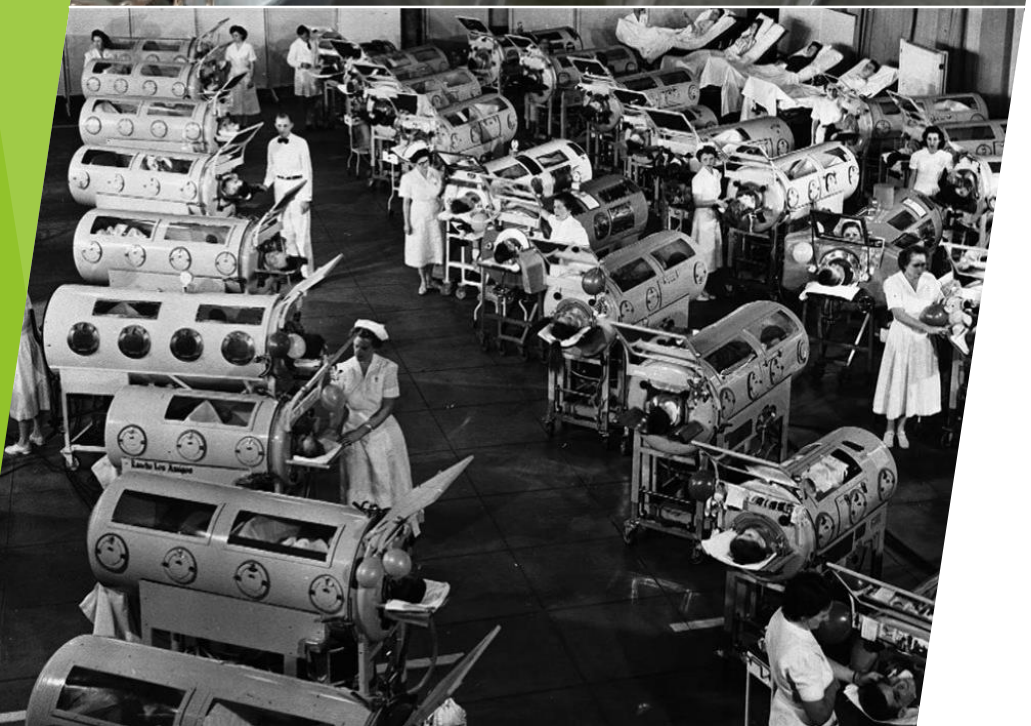
Polio eradication

How to make it a success as it was for smallpox?

Charles Denonne – 06 December 2019



Do we remember what polio is?

Plan

- Historical overview
- Compulsory vaccination ?
- WHO’s Polio endgame decision
- State of play
  - Type 1
  - Type 2
  - Type 3
  - VDPV
- GAP III
- Polio in Belgium

Historical overview

There is no cure for polio, it can only be prevented

- First vaccine in 1955 (Salk/Lepine) - inactivated
- OPV in 1961 (Sabin) – attenuated
- Certification of the eradication of smallpox in 1980
- WHA 41 in 1988 : resolution for the worldwide eradication of polio (objective : 2000)
- Cases due to wild poliovirus have decreased by over 99% since 1988, from an estimated 350 000 cases then, to 33 reported cases in 2018 and 112 in 2019
- As long as a single child remains infected, children in all countries are at risk of contracting polio

Historical overview - Belgium

There is no cure for polio, it can only be prevented

- **1956**: 1038 cases in a single year – vaccine introduced
- **1958**: Large vaccination campaigns
- **1960**: 300 cases of polio
- **1967**: Vaccination becomes mandatory
- **1979**: last autochthonous case
- **1989**: last imported case

- → **2002: EUROPE DECLARED POLIO-FREE**

Compulsory vaccination?

WHO's strategy is based on vaccination

- The strategies for polio eradication work when they are fully implemented
- Failure to implement strategic approaches, however, leads to ongoing transmission of the virus. Endemic transmission of wild poliovirus is continuing to cause cases in border areas of Afghanistan and Pakistan. Failure to stop polio in these last remaining areas could result in as many as 200 000 new cases every year, within 10 years, all over the world.
- That is why :
  - It is critical to ensure polio is eradicated completely, once and for all.
  - It also remain of paramount importance to maintain a high vaccination coverage worldwide.

State of play

OPV is cheap, effective but …

- WPV type 1 is still circulating in 2 countries (112 confirmed cases in 12-2019 in 2 countries)
- WPV type 3 was declared eradicated in 10-2019
- WPV type 2 was declared eradicated in 2015
  - Decision to stop OPV2 vaccination (GAPIII)
  - Unfortunatly, low background universal vaccine coverage lead to simultaneous outbreaks of VDPV type 2,
  - VDPV are circulating (177 confirmed cases in 12-2019 in 15 countries – mainly type 2)

State of play

The issue of cVDPV

- Sabin strains are efficient but genetically unstable and can turn back to a virulent virus. This is problematic as the number of WPV cases is nearing 0
- High income countries generally use the IPV
- It appeared that VDPV strains remain a long time in the environment and as water and sanitation remain a huge challenge in many part of the world …
- Need to maintain a high vaccination coverage after WPV eradication

State of play

The answer to cDVPV

- WHO is currently fighting the fire with its cause as long as a switch to IPV does not seem realistic in many countries and there is not yet any stable OPV on the market
- WHO GAP 3 Strategy was to progressively switch from trivalent OPV to mono or bi-valent OPV
  - => need to re-think the strategy
- Studies are ongoing on new genetically stabilized strains for the production of OPV2

GAP III - post eradication

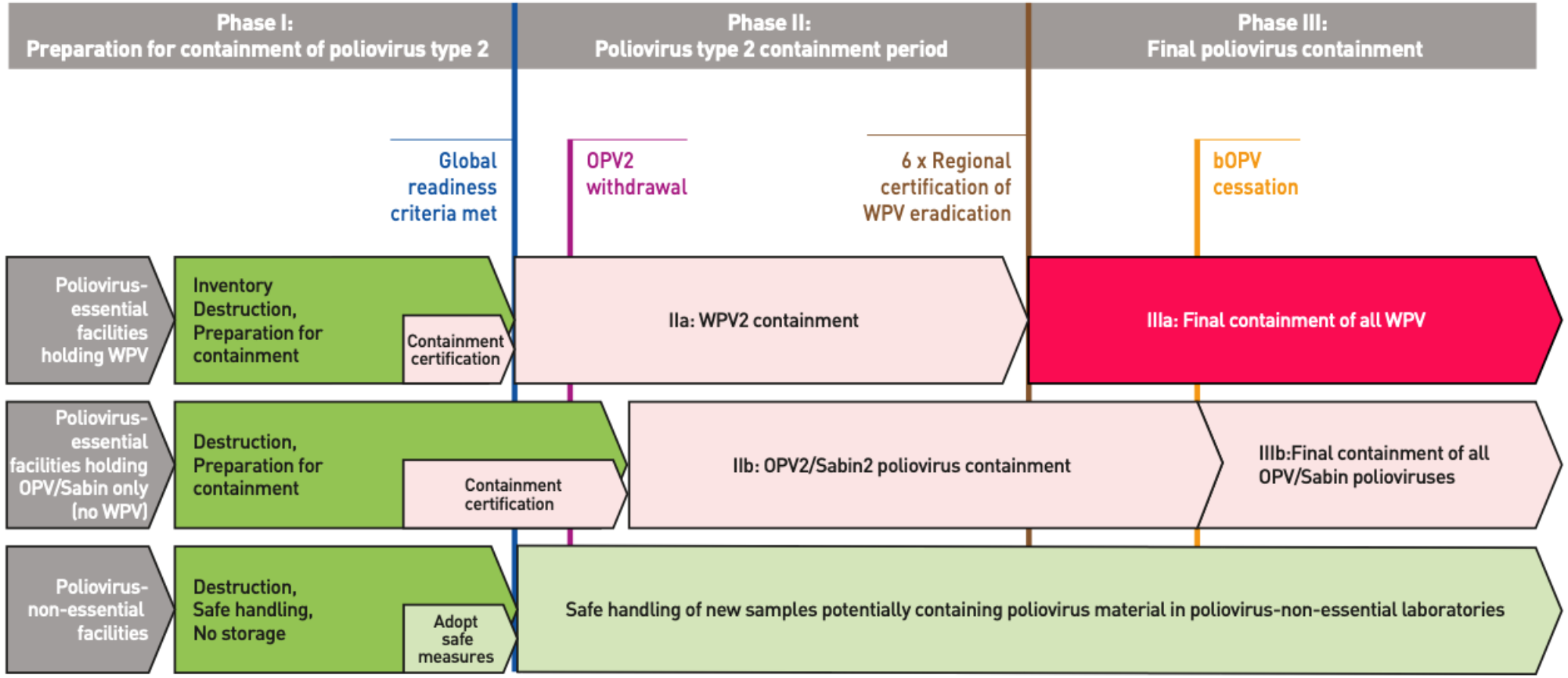
Was WHO too fast?

- Global Action Plan to minimize poliovirus facility-associated risk after type-specific eradication of wild polioviruses and sequential cessation of oral polio vaccine use
- It is a post eradication programme decided by WHO
- https://www.youtube.com/watch?v=L7sS0PYwTgQ&t=2s
- Main idea is to lower the risk of accidental release of type 2 PV from labs
- This requires top level containment policies from polio essential facilities.

GAP III - post eradication

Was WHO too fast?

- It sets a detailed biorisk management standard for poliovirus-essential facilities holding (wild) poliovirus materials
- And a biorisk management standard for safe handling of new samples potentially containing poliovirus material in polio virus non essential facilities



- No containment
- Adoption of safe-handling measures
- Containment of WPV2, OPV2/Sabin2; Final containment of all OPV/Sabin polioviruses
- Final containment of all WPV

Global readiness criteria for OPV2 withdrawal:

1. **IPV:** Introduction of at least one dose of IPV;
2. **bOPV:** Access to a bivalent oral polio vaccine that is licensed for routine immunization;
3. **Surveillance and Stockpile:** Implementation of surveillance and response protocols for type 2 poliovirus (including constitution of a stockpile of mOPV2);
4. **Containment:** Completion of Phase I poliovirus containment activities, with appropriate handling of residual type 2 materials;
5. **Verification:** Verification of global eradication of WPV2.

Trigger for setting a date for the withdrawal of OPV2:

Absence of all persistent cVDPV2

6 x Regional certification of WPV eradication:

The Regional Certification Commissions (RCC) will certify their regions as polio-free once WPV transmission is interrupted in that region, i.e. 36 months after the last WPV is detected.

GAP III - post eradication

Was WHO too fast?

- BE is putting in place a legal framework to implement GAP III (see law of 7/4/2019 – Royal Decree to be published shortly). Main aspects are :
  - Prohibition to handle and to stockpile type 2 (for the time being) poliovirus if you are not recognized and accredited/certificated for this activity
  - Destruction or transfer of type 2 material/potentially infected material in other facilities
  - Compulsory containment measures adapted to the level of risk
  - Compulsory notification of containment breach

GAP III - post eradication

Was WHO too fast?

- Two questions remains :
  - what to do with type 2 genetically stabilized strains? Do they require the same level of containment as wild and sabin strains?
  - how to reconcile GAP 3 requirements with the urgent need of hundreds of millions of OPV2 doses to fight cVDPV2 2019 outbreaks as long as nOPV2 is not available and type 2 population immunization has already declined ?

GAP III - in Belgium and in the world
A consequence of type 2 eradication

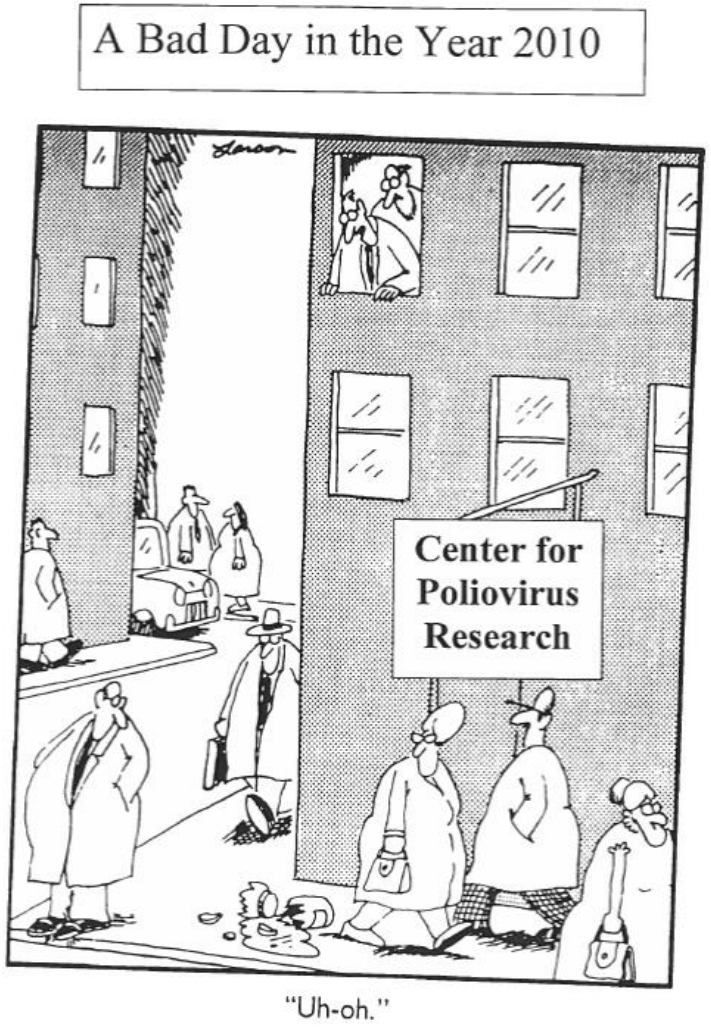
- We foresee at least 3 polio essential facilities in BE and at least 1 non essential facility.
- Linked with vaccine research, production, control and storage
- 26 countries are foreseeing 74 Polio Essential Facilities.

TLP : Amber

Polio vaccination in Belgium and in neighbouring countries

- Polio vaccination (IPV) is compulsory in BE since 1967 coverage around 98%

- In France, polio vaccination is mandatory since 1964 (IPV only since 1982) – coverage around 99%
- In the Netherlands, polio vaccination is not mandatory (IPV) coverage around 93%
- In Germany, polio vaccination is not mandatory. Vaccination coverage around 93%
- In Luxembourg, polio vaccination is not mandatory and coverage is about 99%



Thank you for your attention !

Any questions ?