Technical brief: nOPV2

This document summarizes key operational considerations for the use of nOPV2 in outbreak response as a quick reference for EPI managers, immunization focal points, and field staff. Additional information can be found at http://polioeradication.org/nOPV2

What You Need to Know about nOPV2

- nOPV2 is a modified version of the existing OPV2 vaccine (also known as the Sabin OPV type 2 vaccine, or mOPV2) that provides comparable protection against poliovirus type 2 while being more genetically stable.
- Data to date indicate that the vaccine's safety profile is similar to mOPV2. Its increased genetic stability as compared to mOPV2 means that there is a decreased risk of nOPV2 reverting to a form that could cause paralysis in areas with low immunization coverage.
- Given the urgent public health need to address cVDPV2 in polio-affected countries, and because of nOPV2's similarity in safety and immunogenicity to the existing mOPV2, the GPEI is fast-tracking the development of nOPV2 based on positive clinical trial data to date. Plans are underway to ensure the rapid field availability of the vaccine for outbreak response through WHO's Emergency Use Listing (EUL) procedure.
- To implement nOPV2, countries will need to meet the requirements of the EUL recommendation for use. Special criteria will also apply for the countries that use the vaccine during approximately the first three months when the vaccine is used, referred to as the initial use period. The EUL requirements and the essential criteria for the initial use period are described in detail in the WHO/GPEI guidance document, *Implementation of nOPV2 for cVDPV2 Outbreak Response: Technical Guidance for Countries.*[i]
- nOPV2 is a live type 2 poliovirus and is currently allowed to be handled outside of GAPIII containment for the purposes of production, quality control testing, clinical trials, stockpile and outbreak response. This is a provisional determination (per the Containment Advisory Group) based on pre-clinical data and the results of the first clinical trial and recommendations may change as new information becomes available.[ii]

When to Use nOPV2

- nOPV2 **is to be used in cVDPV2 outbreak response only**. There are no plans to use nOPV2 in routine immunization, where the use of bivalent oral polio vaccine (bOPV) and/or inactivated polio vaccine (IPV) should continue as planned.
- When first used in outbreak response, **nOPV2 should be used alone (i.e. not in combination with other vaccines)**. Sufficient vaccine supply to conduct the full required number of rounds with nOPV2 is required. IPV use can be considered only after the first two rounds with nOPV2 have been completed.

Target Population

As is the case with current outbreak response campaigns, the target population for nOPV2 SIAs will usually be children less than five years of age; however, an expanded age group (up to 10 or 15 years, or the whole population depending on local context) should be considered if there is evidence of virus circulation among older age groups.

Administration, Presentation and Packaging

- Like mOPV2, **a dose of nOPV2 will consist of two drops of the vaccine, delivered orally**.
- **The liquid will be similar in colour to nOPV2, and the same type of dropper dispensers will be used.** The vaccine may present a colour varying from slightly yellow to light red colour due to a slight variation of pH; however, this does not affect the quality of the vaccine.
- **The labelling and packaging design will be distinct** to differentiate nOPV2 from other oral polio vaccines, although they will not be used together in the field.
- **nOPV2 will be supplied in 50-dose vials** to help facilitate timely and effective vaccine production. Wastage will be assessed during the initial use period and vial size could potentially be changed in the future.

Cold Chain and Vial Management

- **nOPV2 should be kept in the cold chain at all times. It should be kept in a freezer at -20°C as long as possible, until it is being used.** It can be stored unopened for approximately three to six months between +2 °C and +8 °C.

- **nOPV2 will be labelled with a VVM**. It will be important to check the VVM before each use and discard the vial if the colour of the square is the same as or darker than the surrounding circle.
- **As with other oral polio vaccines, vaccine carriers with solidly frozen icepacks will be required for transporting the vaccine from health facilities to outreach sessions where refrigeration is not available.**
- Like mOPV2, **nOPV2 is subject to specific containment requirements including the tracking and inventory all full, partial and empty vials.** Following completion of outbreak response, thorough inventories of nOPV2 infectious and potentially infectious materials must be conducted.[iii]

Monitoring and Evaluation

In addition to standard post-campaign monitoring, special post-deployment monitoring requirements apply to nOPV2 use under the EUL and additional requirements apply for countries using nOPV2 during the first three months after the EUL recommendation is issued (the initial use period). The full requirements are detailed in the WHO/GPEI guidance document, *Implementation of nOPV2 for cVDPV2 Outbreak Response: Technical Guidance for Countries*. Key requirements to note are:

- **Safety:** National safety monitoring protocols should be updated to reflect nOPV2 variables and implemented accordingly. A template Vaccine-Related Event (VRE) Response Plan has been developed to support countries in their efforts to ensure coordination and alignment between vaccine safety focal points, EPI program staff, communications leads, and other nOPV2 stakeholders about how to respond to any vaccine-related event.[iv]
- **Surveillance:** AFP Case Investigation Forms should be adapted to record OPV doses, and a plan for systematic contact sampling of all AFP cases for 6 months after an nOPV2 outbreak response should be developed and implemented. So that nOPV2 circulation can be monitored during the initial use period, countries must have at least one functional ES site in areas where nOPV2 will be used and be prepared to develop and implement a plan to collect ES samples twice per month for a period of six months after nOPV2 use.
- **Advocacy, Communications, and Social Mobilization: Use of nOPV2 requires strong communications support.** Countries should make sure they have a national advocacy strategy, a C4D action plan, as well as a crisis communications plan that addresses the needs identified in the nOPV2 VRE response plan.

Safety, Immunogenicity, and Side Effects

Data from the clinical studies conducted to date show nOPV2 to be well tolerated in adults, young children, and infants, with no indication of any increase in general safety risk compared to mOPV2. No serious adverse events have been identified that are considered to be related to vaccination with nOPV2. Immunogenicity of nOPV2 was found to be non-inferior to mOPV2 in infants, meaning that nOPV2 is expected to be as effective in preventing paralytic disease as the current vaccine. Most importantly, it was established that nOPV2 is significantly more genetically stable and thus less likely to revert to neurovirulence compared to mOPV2.[v]

nOPV2 Vaccine Release and Outbreak Response Procedures

nOPV2 vaccine supply will be released by the GPEI through a two-phase process:

- **A GPEI assessment of country readiness for nOPV2 implementation**, described further in the technical guidance document.
- **Establishment of any additional specifications for outbreak response (e.g. target age).** Factors will include available supply, country-level and regional poliovirus epidemiology, and other potential considerations relevant to the specific context of the outbreak.

Training and Additional Resources on nOPV2

Training of staff at every level and across disciplines will be essential for successful nOPV2 implementation. Materials for front-line workers are being developed and should be implemented in coordination with the GPEI. An up-to-date list of training resources and all relevant nOPV2 materials is available on the nOPV2 web page of the GPEI website: **http://polioeradication.org/nOPV2**. New documents and tools for nOPV2 implementation continue to be developed and will be posted to the web page as they become available.

[i] World Health Organization. Implementation of nOPV2 for cVDPV2 outbreak response: Technical Guidance for Countries. 2020 http://polioeradication.org/nOPV2

[ii] World Health Organization. Addendum to the Report of the Teleconference of the Containment Advisory Group (CAG TC3) on nOPV2 candidate vaccines and S19 – poliovirus type 2 strains. 2018. http://polioeradication.org/wp-content/uploads/2017/08/Addendum-CAG-TC3-Dec-2018-EN-1.pdf

[iii] World Health Organization. WHO Global Action Plan to minimize poliovirus facility-associated risk after type-specific eradication of wild polioviruses and sequential cessation of oral polio vaccine use. 2014. http://polioeradication.org/wp-ontent/uploads/2016/12/GAPIII_2014.pdf

[iv] US Centers for Disease Control and Prevention. Vaccine-Related Event Response Plan. 2020.

[v] Global Polio Eradication Initiative. Clinical summary for novel oral polio vaccine type 2 (nOPV2). 2020. http://polioeradication.org/wp-content/uploads/2020/05/Clinical-development-summary-nOPV2-20200521.pdf