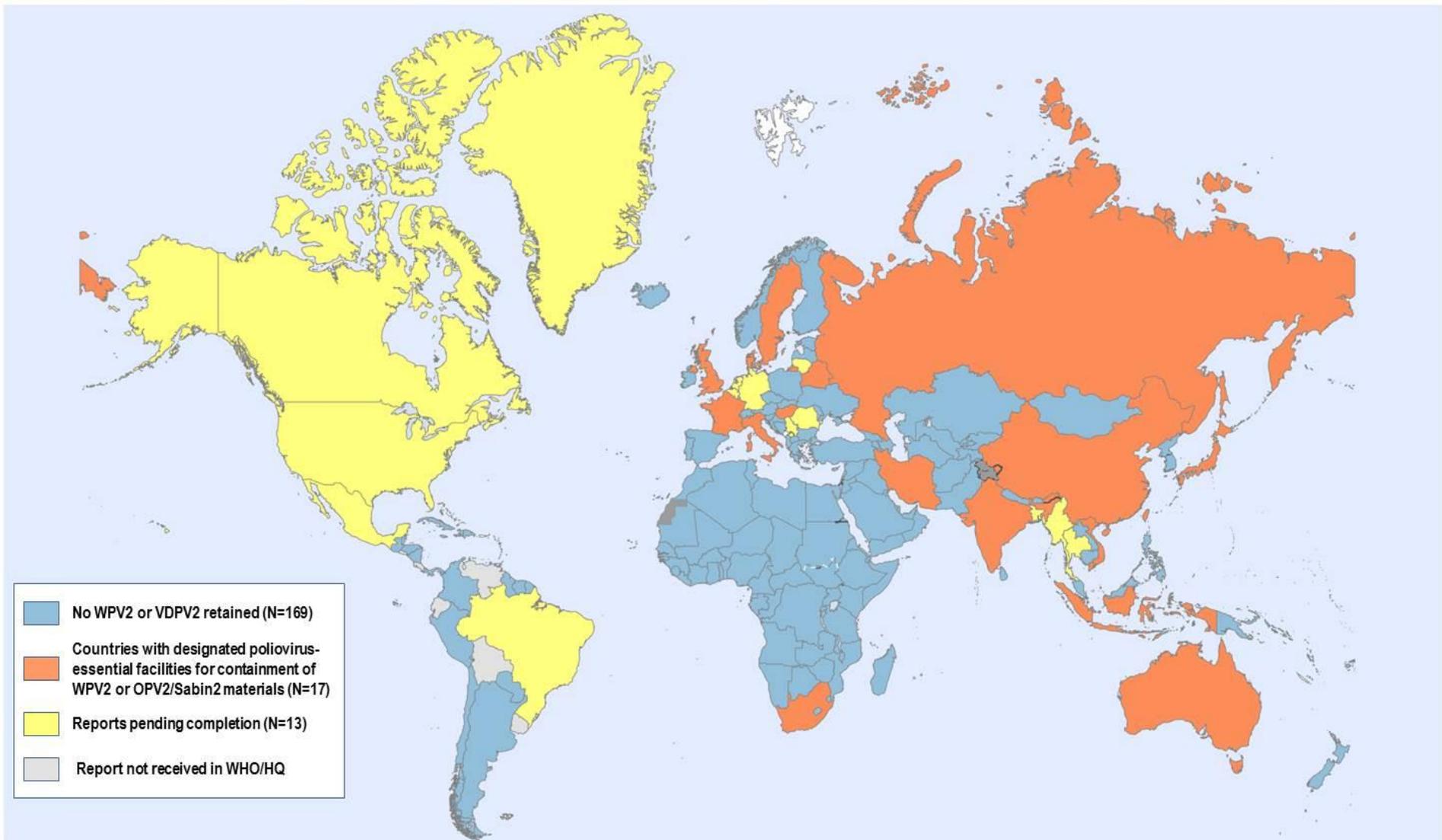
Documentation on containment

- [WHO Global Action Plan \(GAPIII\) for poliovirus containment](#)
- [Containment of Polioviruses, Global Polio Eradication Initiative website](#)
- [Plans for containment of poliovirus following type-specific polio eradication worldwide, 2015. Weekly Epidemiological Record, August 2015](#)
- [World Health Organization Guidelines for Containment of Poliovirus Following Type-Specific Polio Eradication — Worldwide, 2015. Morbidity and Mortality Weekly Report, August 2015](#)

Questions:

- Please send any questions, comments or suggestions to containment@who.int.

Reported progress on completion of GAPIII Phase I



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