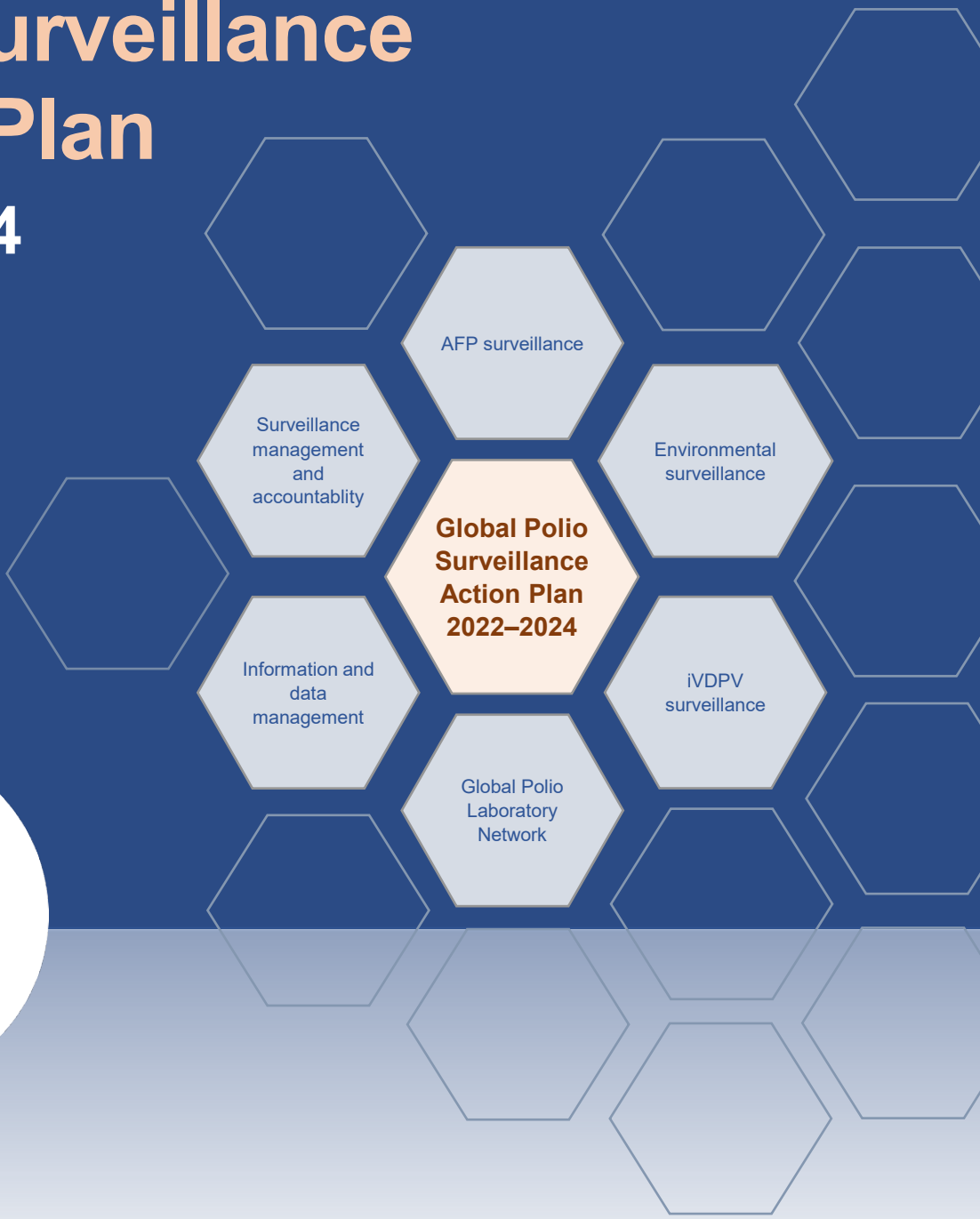
POLIO GLOBAL ERADICATION INITIATIVE

Global Polio Surveillance Action Plan 2022–2024



EVERY LAST CHILD

Global Polio Surveillance Action Plan 2022–2024

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ACRONYMS AND ABBREVIATIONS

AFP	Acute flaccid paralysis
AFR	African Region
AMR	Region of the Americas
CBS	Community-based surveillance
CDC	U.S. Centers for Disease Control and Prevention
CIF	Case investigation form
cVDPV	Circulating vaccine-derived poliovirus
cVDPV2	Circulating vaccine-derived poliovirus type 2
DD	Direct detection
DEM	Digital elevation model
DHIS2	District Health Information Software 2
EMR	Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
ES	Environmental surveillance
eSurv	Electronic surveillance
EUL	Emergency Use Listing
EUR	European Region
EV	Enterovirus
FETP	Field epidemiology training programme
FRR	Financial resource requirements
GPEI	Global Polio Eradication Initiative
GPLN	Global Polio Laboratory Network
GPLNMS	Global Polio Laboratory Network Management System
GPSAP	Global Polio Surveillance Action Plan
HR	High risk
IA2030	Immunization Agenda 2030
IDP	Internally displaced populations
IFA	Information for action
IPOW	Interim Programme of Work
ITD	Intratypic differentiation
IVB	Immunization, Vaccines and Biologicals
iVDPV	Immunodeficiency-associated vaccine-derived poliovirus
KPI	Key performance indicator
M&E	Monitoring and evaluation
MHR	Medium-high risk
MZR	Monthly zero reporting
NGO	Nongovernmental organization
nOPV2	Novel oral polio vaccine type 2
NPAFP	Non-polo acute flaccid paralysis
NPEV	Non-polio enterovirus
OB	Outbreak
OBRA	Outbreak response assessment
OPV	Oral polio vaccine
PCS	Post-Certification Strategy
PID	Primary immunodeficiency disorder
POLIS	Polio Information System
PRSEAH	Preventing and responding to sexual exploitation, abuse and harassment
PV	Poliovirus
QA	Quality assurance
R&D	Research and development
RRT	Rapid response team
SEAR	South-East Asia Region
SOP	Standard operating procedure
UN	United Nations
UNICEF	United Nations Children’s Fund
VDPV	Vaccine-derived poliovirus
VHR	Very high risk
VPD	Vaccine-preventable disease
WebIFA	Web-based information for action
WHE	WHO Heath Emergencies
WHO	World Health Organization
WPR	Western Pacific Region
WPV	Wild poliovirus
WPV1	Wild poliovirus type 1
WZR	Weekly zero reporting

EXECUTIVE SUMMARY

The global effort to eradicate wild poliovirus (WPV) has entered a critical phase. At the start of 2022, wild poliovirus type 1 (WPV1) persists in two endemic countries, Afghanistan and Pakistan, and circulating vaccine-derived poliovirus (cVDPV) has been detected in underimmunized communities in WPV-free countries in three of six regions of the World Health Organization (WHO).

To achieve WPV eradication and end cVDPV transmission, the Global Polio Eradication Initiative (GPEI) launched a new strategy – *Polio Eradication Strategy 2022-2026: Delivering on a Promise*. The GPEI Strategy targets barriers to ending WPV1 and cVDPV transmission and identifies a path toward achieving WPV eradication, with concerted emphasis on continued investments in and improvements of surveillance quality and timeliness of detection.

The GPEI relies on three types of surveillance to detect poliovirus: surveillance for cases of acute flaccid paralysis (AFP) as the primary surveillance approach, supplemented by environmental surveillance (ES) and surveillance for poliovirus among individuals with primary immunodeficiency disorders (PIDs), referred to as immunodeficiency-associated vaccine-derived poliovirus (iVDPV) surveillance. All three systems are supported by the Global Polio Laboratory Network (GPLN) and the polio data and information management system.

Since the previous *Global Polio Surveillance Action Plan (GPSAP), 2018-2020*, field and laboratory surveillance have faced new challenges. The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in late 2019 and the subsequent COVID-19 global pandemic led to a temporary suspension of polio activities in many countries. While surveillance performance declined in the first months of the pandemic, a record number of polioviruses were detected in 2020, reflecting broad setbacks that have resulted from the suspension of outbreak response activities. Before COVID-19, however, many countries still faced some gaps in poliovirus surveillance at subnational levels. In some countries, underperformance was more localized to districts with hard-to-reach areas and among high-risk populations with limited access to the formal health sector. Added to these challenges, some countries face limited resources – both human and financial – due to the diversion of polio surveillance assets to other public health priorities (including COVID-19) or the current financial environment that has resulted in decreased GPEI support to countries.

This new *Global Polio Surveillance Action Plan (GPSAP) 2022–2024* is the first of two action plans that are expected to deliver on the vision of the GPEI Strategy. It aims to translate strategy into action through a focus on increasing the speed of poliovirus detection, improving surveillance quality at the subnational level, fostering the integration of polio surveillance with surveillance for other epidemic-prone vaccine-preventable diseases (VPDs), and mainstreaming gender equality in surveillance activities and programming as a key enabling factor.

The GPSAP 2022–2024 is organized into six mutually supportive objectives:

1. Enhance and sustain AFP surveillance sensitivity and timeliness
2. Optimize the ES network to contribute to the timely detection of polioviruses
3. Establish iVDPV surveillance to sustain polio eradication
4. Maintain and strengthen the capacity and capability of the GPLN
5. Increase efficiency in collecting, managing, and using data for actions
6. Enhance surveillance management and accountability

The GPSAP 2022–2024 focuses on select countries that have been identified as “priority countries” due to persistent gaps in surveillance and chronic vulnerability to poliovirus transmission; however, all countries are encouraged to adopt proposed actions and recommendations. Activities at the country,

regional, and global levels have been identified to help meet targets set by the GPEI Strategy – particularly in relation to achieving a new standard for the timeliness of detection, with specimens reaching the laboratory within 14 days of the onset of paralysis for an AFP case and with testing and sequencing results reported within 35 days of the onset of paralysis.

To support these and other goals of the GPEI Strategy, the GPSAP 2022–2024 focuses on improving surveillance systems with indicators on timeliness and surveillance quality that will support monitoring progress at the global level and for priory countries. As part of the GPSAP, the GPEI will encourage and work with countries to conduct health-seeking behaviour assessments by adapting their AFP case investigation forms (CIFs) to document previous health encounters of cases and their caregivers. A review of CIF data will help identify individuals and facilities not in the AFP reporting network that should be evaluated for inclusion to increase the sensitivity of AFP surveillance. Such reviews will also help in understanding the health-seeking behaviour of vulnerable communities and populations and inform surveillance activities, such as community-based surveillance (CBS). Furthermore, the new GPSAP prioritizes targeted expansion of ES sites in select countries and offers focused support for countries with suboptimal ES networks. The GPEI will also introduce new methodologies and technologies to speed up detection and close surveillance gaps. Building on years of research and development (R&D), a new non-cell-culture testing methodology called direct detection (DD) will be piloted alongside expanded sequencing in select laboratories; if successful, it will be implemented more broadly. The GPEI will also accelerate upgrading the archaic information for action (IFA) system by investing in web-based information and data management platforms, such as WebIFA. To further support timely detection, the GPEI will pilot an electronic specimen tracking system to follow specimens in real time from the point of collection to final laboratory results, which will ensure country programmes can locate and take action if a specimen is delayed at any point in the process.

As the GPEI Strategy prioritizes changes to improve success at the front lines and in the field, each GPSAP objective directly addresses building and sustaining human capacity. GPSAP 2022–2024 elevates the critical value of a supportive work environment by embracing the full spectrum of activities for recruiting, training, and retaining skilled personnel. Programmes are encouraged to increase the gender balance of their personnel, institute policies to prevent and respond to sexual exploitation, abuse and harassment (PRSEAH), and advance gender equality as means toward ensuring a safe and enabling work environment. As part of an effort to ensure gender equity in surveillance reach, performance measures will include data assessment disaggregated by sex. Additionally, mechanisms to review flags for potential inequity in gender will be established.

During this GPSAP period, country programmes will need to balance integration priorities with maintaining the high surveillance standards required to achieve WPV eradication. Key to this endeavour will be ensuring the workforce is equipped and prepared to promote the integration of polio surveillance with surveillance for other epidemic-prone diseases. Together with partners and stakeholders, including the WHO department for Immunization, Vaccines and Biologicals (IVB) and the WHO Health Emergencies (WHE) programme, steps will be taken to assess shared needs and support the long-term sustainability of polio surveillance, particularly as part of post-certification planning.

The GPSAP was developed by the GPEI Surveillance Group, where GPEI partners, WHO regions, and field surveillance and laboratory experts are represented. This GPSAP will be in effect from the first half of the GPEI Strategy period – from 2022 until mid-2024. At the beginning of 2024, overall progress on implementation will be re-evaluated, and a new action plan that captures new developments and reflects on changes to policies and priorities will be developed to cover the remaining part of the GPEI Strategy.

INTRODUCTION

Poliovirus surveillance is one of the key pillars of the global poliovirus eradication effort. The primary system to detect poliovirus transmission is surveillance for polio cases among individuals with acute flaccid paralysis (AFP), supplemented by environmental surveillance (ES) for poliovirus detection in sewage and wastewater, and surveillance for poliovirus among individuals with primary immunodeficiency disorders (PIDs), referred to as immunodeficiency-associated vaccine-derived poliovirus (iVDPV) surveillance.[1] Poliovirus surveillance is supported by a well-functioning Global Poliovirus Laboratory Network (GPLN) and a comprehensive Polio Information System (POLIS) that permits ready access to data to inform action.

Taken altogether, the three surveillance systems (AFP, environmental, and iVDPV surveillance), the GPLN, and POLIS are all essential for polio eradication. Each area of work functions from the field level within countries to the regional and global levels and across the entire Global Polio Eradication Initiative (GPEI), referred to within this document as the "programme."

The ***Global Polio Surveillance Action Plan (GPSAP) 2022–2024*** builds on the previous GPSAP 2018–2020 which introduced a number of interventions and innovations, including targeted activities to strengthen ES, new strategies to access hard-to-reach populations, guidelines for establishing iVDPV surveillance with piloting underway in selected countries, a forum for coordination on surveillance information systems, and standardized guidance to support critical work in field surveillance.[2] The new GPSAP 2022–2024 is also aligned with the surveillance components of the new *Polio Eradication Strategy 2022–2026*: *Delivering on a promise*, referred to as the **GPEI Strategy**.[3] To further support shifts within the GPEI to strengthen collaboration with other health programmes, the GPSAP 2022–2024 draws upon the *Global strategy for comprehensive Vaccine-Preventable Disease (VPD) surveillance* and a global pandemic preparedness strategy, currently under development.[4]

CONTEXT

As the GPSAP 2022–2024 launches, wild poliovirus type 1 (WPV1) currently persists in Afghanistan and Pakistan alongside circulating vaccine-derived poliovirus type 2 (cVDPV2). The GPEI also faces an increase in circulating vaccine-derived poliovirus (cVDPV) outbreaks affecting WPV-free countries in five of six WHO regions since 2019 – an urgent crisis exacerbated by the COVID-19 pandemic.

Delayed detection of both WPV1 and cVDPV2 transmission is one of the greatest risks to the polio eradication programme. Inadequate surveillance at subnational levels, including in areas that are hard to reach and with special populations that may be inaccessible to the programme, impacts the ability of the GPEI to detect poliovirus transmission and respond in a timely manner. Subnational gaps in polio surveillance continue to be evident, particularly in Afghanistan and Pakistan and in some outbreak countries.

[1] Although the objective of polio surveillance among PID patients is to detect any excretion of poliovirus beyond VDPVs, for ease of reference it will be referred to hereafter as "iVDPV surveillance."
[2] Global Polio Eradication Initiative (GPEI). Global Polio Surveillance Action Plan, 2018–2020. Geneva: World Health Organization; 2018 (https://polioeradication.org/wp-content/uploads/2016/07/GPEI-global-polio-surveillance-action-plan-2018-2020-EN-1.pdf).
[3] Global Polio Eradication Initiative (GPEI). Polio Eradication Strategy 2022–2026: Delivering on a promise. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/bitstream/handle/10665/345967/9789240031937-eng.pdf).
[4] Global strategy for comprehensive Vaccine-Preventable Disease (VPD) surveillance. WHO Immunization, Vaccines and Biologicals (IVB). Geneva: World Health Organization; 2020 (https://www.who.int/publications/m/item/global-strategy-for-comprehensive-vaccine-preventable-disease-(vpd)-surveillance). WHO Health Emergencies (WHE). Global pandemic preparedness strategy. In preparation.

The COVID-19 pandemic has also contributed to a decline in the number of AFP cases reported, as safety measures limited domestic and international movement and community health-seeking behaviour drastically changed.

The GPEI Strategy emphasizes that a risk of the delayed detection of poliovirus transmission, compounded by a series of logistical challenges that extend response time beyond the window of maximum impact, represents one of greatest risks to global polio eradication.

Furthermore, with the introduction of the novel oral poliovirus vaccine type 2 (nOPV2), available now under an Emergency Use Licensing (EUL) procedure of the World Health Organization (WHO) for rapid response to cVDPV2 outbreaks, high levels of polio surveillance will be imperative, particularly in the context of post-campaign monitoring. Reliance on the polio surveillance infrastructure to obtain complete, timely, and accurate poliovirus information will be necessary to meet regulatory requirements and eventual applications for nOPV2 prequalification.[5]

Another pressing challenge the GPEI faces during this GPSAP period is *transition*, which refers to the expedited, risk-based transition of staffing and infrastructure from the GPEI to Member States and essential immunization or health emergency programmes.[6] Transition is a major step forward – and a necessary one as the GPEI approaches its goal. However, this process also generates some uncertainty as to whether countries will be able to maintain high-quality polio surveillance. As transition continues to be implemented across WHO regions, country programmes will need to balance integration priorities with maintaining the high standards required to achieve eradication. Moving forward, the GPEI will integrate polio-specific activities with those of other VPDs or emergency preparedness programmes to facilitate the process of transition and ensure the sustainability of polio eradication.

COVID-19 and polio surveillance

When the first wave of COVID-19 hit in early 2020, the GPEI recommended limited frontline interactions to protect programme field staff and communities. During this operational pause, immunization campaigns were postponed, and country programmes faced major challenges. Domestic lockdowns limited the ability of field staff to perform surveillance activities, and the closing of national and international borders prevented specimens from being shipped to or arriving at laboratories for testing, which consequently delayed the detection of several polio outbreaks. Globally, the minimal level of polio surveillance that could be maintained was also affected, as the COVID-19 pandemic created vastly disproportionate impacts across regions.* However, even as surveillance performance declined during the first months of 2020, a record number of viruses were detected, indicating that a minimum level of surveillance was maintained despite these challenges. Furthermore, the COVID-19 pandemic highlighted the importance and reliability of the polio surveillance network for other epidemic-prone diseases. In several countries, the polio field surveillance infrastructure was fully used for the COVID-19 response.

* Zomahoun DJ, Burman AL, Snider CJ, Chauvin C, Gardner T, Lickness JS, Ahmed JA, Diop O, Gerber S, Anand A. Impact of COVID-19 Pandemic on Global Poliovirus Surveillance. MMWR-Morbid Mortal W. 2021 Jan 1;69(5152):1648-1652 (http://doi.org/10.15585/mmwr.mm695152a4).

[5] Global Polio Eradication Initiative (GPEI). Polio Field and Laboratory Surveillance Requirements in the Context of nOPV2 Use. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2021/10/nOPV2-Surveillance-Guidance-1.pdf).

[6] Polio Transition Independent Monitoring Board (TIMB). Fourth report, Navigating complexity. January 2021 (https://polioeradication.org/wp-content/uploads/2021/02/4th-TIMB-Report-Navigating-Complexity-20210131.pdf).

PURPOSE

The purpose of this GPSAP 2022–2024 is to define the surveillance strategies and activities needed to achieve and maintain a surveillance system sensitive enough to detect the circulation of any polioviruses. It is also intended to strengthen coordination between GPEI field surveillance systems, GPLN laboratory surveillance, POLIS and data management, and the management of country, regional, and global teams.

New cross-cutting themes

A major component of the GPSAP is to translate the GPEI Strategy into action. Thus, a special focus will be on increasing the speed of poliovirus detection, improving subnational surveillance quality, fostering polio surveillance integration with other VPD programmes, and mainstreaming gender equality in surveillance activities and programming as a key enabling factor for polio eradication.

- **Speed of poliovirus detection:** Delayed detection of poliovirus transmission negatively affects outbreak response, allowing the virus to spread without interventions. The GPEI Strategy aims to shorten the time between detection and response, with **≥80% of polioviruses confirmed and sequenced within 35 days of onset of the case (or sample collection for ES)**. Meeting this goal depends upon timely action throughout the whole polio surveillance system, from case detection and investigation to specimen shipment and laboratory processing, and for all three types of field surveillance systems (AFP, environmental, and iVDPV surveillance).
- **Subnational surveillance quality**: Endemic and outbreak countries appear to have sensitive AFP surveillance systems at the national level; however, this high-level view can hide gaps at subnational levels, including hard-to-reach areas and special populations. The GPSAP aims to improve surveillance quality at the subnational level by optimizing ES and strengthening AFP surveillance to achieve a **non-polio AFP (NPAFP) rate ≥2 per 100,000 children <15 years of age in at least 80% of the districts (or administrative level 2) with a population <15 years of age of at least 100,000**, in priority countries.
- **Gender equality**: The GPEI recognizes that gender equality is critical to the success of the eradication effort.[7] The GPSAP prioritizes the systematic collection of sex-disaggregated data and gender analysis to inform decision-making and address identified gaps and barriers. It also includes the provision of gender-focused capacity building. Country programmes will implement measures to prevent and respond to sexual exploitation, abuse, and harassment (referred to as PRSEAH policies), train surveillance staff on existing confidential reporting, and commit to ensuring gender-sensitive support mechanisms and systems are in place.
- **Integration**: Polio surveillance integration is not only a step toward the transition of GPEI-supported polio assets and functions in preparation for the post-certification era; it is also a means to shape a sustainable polio-free world through systematic collaboration with other public health actors. While this work is already underway in some WHO regions, the programme will build upon lessons learned to systematically foster integration. The GPSAP directs countries and regions to further identify areas of integration at every stage of the polio surveillance process, from field surveillance to laboratory surveillance and information and data management systems.

[7] Global Polio Eradication Initiative (GPEI). Gender Equality Strategy 2019–2023. Geneva: World Health Organization; 2019 (https://polioeradication.org/wp-content/uploads/2020/10/Gender-Strategy.pdf).

OBJECTIVES

There are six mutually supportive objectives of the GPSAP 2022–2024.

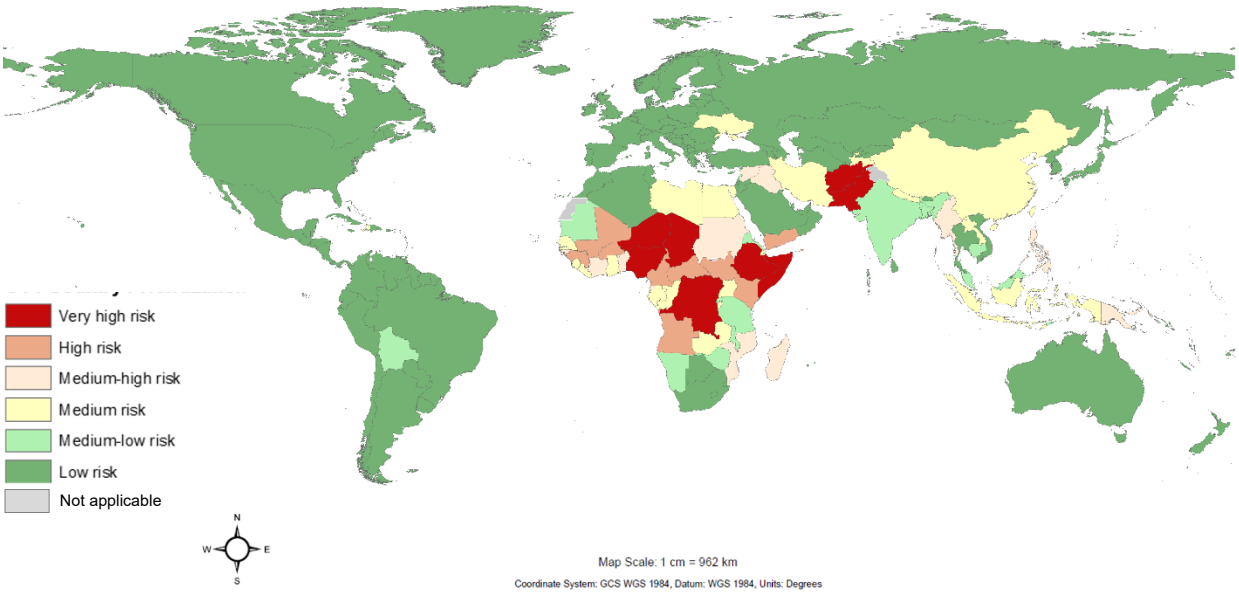
1. Enhance and sustain AFP surveillance sensitivity and timeliness
2. Optimize the ES network to contribute to the timely detection of polioviruses
3. Establish iVDPV surveillance to sustain polio eradication
4. Maintain and strengthen the capacity and capability of the GPLN
5. Increase efficiency in collecting, managing, and using data for action
6. Enhance surveillance management and accountability

GEOGRAPHIES

While the purpose of the GPSAP 2022–2024 and its alignment with the goals of the GPEI Strategy are global in nature, the GPSAP is principally focused on priority countries.

The priority countries defined below were identified through a risk assessment exercise coordinated by the GPEI Surveillance Group that engaged multiple inputs, including WHO regional risk assessments, global risk assessments, regional transition plans, and assessments of each country's obstacles to eradication (**Fig. 1** and **Annex A. Country risk assessment**).

Fig. 1. Country-level risk assessment (as of January 2022)



Source = WHO.

Countries identified at very high, high, and medium-high risks are those identified as having persistent gaps in surveillance and vulnerability to poliovirus transmission (**Table 1**). This list of priority countries is set for the duration of the GPSAP 2022–2024; however, additional countries may be re-prioritized or added as critical risks or gaps in surveillance are identified.

Table 1. Priority countries

Priority group	WHO region	List of countries
Very high risk (VHR)	African	Chad, Democratic Republic of the Congo, Ethiopia, Niger, Nigeria
	Eastern Mediterranean	Afghanistan, Pakistan, Somalia
High risk (HR)	African	Angola, Burkina Faso, Cameroon, Central African Republic, Guinea, Kenya, Mali, South Sudan
	Eastern Mediterranean	Yemen
Medium high risk (MHR)	African	Benin, Côte d'Ivoire, Equatorial Guinea, Guinea Bissau, Madagascar, Mozambique, Togo
	Eastern Mediterranean	Iraq, Sudan, Syrian Arab Republic
	South-East Asia	Myanmar
	Western Pacific	Papua New Guinea, Philippines

TIMELINE

As the new GPEI Strategy covers the period 2022–2026 with a mid-term review planned for the end of 2023, this GPSAP will cover 2022–2024, the initial period of the global programme strategy. A revised surveillance action plan will be developed in early 2024 to cover 2024–2026, the second period of the GPEI Strategy. It will reflect any revisions made during the mid-term review of the GPEI Strategy, with a focus on certification requirements.

AUDIENCE

The GPSAP 2022–2024 was developed by the GPEI Surveillance Group, where GPEI partners, regional focal points, and field surveillance and laboratory experts are represented. The new action plan is intended for use by individuals, organizations, and countries involved in polio eradication efforts. As such, potential readers include: national polio and immunization programme managers and staff; country and regional focal points for polio eradication at the WHO and the UN Children's Fund (UNICEF); immunization and health emergency programmes; polio eradication and immunization technical advisory bodies; and GPEI agency partners.

OBJECTIVES FOR 2022–2024

AFP SURVEILLANCE

Objective 1. Enhance and sustain AFP surveillance sensitivity and timeliness

Background

Surveillance for AFP remains a cornerstone of the polio eradication effort and the gold standard for detecting circulation anywhere within a country. All countries should be able to detect individuals with suspected AFP from any segment of the population through at least one of three strategies: active surveillance, passive surveillance, and community-based surveillance.[8]

Challenges on the ground, however, may detract from achieving sufficient AFP surveillance sensitivity and timeliness. AFP surveillance coverage itself may be limited for several reasons, including an inability to routinely access special populations or hard-to-reach areas. Within the programme, there may be rapid staff turnover and limited training opportunities that impact surveillance quality – or, at the management level, there may be limited review of data needed to drive action. In WPV-free countries, polio surveillance is often deprioritized, which may lead to delayed detection of importations and emergences. Across all countries, the COVID-19 pandemic has also negatively affected the sensitivity and timeliness of the AFP surveillance system, even as the polio surveillance network itself lent crucial support to help contain COVID-19, demonstrating it can go beyond polio surveillance to track any VPDs, outbreaks, or health events.

To address surveillance gaps, country programmes must identify and understand the unique limitations of their AFP surveillance to implement effective strategies. The following activities help focus on critical improvements to strengthen AFP surveillance sensitivity and timeliness (**Table 2**).

Table 2. Major activities and key performance/process indicators for Objective 1

Major activities	Key performance/process indicators
1. Attain and maintain sensitive AFP surveillance, with targeted efforts to identify and address subnational gaps	• ≥80% of districts with >100,000 population under 15 years of age achieving an annualized NPAFP rate of ≥2/100,000
2. Improve timeliness for case detection, investigation, and specimen transport	• ≥80% of AFP cases with two stools collected, both ≥ 24 hours apart, and received in a WHO-accredited laboratory within 14 days of paralysis onset.
3. Facilitate building and sustaining a skilled workforce	• Publish updated field guidelines on the GPEI website by mid-2022 • Finalize training package and post online by mid-2022
4. Implement focused M&E activities, including critical review of surveillance processes and data for action	• Monthly report on KPIs used to target improvements, including sex-disaggregated analyses
5. Integrate AFP surveillance with other health programmes	• Number of priority countries with active surveillance tool integrating selected epidemic-prone diseases • Number of countries with integrated training

AFP = acute flaccid paralysis; GPEI = Global Polio Eradication Initiative; KPIs = key performance indicators; M&E = monitoring and evaluation; NPAFP = non-polio acute flaccid paralysis; WHO = World Health Organization

[8] Global Polio Eradication Initiative (GPEI). Global Guidelines for Acute Flaccid Paralysis (AFP) and Poliovirus Surveillance. In preparation.

Activity 1. Attain and maintain sensitive AFP surveillance, with targeted efforts to identify and address subnational gaps

Attaining and maintaining sensitive AFP surveillance countrywide requires critical review of surveillance performance, as review findings enable countries to adjust their reporting network and AFP surveillance strategies to effectively target and address at-risk communities.

The GPEI recommends the following steps to improve AFP surveillance:

- Review the active surveillance network (including the prioritization of reporting sites, the timeliness and completeness of site visits, and the coverage of the network) and ensure all surveillance staff are engaged in and accountable for conducting active surveillance site visits.
- Map hard-to-reach areas and special populations at the subnational level to identify underperforming areas or other blind spots.
- Carry out data analyses disaggregated by high-risk status, sex, health-seeking behaviour, and other such criteria to help pinpoint subnational gaps and the possible reasons for these gaps, as well as strategies to overcome them (**Annex B. AFP surveillance auditing** and **Annex C. Health-seeking behaviour**).

Community-based surveillance (CBS) can further increase AFP surveillance sensitivity and timeliness of case detection, while also increasing community engagement and acceptance. CBS is recommended where health facility-based surveillance cannot be performed or is not functioning optimally, particularly in high-risk populations or areas with an elevated risk of undetected poliovirus transmission. CBS should be pursued on a case-by-case basis as it can be resource intensive. Before embarking on establishing CBS, country programmes should conduct a CBS needs assessment to identify any barriers, including a health-seeking behaviour assessment (**Annex C**). Based on that assessment, other activities may be sufficient and easier to implement, such as adding informal healthcare providers to the active surveillance network, building on outreach services, or tapping into existing networks for other diseases (**Annex D. Community-based surveillance**).

Improving the quality, accuracy. and availability of the data so it is close to real time will also increase the sensitivity of the AFP surveillance system. Shifting all field-level, paper-based data collection tools to an electronic format will be a priority of the GPSAP 2022–2024, targeting active surveillance, supervision, and CBS (see **Objective 5**).

Endemic and outbreak countries need to **close surveillance gaps in underperforming districts**. This should be done by improving active surveillance and ensuring access with special populations and in hard-to-reach areas.

Activity 1 tasks

- ✓ Conduct an audit of the AFP surveillance system, looking specifically at subnational performance. Consider auditing on an annual basis (**Annex B**).
- ✓ Strengthen and expand the use of active surveillance by all actors, especially at the subnational level, and consider reviewing tools to cover both AFP and VPDs or epidemic-prone diseases.
- ✓ By Q1 2022, WHO African and Eastern Mediterranean Regions to list geographic areas for possible exploration of CBS (**Annex D**).

Activity 2. Improve timeliness for case detection, investigation, and specimen transport

Delayed detection of poliovirus transmission is one of the greatest challenges to eradicating polio, as it negatively impacts the timeliness and effectiveness of the outbreak response and it almost inevitably leads to the expansion of transmission.

To improve the timeliness of detection within AFP surveillance, the programme will aim to reduce all delays from onset of paralysis to the arrival of specimens at a WHO-accredited laboratory to **be completed within 14 days**. Every stage of the process will be targeted for time-saving interventions, and all countries and WHO regions will be monitored at the global level through current and new indicators to track the timeliness of detection (**Annex E. Indicators**).

Priority countries will need to identify and target bottlenecks at every stage of the process – from onset of paralysis to the arrival of stool specimens at a WHO-accredited laboratory. This will be key in reducing delays in detection and response to outbreaks.

To support timely case detection, active surveillance will be prioritized for improvement through the introduction of electronic tools for field implementation and supervision and monitoring (see **Objective 5**).

To support timely specimen shipment to laboratories, an electronic tracking system will be piloted in selected geographies that experience persistent delays from the point of collection to final laboratory results (see **Objective 5**). Tracking field and laboratory surveillance will help pinpoint bottlenecks where interventions are needed to reduce delays (**Annex F. Timeliness: On ways to reduce delays**).

Overall, the identification of bottlenecks will be achieved through regular analysis, periodic desk reviews, and a better understanding of health-seeking behaviour of AFP cases and their caregivers. This will include the systematic collection and analysis of data disaggregated by sex, age, and other factors to support identifying gender-related barriers to seeking care. Findings will be used to introduce effective and timely modifications of AFP surveillance activities, especially in the improvement of active surveillance, AFP case detection, and specimen transport.

Activity 2 tasks

- ✓ Monitor the timeliness of detection against newly developed indicators (**Annex E**).
- ✓ Track delays at the subnational level through every step of the surveillance process (**Annex F**).
- ✓ Pilot the real-time monitoring of specimen movement from the point of collection to arrival at a WHO-accredited laboratory for select priority countries (Chad, the Democratic Republic of the Congo, Somalia, and South Sudan) and take action to address bottlenecks in collection and/or transport time (**Annex. F**).
- ✓ Introduce health-seeking behaviour and gender in data collection and data analysis tools.

Activity 3. Facilitate building and sustaining a skilled workforce

A knowledgeable and skilled workforce is critical for AFP surveillance and its sustainability within an integrated VPD or epidemic-prone disease surveillance system.

To build and sustain the AFP surveillance workforce, countries should consider the entire human resources spectrum – from the selection of personnel for vacancies, to capacity building through programme investments in training, to routine performance assessment through supportive supervision and on-the-job mentoring. Specific attention should also go towards advancing gender equality and increasing the gender balance of teams through recruitment and retention processes (**Annex G. Facilitating a skilled workforce**).

Priority countries will be expected to provide refresher training on integrated surveillance within the GPSAP 2022–2024 period.

Furthermore, countries should ensure that personnel involved in AFP surveillance are equipped to carry out surveillance in a way that supports the GPEI's approach to integration and longer-term sustainability for maintaining polio eradication, by including knowledge and skills of other VPD surveillance and health emergencies in training and development (**Annex H. Integration of poliovirus surveillance**). To that effect, exploring potential links with existing training programmes, such as the field epidemiology training programme (FETP), could be useful. During the COVID-19 pandemic, many training activities were cancelled or postponed. Priority countries will thus need to ensure that their surveillance personnel receive at least one refresher training in the 2022–2024 period. In addition to the technical aspects of surveillance, trainings should include management skills, interpersonal communication skills, and gender-related training components. such as conducting gender data analysis, understanding gender-related barriers to immunization and surveillance, and upholding PRSEAH policies (**Annex I. Gender and Polio Surveillance**).[9]

Activity 3 tasks

- ✓ Update *Global Guidelines for Acute Flaccid Paralysis (AFP) and Poliovirus Surveillance* and post to the GPEI website by mid-2022.
- ✓ Update the existing AFP surveillance training package with training modules on management, interpersonal communication, gender-related components, and integration by mid-2022.
- ✓ Adapt the AFP surveillance training package to online audiences and publish translated versions in Arabic, French, and Spanish.
- ✓ Ensure refresher training on integrated surveillance within the 2022–2024 period. Regions to support countries by developing a training plan in Q1 2022.

[9] The WHO policy directive on protection from sexual exploitation and sexual abuse is available online (https://www.who.int/publications/m/item/information-on-policy-directive-on-protection-from-sexual-exploitation-and-sexual-abuse-(sea)). A PRSEAH section of the standard operating procedures (SOPs) to respond to a polio event or outbreak will appear in a forthcoming version, which will be published on the GPEI website (https://polioeradication.org/polio-today/polio-now/outbreak-preparedness-response).

Activity 4. Implement focused M&E activities and critical review of surveillance processes and data for action

Monitor and analyse AFP data **beyond the standard indicators** to better pinpoint gaps and ensure the early detection of outbreaks.

Across the GPEI, a wealth of data contributes to understanding the overall sensitivity of AFP surveillance. Within this context, the GPSAP 2022–2024 aims to foster approaches that look at data holistically – and increasingly analyse data *beyond the standard indicators* (i.e., beyond core indicators like the non-polio AFP [NPAFP] rate and stool adequacy), so surveillance officers, supervisors, and managers can uncover any possible gaps that may impede progress toward eradication.

To support the programme at all levels, a new set of indicators elaborate both core and non-core surveillance activities (**Annex E. Indicators**). Timeliness, which is especially critical to the GPSAP 2022–2024, will need to be monitored very closely at every stage in the process from detection to response. Particular attention has also been placed on ensuring access to special populations, assessing the impact of gender on surveillance activities, and analysing health-seeking behaviour – as collectively these approaches may uncover missed opportunities for detecting and reporting AFP cases. Additionally, the GPEI encourages that geocodes of AFP cases be reviewed in conjunction with other data sources, particularly as they relate to conflict and accessibility, as this may help identify blind spots.

As data integrity continues to pose a risk to eradication, methods to ensure data reliability and accuracy by supervising data collection and critically reviewing the data as it reaches the management level will need to be prominent in every country plan. Transitioning data collection from paper-based tools to electronic tools is also expected to address issues related to data integrity.

Countries that have used or are planning to use nOPV2 in outbreak response will be expected to follow existing guidance to meet the vaccine safety surveillance requirements for post-deployment monitoring of nOPV2 use.[10]

Activity 4 tasks

- ✓ Review surveillance performance monthly at the subnational and national levels using core and non-core indicators. Follow up and modify activities where results are suboptimal.
- ✓ Review progress against each key performance indicator (KPI) on a monthly basis at the global level (**Annex E**).

Activity 5. Integrate AFP surveillance with other health programmes

The GPEI supports countries in taking ownership of AFP surveillance and integrating polio surveillance activities with other health surveillance systems, such as VPDs or health emergency surveillance systems (**Annex H. Integration of poliovirus surveillance**). Many countries have already optimized their resources – human, financial, material, and technological – to integrate disease surveillance activities. The field components of AFP surveillance, which include staff, vehicles, and data management, have been and continue to be key resources for countries to build and strengthen their surveillance systems and provide rapid response to health emergencies.

[10] Global Polio Eradication Initiative (GPEI). Polio Field and Laboratory Surveillance Requirements in the Context of nOPV2 Use. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2021/10/nOPV2-Surveillance-Guidance-1.pdf).

Endemic countries will need to ramp up integration with VPD surveillance or health emergency programmes under the leadership of the national and provincial emergency operations centres (EOCs). Steps towards integration should include active surveillance implementation and supervisory tools covering both AFP and VPDs, integrated desk and field surveillance reviews and review meetings, and combined training with WHO Health Emergencies (WHE), the Expanded Programme on Immunization (EPI), and VPDs for surveillance staff.

Activity 5 tasks

- ✓ Afghanistan and Pakistan to ramp up VPD surveillance integration via surveillance workplans.
- ✓ Other priority countries to identify areas for integration with other VPD surveillance systems or health emergencies. This can be done incrementally by increasing the number of diseases in the active surveillance and supervisory checklists.

Monitoring

Enhancing and sustaining AFP surveillance sensitivity and timeliness will be monitored by WHO regional offices, WHO headquarters, and GPEI global partners (**Table 3**).

Table 3. Monitoring activities for Objective 1 (AFP surveillance)

Activities	Priority countries	Regional / subregional	Global
1. Attain and maintain sensitive AFP surveillance, with targeted efforts to identify and address subnational gaps	• Conduct AFP surveillance audit and identify blind spots • Develop surveillance strengthening plans to target subnational gaps	• Support countries in identifying and addressing subnational gaps • Publish maps twice yearly with possible blind spots for polio transmission	• Provide guidance on AFP surveillance audits and CBS
2. Improve timeliness for case detection, investigation, and specimen transport	• Quickly identify and rectify delays in specimen transport • Systematize the collection and analysis of health-seeking behaviour and gender-related data	• Provide technical support to countries on delays • Include new timeliness targets in regular bulletins and reports • Provide support in analysing health-seeking behaviour and gender-related data	• Develop technology for specimen tracking • Monitor timeliness against new targets • Provide support in analysing health-seeking behaviour and gender-related data
3. Facilitate building and sustaining a skilled workforce	• Deliver national and subnational trainings within 12–18 months of finalizing surveillance strengthening plans • Develop supervision and mentoring plans	• Adapt guidance documents and training package for regional use • Develop a training plan by Q1 2022 • Facilitate in-person and virtual AFP trainings • Include components on gender and PRSEAH issues	• Finalize Global Guidelines for AFP and Poliovirus Surveillance • Finalize in-person and virtual AFP surveillance training package

AFP = acute flaccid paralysis; CBS = community-based surveillance; PRSEAH = preventing and responding to sexual exploitation, abuse, and harassment

Table 3 (continued)

Activities	Priority countries	Regional / subregional	Global
4. Implement focused M&E activities, including critical review of surveillance processes and data for action	• Report analysis of data disaggregated by sex, high-risk groups and health-seeking behaviour • Assess progress monthly against KPIs	• Assess progress monthly against KPIs	• Assess progress monthly against KPIs • Publish an annual report on AFP surveillance status
5. Integrate AFP surveillance with other health programmes	• Build personnel capacity to conduct integrated surveillance • Afghanistan and Pakistan to ramp up integration efforts, to be documented in surveillance plans • Identify and implement steps in the AFP surveillance process for integration • Explore links with existing training programmes, such as FETP	• Coordinate with EPI/VPD and WHE for capacity building and joint assessment • Provide support to countries in identifying areas for integration in the AFP surveillance process	• Provide guidance on integration • Coordinate with EPI/VPD and WHE for capacity building and joint assessment • Coordinate with existing training programmes on curriculum and strategy, such as FETP

AFP = acute flaccid paralysis; EPI = Expanded Programme on Immunization; FETP = field epidemiology training programme; KPI = key performance indicator; M&E = monitoring and evaluation; VPD = vaccine-preventable disease; WHE = WHO Health Emergencies

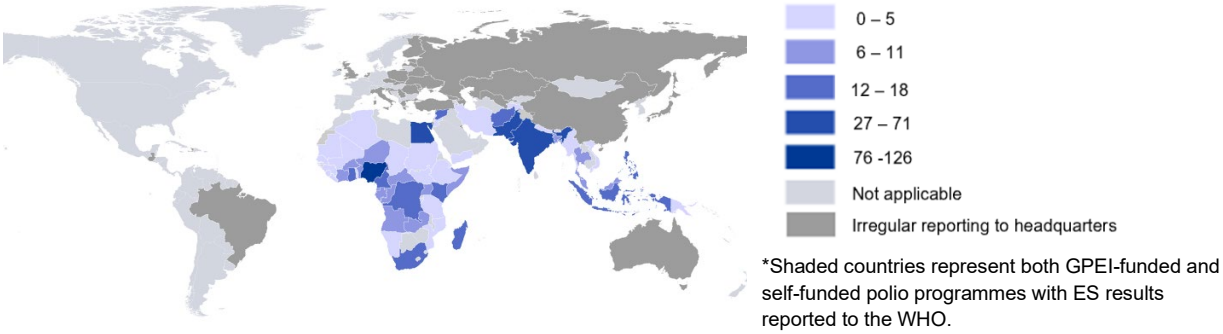
ENVIRONMENTAL SURVEILLANCE

Objective 2. Optimize the ES network to contribute to the timely detection of polioviruses

Background

Well-implemented environmental surveillance (ES) can significantly increase the sensitivity of the poliovirus surveillance system. ES has been used for many years to detect and monitor the reintroduction of WPV into polio-free countries and provide confidence in the successful elimination of WPV in previously endemic countries. Repeatedly, ES has detected transmission in areas undetected by AFP surveillance, highlighting its value as a supplement to AFP surveillance. Since 2016, progress has been made in expanding the global ES network, with the GPEI now supporting over 500 sites (**Fig. 2**).

Fig. 2. Distribution of polio environmental surveillance, January 2022*



*Shaded countries represent both GPEI-funded and self-funded polio programmes with ES results reported to the WHO.

Source: WHO.

Despite this progress, a range of factors, such as security and logistical issues, competing priorities, or a lack of government support, have curtailed ES expansion. In addition, some sites have remained operational despite low sensitivity, which suggests a lack of compliance with ES guidelines. Furthermore, as financial resources for polio surveillance diminish in the coming years, the programme will need to explore collaboration with other programmes to ensure the long-term sustainability of ES for poliovirus. To address these challenges, the programme will pursue the following activities (**Table 4**).

Table 4. Major activities and key performance/process indicators for Objective 2

Major activities	Key performance/process indicators
1. Improve and maintain the quality of environmental sites	• All environmental sites not reaching an enterovirus (EV) detection rate ≥50% over 12 months are investigated and closed or modified
2. Improve the timeliness of ES collection and shipment	• ≥80% of ES samples reach a WHO-accredited laboratory within 3 days of collection
3. Expand and optimize ES in high-risk, geographically diverse areas	• Increased number of new functional ES sites/areas with functional ES in Afghanistan and other priority countries
4. Facilitate a skilled workforce and promote integration	• ES Field Guidance published by mid-2022 • Number of priority countries conducting refresher trainings at least every 2 years
5. Expand the use of electronic data collection tools	• 30% of VHR and HR countries have web-based information management systems for ES • All VHR and HR countries utilize electronic data collection tools for ES (collection and supervision)

ES = environmental surveillance; EV = enterovirus; HR = high risk; VHR = very high risk; WHO = World Health Organization

Activity 1. Improve and maintain the quality of environmental sites

Field Guidance for the Implementation of Environmental Surveillance for Poliovirus is an essential resource to support environmental site management.[11] As it outlines, the first step to improving and maintaining ES quality is to assess site selection.

Quality environmental surveillance should begin with the appropriate selection of sites, located in areas of highest risk for poliovirus circulation. Conditions at sampling sites vary, and as a result the potential yield and epidemiologic significance of sites also varies. Regular observation and assessment of the sample site conditions is therefore important to ensure sites remain appropriate as part of the ES network over time.

The second step to improve site quality is to continue to monitor the sensitivity of the site and modify or close any non-functional sites, defined as sites with EV detection <50% for six months or longer. While a 50% EV detection rate indicates sites of critical importance for assessment, modification and potential closure, sites that detect less than 80% EV might also lack sufficient sensitivity to detect circulating polioviruses and should be closely monitored. Underperforming sites should be closed within three months of a field review if there is no evidence of improvement. If a field review cannot be conducted, a decision should be made at the regional level between field and laboratory colleagues. The volume of ES samples from poorly performing sites burdens laboratories, wastes resources, and may generate a false sense of security that the virus is not circulating. While some sites with low EV isolation have occasionally reported programmatically relevant viruses in sewage in the absence of detection among AFP cases, it is still recommended to seek alternative sampling sites to improve the overall sensitivity of the system. Furthermore, innovative methods, such as use of water quality probes, are under evaluation for field applicability. Most probes detect variables or compounds associated with unsafe drinking water; however, some measurements, such as pH, have been associated with a higher likelihood of enterovirus (EV) survival, which might be useful for ongoing monitoring of ES site quality.

Through regular supervisory visits, factors that could impact site performance may be observed and corrected as needed; such as ensuring adherence to sample collection, packaging and transport procedures or troubleshooting issues.

The GPEI will continue to assess ES benchmarks and indicators for the GPSAP 2022–2024 period.

Activity 1 tasks

- ✓ Adhere to global guidance for monitoring and closing sites.
- ✓ In priority countries, review site performance by conducting desk reviews quarterly at the country and regional levels and twice yearly at the global level.
- ✓ Review and update global ES indicators as needed to improve sensitivity of the ES network.

[11] Global Polio Eradication Initiative (GPEI). Field Guidance for the Implementation of Environmental Surveillance for Poliovirus. In preparation.

Activity 2. Improve the timeliness of ES collection and shipment

To improve timeliness of collection and shipment of ES samples, the GPEI has set a goal to have samples arrive in a WHO-accredited laboratory within three days of collection. This implies that there should not be any delay or batching of samples and that the collection of samples and their transfer to the laboratory must be well planned and followed (**Annex F. Timeliness: On ways to reduce delays**). When conditions delay collection and the typical sample transportation method cannot be utilized, an alternative plan for transport must be in place so samples still reach the laboratory within three days.

As with AFP surveillance, the programme will explore the use of specimen tracking for ES samples to ensure that country programmes can locate and take actions if a sample is delayed at any point (see **Objective 5**). Electronic data collection also plays a role in ensuring valid data regarding location and time of collection and will contribute to documenting any possible delays.

Activity 2 tasks

- ✓ Monitor timeliness of collection and shipment against the newly developed indicators and track any delays at subnational level for swift action (**Annex E. Indicators**).
- ✓ Pilot in selected countries (Somalia, Chad, the Democratic Republic of the Congo, and South Sudan) the real-time monitoring of sample movement from the point of collection to the arrival at the laboratory and take action to address bottlenecks in collection and/or transport time (**Annex. F**).
- ✓ Ensure an alternate transport plan is available if samples cannot be collected as planned.

Activity 3. Expand and optimize ES in high-risk, geographically diverse areas

As ES has proven to be critical to the detection of poliovirus, the GPEI Strategy recommends its expansion and optimization in high-risk areas.

The contribution of ES to a country's poliovirus surveillance system varies depending on the epidemiologic situation, as well as on poliovirus vaccine use. In endemic countries, ES helps to monitor the interruption of WPV1 transmission and supplements AFP surveillance by identifying epidemiological links between separate geographical areas, potential virus reservoirs, and emergent transmission routes. Overall, Afghanistan and Pakistan have sensitive polio surveillance that includes well-functioning ES systems; however, some gaps in detection have been observed at the subnational level and in hard-to-reach areas. In Afghanistan, ES sites operate in 10 of 36 provinces in areas with WPV1 transmission.

To improve sensitivity, Afghanistan may benefit from expanding its ES network to other high-risk areas. The ES network in Pakistan may be further optimized through expansion in areas with regular nomadic population movements and seasonal migrations.

In non-endemic countries, ES can help detect the importation of WPV/cVDPV or the emergence of VDPV, confirm the scope of an outbreak, provide additional evidence that virus interruption has been achieved, and document campaign response effectiveness. Since 2019, several countries have initiated (Democratic Republic of the Congo, Liberia, Sierra Leone, Tajikistan, and Viet Nam) or expanded (Malaysia, Philippines, and Uganda) national ES networks, with some doing so in response to local cVDPV outbreaks or outbreaks in neighbouring countries. Countries that plan to initiate, expand, or optimize their ES networks for the GPSAP 2022–2024 are listed in **Table 5**.

Table 5. Countries planning to initiate, expand, or optimize environmental surveillance, by region

WHO region	ES initiation planned	ES expansion planned	ES optimization planned
African	Botswana, Eritrea, Malawi, Rwanda, Zimbabwe		Burkina Faso, Cameroon, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Mozambique, Niger, Togo
Eastern Mediterranean	Iraq, Libya, Oman, Saudi Arabia, Tunisia, United Arab Emirates	Afghanistan, Islamic Republic of Iran, Lebanon, Somalia, Yemen	Pakistan
South-East Asian		Bangladesh, India, Nepal, Thailand	Indonesia
Western Pacific	Cambodia, Republic of Korea, Lao People's Democratic Republic, Mongolia	Viet Nam	Papua New Guinea (ES has not been operational during COVID-19 pandemic and needs to be reactivated.)
European	Kyrgyzstan		
Americas		Guatemala, Haiti	

Countries looking to initiate, expand, or optimize ES should carefully follow global guidance and consider geographically diverse areas based on risk and feasibility. Countries are encouraged to consider short-term ad hoc sites among newly identified high-risk areas (e.g., a new outbreak geography), where feasible.[12] However, it is important to note that it may not be possible to establish an ES site in all desired locations, as an appropriate sampling site may not be found.

Recommendation with nOPV2 use
To respond to cVDPV2 outbreaks, nOPV2 will be the primary vaccine of choice. While nOPV2 is under an EUL, the safety of the vaccine must be monitored to detect any genetic changes to the nOPV2 strain. It is recommended (though not required) that countries have at least one functional ES site in the area of nOPV2 use. This may be an existing site or a new ad hoc site.

In settings that lack a sewer system, the programme must rely on other systems for wastewater flow, such as open canals or water channels. Estimating catchment populations in these settings can be difficult. Digital elevation models (DEM) and "blue line" data (synthetic, digital streams and waterways generated by determining flow, direction, and accumulation) are tools that can help identify potential areas for ES sites.[13] Where DEMs are not available, field intelligence and data – for example, from microplanning or local wastewater management bodies – should be used to estimate populations in catchment areas. Smartphone applications with detailed global positioning system (GPS) location, should be implemented whenever possible to support accurate, complete, and timely collection of the exact location and descriptive details of potential and existing environmental sites.

The selection and operationalization of new sites will always be contingent on agreement from the national laboratory – or a regional reference laboratory coordinator when expanded testing capacity is not available in-country. Furthermore, all new sites should undergo a validation process during the first six to 12 months of operation to determine if collection of sewage samples should be continued long-term as part of the routine ES network.

[12] Global Polio Eradication Initiative (GPEI). Standard Operating Procedures for Poliovirus Surveillance Enhancement Following Investigation of a Poliovirus Event or Outbreak. Geneva: World Health Organization; December 2020 (https://polioeradication.org/wp-content/uploads/2021/02/SOPs-for-Polio-ES-enhancement-following-outbreak-20210208.pdf).
[13] Current DEM models for sites in 30 countries are available online (https://es.world).

Activity 3 tasks

- ✓ Support ES expansion in Afghanistan and ES optimization in Pakistan.
- ✓ Support ES initiation, expansion, or optimization in select countries and new priority areas.
- ✓ Evaluate and develop the use of technology and new methods for ES site selection

Activity 4. Facilitate a skilled workforce and promote integration

Polio surveillance and laboratory officers in all priority countries are expected to receive refresher AFP/VPD trainings at least once every two years (**Annex G. Facilitating a skilled surveillance workforce**). These trainings should incorporate information on and an orientation to ES to increase overall awareness and understanding.

To support sustainability of the ES system beyond polio, countries should explore the use of ES for the detection of other VPDs or other programme areas. Opportunities should be explored in close coordination with country-level surveillance, laboratory, and emergency response offices, where applicable.

To support refresher trainings for surveillance officers, the GPEI has developed *Field Guidance for the Implementation of Environmental Surveillance for Poliovirus*.[14] This guidance document provides an introduction to ES and encourages close coordination with officers across the national laboratory or from other health programmes.

To promote the long-term sustainability of the ES system, opportunities to integrate with disease areas beyond polio should be explored. Pakistan, for example, has capitalized on the availability of their existing ES network to demonstrate its utility for detecting SARs-CoV-2.[15] Furthermore, monitoring antimicrobial resistance and general EV surveillance is routinely utilized in many countries in the Americas and in the European Region.[16]

Activity 4 tasks

- ✓ Publish *Field Guidance for the Implementation of Environmental Surveillance for Poliovirus* by mid-2022.
- ✓ Update ES component of AFP/VPD surveillance trainings.
- ✓ Conduct refresher trainings at least once every two years in all priority countries.
- ✓ Explore and document the use of polio ES for detection of other pathogens.

[14] Global Polio Eradication Initiative (GPEI). Field Guidance for the Implementation of Environmental Surveillance for Poliovirus. In preparation.
[15] Sharif S, Ikram A, Khurshid A, Salman M, Mehmood N, Arshad Y, et al. (2021) Detection of SARs-CoV-2 in wastewater using the existing environmental surveillance network: A potential supplementary system for monitoring COVID-19 transmission. PLoS ONE. 16(6): e0249568 (https://doi.org/10.1371/journal.pone.0249568).
[16] Årdal C, McAdams D, Westera AL, Møgedalc S. Adapting environmental surveillance for polio to the need to track antimicrobial resistance. Bull World Health Organ. 2021;99:239–240 (http://doi.org/10.2471/BLT.20.258905).

Activity 5. Expand the use of electronic data collection tools

The evolution of GPEI data management strategies has followed the rapid expansion of ES, which has led to disparate systems that are not interoperable. Under the GPSAP 2022–2024, the GPEI will work to align these data collection and management approaches (see **Objective 5**). For example, the use of mobile data collection systems is now used to track and provide near real-time assessment of supervisory visits, their frequency and completion rates, and the timely follow-up of issues identified during the visit. To date, most countries in the African Region and several countries in the Eastern Mediterranean Region use mobile data systems at the point of collection. In other regions, the use of MS Excel workbooks and Access databases continue to be the primary mechanisms for recording and sharing data, which creates challenges in accessing and analysing accurate, real-time data.

Activity 5 tasks

- ✓ Support and ensure use of mobile electronic data collection tools to supervise sample collection and site supervision in all priority countries.

Monitoring

Optimizing the ES network to contribute to the timely detection of polioviruses will be monitored by WHO country and regional offices and subregional partners, along with WHO global headquarters (**Table 6**).

Table 6. Monitoring activities for Objective 2 (ES optimization)

Activity	Priority countries	Regional / subregional	Global
1. Improve and maintain the quality of environmental sites	• Monitor KPIs and take timely corrective action • Conduct quarterly desk or field review of ES site performance • Close all underperforming sites per ES review	• Conduct quarterly desk review of existing ES network • Provide field review of underperforming ES sites and close underperforming sites	• Support ES field reviews • Review and propose updated indicators on ES sensitivity • Conduct a twice-yearly desk review of ES performance
2. Improve the timeliness of ES collection and shipment	• Track timeliness from sample collection to laboratory results • Develop alternative transport plans for any sample delays	• Track timeliness from sample collection to final laboratory results	• Monitor indicators on timeliness and provide feedback
3. Expand and optimize ES in high-risk, geographically diverse areas	• Expand ES to geographically diverse areas, where feasible • Use technology to help identify suitable ES sites	• Monitor and support ES expansion in priority countries and other new priority areas • Support the use of technology or new methods to improve ES site selection	• Monitor and support ES expansion in priority countries and other new priority areas • Evaluate and develop the use of technology and new methods for ES site selection

ES = environmental surveillance; KPIs = key performance indicators

Table 6 (continued)

Activity	Priority countries	Regional / subregional	Global
4. Facilitate a skilled workforce and promote integration	• Conduct refresher on ES as part of AFP/VPD national and subnational trainings • Document the use of polio ES for other VPD surveillance	• Support trainings in all priority countries • Document the use of polio ES for other VPD surveillance	• Publish *Field Guidance for the Implementation of Environmental Surveillance for Poliovirus* by mid-2022 • Update training materials • Support regional surveillance capacity-building activities • Document the use of polio ES for other VPD surveillance
5. Expand the use of web-based surveillance systems	• Implement electronic tools for ES sample collection and supervision in (at a minimum) all priority countries	• Support implementation of electronic tools for sample collection and supervision in priority countries	• Roll out web-based ES information management system for use across priority countries

AFP = acute flaccid paralysis; ES = environmental surveillance; VPD = vaccine-preventable disease

iVDPV SURVEILLANCE

Objective 3. Establish iVDPV surveillance to sustain polio eradication

Background

Individuals with primary immunodeficiency disorders (PIDs), namely those with disorders affecting the B-cell system, who are exposed to live oral poliovirus vaccines (OPVs) are at increased risk of prolonged replication and excretion of vaccine viruses, which can lead to the development of immunodeficiency-associated vaccine-derived polioviruses (iVDPVs).[17] In addition to the risk of developing paralytic poliomyelitis, individuals infected with iVDPV present a potential risk of initiating VDPV outbreaks, though to date no iVDPV outbreaks have been detected. The circulation of iVDPVs thus poses a global risk to polio eradication, which led the Strategic Advisory Group of Experts (SAGE) to recommend expanding poliovirus surveillance among PID individuals when it called for a strategy to begin planning for the post-certification period.[18]

The activities outlined below address iVDPV surveillance in the GPSAP 2022–2024 period (**Table 7**). The development of iVDPV surveillance is currently underway,[19] with guidance, training materials and information system available to support countries as they begin to implement surveillance activities. In addition, an assessment of countries was done by the programme to estimate countries' iVDPV risk and prioritize intervention (**Fig. 3**).

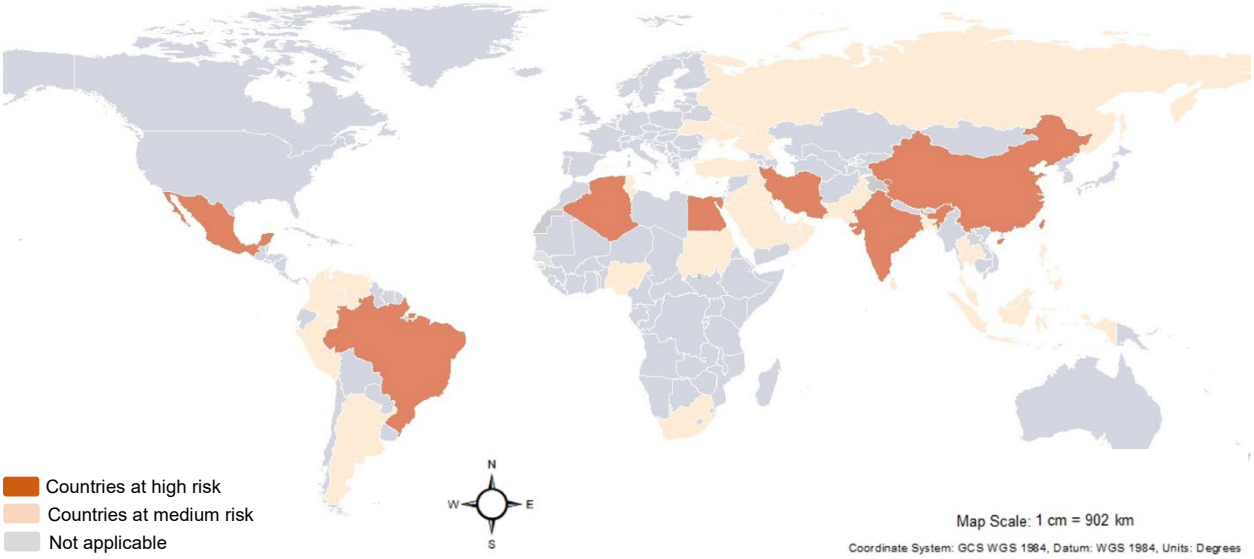
Table 7. Major activities and key performance/process indicators for Objective 3

Major Activities	Key performance/process indicators
1. Review pilot country implementation and assess iVDPV surveillance	• Number of countries with functioning iVDPV surveillance
2. Sensitize WHO regions and high-risk countries on iVDPV surveillance	• Number of awareness activities and webinars by region
3. Update the information system and training and guidance materials	• Number of countries reporting iVDPV-related data through POLIS • Number of countries that conducted training and capacity building
4. Develop a long-term plan for iVDPV surveillance through the post-certification era	• Long-term plan available and costed
5. Communicate and coordinate access to antiviral therapies	• All eligible patients are offered available antiviral therapy

iVDPV = immunodeficiency-associated vaccine derived poliovirus; PIDs = primary immunodeficiency disorder; POLIS = Polio Information System

[17] Li L, Ivanova O, Driss N, Tiongco-Recto M, da Silva R, Shahmahmoodi S, Sazzad H, Mach O, Kahn AL, Sutter RW. Poliovirus excretion among persons with primary immune deficiency disorders: summary of a seven-country study series. J Infect Dis. 2014;210 Suppl 1, S368-372 (https://doi.org/10.1093/infdis/jiu065).
[18] Meeting of the Strategic Advisory Group of Experts on immunization, October 2016 – conclusions and recommendations. Wkly Epidemiol Rec. 2016;48(91)561-94 (http://apps.who.int/iris/bitstream/handle/10665/251810/WER9148.pdf).
[19] Although the objective of polio surveillance among PID patients is to detect any excretion of poliovirus beyond VDPVs, for ease of reference it is referred to as "iVDPV surveillance." Global Polio Eradication Initiative (GPEI). Guidelines for Implementing Poliovirus Surveillance among Patients with Primary Immunodeficiency Disorders (PIDs). Geneva: World Health Organization; December 2020 (https://polioeradication.org/wp-content/uploads/2020/12/Guidelines-for-Implementing-PID-Suveillance-3.3-20201215.pdf). The iVDPV surveillance system was built on previous research projects that were developed and supported by the WHO in Bangladesh, China, Egypt, India, Iran (Islamic Republic of), Pakistan, Russian Federation, Sri Lanka, and Tunisia.

Fig. 3. Countries at high and medium risk of iVDPV



Source: WHO, October 2018.

Activity 1. Review pilot country implementation and assess iVDPV surveillance

Four countries in the Eastern Mediterranean Region (Egypt, the Islamic Republic of Iran, Jordan, and Tunisia) were selected to pilot the implementation of an iVDPV surveillance system. Regional training was carried out, and country plans were developed and budgeted; however, field implementation was delayed in some countries and came to a full halt in all countries due to the COVID-19 pandemic.

Under the GPSAP 2022–2024, the GPEI will review progress and challenges in each pilot country, with a view toward what will be required to fully and rapidly establish iVDPV surveillance.

In addition to the risk of iVDPV re-establishing poliovirus circulation and initiating outbreaks, the rollout of nOPV2 also necessitates action. As part of the EUL for nOPV2, the GPEI has an obligation to assess the vaccine's safety among PID patients. Monitoring will thus need to be sustained in countries with nOPV2 use that have a capacity to diagnose PIDs until sufficient cases have been collected to assess the vaccine's safety with regards to disease or prolonged shedding of nOPV2.[20] As of Q4 2021, five of the 34 countries assessed for nOPV2 readiness have reported capacity or expressed interest in establishing iVDPV surveillance. The programme is in the process of verifying country capacity to diagnose and follow up with PID patients. Where it proves possible, the GPEI will facilitate the set-up and implementation of iVDPV surveillance.

[20] Global Polio Eradication Initiative (GPEI). Polio Field and Laboratory Surveillance Requirements in the Context of nOPV2 Use. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2021/10/nOPV2-Surveillance-Guidance-1.pdf).

Table 8. iVDPV surveillance development in selected countries

Country	iVDPV risk assessment (2018)	Pilot countries for iVDPV surveillance	iVDPV research project	Selected due to nOPV2 use
Bangladesh	Medium		X	
China	High		X	
Egypt	High	X	X	
India	High		X	
Iran (Islamic Republic of)	High	X	X	
Jordan	Low	X		
Nigeria	Medium			X
Pakistan	Medium		X	
Russian Federation	Medium		X	
Senegal	Low			X
Sri Lanka	Medium		X	
Tunisia	Medium	X	X	

iVDPV = immunodeficiency-associated vaccine-derived poliovirus; nOPV2 = novel oral polio vaccine type 2

Activity 1 tasks

- ✓ Review pilot iVDPV surveillance implementation in Egypt, the Islamic Republic of Iran, Jordan, and Tunisia. Assess degree of completion, magnitude of challenges, and possible solutions, and decide whether to defer or expedite and expand implementation.
- ✓ Develop a plan to speed-up field implementation in pilot countries, including expected results and timelines.
- ✓ Continue to verify the capacity of countries for iVDPV surveillance as part of nOPV2 post-deployment monitoring. Add polio testing and follow-up, where appropriate.

Activity 2. Sensitize WHO regions and high-risk countries on iVDPV surveillance

All WHO regions and countries should be familiarized with iVDPV surveillance as a new pillar of the polio eradication programme, alongside AFP and environmental surveillance. As polio eradication comes within grasp, iVDPV surveillance will become increasingly important.

Under the GPSAP 2022–2024, countries with a higher risk of iVDPV will be prioritized for programme engagement. If countries have the capacity and systems in place to detect, test, and follow up with PID patients, they will be encouraged to review available resources and implement iVDPV surveillance.

Activity 2 tasks

- ✓ Identify and train focal points at the regional level and explore cultivating master trainers.
- ✓ Host webinars on iVDPV surveillance to brief regions and all countries at high risk for iVDPV. Priority to be given to countries with previous and current iVDPV research projects (**Table 8**, above).
- ✓ Liaise with interested parties (i.e., Ministries of Health, immunology groups, research projects) to promote guidance material and the use of POLIS for iVDPV surveillance.

Activity 3. Update the information system and training and guidance materials

Guidance, training materials, and information system updates for iVDPV surveillance were developed under the previous GPSAP 2018–2020 period.[21] As field implementation moves forward and as polio-related R&D continues to pursue effective antiviral drugs and more efficient testing methods, the programme will regularly monitor the data, as well as update and translate all available guidance and training materials.

Activity 3 tasks

- ✓ Monitor iVDPV surveillance data as part of the monthly global surveillance update.
- ✓ Review and update current guidance and tools, as needed.
- ✓ Translate documents and tools in at least two additional WHO languages (Arabic and French).

Activity 4. Develop a long-term plan for iVDPV surveillance through the post-certification era

iVDPV surveillance will become even more important in the post-certification era. Some guidance is provided in the *Polio Post-Certification Strategy*,[22] but there is currently no long-term strategic plan for iVDPV surveillance

Under the GPSAP 2022–2024 period, the programme will develop a long-term plan for iVDPV that explores the risk and transmissibility of iVDPVs, including the prevalence and survivability of PID patients. The plan will be costed and integrated with other non-polio surveillance systems to ensure its sustainability, especially in the first six to nine years following eradication when iVDPVs are likely to be the primary risk for a re-emergence of poliovirus.

Activity 4 tasks

- ✓ Review available data and current knowledge on iVDPV.
- ✓ Develop and cost a long-term strategic plan for iVDPV surveillance that extends through the post-certification era, ensuring some level of integration with existing surveillance systems.

Activity 5. Communicate and coordinate access to antiviral therapies

Polio antiviral therapies are still under development, including a combination therapy of two drugs: Pocacavir and V-7404. At present, however, only pocapavir is available under compassionate use for PID patients excreting poliovirus (including iVDPV) or non-polio enterovirus (NPEV) infections in life-threatening situations. Under the GPSAP 2022–2024, the programme will continue to monitor the development of antiviral therapies and will keep countries updated on the progress, availability, and process required to access those drugs under compassionate use. The programme will coordinate all communication with the antiviral manufacturer at the global level, as needed.

[21] Global Polio Eradication Initiative (GPEI). Guidelines for Implementing Poliovirus Surveillance among Patients with Primary Immunodeficiency Disorders (PIDs); Geneva: World Health Organization; 2020 (https://polioeradication.org/wp-content/uploads/2020/12/Guidelines-for-Implementing-PID-Suveillance-3.3-20201215.pdf).
[22] Global Polio Eradication Initiative (GPEI). Polio Post-Certification Strategy. Geneva: World Health Organization; 2018 (http://polioeradication.org/wp-content/uploads/2018/04/polio-post-certification-strategy-20180424-2.pdf).

Activity 5 tasks

- ✓ Monitor progress with antiviral therapy.
- ✓ Brief countries on current recommendations and steps for compassionate use of Pocapavir.
- ✓ Facilitate communication between treating physicians and antiviral manufacturer to secure antiviral drugs under compassionate use.
- ✓ Register eligible PID patients for the future availability of combination antiviral therapy.

Monitoring

Establishing iVDPV surveillance to sustain polio eradication will be monitored by WHO headquarters and regional offices and global partners (**Table 9**).

Table 9. Monitoring activities for Objective 3 (iVDPV surveillance)

Activity	Priority countries	Regional / subregional	Global
1. Review pilot country implementation and assess iVDPV surveillance	• Step up field implementation according to proposed updated plan • Assess capacity to set up iVDPV surveillance, using the nOPV2 checklist[23]	• Eastern Mediterranean Region to develop a regional plan with expected results and timeline to help monitor progress in pilot countries • Verify the capacity of countries with nOPV2 use for iVDPV surveillance and provide technical support	• Assess pilot countries, and decide on way forward in coordination with region and countries • Verify the capacity of countries with nOPV2 use for establishing iVDPV surveillance and provide technical support
2. Sensitize WHO regions and high-risk countries on iVDPV surveillance	• Roll out iVDPV surveillance in countries with research projects, if applicable	• Brief all countries at high risk for iVDPVs on iVDPV surveillance	• Organize webinars with each region • Train iVDPV surveillance focal points, master trainers at the regional level
3. Update the information system and training and guidance materials	• Use iVDPV information system in countries selected for iVDPV surveillance • Routinely share data with the regional and global level	• Include the iVDPV information system in the regional POLIS system • Train pilot countries on data management for iVDPV surveillance	• Update and translate guidance and tools • Provide a monthly global report on iVDPV surveillance data, disaggregated by sex

iVDPV = immunodeficiency-associated vaccine-derived poliovirus; nOPV2 = novel oral polio vaccine type 2; POLIS = Polio Information System; WHO = World Health Organization

[23] To assess country-level iVDPV surveillance capacity, see Annex E of Polio Field and Laboratory Surveillance Requirements in the Context of nOPV2 Use. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2021/10/nOPV2-Surveillance-Guidance-1.pdf).

Table 9 (continued)

Activity	Priority countries	Regional / subregional	Global
4. Develop a long-term plan for iVDPV surveillance through the post-certification era	• Contribute to the development of a long-term plan and vision for iVDPV surveillance	• Contribute to the development of a long-term plan and vision for iVDPV surveillance	• Review available data and current knowledge on iVDPV • Develop a long-term, costed plan for iVDPV surveillance
5. Communicate and coordinate access to antiviral therapies	• Register eligible PID patients for the future availability of combination antiviral therapy	• Brief all selected countries on the compassionate use of antiviral therapy	• Provide updates to regions on the development of antiviral therapies • Coordinate access to antiviral therapies for PID patients through antiviral manufacturer

iVDPV = immunodeficiency-associated vaccine-derived poliovirus; PID = primary immunodeficiency disorder

GLOBAL POLIO LABORATORY NETWORK

Objective 4. Maintain and strengthen the capacity and capability of the GPLN

Background

The success of the GPEI depends heavily upon coordinated laboratory and field surveillance. Field surveillance collects, handles, and transports specimens to the laboratory, and laboratory surveillance processes and tests specimens. Laboratory results not only provide confirmation of poliovirus type, but also provide molecular genetic data which offers critical information on the linkages between viruses and outbreaks, population movements, gaps in surveillance performance, and ultimately progress towards interrupting transmission.

The GPLN consists of 145 global, regional, and national polio laboratories in 92 countries across all six WHO regions. All GPLN laboratories follow WHO procedures for detecting and characterizing polioviruses from stool specimens and sewage samples collected from the environment. This is done through poliovirus isolation, intratypic differentiation (ITD) of isolated polioviruses, and sequencing of non-Sabin-like and ITD-discordant viruses to determine if they are WPV, Sabin (vaccine) virus or VDPV.[24] GPLN laboratories are backed up by a strong quality assurance (QA) programme, which includes annual proficiency testing and accreditation by the WHO.

Under the GPSAP 2022–2024, the GPLN will implement the following activities (**Table 10**), with a continued focus on overall timeliness and accuracy of testing.

Table 10. Major activities and key performance/process indicators for Objective 4

Major activities	Key performance/process indicators
1. Sustain and strengthen processing capacity in key laboratories serving VHR and HR countries	• GPLN standards met for stool specimens and sewage samples processing
2. Implement direct detection (DD) and other new methodologies and algorithms (including sequencing) in laboratories serving VHR and HR countries	• Percentage of selected laboratories serving VHR and HR countries that are fully upgraded and accredited for DD and/or sequencing (initial target: 12 labs for DD and 6 labs for sequencing), monitored on quarterly basis
3. Strengthen oversight of the quality assurance system in all labs serving endemic and outbreak countries	• Percentage of documented on-site accreditation and support visits in priority labs that have been conducted as planned
4. Participate in national laboratory preparedness and outbreak response	• Percentage of planned desk reviews or on-site assessments completed within 2 weeks for new outbreak countries • Laboratories included in activities (e.g., RRT preparedness work, OBRAs) in all OB countries
5. Continue to engage other surveillance networks and document integrated assets and activities	• Annual report on activities conducted in priority transition countries
6. Finalize a GPLN post-certification action plan	• GPLN post-certification action plan is finalized by Q4 2023 for at least 2 endemic/outbreak regions

DD = direct detection; GPLN = Global Polio Laboratory Network; HR = high risk; OB = outbreak; OBRAs = outbreak response assessments; RRT = rapid response team; VHR = very high-risk

[24] Department of Immunization, Vaccines and Biologicals. WHO Polio Laboratory Manual 4th ed. Geneva, Switzerland: World Health Organization; 2004 (https://apps.who.int/iris/bitstream/handle/10665/68762/WHO_IVB_04.10.pdf).

Activity 1. Sustain and strengthen processing capacity in key laboratories

Maintaining GPLN capacity in all six WHO regions will remain a priority throughout the GPSAP 2022–2024 period. Since it is expected that the number of stool specimens and sewage samples will increase due to efforts to increase polio surveillance sensitivity (see **Objective 1** and **Objective 2**), surge capacity will need to be added to accommodate the increased workload in key laboratories serving high-risk and very high-risk countries.

Activity 1 tasks

- ✓ Increase laboratory capacity through surge staffing and additional equipment in three currently operational laboratories in West Africa, East Africa (which serves Somalia and Yemen) and the Western Pacific Region (Philippines).

Activity 2. Implement direct detection in laboratories serving high-risk countries

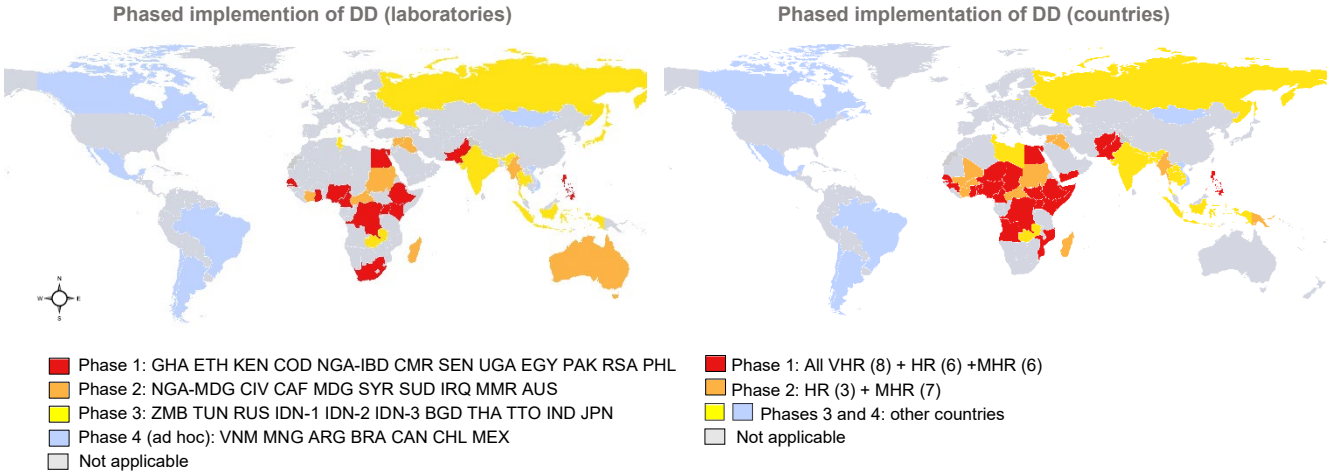
One priority of the GPEI Strategy is to facilitate a more rapid response by reducing the time between onset of paralysis and laboratory results. To meet the 21-day target from receipt of AFP specimens in a WHO-accredited polio laboratory to provision of a sequencing result, the GPLN has launched a demonstration project for direct detection (DD), a newly validated testing methodology that extracts ribonucleic acid (RNA) directly from stool suspension, followed by real-time reverse transcription polymerase chain reaction (rRT-PCR) testing using a set of nine primers targeting all enteroviruses, Sabin 1, Sabin 2, Sabin 3, all polioviruses, all type 2 poliovirus, nOPV2, WPV1 and wild poliovirus type 3 (WPV3). Field non-inferiority trials will be conducted to compare DD to the current standard testing algorithm. Training in DD for priority laboratories has been conducted in Q4 2021, with outcomes to be consolidated in Q1–Q2 2022. If the parallel testing evaluations are favourable and suggest DD may significantly reduce the amount of time to detect and report negative specimens, as well as the time to obtain ITD results for polio-positive specimens, the GPLN Surveillance Working Group will roll out this non-cell-culture methodology to 30 priority countries (**Table 11** and **Fig. 4**).

Table 11. Expected rollout of direct detection to laboratories

Phase*	Targeted start date	Laboratories
Phase 1	Q2 2022	12 laboratories serving 24 countries, including all very high-risk countries (n=8)
Phase 2	Q3 2022	9 laboratories serving 10 additional at-risk countries
Phases 3 and 4	Q4 2022 / Q1 2023	18 additional laboratories

* This phased approach may be adjusted depending on regional priorities (including non-endemic and non-outbreak regions) and evolution of cVDPV epidemiology.

Fig. 4. Laboratories identified for phased implementation of direct detection (left) and the countries they cover (right)



DD = direct detection; HR = high risk; MHR = medium-high risk; VHR = very high risk
Source: WHO.

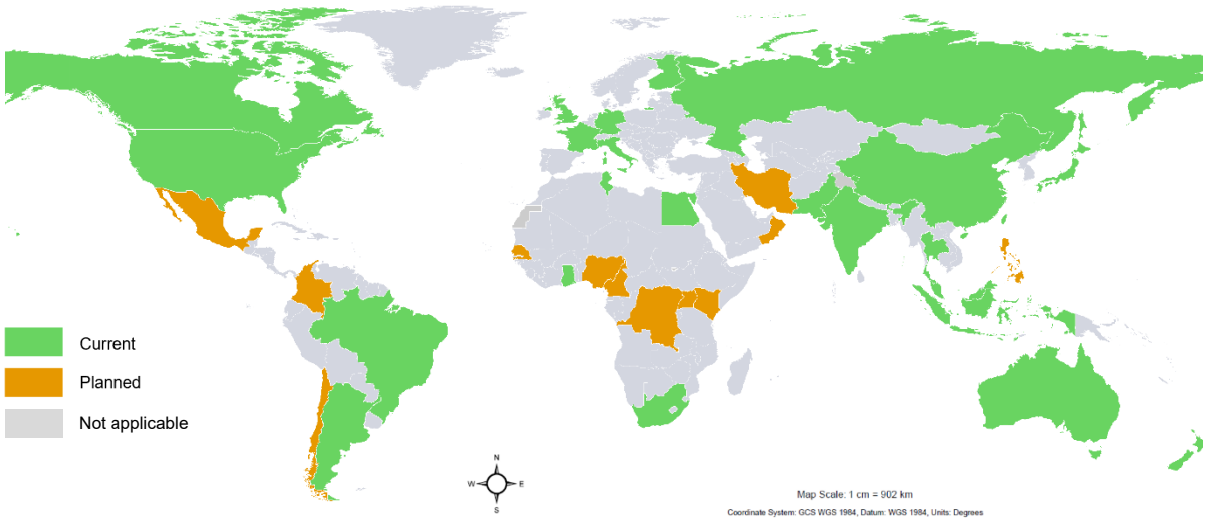
The GPLN has also started to pilot test the inclusion of a MinION sequencing methodology to the DD algorithm. Since DD outcomes may indicate invalid and indeterminate results which require confirmation by sequencing, this sequencing may help evaluate the percent of specimens which will have to be sequenced in addition to viruses of interest (i.e., non-Sabin-like and Sabin-like-discordant and type 2 viruses). Two new algorithms that include a sequencing step will be tested to identify and solve implementation issues, including logistics and analytics.

During this pilot phase, priority was given to laboratories serving high-risk countries (see **Fig. 1. Country risk prioritization** in **Introduction**). Ten laboratories were targeted for DD implementation (seven in the African Region, two in the Eastern Mediterranean Region, and one in the Western Pacific Region), and six laboratories in the African Region were targeted to pilot test feasibility of sequencing capacity building in the context of DD implementation.

Among laboratories covering high-risk areas that are planned for the expansion of sequencing capacity (**Fig. 5**), the following laboratories and regions are currently planned for MinION or Sanger sequencing.

- Two sequencing laboratories in the African Region (the National Institute for Communicable Diseases in South Africa and the Noguchi Memorial Institute for Medical Research in Ghana) will be assessed to resolve all bottlenecks to good, sustained performance.
- Three laboratories in the African Region (Cameroon, Democratic Republic of the Congo, and Senegal) which have experience with the MinION technology have been selected to pilot-test a new algorithm, including this sequencing technology that is under validation by GPEI partners.
- Three laboratories in the African Region (Uganda, Kenya, and Nigeria-Ibadan) will be trained and mentored starting in 2022 to conduct Sanger sequencing.
- Two laboratories in the Western Pacific Region (Malaysia and Philippines) and one in the South-East Asia Region (Bangladesh) will receive training for Sanger sequencing to build additional capacity in the region and improve timeliness of detection.
- Two laboratories in the Eastern Mediterranean Region (the Islamic Republic of Iran and Oman) which are already doing sequencing will be upgraded and mentored until full completion of accreditation process by GPLN.

Fig. 5: Current and planned expansion of sequencing capacity in laboratories covering high-risk areas



Current = 27 laboratories
Planned = 13 laboratories: AFR(6), AMR(3), EMR(2), SEAR(1), WPR(1)
AFR = African Region; AMR = Region of the Americas; EMR = Eastern Mediterranean Region; SEAR = South-East Asia Region; WPR = Western Pacific Region
Source: WHO.

Per GPLN procedures, approval for routine use of any new procedure will be granted to a laboratory only after it passes proficiency testing and an accreditation scheme for that specific procedure.

Activity 2 tasks

- ✓ Adopt and fast-track implementation of DD from stool specimens in laboratories covering very high-risk, high-risk, and medium high-risk countries (**Table 11** and **Fig. 4**).
- ✓ Support the expansion of sequencing capacity in laboratories covering high-risk areas (**Fig. 5**).

Activity 3. Strengthen oversight of the quality assurance system

Quality assurance (QA) remains a top GPLN priority as it gives confidence in virologic and molecular results and information used by the GPEI to subsequently tailor critical interventions on surveillance, outbreak response, and containment, among other programme activities. The GPLN monitors QA via a web-based GPLN management system (GPLNMS).

As part of the GPLN strategy, a new proficiency testing scheme aimed at ensuring accurate testing of ES sewage samples was designed, assessed, and validated over the past three years. The testing scheme is now set to officially launch in approximately 70 laboratories across all six WHO regions.

Strengthening oversight of QA in laboratories serving endemic and outbreak countries will include using GPLNMS for performance assessment and monitoring, designing and validating DD QA procedures [e.g., proficiency testing (PT) and performance indicators including turn-around-time (TAT)], and resuming on-site accreditation reviews of key laboratories which had been suspended due to the COVID-19 pandemic.

Activity 3 tasks

- ✓ Launch a new proficiency testing scheme for ES in Q1–Q2 2022.
- ✓ Design and validate comprehensive DD QA procedures.
- ✓ Validate an electronic module in GPLNMS for results reporting, assessment, and validation.
- ✓ Ensure GPLNMS is used to improve internal communications and streamline QA.
- ✓ Resume on-site accreditation reviews on key laboratories, with priority given to specialized regional and national laboratories serving high-risk countries. Trained consultants with polio laboratory operations expertise will expedite this catch-up process in 2022.

Activity 4. Participate in national preparedness and outbreak responses

To support the goal set by the GPEI Strategy to stop both WPV1 and cVDPV2 transmission by the end of 2023, surveillance and outbreak preparedness and response teams will strengthen communication and collaboration. Upstream and continuous coordination – between field surveillance, laboratory surveillance and outbreak response – allows for immediately evaluating any potential bottlenecks in the receipt and processing of specimens, as well as in reporting specimen results. Possible solutions to issues may include: re-routing stool specimens and/or sewage samples; evaluating processes and procedures to ensure accurate, timely reporting of outbreak-related laboratory results; and ensuring the laboratory's contribution as a member of the outbreak investigation team.

Under the GPSAP 2022–2024, all laboratories will work with their WHO country and regional offices to ensure their contingency or emergency response plans are part of the national emergency management system, including strategies to mobilize resources in emergency situations.

Activity 4 tasks

- ✓ Formalize and monitor collaboration between laboratories and outbreak preparedness and response teams.

Activity 5. Continue to engage other surveillance networks and document integrated assets and activities

The GPLN and established laboratory networks for other VPDs – such as measles, rubella, rotavirus, yellow fever, Japanese encephalitis and influenza – have historically worked closely together. This engagement has usually occurred wherever laboratories are hosted by the same department or institution. The critical value of integrating laboratory networks became especially evident during the COVID-19 pandemic, when the GPLN helped launch COVID-19 laboratory response in many countries by using polio staff, equipment, reagents, and consumables.

Under the GPSAP 2022–2024, comprehensive documentation on past integration efforts will lay the groundwork for a more systematic way to capture integrated activities and inform future preparedness. In addition to a targeted survey for COVID-19 laboratory response, joint assessments by the GPLN and the Global Measles and Rubella Laboratory Network will be accelerated to document integration and identify other areas where progress toward integration can be made.

Activity 5 tasks

- ✓ Document integrated activities, using COVID-19 laboratory response as a starting point.
- ✓ Conduct a joint assessment with the Global Measles and Rubella Laboratory Network to further promote integration.

Activity 6. Finalize a GPLN post-certification action plan

Following the global certification of poliovirus eradication and the cessation of live OPV use, laboratory capacities must be sustained to continue to detect polioviruses, even as surveillance in the post-certification era will need to be recharacterized as future risks shift to chronically infected immunodeficient patients and potential containment breach from a poliovirus-holding facility (e.g., a laboratory or vaccine manufacturer).

To prepare for this post-certification period, field and laboratory surveillance will need to be aligned with a more integrated surveillance approach, one that can be sustained indefinitely. Under the GPSAP 2022–2024, the GPLN will resume work on the evolution of its structure and functions to meet the surveillance requirements as described in the *Polio Post-Certification Strategy*.[25]

Activity 6 tasks

- ✓ Revisit the *Post-Certification Strategy* and finalize a GPLN post-certification action plan for endemic and outbreak regions by the end of 2023.

Monitoring

Maintaining and strengthening the capacity and capability of the GPLN network will be monitored by WHO headquarters and regional offices and global partners (**Table 12**).

Table 12. Monitoring activities for Objective 4 (GPLN capacity and capability)

Activity	Regions	Global
1. Sustain and strengthen processing capacity in key laboratories serving VHR and HR countries	• Evaluate laboratory needs based on projected workload and develop a regional support plan to maintain laboratory performance standards	• Support regional plans aiming to secure human and financial resources for the GPSAP 2022–2024 period
2. Implement direct detection (DD) and other new methodologies and algorithms (including sequencing) in laboratories serving VHR/HR countries	• Assess laboratories' needs and readiness to implement validated methodologies and testing algorithms	• Design a workplan and work with GPLN Small Working Group to validate and implement new methodologies

DD = direct detection; GPLN = Global Polio Laboratory Network; GPSAP = Global Polio Surveillance Action Plan; HR = high risk; VHR = very high risk

[25] Global Polio Eradication Initiative (GPEI). Polio Post-Certification Strategy. Geneva: World Health Organization; 2018 (http://polioeradication.org/wp-content/uploads/2018/04/polio-post-certification-strategy-20180424-2.pdf).

Table 12 (continued)

Activity	Regions	Global
3. Strengthen oversight of the quality assurance system in all labs serving endemic and outbreak countries	• Validate accreditation scheme and develop a regional schedule for 2022–2024 by end of Q1 2022	• Define a scheme and guidance for formal accreditation (including on-site visits, where possible) for laboratories serving endemic and outbreak countries
4. Participate in national laboratory preparedness and outbreak response	• Document laboratory and regional office participation, activities and inputs on outbreak preparedness and response	• Work with the Outbreak Response and Preparedness Group to set mechanisms for the formal involvement of national polio laboratories in outbreak preparedness and response
5. Continue to engage other surveillance networks and document integrated assets and activities	• Work with WHO headquarters to foster and document synergies between polio laboratories and other laboratories within the same country	• Define a Programme of Work on integration with IVB and WHO regional offices for the GPSAP 2022–2024 period
6. Finalize a GPLN post-certification action plan	• Assess country needs and develop post-certification action plan to support the long-term sustainability of laboratory surveillance	• Revisit laboratory component of the PCS and develop a GPLN framework and roadmap to ensure sustainability of polio diagnostics in the post-certification era, in endemic and outbreak regions.

GPLN = Global Polio Laboratory Network; GPSAP = Global Polio Surveillance Action Plan; IVB = Immunization, Vaccines and Biologicals; PCS = Post-Certification Strategy; WHO = World Health Organization

INFORMATION AND DATA MANAGEMENT

Objective 5. Increase efficiency in collecting, managing, and using data for action

Background

Quickly collecting and processing reliable surveillance data is vital to the GPEI. The GPEI Strategy calls for a shift to web-based information systems and electronic mobile data collection tools, where feasible, to support access to real-time data for monitoring timeliness of virus detection. At the global level, the GPEI relies upon the Polio Information System (POLIS). At the country level, EpiInfo is commonly used, and teams often use a mix of Access databases and Excel for AFP and ES data management. Many country programmes and regions are introducing new mobile technologies for real-time data collection, but a lack of standardization across platforms creates new challenges by making any data comparison (both across regions and countries and between laboratory and field data) difficult. Tracking specimens from the field to the laboratory also presents challenges, which were highlighted as international borders were closed and flights cancelled during the COVID-19 pandemic.

The Polio Information System (POLIS)

POLIS collects all polio-related data shared at the global level. It harmonizes data across all six WHO regions, processes and performs quality checks, and generates analyses across AFP and environmental surveillance, laboratory data and supplemental immunization activities (SIAs). The central repository provides readily available standardized data, analyses, and progress outputs for the GPEI partners and member states.

Access POLIS: https://extranet.who.int/polis

To support real-time data exchange between the field and laboratory, data management will be made more efficient (**Table 13**). New systems must be interoperable with existing systems to advance integration, as this not only supports data exchange but may also contribute to greater sustainability in the long term. Furthermore, to ensure the GPEI can track and monitor stool shipments from the field to the laboratory and between laboratories, the programme will upgrade regional systems to adopt new data collection methods and avoid losing data between countries or at the global level.

Table 13. Major activities and key performance/process indicators for Objective 5

Major activities	Key performance/process indicators
1. Assess information and data management needs for priority countries	• Joint assessment of country-level needs with IVB/EPI and WHE in at least 30% of VHR and HR countries
2. Upgrade archaic polio information systems to web-based systems	• 30% of laboratories serving VHR and HR countries have web-based IFA or similar information management system • 30% of VHR and HR countries have web-based information management systems
3. Develop an online system to track specimen collection and transport	• ≥4 priority countries have piloted an online tracking system
4. Adapt the information management system and shift from paper-based to electronic data collection tools	• Afghanistan and Pakistan shift to electronic handheld devices for AFP and ES data, where possible • 30% of VHR and HR countries use mobile, handheld devices for active surveillance data collection • All timeliness indicators (Annex E) can be monitored in POLIS

AFP = acute flaccid paralysis; EPI = Expanded Programme on Immunization; ES = environmental surveillance; HR = high risk; IFA = information for action; IVB = Immunization, Vaccines and Biologicals; POLIS = Polio Information System; VHR = very high risk; WHE = WHO Health Emergencies

Activity 1. Assess information and data management needs for priority countries

Integral to the GPEI Strategy is a commitment to support the implementation of the comprehensive VPD surveillance strategy and the global pandemic preparedness strategy.[26] To ensure alignment and coherent planning, the GPEI will collaborate with the Immunization, Vaccines and Biologicals (IVB), EPI and WHE programmes to perform a landscape analysis of data systems in priority countries as a part of their joint assessment. As the GPEI supports countries in shifting to electronic tools and systems for data collection, exchange, and storage, particular attention will be paid to ensure that all programmes benefit from the investment in systems for robust real-time data. These joint assessments will thus ensure data systems implemented in priority countries are interoperable and integrate with other VPD surveillance systems, including Health Management Information System (HMIS).

Activity 1 tasks

- ✓ Review information systems at the country level, with a focus on VHR and HR countries.
- ✓ With WHE and IVB/EPI, conduct joint assessments of country information system needs.

Activity 2. Upgrade archaic polio information systems to web-based systems

The transition from an EpiInfo-based "information for action" (IFA) system to a web-based "information for action" system (WebIFA) has been successfully piloted in Afghanistan and Pakistan and is now fully functional.

Under the GPSAP 2022–2024, the programme will address any remaining system needs in Afghanistan and Pakistan. In addition, the programme will explore and support a shift to web-based platforms for laboratories serving priority countries for AFP or environmental surveillance or for both. Furthermore, the GPEI will ensure that WebIFA will be interoperable with other systems, including District Health Information Software 2 (DHIS2) systems.

WebIFA

WebIFA is an information system at the country level that links both laboratory data and field data in one location by combining the main features of IFA and LabIFA, which include the ability to enter AFP cases, AFP contacts, specimens with lab results, environmental site information and samples.

Table 14 outlines the current rollout plan for WebIFA that focuses on laboratories serving VHR and HR countries. In countries where the field uses an established case-based data collection tool, like DHIS2, WebIFA will ensure interoperability and provide an ES-only option to the country.

[26] WHO Immunization, Vaccines and Biologicals (IVB). Global strategy for comprehensive Vaccine-Preventable Disease (VPD) surveillance. Geneva: World Health Organization; 2020 (https://www.who.int/publications/m/item/global-strategy-for-comprehensive-vaccine-preventable-disease-(vpd)-surveillance). WHO Health Emergencies. Global pandemic preparedness strategy. In preparation.

Table 14. Laboratories to be upgraded from archaic IFA systems to WebIFA, 2022–2023

Lab (country code)	Country field surveillance	AFP and/or ES	Status for planning
PAK	Afghanistan	AFP and ES	Completed
	Pakistan	AFP and ES	Completed
UGA	South Sudan	AFP and ES	Underway
	Uganda	ES only	Underway
NIE	Nigeria	AFP and ES	Haulted
BAN	Bangladesh	AFP and ES	2022
EMR	ALL Eastern Mediterranean countries	AFP and ES	2022/23
ETH	Ethiopia	AFP and ES	2022
KEN	Kenya	AFP and ES	2022
	Somalia	AFP and ES	2022
SA	(As a regional reference lab)	AFP and ES	2022
SEN	Niger	AFP and ES	2022
	Senegal	AFP and ES	2022
CIV	Côte d'Ivoire	AFP and ES	2023
CMR	Cameroon	AFP and ES	2023
	Chad	AFP and ES	2023
DRC	Democratic Republic of the Congo	AFP and ES	2023

AFP = acute flaccid paralysis (surveillance); ES = environmental surveillance

Activity 2 tasks

- ✓ Upgrade the laboratory data system to WebIFA (or other web-based data management system) for AFP surveillance or ES in at least 12 labs serving priority countries (**Table 14**, above).
- ✓ Continue the expansion of WebIFA in Afghanistan and Pakistan, taking into account any security limitations, and support the shift to the online case investigation form (CIF) as part of WebIFA.

Activity 3. Develop an online system to track specimen collection and transport

Currently, no standardized or centralized system exists to track specimen collection and transport from the field to its arrival in a WHO-accredited laboratory, nor to track specimens' movement between laboratories for further testing. During the COVID-19 pandemic when it became very challenging to ship specimens, particularly across international borders, country programmes had a backlog of specimens waiting to be transported. Some countries set up paper-based systems to track where specimens were stored, but the lack of standardization and delays in collecting and verifying data made the system inaccurate or quickly outdated. While there's an option in WebIFA to track specimens, this may not be the data system used in all priority countries, so the programme will need to identify alternative tracking mechanisms.

Activity 3 tasks

- ✓ Incorporate process indicators in POLIS to track specimens from collection to final results, highlighting countries experiencing persistent delays.
- ✓ Develop an easy-to-implement online tracking system.
- ✓ Pilot the new online system in at least four countries: Chad, the Democratic Republic of the Congo, Somalia, and South Sudan.

Activity 4. Adapt the information management system and shift from paper-based to electronic data collection tools for field surveillance

A mobile electronic-based data information system, known as a "mobile e-data system," is critical to efficiently monitor surveillance performance in near real time.

Mobile e-data systems in priority countries
In the African Region, most countries use electronic surveillance (eSurv) and integrated supportive supervision (ISS). In the Eastern Mediterranean Region, Afghanistan and Pakistan have shifted to electronic tools, but Somalia and Yemen use paper-based tools (**Table 15**).

To improve surveillance quality and validate data on active surveillance and supervision, all field-level, paper-based data collection tools should be transitioned to a mobile e-data system in all very high- and high-risk countries (**Table 15**). The priority will be to shift specific components of the AFP surveillance system (including CBS) and the ES system to mobile e-data systems. To support comparison across geographies and potentially promote integration, the GPEI will develop standard variables for country use.

Table 15. Priority countries for the expanded use of electronic tools for active surveillance

Country	Region	Electronic tool for active surveillance
Afghanistan	EMR	WebIFA
Angola	AFR	Increase eSurv use
Cameroon	AFR	Increase eSurv use
Chad	AFR	Increase eSurv use
Democratic Republic of the Congo	AFR	Increase eSurv use
Ethiopia	AFR	Increase eSurv use
Guinea	AFR	Increase eSurv use
Kenya	AFR	Increase eSurv use
Niger	AFR	Increase eSurv use
Nigeria	AFR	Increase eSurv use
Pakistan	EMR	Align with WebIFA
Somalia	EMR	Electronic tool to be implemented
South Sudan	AFR	Increase eSurv use
Yemen	EMR	Electronic tool to be implemented

AFR = African Region; EMR = Eastern Mediterranean Region; eSurv = electronic surveillance; WebIFA = web-based information for action

In countries that implement WebIFA, starting with endemic countries, existing electronic data collection tools will be integrated with the system. At a minimum, the tools which will be integrated include: active surveillance (VPD-integrated) form, (integrated) supervision form, case investigation form (CIF) and the detailed CIF, 60-day follow-up examination, ES collection form, ES site assessment form, and blue lines for water ways. A generic tool for CBS will also be developed.

In the GPSAP 2022–2024 period, the programme will ensure that adequate training on the use of digital tools is provided to all existing and new staff, ensuring equal and meaningful participation of women given the digital gender gap that exists in many contexts (**Annex G** and **Annex I**). Wherever mobile e-data systems are in-use, countries should ensure all surveillance staff actively use them.

New indicators, including those proposed in the GPEI Strategy and in the GPSAP 2022–2024, will be incorporated in POLIS for monitoring at the country, regional, and global levels.

Activity 4 tasks

- ✓ Develop standard variables for active surveillance and supervision. Include standard variables in the regional electronic tool and link regional data repository to POLIS.
- ✓ Shift to electronic tool for active surveillance in Somalia and Yemen and consolidate its current use in other priority countries (**Table 15**).
- ✓ Develop and provide generic electronic tools for CBS.
- ✓ Incorporate core and non-core indicators into route global analyses (POLIS).

Monitoring

Increasing efficiency in collecting, managing, and using data for action will be monitored by WHO headquarters and regional offices, along with global partners (**Table 16**).

Table 16. Monitoring activities for Objective 5 (Information and data management)

Activity	Priority countries	Regional / subregional	Global
1. Assess information and data management needs for priority countries	• VHR and HR countries to participate in the assessment	• Review available information systems at the country level • Carry out joint assessment with IVB/EPI and WHE teams	• Coordinate joint assessment with the regional offices, VPD, IVB/EPI, and WHE teams
2. Upgrade archaic polio information systems to web-based systems	• Shift to online CIF in Afghanistan and Pakistan. Train staff and roll out the system • In select countries and laboratories, test and roll out WebIFA for AFP/ES	• Support selected laboratories and countries in upgrading data management system and training staff • Provide support for WebIFA expansion in Afghanistan and Pakistan	• Support selected laboratories and countries in upgrading data management system and training staff • Provide support for of WebIFA expansion in Afghanistan and Pakistan

AFP = acute flaccid paralysis; CIF = case investigation form; EPI = Expanded Programme on Immunization; ES = environmental surveillance; HR = high risk; IVB = Immunization, Vaccines and Biologicals; VHR = very high risk; VPD = vaccine-preventable disease; WebIFA = web-based information for action; WHE = WHO Health Emergencies

Table 16 (continued).

Activity	Priority countries	Regional / subregional	Global
3. Develop an online system to track specimen collection and transport	• Roll out stool specimen tracking mechanism and train personnel; supervise and take corrective actions • Monitor timeliness indicator	• Support, train, and monitor implementation of tracking systems in at least 4 countries • Monitor timeliness indicator	• Explore and propose systems to track stool specimens from the field to the laboratory • Monitor timeliness indicator
4. Adapt the information management system and shift from paper-based to electronic data collection tools	• Implement or adapt existing e-surveillance and e-supervision systems with new standard variables in all VHR and HR countries • Include and monitor new set of core indicators	• Modify existing regional electronic tool on active surveillance and supervision to include standard variables • Train country on electronic surveillance and supervision, if applicable • Include and monitor new set of core indicators	• Develop SOPs for data and standard variables on active surveillance and supervision • Set up a link between POLIS and the regional data repository on active surveillance and supervision • Incorporate and monitor new core indicators in POLIS • Develop and provide generic electronic tools for CBS

CBS = community-based surveillance; HR = high risk; POLIS = Polio Information System; SOPs = standard operating procedures; VHR = very high risk

SURVEILLANCE MANAGEMENT AND ACCOUNTABILITY

Objective 6. Enhance surveillance management and accountability

Background

The GPSAP 2022–2024 outlines the most pressing challenges facing polio surveillance and the priorities needed to meet these challenges by improving the timeliness of virus detection, integrating polio surveillance with other health programmes to ensure sustainability, and ensuring surveillance activities and country programmes are gender responsive, as gender inclusion is critical to achieving polio eradication.[27]

To ensure country programmes deliver on these priorities, managers of surveillance programmes will focus their efforts on the following activities (**Table 17**).

Table 17. Major activities and key performance/process indicators for Objective 6

Major activities	Key performance/process indicators
1. Develop and track GPSAP implementation for priority countries	• Number of priority countries with surveillance strengthening plans that incorporate GPSAP 2022–2024 recommendations • Biannual report to the GPEI Strategy Committee on GPSAP implementation
2. Monitor strategic risks to surveillance performance and accountability	• Monthly report on surveillance performance to GPEI Strategy Committee • Biannual report on surveillance risk register to GPEI Strategy Committee
3. Foster integration and sustainability	• Number of priority countries with active surveillance tool integrating selected epidemic-prone diseases • Number of priority countries with integrated training
4. Foster gender responsiveness	• Key indicators disaggregated and analysed by sex

GPEI = Global Polio Eradication Initiative; GPSAP = Global Polio Surveillance Action Plan

Activity 1. Develop and track GPSAP implementation for priority countries

Priority countries are expected to develop, implement, monitor, and report on their surveillance strengthening plans, incorporating the activities and tasks as described in this GPSAP. Such plans should cover all aspects of surveillance, highlighting timelines for delivering on key activities and identifying clear lines of responsibility and accountability to support implementation. Consistent with the GPEI Strategy, surveillance strengthening plans should address how countries will increase the timeliness of detection, integrate polio surveillance with other programmes, and ensure gender responsiveness across programme activities. As the GPEI only supplements government funding in select priority countries, fundraising and cost-sharing schemes, as well as government financial and managerial contributions, will be essential to country plans (**Annex J. Budget and finance**).

Surveillance strengthening plans are considered live documents and should be updated as the epidemiology changes and as new recommendations become available. Reports on the status of implementation will be submitted by priority countries to the regions on a quarterly basis; reports at the regional and global levels will be completed on a biannual basis. To further support surveillance

[27] Global Polio Eradication Initiative (GPEI). Gender Equality Strategy 2019–2023. Geneva: World Health Organization; 2019 (https://polioeradication.org/wp-content/uploads/2020/10/Gender-Strategy.pdf).

strengthening plans, country programmes are encouraged to consult resources selected across the areas of work that inform GPSAP 2022–2024 objectives (**Annex K. Resources**).

As part of its monitoring, the Surveillance Group will review the relevance and feasibility of the GPSAP key performance indicators in the first half of 2022.

Activity 1 tasks

- ✓ Priority countries to develop surveillance strengthening plans with area-specific integration and clear lines of responsibility and accountability, incorporating GPSAP 2022–2024 recommendations.
- ✓ Priority countries to report to regions on quarterly basis on the status of implementation of surveillance strengthening plans.
- ✓ Report to the Strategy Committee on a biannual basis on GPSAP 2022–2024 implementation.
- ✓ Where necessary, review GPSAP performance/process indicators and set targets by Q2 2022.

Activity 2. Monitor strategic risks to surveillance performance and accountability

The GPEI Strategy identifies poor surveillance as a key risk to polio eradication. To prepare for and effectively respond to this risk, the GPEI Surveillance and Advocacy Groups, under the guidance of the Strategy Committee, will develop a surveillance risk register that identifies specific risks, their associated impact, their likelihood, mitigation measures, current risk status, and risk owner(s). To monitor risks to surveillance performance at the country level, country programmes should continue to conduct desk and field reviews, whether as internal reviews or independent, external reviews with an international presence. A toolkit for surveillance review will be developed to guide, facilitate, and standardize surveillance reviews.

Risks to polio surveillance will be monitored through a **risk register** that will identify the risk owners and hence where **accountability** lies for risk management.

The Surveillance Group will also report to the Executive Management Unit on global surveillance risk and performance.

Activity 2 tasks

- ✓ Monitor surveillance performance for all countries with a focus on priority countries.
- ✓ Finalize external surveillance reviews for VHR and HR countries in coordination with regional offices; align reviews with planned activities, including outbreak response assessments (OBRAs), VPD surveillance reviews, and WHE surveillance assessments.
- ✓ Develop a surveillance review toolkit to include templates, digital forms, an analysis framework, and a brief guide for when and how to use and adapt each tool.
- ✓ Develop a risk register and submit risk reports biannually to the Strategy Committee.

Activity 3. Foster integration and sustainability

As the world prepares for polio eradication, GPEI partners are actively supporting countries to transition out of GPEI support to nationally-owned and -driven programmes to ensure that key assets and capacities, including surveillance, are maintained in the post-certification era after the sunset of the GPEI. One approach to support this transition is to integrate polio immunization and surveillance activities into

other programmes (e.g., VPD surveillance, the Measles & Rubella Initiative [M&RI], and WHE) and several countries and regions are in the process or have successfully done so.

To advance integration, a multi-partner initiative was launched at the end of 2019, known as the "Interim Programme of Work for Integrated Actions" (iPOW).[28] with a focus on the immediate, urgent, and most feasible actions that can be operationalized in the context of COVID-19. In Afghanistan and Pakistan, polio assets have been used to conduct surveillance for epidemic-prone diseases and response to other outbreaks and health emergencies, including the COVID-19 pandemic. However, the support has often been need-based and incident-specific.

Building on this effort, the Surveillance Group will monitor the extent to which activities are integrated and the impact of integration on polio surveillance as a crucial component for the GPSAP 2022–2024 period.

In the first half of 2022, the Surveillance Group will develop a road map for surveillance integration. By thoroughly exploring WHO teams and activities in both field and laboratory surveillance and polio information and data management, the Surveillance Group will systematically identify areas that may benefit from collaboration with other programmes, such as other VPD or health emergency programmes. Then, in coordination with other programmes and groups, a plan to integrate those selected areas and activities will be developed as a step toward the transition of the polio functions to other disease programmes. The road map will build upon lessons identified from regions and countries and will take into account the integration of activities that has already started at the global level.

Activity 3 tasks

- ✓ Develop a road map for polio surveillance integration by Q1 2022.
- ✓ Coordinate with IVB/EPI, VPD, and WHE on key field surveillance activities.
- ✓ Ramp up integration efforts in Afghanistan and Pakistan, starting with integrating COVID-19 and measles surveillance in country polio surveillance workplans.
- ✓ Monitor KPIs to assess the impact of integration on polio surveillance sensitivity; if sustained decline in sensitivity is identified, conduct rapid assessment followed by appropriate action.

Activity 4. Foster gender responsiveness

In alignment with the GPEI Polio Eradication Strategy and the GPEI Gender Strategy, polio surveillance managers should aim to foster gender responsiveness with all surveillance-related work.[29]

Applying a gender lens to surveillance requires the systematic collection of sex-disaggregated data to support gender analysis which can then help address gaps and barriers and inform decision-making. To foster greater gender responsiveness, gender analyses will be performed on both epidemiological and programmatic data, including staffing. Efforts will be made to ensure an inclusive and diverse workforce,

A gender lens is to be applied to all surveillance-related work and activities to address gender-related barriers to immunization and surveillance, promote **gender equality** and foster **gender responsiveness**.

[28] Global Polio Eradication Initiative (GPEI). Polio Eradication and Essential Programme on Immunization Interim Programme of Work for Integrated Actions in the context of the COVID-19 pandemic. Geneva: World Health Organization; 2020 (https://polioeradication.org/wp-content/uploads/2020/09/Integration-POW-under-Covid-v2.0.pdf).
[29] Global Polio Eradication Initiative (GPEI). Polio Eradication Strategy 2022–2026: Delivering on a promise. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/bitstream/handle/10665/345967/9789240031937-eng.pdf). Global Polio Eradication Initiative (GPEI). Gender Equality Strategy 2019–2023. Geneva: World Health Organization; 2019 (https://polioeradication.org/wp-content/uploads/2020/10/Gender-Strategy.pdf).

to increase the recruitment and retention of women in surveillance, and to achieve gender-balanced teams. Particular focus will be brought to areas where women's participation is currently low, as team composition can create surveillance gaps due to context-specific barriers (i.e., men in some contexts cannot enter homes). Fostering gender responsiveness will also include the provision of gender-focused capacity building, such as trainings for staff on gender-related barriers to surveillance. In addition, surveillance staff training will include information about existing safeguarding and reporting mechanisms and policies related to preventing and responding to sexual exploitation, abuse, and harassment (PRSEAH) (**Annex I: Gender**).

Activity 4 tasks

- ✓ Ensure that surveillance interventions, guidelines, strategies, and policies incorporate gender considerations and address gender-related barriers to immunization and surveillance.
- ✓ Monitor gender-related KPIs and take corrective action, as needed.
- ✓ Ensure all surveillance staff undergo PRSEAH training.
- ✓ Include a gender module in surveillance trainings.

Monitoring

Enhancing surveillance management and accountability will be monitored by WHO headquarters, WHO regional offices, and GPEI global partners (**Table 18**).

Table 18. Monitoring activities for Objective 6 (management and accountability)

Activities	Priority countries	Regional / subregional	Global
1. Develop and track GPSAP implementation for priority countries	• Develop surveillance strengthening plans for selected priority countries • Report to region on implementation status on a quarterly basis	• Support countries in development of their plans • Monitor implementation of the plan and report for priority countries on a biannual basis	• Report on GPSAP implementation on a biannual basis • Review GPSAP key performance and process indicators, if necessary
2. Monitor strategic risks to surveillance performance and accountability	• Monitor surveillance performance monthly through review meetings • Monitor progress of implementation of plan/recommendations against targets quarterly • Implement integrated surveillance reviews	• Finalize external surveillance review plans for priority countries • Report on surveillance performance on a monthly basis	• Finalize external surveillance review plans • Develop a surveillance review toolkit • Develop surveillance risk register; report biannually to Strategy Committee • Report monthly on surveillance performance to Strategy Committee

GPSAP = Global Polio Surveillance Action Plan

Table 18 (continued).

Activities	Priority countries	Regional / subregional	Global
3. Foster integration and sustainability	• Ramp up integration, particularly with integrated active surveillance tools, information systems, and capacity building	• Coordinate with regional VPD and emergency group on joint integration • Monitor progress on integration twice a year • Monitor monthly polio surveillance performances in all 'transitioned' countries	• Coordinate with IVB and WHE on joint surveillance activities • Develop a road map on integration by Q1 2022 • Regularly monitor polio surveillance performance in all transitioned countries
4. Foster gender responsiveness	• Ensure surveillance staff undergo PRSEAH training • Ensure surveillance trainings include a gender component • Ensure all data are disaggregated by sex, where applicable, with gender analysis	• Ensure surveillance staff undergo PRSEAH training • Ensure all surveillance trainings include a gender component • Ensure all data are disaggregated by sex, where applicable, with gender analysis	• Ensure surveillance staff undergo mandatory PRSEAH training, at all levels • Monitor gender-related KPIs and take corrective action, as needed • Include a gender module in the surveillance training

IVB = Immunization, Vaccines and Biologicals; KPIs = key performance indicators; PRSEAH = preventing and responding to sexual exploitation, abuse, and harassment; VPD = vaccine-preventable disease; WHE = WHO Health Emergencies

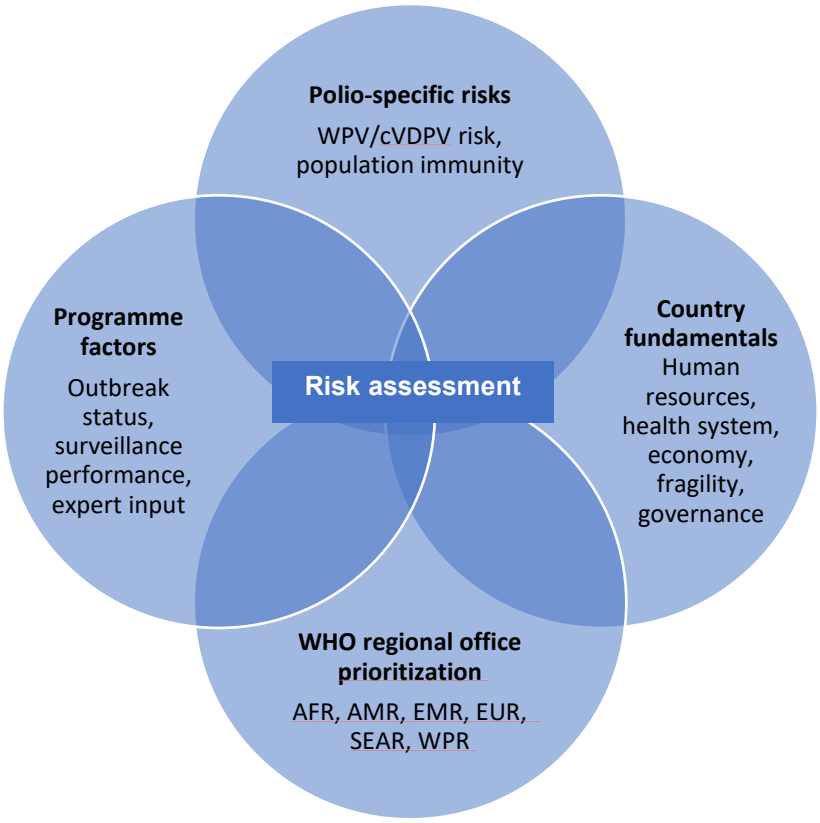
ANNEXES

ANNEX A. COUNTRY RISK ASSESSMENT

While clear progress has been made toward achieving polio eradication, the prolonged tail of wild poliovirus type 1 (WPV1) transmission in the final endemic countries and recurrent circulating vaccine-derived poliovirus (cVDPV) outbreaks across a growing number of regions present a unique risk for the programme. Consequently, any slacking of efforts will likely result in major reversals in gains for global polio eradication.

The capacity to consistently detect and respond to poliovirus detection is ultimately dependent on existing within-country capacity – and fragile states, especially those with ongoing conflict, are especially vulnerable. The Global Polio Eradication Initiative (GPEI) has invested heavily over decades in establishing and maintaining a robust global polio surveillance system in countries. To support activities during the Global Polio Surveillance Action Plan (GPSAP) 2022–2024, the GPEI Surveillance Group conducted a risk assessment with an eye to the medium- to longer-term need to ensure continued direct support for the highest risk countries. Factors that were considered include: polio-specific risks, programme factors related to surveillance performance and outbreak status, country variables such as health security and human resource capacity, and WHO regional office insights (**Fig. A1** and **Table A1**).

Fig. A1. Key factors used to assess risk



AFR = African Region; AMR = Region of the Americas; cVDPV = circulating vaccine-derived poliovirus; EMR = Eastern Mediterranean Region; EUR = European Region; SEAR = South-East Asia Region; WPR = Western Pacific Region; WPV = wild poliovirus
Source: WHO.

Table A1. Key factors used to assess risk, defined

Factor	Description
Polio-specific risk	Includes: • WPV and VDPV epidemiology over the past decade, with countries with prolonged and/or recurrent poliovirus circulation at higher risk; and • population immunity level, including essential immunization, with countries with a higher number of underimmunized populations at higher risk.
Country fundamentals	Includes: • governance and fragility, recognizing that fragile countries and countries with weaker governance are at higher risk; • economy, recognizing that countries with weaker economies and/or dependent on external financing are in need of greater GPEI financial support; • human resource capacity, recognizing that countries with lower human resource capacity need more in-country technical support; and • health system indicators, recognizing that countries with weaker health systems require more focused polio-specific surveillance system development and support.
WHO regional office prioritization	• WHO regional risk assessments included to further adjust risk.
Other programme factors	Includes: • current outbreak status (for low-risk countries, risk is automatically increased if country has an ongoing outbreak); • surveillance performance (underperformance, especially delayed timeliness of detection elevates the risk); and • expert input by the GPEI Surveillance Group. (Without fundamentally changing the overall risk assessment, feedback from members of the Surveillance Group was used to make adjustments.)

GPEI = Global Polio Eradication Initiative; VDPV = vaccine-derived poliovirus; WHO = World Health Organization; WPV = wild poliovirus

Based on this risk assessment, the Surveillance Group developed a multi-tier country risk classification to inform surveillance priorities under the GPSAP 2022–2024 (**Table A2**). Countries identified as very high, high, and medium-high risk are those that have persistent gaps in surveillance and are chronically vulnerable to poliovirus transmission. They are referred to within the GSPAP as “priority countries.”

This country risk assessement will be conducted at least annually to support timely detection and response throughout the full term of the GPSAP 2022–2024.

Table A2. Country risk assessment (2022)

Risk level*	WHO Region	Countries
Very high risk	AFR	Chad, Democratic Republic of the Congo, Ethiopia, Niger, Nigeria
	EMR	Afghanistan, Pakistan, Somalia
High risk	AFR	Angola, Burkina Faso, Cameroon, Central African Republic, Guinea, Kenya, Mali, South Sudan
	EMR	Yemen
Medium-high risk	AFR	Benin, Côte d'Ivoire, Equatorial Guinea, Guinea Bissau, Madagascar, Mozambique, Togo
	EMR	Iraq, Sudan, Syrian Arab Republic
	SEAR	Myanmar
	WPR	Papua New Guinea, Philippines
Medium risk	AFR	Burundi, Congo, Gabon, Gambia, Ghana, Liberia, Senegal, Sierra Leone, Uganda, Zambia
	EMR	Djibouti, Egypt, Iran (Islamic Republic of), Libya
	EUR	Tajikistan, Ukraine
	SEAR	Indonesia, Nepal
	AMR	Haiti
	WPR	Lao People's Democratic Republic, China
Medium-low risk	AFR	Eritrea, Malawi, Mauritania, Namibia, Rwanda, United Republic of Tanzania, Zimbabwe
	EMR	Lebanon
	SEAR	Bangladesh, India, Timor-Leste
	AMR	Bolivia (Plurinational State of)
	WPR	Cambodia, Malaysia
Low risk	All regions	All other countries

AFR = African Region; AMR = Region of the Americas; EMR = Eastern Mediterranean Region; EUR = European Region; SEAR = South-East Asia Region; WPR = Western Pacific Region

* In the event of an outbreak, any country not already classified as medium risk or higher shall be automatically classified as medium risk.

ANNEX B. AFP SURVEILLANCE AUDITING

All countries must annually audit their acute flaccid paralysis (AFP) surveillance performance. Audits enable expansion or optimization of the system to ensure sensitive surveillance coverage, including geographic and demographic representativeness. Special attention should be given to high-risk, access-compromised, and hard-to-reach areas and populations, as these often require additional strategies and resources. All risk assessment, population identification, and mapping should be developed in close coordination with Ministries of Health and authorities at all levels. Local organizations or women's groups that work close to or closely with at-risk populations should also be consulted.

The process to conduct an AFP surveillance audit includes the following activities.

- Assessing available resources and opportunities:
    - Describing the current AFP surveillance network in detail, covering all activities being conducted (e.g., active surveillance) and where they're conducted.
    - Mapping and profiling all resources that could support polio surveillance activities: healthcare providers and facilities (public and private, for-profit and non-profit, military and civilian), key community actors (leaders, traditional healers, faith leaders), nongovernmental organizations (NGOs), humanitarian agencies, and the Medical Corp of the military, if required.
    - Mapping human resources (from all sources) available for surveillance and evaluating their contribution to polio surveillance.
    - Reviewing the surveillance capacity and training needs of all available staff.
- Using standard surveillance indicators to assess surveillance network coverage and sensitivity at national and subnational levels (**Annex E**), followed by taking a "deeper dive" into data that may help identify factors underlying inadequate performance or puzzling findings. Such exercises can be conducted using the desk surveillance review guide.[30]
- Identifying and mapping inaccessible and hard-to-reach areas and special populations as they may need special planning or additional strategies.
    - Mapping all access- and security-compromised areas. Use regular updates from all available data on accessibility, including data from within the countries (military, if available, and other government programmes or ministries, such as the Ministry of Education) and from the Office for the Coordination of Humanitarian Affairs (OCHA), the Office of the United Nations High Commissioner for Refugees (UNHCR), International Organization for Migration (IOM), ReliefWeb maps, NGOs, and other sources.
    - Mapping all underserved populations: refugees, internally displaced populations (IDPs), economic migrant populations, nomadic populations, fishing communities, mining communities, border communities, ethnic minority populations, and others.
- Assessing health-seeking behaviour and gender disparities by conducting disaggregated analysis by sex and population group to identify any possible barriers to the timely detection of AFP cases.
- Considering epidemiological risks (e.g., areas with a history/risk of importation, outbreaks, or missed transmission) when identifying areas for focus when prioritizing surveillance activities.
- Using all the data reviewed to develop or modify plans to address all identified gaps.

[30] A downloadable desk review template can be found online at: https://bit.ly/desk-review-template-v2022.

ANNEX C. HEALTH-SEEKING BEHAVIOUR

Delays in detecting cases or missing cases altogether may arise from a limited understanding of the health-seeking behaviour of acute flaccid paralysis (AFP) cases and their caregivers, as well as the barriers they may experience in accessing health care. To address this, country programmes must collect health-seeking behaviour data disaggregated at the lowest possible administrative level by gender and by risk status, for example special population groups. When analysed, such data can point to possible subnational surveillance gaps and may help strengthen programme activities through a deeper understanding of the underlying causes.

Health-seeking behaviour assessment

Health-seeking behaviour assessments aim to identify healthcare facilities or persons that cases and their caregivers seek out, but that may miss reporting AFP cases to the country programme or may report cases but are not currently in the AFP reporting network. Once these individuals or facilities have been identified, the programme can take the appropriate action to increase the sensitivity of the AFP surveillance system – for example, by re-training a focal point on AFP reporting or by including a new focal point in the reporting network. These assessments review information collected on modified case investigation forms (CIFs) where AFP cases detail their health encounters before their case was officially reported through the AFP active surveillance network.

This exercise can be conducted by countries whose CIFs record previous health encounters. Countries that currently do not collect such information are recommended to consider adopting the CIFs changes proposed below.

Health-seeking behaviour assessments can be coordinated as part of the periodic review of the reporting network, during outbreak response assessments (OBRAs), surveillance reviews, or other activities aimed at reviewing and strengthening the AFP surveillance network. Those conducting the assessment should also reach out to other programmes within the Ministry of Health, such as Maternal and Child Health, which may conduct their own health-seeking behaviour assessments, to both further inform assessment methods and identify subsequent actions to address gaps.

Step one: rapid review of the reporting network

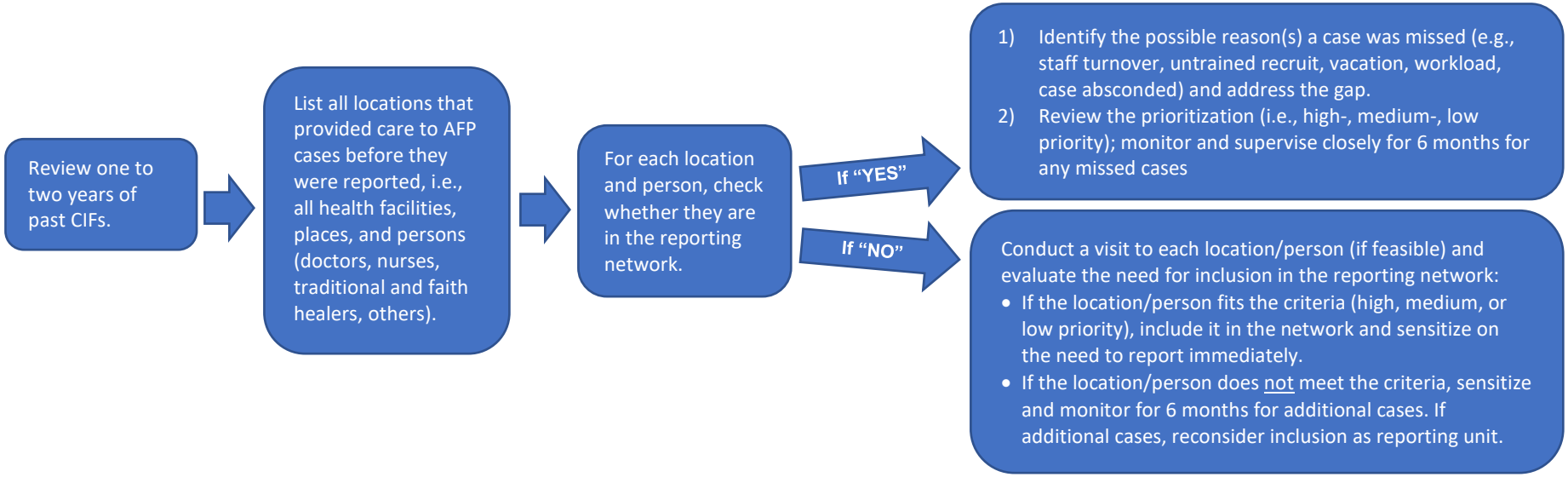
The first step of a health-seeking behaviour assessment is a rapid review of the network conducted via a retrospective review of CIFs (**Fig. C1**). The rapid review should aim to answer the following questions:

- How many reporting sites missed reporting an AFP case? Which ones, and where?
- What are the non-reporting sites (i.e., not part of the reporting network) that (a) received and (b) reported an AFP case?

Step two: review for possible cluster(s) of delayed reporting

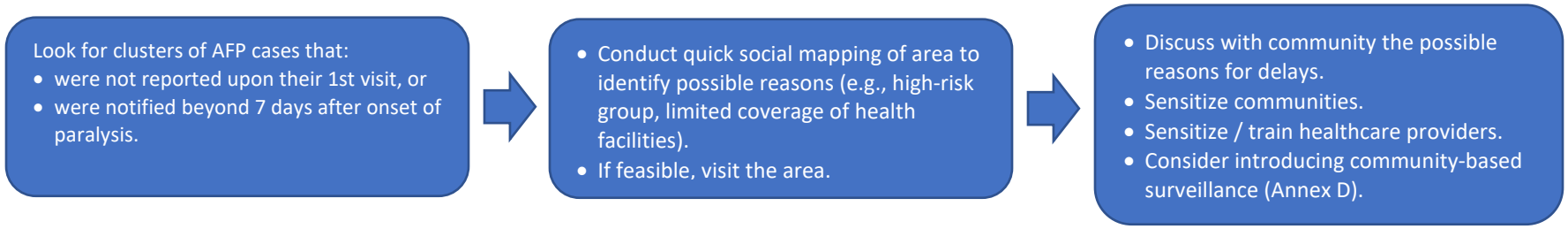
The second step of a health-seeking behaviour assessment searches for clusters of AFP cases that were detected late (**Fig. C2**). The aim is to identify geographical areas where delays in detecting AFP cases may be linked to particular habits or attitudes within a special population towards health care and seeking care, or where AFP surveillance may be overlooking local, more traditional service providers.

Fig. C1. Rapid review of the AFP surveillance network



CIF = case investigation form
Source: WHO.

Fig. C2. Search for late-detected AFP clusters



AFP = acute flaccid paralysis
Source: WHO.

Modified case investigation forms

To achieve a better understanding of health-seeking behaviour, CIFs should be modified to include:

- the number of health encounters the case had before it was notified;
- whether the reporting sites (facility/person) that saw the case before it was notified are part of the reporting network; and
- whether or not the encounter(s) led to a notification.

The GPEI has developed a sample section of the CIF to help countries capture health-seeking behaviour information (**Fig. C3**). Two templates (one for endemic and one for non-endemic countries) can also be found in the *Global Guidelines for Acute Flaccid Paralysis Surveillance for Poliovirus*.[31]

Fig. C3. Sample health encounters section to be added to case investigation forms

Health encounters

Did the Case seek help at any other place after parent(s) or caregiver(s) noticed paralysis or weakness in the child and before being seen at the current place? Yes / No

In chronological order, list the Place(s) and/or Person(s) the Case visited for health care between Onset and visiting this place (Notification). Please fill out the table below in chronological order, including this place:

Total Number of Health Encounters for this case:_____

Date of Visit	1: ____/____/____	2: ____/____/____	3: ____/____/____	4: ____/____/____	5: ____/____/____
Name of Facility or Person (1)					
Type of Facility or Person (2)					
Location [Address] of Facility or Person with Phone number					
Is this site a part of the reporting network?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
Was the case Notified?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
Action(s) taken if case was not notified					

(1) "Name of Person" if Traditional or Faith Healer, or other Individual
(2) 1=Hospital / 2=Clinic or Health Center / 3=Pharmacy / 4=Traditional or Faith healer / 5=Other (specify)

Source: WHO.

Indicators on health-seeking behaviour

The GPEI has identified indicators for health-seeking behaviour (**Table C1** and **Annex E**). The GPEI recommends the following frequency for health-seeking behaviour assessments:

- *priority countries* should analyse health-seeking behaviour monthly; and
- *non-priority countries* should review health-seeking behaviour quarterly and include assessment findings in desk reviews.

[31] Global Guidelines for Acute Flaccid Paralysis Surveillance for Poliovirus is planned for publication in 2022. In the meanwhile, templates for modified CIFs for endemic and non-endemic countries can be found online: https://bit.ly/CIF-non-endemic-v2021 and https://bit.ly/CIF-non-endemic-v2021.

Table C1. Non-core indicators on health-seeking behaviour*†

Indicator	Calculation (expressed as a percentage)	Target
AFP case encounters‡	# of AFP cases with <=2 health encounters between onset and notification / # of AFP cases	>=80%
Adequacy of notification by designation	# of 1st health encounters that led to a notification, by designation [reporting source]§ / # of health encounters by that same designation	>=80%
Appropriateness of surveillance network	# of AFP cases with first health encounters with a reporting site within the AFP surveillance network / # of AFP cases	>=80%
Late reported AFP cases: Completeness of health encounter information	Among AFP cases reported >14 days after paralysis onset: # of AFP cases with no information on health encounters / # AFP cases reported >14 days after paralysis onset	>=80%

AFP = acute flaccid paralysis

* For priority countries (very high risk, high risk, and medium-high risk), indicators should be analysed monthly.

† For non-priority countries, indicators should be reviewed quarterly and included in desk reviews.

‡ Results should be stratified by sex.

§ This is the "percentage of 1st encounters by designation (e.g., doctor, nurse, traditional healer, vaccinator, other) that led to the notification of an AFP case."

ANNEX D. COMMUNITY-BASED SURVEILLANCE

The information below is drawn from a detailed job aid found in the *Global Guidelines for Acute Flaccid Paralysis Surveillance for Poliovirus*, to be published by mid-2022.

Definition and rationale

Community-based surveillance (CBS) is the systematic detection and reporting of events of public health significance within a community and by community members. For CBS, trained community members (e.g., informants, volunteers) are engaged to report suspected cases of acute flaccid paralysis (AFP), based on a simplified AFP case definition tailored for use by community members, to a designated focal person who is part of the AFP surveillance system (usually a focal point in a network health facility or a surveillance officer). CBS can provide an additional link between communities and the facility-based AFP surveillance system via the designated focal point; it can also increase community engagement in healthcare and acceptance of immunization and surveillance activities. However, initiating CBS should be carefully assessed as it may not be the most efficient option to address surveillance gaps which could be better addressed by sensitization activities and adjustments to the active surveillance network. Programmes are advised to look first at more sustainable, cost-effective solutions.

Modalities

CBS methods or modalities range from **low resource intensity** (i.e., building upon other existing networks) to **high resource intensity** (i.e., paying informants and using specialized digital tools).

Major cost drivers for CBS include: training (initial training and refreshers); supervision; reporting incentives or monthly payment; and the use of digital technology, mobile phones, or other tools (initial and recurring costs). Training, sensitization, and supervision are minimum essential activities for all modalities of CBS. The addition of other activities and extent of implementation comes with increased costs (e.g., monetary value of reporting incentives can vary, and technology can range from low-cost short message service [SMS] to more expensive smartphones requiring data). When considering CBS, countries should note that the surveillance system may be more cost effective if used for multiple diseases rather than a single disease.

It is critical to balance the needs of the programme to increase AFP surveillance sensitivity with available funds and resources, **making a low intensity CBS modality preferred**, if feasible in the given context. In some situations, especially in hard-to-reach and high-risk areas, the high resource intensity modality may be the only viable option to achieve the essential goal of eradication.

In some areas and regions, CBS modalities for polio are referred to as formal or informal CBS, based on the following description:

- **Formal CBS** has a high resource intensity with incentives, close supervision, and telecommunication tools (e.g., auto-visual AFP detection and reporting [AVADAR]). It usually functions independently of the facility-based surveillance with informants directly linked with surveillance officers.
- **Informal CBS** has a low resource intense modality with volunteers sensitized annually who receive minimal incentives for reporting verified true AFP cases. Informants are usually linked to focal points within nearby health facilities, so informal CBS often works more closely with facility-based surveillance.

Needs assessment for CBS

A needs assessment should be conducted to determine if CBS will be an efficient strategy to improve AFP surveillance sensitivity and, if applicable, to decide on the type or modality.

Before moving forward with implementing CBS, a **needs assessment must be carried out** and other potential surveillance strengthening options must be explored first.

The needs assessment is a situational analysis that explores the following questions:

- How well does the current AFP surveillance system cover or reach special populations or hard-to-reach areas?
- What are the real issues behind surveillance gaps? Is it access, utilization, or acceptability?
- Is linking informants to existing health facility an option? Or is it impossible or unacceptable to report through health facilities?
- What is the health-seeking behaviour of communities and what are the influencing factors (e.g., gender, ethnicity, internally displaced populations [IDPs] or refugees, place of residence, etc.)?
- Who are the primary reporters of AFP cases in the communities and are they included in the active surveillance network?
- What resources in the geographic area should be consulted, such as healthcare facilities and providers (public and private), humanitarian agencies (UN, etc.), or nongovernmental organizations (NGOs)? Are there any CBS activities currently operating (e.g., for other diseases)?
- What healthcare providers and existing community networks – particularly women's groups, community professional and political networks, and grassroots organizations – could be engaged?

Process to establish CBS

If the conclusion of the needs assessment is that CBS is the most effective strategy to improve AFP surveillance sensitivity and no other surveillance strategies can deliver for a specific population or area, the process to establish CBS is to decide on the modality and follow the process below.

1. **Sensitization:** Identify, sensitize, and brief key community actors (local and religious leaders, traditional healers, female leaders) to engage and gain their support for leadership for CBS.
2. **Selection:** Select community volunteers jointly with community leaders based on certain criteria. Select volunteers who possess a good character, who are invested with community trust and acceptance, and who are knowledgeable of the area, live within the community and speak the local language/dialect, as well as who represent an education level, age, and gender suited to the community culture and norms.
3. **Support**: Identify gender-related barriers and challenges that the community and/or informants may face and build the support needed to resolve them. For example, evaluate an informant's access to information, literacy levels or training, decision-making power, or restricted mobility/transport/money. Issues related to security and safety should also be addressed, as well as the acceptability of tools, equipment, and mobility, particularly for female informants.

4. **Capacity building:** Train community volunteers using concise educational materials, the simplified AFP case definition, suspected AFP case recording and reporting policies, stool collection and handling procedures, and clear roles and responsibilities. Provide materials to support tasks, such as visual job aids, case investigation forms (CIFs), tools to record information, focal point contact information, and stool collection kits.

Ahead of initiating CBS In hard-to-reach areas, plans should be made in advance to support:

- storage or transportation of stool specimens to a designated health facility or polio focal person;
- provision for the "suspect" case to be moved to the health facility or polio focal person;
- remote supervisory activities and trainings; and
- notice to the laboratory to inform of a potential increased workload.

5. **Activities:** Community volunteers will:

   - actively search for suspect AFP cases in the community through rumours, regular home visits (i.e., biweekly visits), and more frequent visits to traditional healers and religious leaders (i.e., weekly visits);
   - keep records of vaccination status and basic demographic data for families and children; and
   - immediately report a suspect case of AFP to the designated CBS focal point and/or the surveillance officer. The surveillance officer will follow up to confirm that the suspect AFP case meets the AFP case definition, initiate investigation and specimen collection, and notify the district health authority.

6. **Supportive supervision:** Establish an oversight structure that supports community volunteers by conducting regular supervisory visits and providing feedback to volunteers and conduct periodic refresher trainings to ensure volunteers maintain their knowledge and skills.

Non-core and core indicators

In addition to non-core indicators for CBS (**Table D1**), core indicators on the timeliness of AFP notification, investigation, and related field activities must also be monitored (**Annex E, Table E2**).

Table D1. Non-core indicators for community-based surveillance

Indicator	Calculation (expressed as a percentage)	Target
Proportion of AFP cases reported by CBS*	# of AFP cases (those on linelist) identified by community informant / # of AFP cases on linelist	To be identified by the country level*
Completeness of weekly/monthly zero reporting (WZR/MZR)	# of reports received from community informants / # of expected reports from community informants	>=80%
Timeliness of WZR/MZR	# of reports received on time from community informants / # of expected reports from community informants	>=80%

AFP = acute flaccid paralysis; CBS = community-based surveillance; MZR = monthly zero reporting; WZR = weekly zero reporting
* Target to be adjusted at the country level; priority countries to regularly analyse.

Table D1 (continued)

Indicator	Calculation (expressed as a percentage)	Target
Proportion of female informants	# female informants / # informants	>=50%-80%*
Proportion of informants from local area	# local informants / # informants	>=80%*
Supervision of informants[†,‡]	# informants who have received at least one supervisory visit in last 3 months / # number of informants	>=80%
Informant training[‡, §]	# informants with training within the last year / # of informants	>=80%
Informant turnover rate[‡, §,¶]	# informants who left during the previous year / # informants	To be identified by the country level

* Target to be adjusted at the country level; priority countries to regularly analyse.

† To be reviewed quarterly; priority countries to regularly analyse. Suggest to stratify results by supervisor.

‡ Results should be stratified by sex.

§ To be reviewed annually; priority countries to regularly analyse

¶ Informant turnover rate is a flag; the target is to be defined at country level.

ANNEX E. INDICATORS

Indicators highlighted in bold are monitored at the country, regional, and global levels; indicators that are not bolded are monitored at the regional and/or country levels only.

Core indicators on timeliness

Core indicators on timeliness have been identified to capture the overall capacity of the programme to identify rapidly any wild poliovirus (WPV) or vaccine-derived poliovirus (VDPV). This capacity has been defined as: (1) the capacity of the programme to report a positive acute flaccid paralysis (AFP) case or environmental surveillance (ES) sample rapidly so that a response can be mounted fast; and (2) the capacity to process rapidly any positive specimen (**Table E1**). Additional indicators highlight the capacity of the programme to report any laboratory results rapidly, regardless of the final result.

Table E1. Overall indicators on timeliness

Indicator		Calculation (expressed as a percentage)	Target
Overall detection of WPV/VDPV	For AFP (1)	# of AFP cases* with WPV/VDPV final lab results <=35 days of onset / # of AFP cases* with WPV/VDPV final lab results	>=80%
	For ES (1)	# of ES samples with WPV/VDPV final lab results <=35 days of collection / # of ES samples with WPV/VDPV final lab results	>=80%
	System capacity (2)†	# of WPVs and VDPVs with final lab results <=35 days of onset for AFP cases or collection date for ES samples / # of WPVs and VDPVs	>=80%
AFP detection – system		# of AFP cases* with final lab results <=35 days of onset / # of AFP cases*	>=80%
ES detection – system		# of ES samples with final lab results <=35 days of collection / # of ES samples	>=80%

AFP = acute flaccid paralysis; ES = environmental surveillance; VDPV = vaccine-derived poliovirus; WPV = wild poliovirus
*Aggregated results: all lab results (AFP + contacts) used to classify AFP case as confirmed/discarded
†Specimen-based calculation

Table E2. Indicators on timeliness for field activities

Indicator	Calculation (expressed as a percentage)	Target
Timeliness of notification	# of AFP cases reported <=7 days of onset / # of AFP cases	>=80%
Timeliness of investigation	# of AFP cases investigated <=48 hours of notification / # of AFP cases	>=80%
Timeliness of field activities	# of AFP cases with 2 **stool specimens** collected >=24 hrs apart AND <=11 days of onset / # of AFP cases	>=80%

AFP = acute flaccid paralysis

Table E2 (continued)

Indicator	Calculation (expressed as a percentage)	Target
Timeliness of field and shipment activities	# of AFP cases with 2 **stool specimens** collected >=24 hours apart AND received in good condition* at a WHO-accredited laboratory AND <=14 days of onset / # of reported AFP cases	>=80%
Timeliness of stool specimen shipment	# of **stool specimens** that arrive in good condition* at a WHO-accredited lab AND <=3 days of specimen collection / # of **stool specimens** collected	>=80%
Timeliness of ES sample shipment	# of **sewage samples** that arrive at a WHO-accredited lab <=3 days of sample collection / # of **sewage samples** collected	>=80%

AFP = acute flaccid paralysis; ES = environmental surveillance; WHO = World Health Organization
*For calculations: missing stool condition = poor condition

Table E3. Indicators on timeliness for laboratory activities

Indicator	Calculation (expressed as a percentage)	Target
AFP: Timeliness of reporting laboratory results (system performance)	# of **stool specimens** with final lab results available <=21 days from a DD country OR <=28 days from a non-DD country of receipt at a WHO-accredited lab / # of **stool specimens** collected	>=80%
AFP: Timeliness of reporting WPV/VDPV results (detection)	# of **stool specimens** with WPV/VDPV final lab results available <=21 days of receipt from a DD country OR <=28 days of receipt from a non-DD country at a WHO-accredited lab / # of **stool specimens** collected positive for WPV/VDPV	>=80%
AFP: Timeliness of reporting PV laboratory results	# PV **stool specimens** with sequencing results available <=7 days of receipt at a WHO-accredited sequencing lab / # of PV **stool specimens** positive by ITD requiring sequencing	>=80%
ES: Timeliness of reporting laboratory results	# of ES samples with final lab results available <=32 days of receipt at a WHO-accredited sequencing lab / # of ES samples collected with final lab results	>=80%
ES: Timeliness of reporting PV laboratory results	# PV ES samples with sequencing results available <=7 days of receipt at a WHO-accredited sequencing lab / # of PV ES samples positive by ITD requiring sequencing	>=80%

AFP = acute flaccid paralysis; DD = direct detection; ES = environmental surveillance; ITD = intratypic differentiation; PV = poliovirus; VDPV = vaccine-derived poliovirus; WHO = World Health Organization; WPV = wild poliovirus

Core indicators on surveillance quality

Table E4. Core indicators on AFP surveillance quality

Indicator	Calculation	Target
NPAFP rate*	(# of cases discarded as NPAFP in children <15 years of age / # of children <15 years of age) x 100 000 per year Note: Endemic countries are encouraged to have >=3	AFR, EMR, SEAR: >=2 AMR, EUR, WPR: >=1 OB-affected†: >=2
NPAFP rate – subnational	(# of districts with >=100 000 children <15 years old that meet the NPAFP rate target / # of districts with >=100 000 children <15 years old) x 100 Note: Need to reach >=3 per 100,000 in all high-risk districts within an outbreak country	AFR, EMR: >=80% SEAR: >=50% AMR, EUR, WPR: NA OB-affected districts*: 100%
Stool adequacy	(# of AFP cases with 2 **stool specimens** collected >=24 hours apart AND <=14 days of onset AND received in good condition‡ in a WHO-accredited laboratory / # of AFP cases) x 100 Notes: Certification indicator (14 days)	≥80%
Stool adequacy – subnational	(# of districts that reported >=5 AFP cases that meet the stool adequacy target / # of districts that reported >=5 AFP cases) x 100	≥80%
Stool timeliness	(# of AFP cases with 2 **stool specimens** collected >=24 hrs apart, AND <=14 days of onset / # of reported AFP cases) x 100 Note: Certification indicator (14 days of onset)	≥80%

AFP = acute flaccid paralysis; AFR = African Region; AMR = American Region; EMR = Eastern Mediterranean Region; EUR = European Region; NA = not applicable; NPAFP = non-polio acute flaccid paralysis; OB = outbreak; SEAR = South-East Asia Region; WHO = World Health Organization; WPR = Western Pacific Region

*Rate should be annualized.

†Outbreak-affected country is defined as: any country experiencing a WPV/cVDPV outbreak currently or in the previous 12 months.

‡For calculation: missing stool condition = poor condition

Table E4 (continued)

Indicator	Calculation (expressed as a percentage)	Target
Stool condition	# of AFP cases with two **stool specimens** arriving in good condition* at a WHO accredited lab / # of reported AFP cases	>=80%
Composite index – national	Population living in districts that meets both NPAFP rate target and stool adequacy target / Population living in all districts (Admin2)	>=80%
Composite index – subnational	# of districts with ≥100,000 children <15 years old that meet NPAFP rate target and stool adequacy target / # of districts with ≥100,000 children < 15 years of age	>=80%
Adequacy of active surveillance visits† (2 calculations)	1. # visits to HP sites conducted / # HP site visits planned 2. # HP sites visited / Total # HP sites	1. >=80% 2. 100%
Completeness of 60-day follow-ups	# of inadequate AFP cases with a follow up exam for residual paralysis completed >=60 days AND <= 90 days of onset / # of inadequate AFP cases	>=80%
Completeness of weekly zero reporting (WZR)	# of sites reporting / # of designated reporting sites for AFP surveillance	>=80%
Timeliness of WZR	# of sites reporting by the deadline / # of designated reporting sites for AFP surveillance	>=80%

AFP = acute flaccid paralysis; HP = high priority; NPAFP = non-polio acute flaccid paralysis; WZR = weekly zero reporting
*For calculation: missing stool condition = poor condition
†(a) High-priority sites are those facilities where there is a high likelihood of seeing an AFP case; they are visited at least on a weekly basis and sometimes more often, (b) Combination indicator in which "all HP sites have >=1 visit each month" to be used as a flag, (c) Calculated per month

Table E5. Core indicators on ES quality

Indicator*	Calculation (expressed as a percentage)	Target
EV detection rate	# samples where EV was detected / # of samples	>=50%
ES sample collected on schedule	# of months with >=1 sample collected / # months with >=1 sample scheduled to be collected	>=80%
ES sample collected on schedule (week)	# of samples are collected on the week assigned / # of samples collected	>=80%
ES sample collected at scheduled (hour)	# of samples are collected at the recommended hour of day / # of sample collected	>=80%
Condition of ES sample	# of samples arrive in the laboratory in good condition† / # of sample arrived in the laboratory	>=80%

ES = environmental surveillance; EV = enterovirus
*Similar to other indicators, calculated based on 12 months. All indicators are site-specific
†For calculation: missing stool condition = poor condition.

Non-core indicators

Table E6. Non-core indicators on AFP surveillance*†

Indicator	Calculation (expressed as a percentage)	Target
Unreported AFP cases found during active surveillance	# of unreported AFP cases found in the register during active surveillance visits / month	None
Percentage of supervised active surveillance visits‡	# of active surveillance visits supervised per month / # of active surveillance visits conducted per month	>=25%
Number of supervisory visits in high-priority sites	# HP sites with >=1 supervised visit in the last 6 months / # of HP sites	100%
AFP case field validation Note: as opposed to a clinical validation; would be done by a supervisor or higher than the person who reported the case	# of AFP cases validated <=14 days of investigation / # of AFP cases	>=30%
Completeness of AFP contact sampling	# of inadequate AFP cases with contact sampling§ / # of inadequate AFP cases	>=80%
Timeliness of AFP contact sampling	# of contact stool specimens of inadequate cases collected <=7 days of investigation / # of contact stool specimens of inadequate cases	>=80%

AFP = acute flaccid paralysis; HP = high priority

* For priority countries (very high risk, high risk, and medium-high risk), indicators should be analysed monthly.

† For non-priority countries, indicators should be reviewed quarterly and included in desk reviews.

‡ Calculated by priority site, by geography, and by quarter.

§ 2 or 3 contact samples per inadequate AFP case, as per regional recommendation.

Table E7. Non-core indicators on health-seeking behaviours*†

Indicator	Calculation (expressed as a percentage)	Target
AFP case encounters‡	# of AFP cases with <=2 health encounters between onset and notification / # of AFP cases	>=80%
Adequacy of notification by designation	# of 1st health encounters that led to a notification, by designation [reporting source]§ / # of health encounters by that same designation	>=80%
Appropriateness of surveillance network	# of AFP cases with first health encounters with a reporting site within the AFP surveillance network / # of AFP cases	>=80%
Late reported AFP cases: Completeness of health encounter information	Among AFP cases reported >14 days after paralysis onset: # of AFP cases with no information on health encounters / # AFP cases reported >14 days after paralysis onset	>=80%

AFP = acute flaccid paralysis

* For priority countries (very high risk, high risk, medium-high risk), indicators should be analysed monthly.

† For non-priority countries, indicators should be reviewed quarterly and included in desk reviews.

‡ Results should be stratified by sex.

§ This is the "percentage of 1st encounters by designation (e.g., doctor, nurse, traditional healer, vaccinator, other) that led to the notification of an AFP case."

Table E8. Non-core indicators on community-based surveillance

Indicator	Calculation (expressed as a percentage)	Target
Proportion of AFP cases reported by CBS	# of AFP cases (those on linelist) identified by community informant / # of AFP cases on linelist	TBD
Completeness of weekly/monthly zero reporting (WZR/MZR)	# of reports received from community informants / # of expected reports from community informants	>=80%
Timeliness of WZR/MZR	# of reports received on time from community informants / # of expected reports from community informants	>=80%
Proportion of female informants	# female informants / # informants	>=50%-80%*
Proportion of informants from local area	# local informants / # informants	>=80%*
Supervision of informants† ‡	# informants who have received at least one supervisory visit in last 3 months / # number of informants	>=80%
Informant training‡ §	# informants with training within the last year / # of informants	>=80%
Informant turnover rate‡ § ¶	# informants who left during the previous year / # informants	TBD

AFP = acute flaccid paralysis; CBS = community-based surveillance; MZR = monthly zero reporting; TBD = to be determined; WZR = weekly zero reporting

*Target to be adjusted at the country level; priority countries to regularly analyse.

† To be reviewed quarterly; priority countries to regularly analyse. Suggest to stratify results by supervisor.

‡ Results should be stratified by sex.

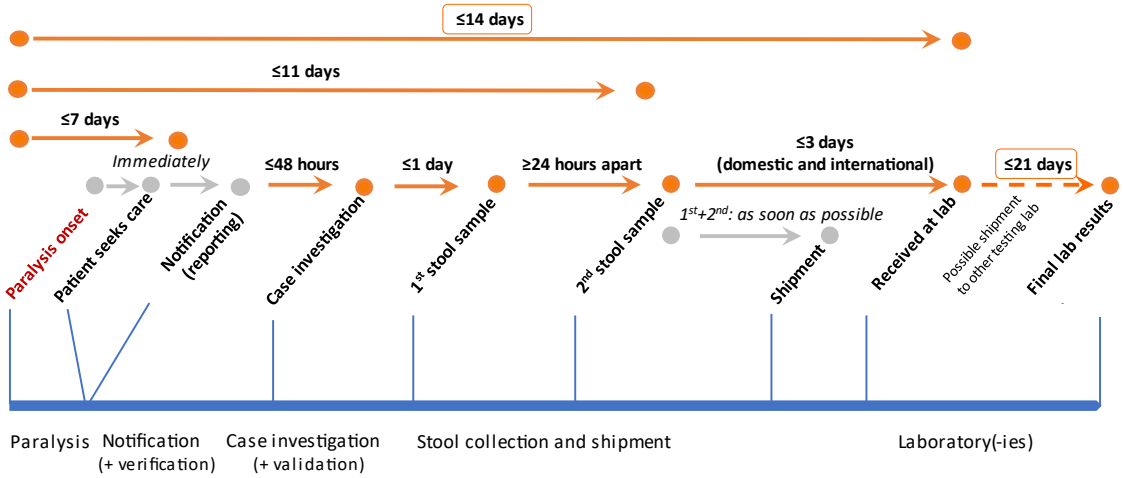
§ To be reviewed annually; priority countries to regularly analyse.

¶ Informant turnover rate is a flag; the target is to be defined at the country level.

ANNEX F. TIMELINESS: ON WAYS TO REDUCE DELAYS

The GPEI Strategy set a targeted timeline for detection and response, which the Global Polio Surveillance Action Plan (GPSAP) 2022–2024 elaborates as a 35-day window for all stages from onset to the final lab result (**Fig. F1**).

Fig. F1. Timeliness of detection (AFP cases), 35 days (onset to final lab result)



AFP = acute flaccid paralysis
Source = WHO.

As delays in detection can happen at any stage of field, logistic, and laboratory activities, countries must monitor timeliness at every stage of the process, particularly at the subnational level and especially in the collection and transport of stool specimens. Only with clear insight into delays can swift actions be taken to address the identified bottlenecks. Furthermore, anticipating issues and proactively identifying alternatives as part of preparedness is highly recommended.

The table below highlights some of these delays, their possible causes, and ways the programme can address them (**Table F1**). While this table focuses on acute flaccid paralysis (AFP) cases, similar delays, possible causes and solutions may apply to other human specimens (e.g., from AFP contacts and healthy children) and environmental surveillance (ES) samples.

Table F1. Possible delays in detection, their causes and mitigation measures

Stage	Target	Possible causes	Mitigation measures and possible solutions
Onset to care seeking	AFP cases reported ≤ 7 days of onset (Ideally: immediately)	• Distance to nearest facility/person • Distrust in the health system • Cost of service • Language barrier • Gender barriers (including no female nurse/doctor, no authorization to travel to health facility)	• Modify data collection tools and analyse by disaggregated data: social or linguistic profile/at-risk population group, sex, and health-seeking behaviour through modified data collection and analysis tools • Conduct periodic (six-month) social mapping as part of the active surveillance network review to identify gaps in coverage • Based on findings, address all issues (e.g., mobile clinics, female health workers, consultation and sensitization with the community)

AFP = acute flaccid paralysis

Table F1 (continued)

Stage	Target	Possible causes	Mitigation measures and possible solutions
Care seeking to notification	AFP cases reported ≤ 7 days of onset (Ideally immediately)	• Lack of awareness and sensitization of healthcare providers	• Conduct consistent, supportive supervisory visits to reporting units • Ensure training and sensitization of every new staff member • Provide information, education and communication (IEC) materials: case definition, reporting requirement and pathway, surveillance officer contact information
Notification to investigation	≤ 48 hours	• Lack of training • Absence of qualified person to conduct investigation • Delay in locating the case • Case is lost to follow-up (i.e., cannot find case) • Competing priorities, challenging workloads	• Ensure case investigation kits (equipment, supplies, and materials) are readily available • Promote clear responsibilities and reasonable workloads (i.e., back-up should be available in the absence of the main surveillance officer) • Conduct regular trainings for surveillance officers and back-ups (e.g., other public health staff) at the field level
Investigation to stool 1 collection	≤ 1 day	• Absence of kit • Inability to locate the case (due to discharge, travel, etc.) • Inadequate stool specimen, or case has died	• Ensure case investigation kits (equipment, supplies and material) are readily available • Ensure contact information and address of case is available • If stool specimen collection must be done by caregiver, ensure it is adequately done
Stool 1 collection to stool 2 collection	≥ 24 hours apart	• Inadequate stool specimen, or case has died. • Case is no longer at same location (follow-up issues).	• Provide clear instructions to nurses and caregivers on collecting the stool specimen. • Provide clear instructions on contact sampling in the event of a case of inadequate specimens
Stool 2 collection to shipment to national level	Stools 1+2 arrival at laboratory ≤ 3 days of collection of stool 2 (ideally immediately)	• No or poor communication on when stool 2 was collected • Poor coordination with courier services • Issues related to routes of transport (e.g., lockdowns, route closure) • Batching of specimen	• Pilot electronic tracking of stool specimens[32] • Plan transport ahead of time, including plan for contingencies • Obtain special permission to transport samples, if needed • Identify alternative routes, carriers • Increase storage capacity, identify storing points • Don’t batch specimens • Prioritize samples for shipment in event of suspected polio case (“hot” case)

AFP = acute flaccid paralysis

[32] For more information, please refer to Objective Five of the GPSAP. A forthcoming guidance note will also be developed by the GPEI Surveillance Group on electronic specimen tracking.

Table F1 (continued)

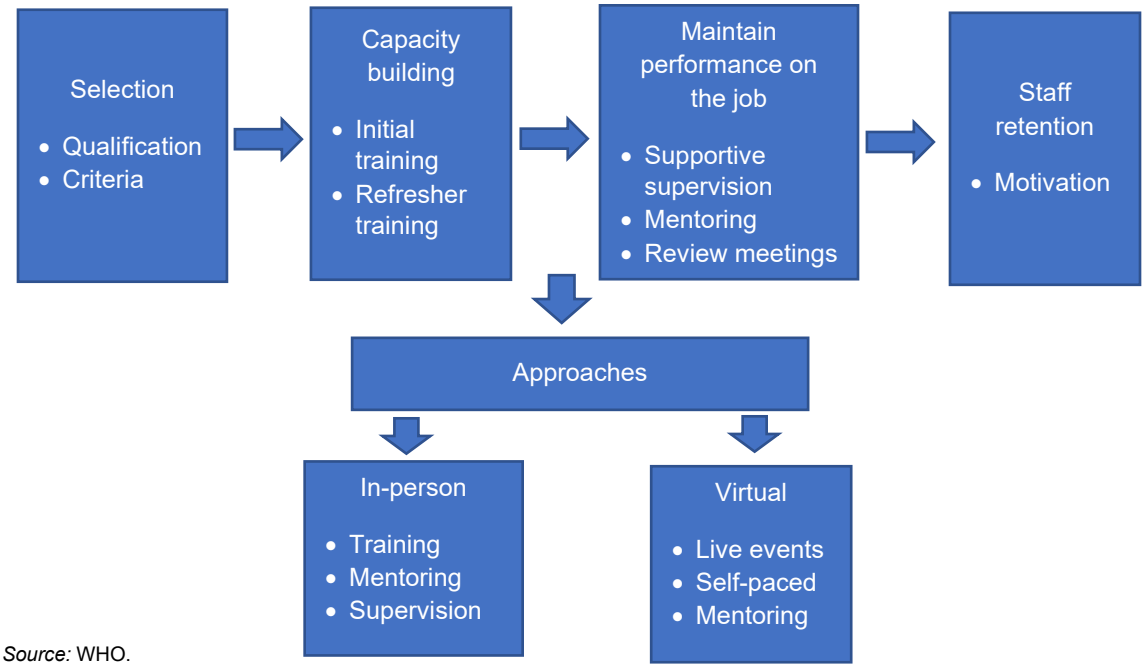
Stage	Target	Possible causes	Mitigation measures and possible solutions
Shipment to national level to arrival at national level	Stools 1+2 arrival at laboratory ≤ 3 days of collection of stool 2	• Poor planning for transport, shipment • Insecurity or road closures • Samples kept at national level until a number are collected and shipped ("batch" send-off) • International border closures • Suspension of flights	• Pilot electronic tracking of stool specimens • Create contingency plans with alternative routes or laboratory • Explore and pursue ad hoc solutions in case of conflict or insecurity (e.g., using humanitarian flights for transport; sending samples to an alternative WHO-accredited lab)
Arrival at national level to shipment to (inter)national laboratory	Stools 1+2 arrival at laboratory ≤ 3 days of collection of stool 2 (*Ideally immediately*)		
Shipment to (inter)national laboratory to arrival at (inter)national laboratory	Stools 1+2 arrival at laboratory ≤ 3 days of collection of stool 2		
Arrival at (inter)national laboratory to final results **(i.e., negative results or sequencing results for positive specimens)**	Stools 1+2 are processed following standard GPLN procedures within defined GPLN target times for all procedures	• International border closures • Issues with shipping isolates to sequencing laboratory • Shortage of critical reagents • Ambiguities in testing outcomes (e.g., mismatched or missing EPID numbers, suspicion of cross-contamination). • Receipt of large batches of specimens.	• Ensure a minimum buffer stock (critical consumables and reagents) for a one-year workload when placing orders for 2022 • Secure a shipping contract with several in-country couriers • Develop an alternative domestic and international shipping plan with different sequencing laboratories

EPID = epidemiological; GPLN = Global Polio Laboratory Network; WHO = World Health Organization

ANNEX G. FACILITATING A SKILLED SURVEILLANCE WORKFORCE

A skilled workforce is essential for a well-functioning surveillance system. To facilitate a skilled workforce, surveillance managers should aim to implement a wide spectrum of activities that help to build and sustain human capacity (**Fig. G1**), taking note of the approaches outlined below.

Fig. G1. Spectrum of activities to build and sustain a skilled workforce



Source: WHO.

Selection: The selection of surveillance officers, supervisors, and community-based surveillance (CBS) informants should be based on a candidate's ability to perform the role and their potential for development. Gender balance and appropriateness to cultural and social norms should be prioritized and upheld for all roles.

Capacity building: While capacity building is a larger function that represents a shared responsibility between managers and staff (**Fig. G2**), it is fundamentally rooted in training. All surveillance staff should be equipped with an initial training and advanced formal trainings, offered either in-person or virtually, at least every two years and with regular refresher trainings, preferably with certificates that reference a validity period, such as an annual certification.

Fig. G2. Shared responsibilities within capacity building

Source: WHO.

Maintaining performance: Managers should follow through on training and capacity building to make sure field staff are supported in their roles – so their skills are applied and further developed.

- One-on-one mentoring helps to build field staff capacity and confidence. As part of their mentoring and monitoring roles, managers should conduct regular active surveillance visits and case investigations with field staff, where they can provide on-the-job demonstration and real-life examples. Ad hoc mentoring opportunities should also be offered, based on needs.
- Supportive supervision should follow a predefined plan, using checklists for staff performance and other documentation, including staff feedback and follow-up on potential corrective actions.
- Managers should hold review meetings – both regular group review meetings and one-on-one personal reviews – to discuss performance, provide updates, and set objectives and goals.

Staff retention: Retention among staff is bolstered when managers prioritize supportive supervision, reward and recognize good performers, advocate for career development, add motivational inputs during meetings (focusing on contribution to the "big picture"), and involve celebrities and well-known figures to elevate the public perception of the programme.

The Surveillance Group is finalizing *Global Guidelines for Acute Flaccid Paralysis (AFP) and Poliovirus Surveillance* and a related polio surveillance training package, which are being updated to reflect the priorities, indicators, and targets of the GPEI Strategy. These resources should be available by Q1 2022. Regional offices and country programmes are expected to adapt this material to suit the local context. For further information, contact your regional polio/VPD surveillance focal point.

Table G1. Skilled workforce resources

Area	Resource
Polio-related sites	• Polio surveillance guidelines, guidance documents, job aids, checklists are available on the GPEI website under Tools, Protocols and Guidelines • Polio Health Topic on the WHO website • OpenWHO courses available in English and French • UNICEF's Agora e-courses on polio and public health
Basic generic skills	• Immunization Academy's video training • The CDC Public Health 101 series • The Laboratory Safety Institute
E-learning and virtual mentoring	• E-learning methodologies and good practices (UN Food and Agricultural Organization) • Best practices for virtual mentoring (Together Platform) • 7 Lessons Learned from 7 Months of Remote Mentoring (Towards Data Science blog) • Building human capacity (The 3 by 5 initiative for HIV/AIDS)
Gender	• Gender and Polio Surveillance Training available in English and French. To inquire about availability, contact Corey.Peak@gatesfoundation.org. • Gender dimension of acute flaccid paralysis surveillance in Nigeria (International Journal of Gender & Women's Studies) • Gender mainstreaming for health managers: a practical approach (WHO)

CDC = U.S. Centers for Disease Control and Prevention; GPEI = Global Polio Eradication Initiative; UNICEF = United Nations Children's Fund; WHO = World Health Organization

ANNEX H. INTEGRATION OF POLIOVIRUS SURVEILLANCE

For over 30 years, the Global Polio Eradication Initiative (GPEI) has financially supported the WHO polio eradication programme. With the foreseeable closure of the GPEI when eradication is declared, GPEI funding will stop. This presents a risk to sustaining eradication, as many countries are heavily reliant on GPEI infrastructure and have benefitted from GPEI support for broader public health interventions.

What is the difference between transition and integration?

"Integration" and "transition" are separate but interrelated processes.

- **Polio transition** aims to sustain and, where needed, repurpose the network and infrastructure set up to eradicate polio to strengthen broader health priorities, especially essential immunization, disease detection, and emergency preparedness and response. Transition is the process of mainstreaming GPEI supported functions into country health systems and shifting GPEI funding to country governments.[33]
- **Polio integration** is defined by the GPEI Strategy as "joint efforts between the polio eradication programme and a range of partners with the objective of improving immunization [and surveillance] outcomes in targeted geographies."[34] Integration for surveillance is pursued primarily through strengthened collaboration with other programmes.

Why is integration needed?

- Transition is expected to occur in a phased approach. This phased approach can occur through integration, where support from GPEI partners will still be needed until the governments and/or other partners are ready to take over.
- Integration is an essential element of the new GPEI Strategy and integral to the Immunization Agenda 2030 (IA 2030), as well as the Gavi 5.0 Strategic Plan (2021–2025) – each of which is committed to working in a systematic and integrated way to protect populations.[35] The overarching goals encompassed by these strategies are not only to achieve and sustain polio eradication, but also to attain broader aspirations of reaching underimmunized and "zero dose" children to reduce mortality and morbidity from vaccine-preventable diseases (VPDs) across the life cycle.
- The COVID-19 pandemic, on the one hand, has had a negative impact on key surveillance and immunization activities for polio and other VPDs and temporarily halted polio transition. On the other hand, polio eradication assets have played a crucial role in fighting the pandemic using polio staff, structures, information systems, and working methods. This situation opened up insights and opportunities as to how to deliver integrated service using quick innovative approaches. To support pandemic response while delivering polio and broader immunization and surveillance activities, the GPEI and the Expanded Programme on Immunization (EPI) accelerated their integration initiative and launched an interim Programme of Work for Integrated

[33] Polio transition is guided by the Strategic Action Plan on Polio Transition (2018–2023). The latest report on polio transition is available in: Seventy-second World Health Assembly. Geneva, 10 May 2019. Geneva: World Health Organization; 2019 (https://www.who.int/polio-transition/A72_10-en-2.pdf). The polio transition group can be contacted at: polio-transition@who.int.
[34] Global Polio Eradication Initiative (GPEI). Polio Eradication Strategy 2022–2026: Delivering on a promise. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/bitstream/handle/10665/345967/9789240031937-eng.pdf).
[35] Immunization Agenda 2030: A global strategy to leave no one behind (IA2030). WHO Immunization, Vaccines and Biologicals (IVB). Geneva: World Health Organization; 2020 (https://www.who.int/teams/immunization-vaccines-and-biologicals/strategies/ia2030). Gavi, the Vaccine Alliance. Phase V Strategy (2021–2025). Geneva: Gavi, the Vaccine Alliance; 2019 (https://www.gavi.org/our-alliance/strategy/phase-5-2021-2025).

Actions in the context of COVID-19 (iPOW).[36] The iPOW provides guidance to synergize polio eradication and EPI efforts in mutually beneficial areas. By building upon this spirit of cooperation, joint planning, and emergency response, polio eradication can be achieved amid competing health priorities and in a resource-limited environment.

What are the risks related to integration?

There is a risk that the quality and overall sensitivity of polio surveillance in priority countries will be compromised due to poorly planned or poorly implemented integration (i.e., as a result of insufficient or inadequate resources, diffusion of responsibility, or lack or dilution of management and oversight structures).

What part of polio surveillance can be integrated?

The following technical areas of work and enabling functions are well suited to be aligned and integrated with programmes and departments implementing surveillance for epidemic-prone VPDs. Except for endemic countries, a broad process of integration has been ongoing for many years. To support surveillance integration in endemic countries ahead of eradication and certification, it will be imperative to have a baseline assessment of the current level of integration of the polio surveillance system.

Table H1. Potential areas of integration in all priority countries

Area of work	Activities and processes for integration
AFP surveillance	• Active surveillance, CBS, supervision, surveillance reviews, specimen transport
ES surveillance	• Collection, supervision, transport of samples for polio and other pathogens
Laboratory surveillance	• Integrate national poliovirus laboratories with other viral or infectious diseases
Information systems	• Information systems, electronic data collection tools, GIS data, data analysis, and risk assessment
Management & coordination	• Integrated strategic planning at the country, regional, and global levels • Technical and operational management, including staff management and capacity building

AFP = acute flaccid paralysis; CBS = community-based surveillance; ES = environmental surveillance; GIS = geographic information system

How should integration be best approached?

Integrating surveillance systems cannot take a “one size fits all” approach. Surveillance systems must be adapted to the needs of the country, as countries have different demographics and different levels of technical capacity, face different economic and geopolitical challenges, and are at different stages of epidemiological transition. These underlying factors are the country-specific fundamentals that, taken in addition to disease-specific risk, determine a country’s capacity to tackle challenges.

Key actions to support successful surveillance integration include:

- internalizing that surveillance strategy is not a one-size-fits-all endeavour and ensuring surveillance strategies are adapted to the local context;
- providing country-level technical, financial and other support to priority countries that have the greatest gap in capacity;

[36] Global Polio Eradication Initiative (GPEI). Polio Eradication and Essential Programme on Immunization Interim Programme of Work for Integrated Actions in the context of the COVID-19 pandemic. Geneva: World Health Organization; 2020 (https://polioeradication.org/wp-content/uploads/2020/09/Integration-POW-under-Covid-v2.0.pdf).

- focusing on surveillance quality and not quantity, as success is not defined by the number of VPDs targeted by the system but by surveillance quality and sensitivity for the highest priority VPDs; and
- identifying an ambitious long-term goal while developing a clear, targeted short-term action plan.

Steps that can be taken to ensure integration works for the country include:

- creating a unified surveillance and analytics team as a one-stop-shop for all surveillance and analytics needs;
- developing one harmonized surveillance operational plan at the country level;
- building targeted human resource capacity at both the national and subnational levels;
- harmonizing field guidance and data collection tools; and
- harmonizing data and information management infrastructure.

Next steps

Regions and countries have taken different approaches and are at different stages of endorsement and implementation of integration and transition. However, for integration to be successful, the programme must systematically review and promote integration at each and every step of the polio surveillance processes at the country, regional, and global levels, with a focus on priority countries.

To achieve successful integration, a few priority countries will be prioritized for early implementation. The GPEI has already taken steps and some integrated activities are proposed in this GPSAP. The Surveillance Group will further advance integration by working with other stakeholders working on surveillance for epidemic-prone VPDs to jointly develop a roadmap that: clearly defines the vision for surveillance integration in priority countries, and addresses the operational steps of integration in priority countries, while ensuring coordination at the country, regional, and global levels.

ANNEX I. GENDER AND POLIO SURVEILLANCE

If gender roles, norms and relations are not adequately understood, analysed, and addressed, polio eradication interventions will not be as effective in reaching every last child.

The GPEI published its *Gender Equality Strategy 2019–2023* to provide both direction and scope for advancing equality and for strengthening gender mainstreaming across all interventions, strategies, and policies.[37] To support GPEI partners, regional offices, and country programmes toward greater gender mainstreaming, useful definitions and a gender-responsive assessment scale are provided below (**Table I1** and **Fig. I1**).

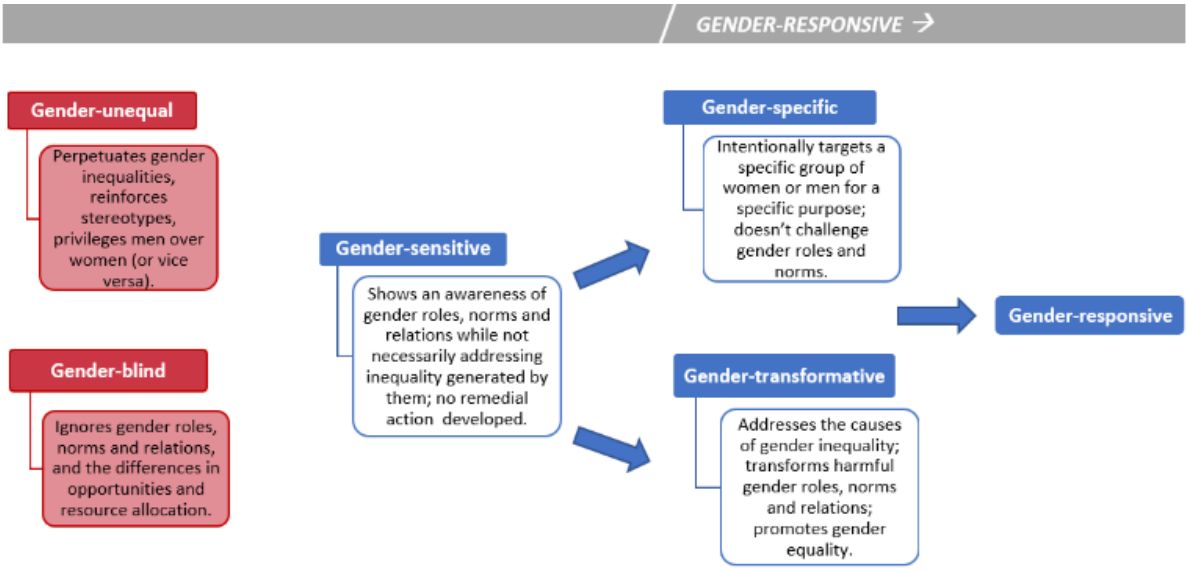
Table I1. Definitions related to gender

Term	Definition
Sex	Typically assigned at birth and refers to the biological characteristics that define people as female, male or intersex.
Gender	Refers to the socially constructed roles, norms, and behaviours that a given society considers appropriate for individuals based on the sex they were assigned at birth. Gender also shapes the relationships between and within groups of women and men.
Gender equity	The process of being fair to women and men. It recognizes that men and women have different needs, power, and access to resources, which should be identified and addressed in a manner that rectifies the imbalance. Addressing gender equity leads to equality.
Gender equality	The absence of discrimination based on a person's sex or gender. It means providing the same opportunity to each person, including access to and control of social, economic, and political resources, with protection under the law (such as health services, education and voting rights).
Gender mainstreaming	The process of assessing the implications for women, men, and gender diverse people of any planned action within a health system, including legislation, policies, programmes, or service delivery, in all technical areas and at all levels. It is a strategy for making the concerns and experiences of diverse women and men an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all spheres so that they benefit equally, and inequality is not perpetuated. Gender mainstreaming is not an end in itself but a strategy, an approach and a means to achieve the goal of gender equality.
Gender-sensitive	Programmes that show an awareness of gender roles, norms and relations while not necessarily addressing inequalities generated by them. No remedial actions are developed.
Gender-responsive	Programmes or policies where gender norms, roles and inequalities have been considered and measures have been taken to actively address them. They go beyond gender sensitivity and include gender-specific and gender-transformative actions.
Gender-specific	Programmes that intentionally target a specific group of women or men for a specific purpose, but don't challenge gender roles and norms.
Gender-transformative	Approaches that attempt to redefine and change existing gender roles, norms, attitudes, and practices. These interventions tackle the root causes of gender inequality and reshape unequal power relations.

*Definitions from the IA2030 Gender Annex (publication forthcoming) and from WHO's Gender Mainstreaming Manual for health managers and WHO Q&A: https://www.who.int/health-topics/gender#tab=tab_1 and https://www.who.int/news-room/questions-and-answers/item/gender-and-health.

[37] Global Polio Eradication Initiative (GPEI). Gender Equality Strategy 2019–2023. Geneva: World Health Organization; 2019 (https://polioeradication.org/wp-content/uploads/2020/10/Gender-Strategy.pdf).

Fig. I1. Gender-responsive assessment scale



Source: Adapted from WHO's Gender Responsive Assessment Scale: Criteria for assessing programmes and policies. Gender mainstreaming for health managers: a practical approach. Geneva: World Health Organization; 2011 (https://apps.who.int/iris/bitstream/handle/10665/44516/9789241501064_eng.pdf).

Gender-related delays in detection

In any context and especially in high-risk areas and with special populations, the polio surveillance system must be able to identify the stages at which gender norms, roles, and relations, as well as existing gender inequalities, may affect case detection and notification (**Table I2**).

To minimize the risk of gender-related delays in detection:

- Programmes are encouraged to collect and analyse sex-disaggregated data on a systematic basis, including through adapted case investigation forms (CIFs) and analytic tools, and identify stages with consistent, recurrent (over a 12- to 24-month period) delays in detection, notification, and investigation that may be linked to gender barriers.
- Where observed, surveillance officers and/or programme managers should conduct in-depth assessments with the support of the management and gender specialists and consider possible, locally acceptable actions to address the gaps (see **Table I2**).

When considering actions to inform and support surveillance interventions, always:

- collaborate with and reach out to women's groups, women's health committees, grassroots networks and other organizations with a strong understanding and influence around health-seeking behaviours, gender-related barriers, and children's health issues;
- consult with community authorities, religious leaders, opinion influencers, and elders, including women, to sensitize and negotiate access to women or households and increase women's participation;
- sensitize and promote fathers' and men's equal participation in childcare, caregiving, and household responsibilities and tasks; and
- ensure communication channels, tools, materials, and messages are context-specific, informed by gender analysis, and free from harmful gender stereotypes.

Table I2. Examples of gender-related barriers in surveillance detection and response

Stages	Possible issues and their causes	Possible actions
Onset of paralysis to care-seeking	Not seeking care or delay in seeking care: • women caregivers lack decision-making power and/or faces challenges or restrictions in mobility (lack of transport, money, time, multiple household duties, need of authorization to travel to health facility, and/or of a male escort/traveling companion) • low awareness and literacy rate of women caregivers and lack of access to health information in suitable formats • discriminatory attitude in health-seeking behaviour for female patients (e.g., boys' access to health care prioritized / delays in seeking care for girls, poor quality of services of health workers towards women) • absence of local female healthcare providers	• Carry out gender analysis/assessment to identify specific gender barriers to the context/setting • Advocate with local authorities • Sensitize community and involve men in sensitization and outreach activities • Adapt services to women's need (adapt opening times for health services, outreach surveillance activities, etc.)
Notification	Late or no notification due to: • insufficient knowledge and training opportunities provided for women care worker • unresponsive medical hierarchy when a female worker notifies an AFP case • active surveillance visits not conducted regularly and/or adequately due to lack of suitable modes of transport, and/or male escort • lack of women as community informants (e.g., in CBS) due to existing gender norms and roles	• Ensure availability of training for all staff • Engage with women workers at the forefront to identify and address their needs and challenges, esp. safety-related (e.g., timing of trainings, transport options, location) • Sensitize local health workers (including to security/safety considerations) • Ensure availability of safe and adequate transport for personnel • Reaching out to and collaborating with local women's groups to find solutions • Adjust CBS team composition
Case investigation and stool collection	Delayed investigation and/or stool collection due to: • insufficient training opportunities provided for women surveillance officers • lack of female surveillance officers needed to enter home of AFP case • inability of women caregivers to stay overnight in a health facility when case is hospitalized • safety and security risks faced by women workers	• Training of health care worker/surveillance officers takes into account gender-related challenges and barriers to women's participation (e.g., location, timing, transport, traveling companion if needed) • Adjust surveillance team composition • Sensitize local health system and/or community • Ensure safety of women working at the forefront

AFP = acute flaccid paralysis; CBS = community-based surveillance

Gender, the work environment, and organizational culture

Managers of polio surveillance must ensure that a gender lens is also applied to the programme both to promote gender equality and to address any gender-related barriers or other factors impacting the safety and performance of its staff, as well as their career advancement. An organization that neither promotes gender equality, nor responds to the needs of women and men in its policies and programming, nor enhances women's meaningful participation at all levels cannot provide a safe and enabling work environment and culture that maximizes its potential.

Actions to consider

- Increase women's equal and meaningful participation in the surveillance workforce at all levels and identify gaps in surveillance team composition that can contribute to deficiencies in case investigation (e.g., all-men teams not being able to access homes in certain contexts). This includes gender balance among supervisors.
- Identify specific needs and barriers faced by women frontline workers to increase women's participation (e.g., needs or barriers related to mobility, safety, transportation, equipment, literacy [including digital literacy], and training)
- Conduct mandatory training for all staff on preventing and responding to sexual exploitation, abuse, and harassment (PRSEAH).
- Share information about existing reporting and support mechanisms and systems in place to address all forms of sexual exploitation, abuse, or harassment.
- If not already in place, set up communication mechanisms for women involved in polio surveillance to be able to voice and discuss in confidence those issues impacting their physical and emotional wellbeing at work (e.g., mentorship, staff representative).
- Ensure that the gender module is included in all polio surveillance trainings, with a focus on a description of gender and gender-related barriers in surveillance.
- Institutionalize the systematic and regular provision of gender analysis in all reports.
- Ensure that training and sensitization sessions at health facilities or within communities:
    - include gender-related barriers to immunization and surveillance;
    - highlight equal parenting and shared caregiving responsibilities and promote fathers' equal participation in childcare, caregiving, and household tasks (preferring the words "parents and caregivers");
    - try to ensure that diverse women and men are represented in training visuals and images;
    - provide sex-disaggregated data and gender analysis whenever possible, where "real life" examples and illustrations are needed, and highlight the importance of collecting and analysing data disaggregated by sex in all monitoring and evaluation (M&E) activities; and
    - are accessible to all participants (e.g., facilities are safe and easily reached, timing is accommodating, seating arrangement is appropriate, and organizers and facilitators know how to facilitate sessions to ensure participation from all).

Gender-related indicators

The GPEI has identified surveillance indicators on gender and polio surveillance (**Table I3** and **Annex E**).

Table I3. Gender-related monitoring indicators

Indicators	Calculation (expressed as a percentage)
AFP detection – system	# of AFP cases** by sex with final lab results ≤35 days of onset / # of AFP cases
Timeliness of field activities	# of AFP cases by sex with 2 samples collected ≥ 24 hrs apart, both within 11 days of paralysis onset / # of reported AFP cases
Timeliness of notification	# of AFP cases by sex reported within 7 days of paralysis onset / # of reported AFP cases
Health contact	# of AFP cases by sex with ≤2 health care encounters between onset and before notification / # of AFP cases
Professional profile by sex (by category)	# of women [professional profile] / total # of staff or informants (by category: surveillance officer, supervisor, CBS informant)
Staff with completed PRSEAH	# of surveillance staff having completed PRSEAH training / # of staff

AFP = acute flaccid paralysis; CBS = community-based surveillance; PRSEAH = preventing and responding to sexual exploitation, abuse, and harassment
**Aggregated results: all lab results (AFP + contacts) used to classify AFP case as confirmed/discarded

Table I4. Resources on gender and health

Area	Resource
GPEI resources	• Gender Equality Strategy 2019–2023 (2019) • Technical Brief: Gender (2018)
Guidance tools and resources	• WHO. *Gender Analysis Matrix* (GAM) and *Gender Analysis Questions* (GAQ) in Gender mainstreaming for health managers: a practical approach (2011) • Jhpiego. Gender analysis toolkit for health systems (2016) • UNICEF Regional Office for South Asia. Gender toolkit: Integrating gender in programming for every child in South Asia (2018) • UNICEF Regional Office for South Asia. Gender-responsive communication for development: guidance, tools, and resources (2018) • UNICEF Regional Office for South Asia. Immunization and gender: a practical guide to integrate a gender lens into immunization programmes (2019)

ANNEX J. BUDGET AND FINANCE

As part of the eradication effort, the Global Polio Eradication Initiative (GPEI) provides direct funding support for surveillance to countries, usually via the World Health Organization (WHO) but also as direct support by specific GPEI partners to countries, regions, or other stakeholders. GPEI funds that are included in the official GPEI-approved budget are referred to as GPEI financial resource requirements (FRR). Other support provided by partners and donors are considered non-FRR support.

To ensure the programme delivers on the surveillance-related objectives of the GPEI Strategy, particularly as it relates to the timeliness of detection, the GPEI Surveillance Group worked with WHO regional offices to develop surveillance plans and budgets for all countries. The Surveillance Group submitted a budget proposal to the GPEI Strategy Committee, and a final surveillance budget of US$ 155 million was submitted to and approved by the Polio Oversight Board as part of the overall GPEI financial resource requirements for 2022 (**Table J1**).

Table J1. GPEI surveillance budget, financial resource requirements, 2022

Region	Cost centre	Technical assistance	Surveillance running cost	Laboratory	Total
AFR	AFRO	1,864,000	850,000	4,700,000	7,414,000
	Angola	1,592,000	1,137,000		2,729,000
	Cameroon	184,000	1,137,000		1,321,000
	Chad	970,000	1,750,000		2,720,000
	DR Congo	2,256,000	2,887,000		5,143,000
	Ethiopia	1,011,000	2,187,000		3,198,000
	Guinea	199,000	370,000		569,000
	Kenya	593,000	775,000		1,368,000
	Niger	657,000	1,079,000		1,736,000
	Nigeria	12,800,000	8,443,000	2,919,000	24,162,000
	South Sudan	658,000	2,975,000		3,633,000
AMR	AMRO		701,000	267,000	968,000
EMR	EMRO	2,753,000	1,080,000	1,210,000	5,043,000
	Afghanistan	8,722,000	13,224,000		21,946,000
	Pakistan	4,466,000	19,489,000	3,000,000	26,955,000
	Somalia	805,000	4,136,000		4,941,000
	Syria			24,000	24,000
	Yemen			49,000	49,000
EUR	EURO	251,000	670,000	514,000	1,435,000
HQ	Global/HQ	3,239,000	21,750,000*	12,000,000	36,989,000
SEAR	SEARO		675,000	1,289,000	1,964,000
	Myanmar			16,000	16,000
	Bangladesh			55,000	55,000
	Indonesia			68,000	68,000
	Nepal			6,000	6,000
WPR	WPRO	129,000	185,000	437,000	751,000

AFR = African Region; AFRO = African Regional Office; AMR = Region of the Americas; AMRO = Regional office of the Americas; EMR = Eastern Mediterranean Region; EMRO = Eastern Mediterranean Regional Office; EUR = European Region; EURO = European Regional Office; HQ = Headquarters; SEAR = South-East Asia Region; SEARO = South-East Asia Regional Office; WPR = Western Pacific Region; WPRO = Western Pacific Regional Office

The approved budget includes support for technical assistance and surveillance running costs for two WPV-endemic countries, 10 priority countries in the African Region, and one priority non-endemic country in the Eastern Mediterranean Region. Support for Afghanistan, Pakistan, and Nigeria constitute 47% of the overall budget. The overall approved budget also includes allocations for capacity building, environmental surveillance (ES) expansion, and investment in the data and information management infrastructure.

Under this approved budget, laboratory costs have increased by 110% to US$ 26.5 million in 2022. In addition to maintaining full support for the laboratory, the budget includes additional support for new initiatives such as direct detection (DD), sequencing capacity expansion, and overall strengthening of laboratory capacity.

Non-FRR

Not all activities included in the GPSAP 2022–2024 are funded through the GPEI FRR budget. Successful implementation of the GPSAP will depend upon non-FRR contributions as well, which support critical core activities and new initiatives. **Table J2** below summarizes non-FRR support for 2022. This support covers core surveillance costs in non-WPV endemic countries that are funded through the WHO base budget, support for community-based surveillance (CBS) in high-risk countries, investment in information and data management infrastructure, including upgrading the archaic information for action (IFA) system and additional support for innovation.

Table J2. Financial support for surveillance outside the GPEI's financial resource requirements, 2022

	Non-FRR total	WHO*	BMGF	CDC	USAID
Surveillance running cost	48,928,879	?	32,726,048	7,202,831	9,000,000
Field surveillance (AFP and ES)	38,271,539	?	22,588,708	6,682,831	9,000,000
Data and information management	10,657,340	?	10,137,340	520,000	
Laboratory	10,809,572	0	2,499,199	8,310,373	
Technical assistance	-	?			
Total	59,738,451	-	35,225,247	15,513,204	9,000,000

AFP = acute flaccid paralysis; BMGF = Bill & Melinda Gates Foundation; CDC = U.S. Centers for Disease Control and Prevention; ES = environmental surveillance; Non-FRR = non-financial resource requirements; USAID = U.S. Agency for International Development; WHO = World Health Organization

Additional needs

Considering the push to enhance surveillance quality across all priority countries, targeted surveillance enhancement measures may be required. When these needs arise, the Surveillance Group will review proposed plans including any additional resource requirement. In accordance with established process and procedure, if additional resource requirement cannot be met within the approved budget, the Surveillance Group will submit the proposal for consideration to the GPEI Strategy Committee.

Next steps

The Surveillance Group will carry out the following M&E activities:

- ✓ On a monthly basis, produce FRR utilization summaries by cost centre, to be shared with all relevant offices.
- ✓ On a quarterly basis, conduct a joint review of programme implementation, including utilization of FRR allocations.
- ✓ On a biannual basis, include a narrative on FRR utilization in the Surveillance Group's report to the Strategy Committee.
- ✓ On an annual basis, assess overall surveillance funding outlook, including non-FRR and include in annual feedback to the Strategy Committee.

ANNEX K. RESOURCES

Programme information

- Global Polio Eradication Initiative (website) - http://polioeradication.org/
  The GPEI website includes updated global counts on wild and vaccine-derived poliovirus.
- Polio Eradication Strategy 2022–2026: Delivering on a promise. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/bitstream/handle/10665/345967/9789240031937-eng.pdf).
  Available in English, 中文, Français, Русский, Español at: https://polioeradication.org/gpei-strategy-2022-2026
- Global Polio Surveillance Action Plan, 2018–2020. Geneva: World Health Organization; 2018 (https://polioeradication.org/wp-content/uploads/2016/07/GPEI-global-polio-surveillance-action-plan-2018-2020-EN-1.pdf).

Acute flaccid paralysis (AFP) surveillance

- Global Guidelines for Acute Flaccid Paralysis (AFP) and Poliovirus Surveillance. In preparation.
- Interim Quick Reference on Strengthening Polio Surveillance during a Poliovirus Outbreak. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2021/12/Quick-Reference_Strengthening-Surveillance-during-Poliovirus-Outbreaks_24-March-2021.pdf).
- Guidelines for Implementing Polio Surveillance in Hard-to-Reach Areas & Populations. Geneva: World Health Organization; 2018 (https://polioeradication.org/wp-content/uploads/2020/10/Guidelines-polio-surveillance-H2R-areas.pdf).
- Job Aid: Use of AFP contact sampling and targeted healthy children stool sampling. Geneva: World Health Organization; 2020 (https://polioeradication.org/wp-content/uploads/2020/03/AFP-contact-sampling-and-targeted-healthy-children-stool-sampling-20200327.pdf).

Environmental surveillance (ES)

- Field Guidance for the Implementation of Environmental Surveillance for Poliovirus. In preparation.
- Guidelines on Environmental Surveillance for the Detection of Polioviruses. Geneva: World Health Organization; 2015 (polioeradication.org/wp-content/uploads/2016/07/GPLN_GuidelinesES_April2015.pdf).
- Standard Operating Procedures for Polio Environmental Surveillance Enhancement Following Investigation of a Poliovirus Event or Outbreak. Geneva: World Health Organization; 2020 (https://polioeradication.org/wp-content/uploads/2021/02/SOPs-for-Polio-ES-enhancement-following-outbreak-20210208.pdf).
- Abdullahi WH, Blake IM, Sume G, Braka F, Jimoh A, Dahiru H, Bonos M, et al. Characterizing Environmental Surveillance Sites in Nigeria and Their Sensitivity to Detect Poliovirus and Other Enteroviruses. J Infect Dis. 2020; jiaa175,1-10 (https://doi.org/10.1093/infdis/jiaa175).

nOPV2 implementation – post-deployment monitoring for surveillance

- Polio Field and Laboratory Surveillance Requirements in the Context of nOPV2 Use. Geneva: World Health Organization; 2021 (https://polioeradication.org/wp-content/uploads/2020/12/Polio-Field-and-Laboratory-Surveillance-requirements-in-the-context-of-nOPV2-use-20201218.pdf).

Community-based surveillance (CBS)

- Technical Contributors to the June 2018 WHO meeting. A definition for community-based surveillance and a way forward: results of the WHO global technical meeting, France, 26 to 28 June 2018. Euro Surveill. 2019;24(2): pii=1800681 (https://doi.org/10.2807/1560-7917.ES.2019.24.2.1800681).

Immunodeficiency-association vaccine-derived poliovirus (iVDPV) surveillance

- Guidelines for Implementing Poliovirus Surveillance among Patients with Primary Immunodeficiency Disorders (PIDs). Geneva: World Health Organization; 2019 (https://polioeradication.org/wp-content/uploads/2020/12/Guidelines-for-Implementing-PID-Suveillance-3.3-20201215.pdf).

- Li L, Ivanova O, Driss N, Tiongco-Recto M, da Silva R, Shahmahmoodi S, Sazzad H, Mach O, Kahn AL, Sutter RW. Poliovirus excretion among persons with primary immune deficiency disorders: summary of a seven-country study series. J Infect Dis. 2014;210 Suppl 1, S368-372 (https://doi.org/10.1093/infdis/jiu065).

Poliovirus testing

- Department of Immunization, Vaccines and Biologicals. WHO Polio Laboratory Manual 4th ed. Geneva, Switzerland: World Health Organization; 2004 (https://apps.who.int/iris/bitstream/handle/10665/68762/WHO_IVB_04.10.pdf).

Gender

- WHO task team for preventing and responding to sexual exploitation, abuse and harassment (website) - https://www.who.int/initiatives/preventing-and-responding-to-sexual-exploitation-abuse-and-harassment.
- Information on Policy Directive on Protection from sexual exploitation and sexual abuse (SEA). Geneva: World Health Organization; 2021 (https://www.who.int/publications/m/item/information-on-policy-directive-on-protection-from-sexual-exploitation-and-sexual-abuse-(sea)).

COVID-19

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