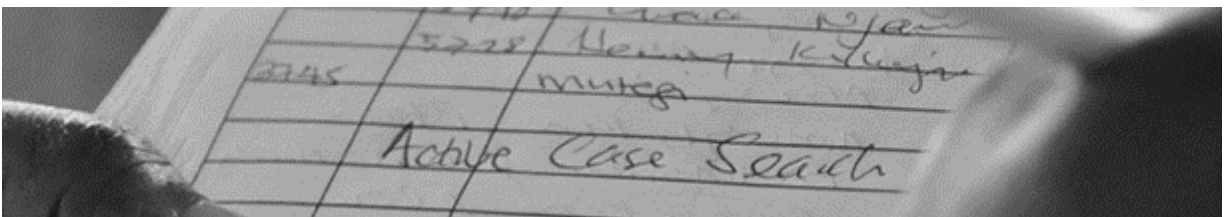




**Guidelines for
Implementing
Polio Surveillance in
Hard-to-Reach
Areas & Populations**



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Their dedication to finding the last remnants of poliovirus in the hardest-to-reach areas and populations deserves the highest praise, as they have provided the programme with a blueprint for polio surveillance in the final stages of global eradication.

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Acronyms

ACS	Active case search
AFP	Acute flaccid paralysis
AFR	WHO African region
AVADAR	Auto-Visual AFP Detection and Reporting System
bOPV	Bivalent oral poliovirus vaccine
CBS	Community-based surveillance
CIF	Case Investigation Form
DEM	Digital elevation map
EMR	WHO Eastern Mediterranean region
ERC	Expert Review Committee
ES	Environmental surveillance
EVS	Enterovirus surveillance
EWARN	Emergency Warning and Response Network
GCC	Global Commission for the Certification of Poliomyelitis Eradication
GIS	Geographic information system
GPLN	Global Polio Laboratory Network
HF	Health facility
IDP	Internally displaced population
IOM	International Organization for Migration
mOPV	Monovalent oral poliovirus vaccine
MSF	Médecins Sans Frontières (Doctors without Borders)
INGO	International nongovernmental organization
NPAFP	Non-polio acute flaccid paralysis
NPEV	Non-polio enterovirus
NGO	Nongovernmental organization
OCHA	Office for the Coordination of Humanitarian Affairs
OPV	Oral poliovirus vaccine
RCC	Regional Certification Commission
RI	Routine immunization
RW	Residual weakness
SIA	Supplemental immunization activities
SMS	Short messaging service
tOPV	Trivalent oral poliovirus vaccine
UNDP	United Nations Development Programmes
UNHCR	United Nations High Commissioner for Refugees
USSD	Unstructured Supplementary Service Data
VDPV	Vaccine-derived poliovirus
WASH	Water, sanitation, and hygiene
WPV	Wild poliovirus

1. Introduction

As the world nears the achievement of interrupting poliovirus transmission and certifying global wild poliovirus (WPV) eradication, surveillance continues to be critical to the eradication effort. Through its ability to detect any virus circulation, importation, and emergence – or provide evidence of its absence—surveillance is a defining criterion for certifying eradication.

The remaining non-certified regions, the Eastern Mediterranean Region (EMR) and African Region (AFR), face unique challenges in the fight to achieve eradication due to access-compromised and hard-to-reach areas and populations. Areas may become access-compromised due to conflict and insecurity, or they may be hard-to reach due to geographical barriers such as difficult terrain and poor roads. When geographical barriers or security issues impede access entirely, such areas and the people living within them become inaccessible. Through migration and displacement, populations may become hard to reach – or their movement may create a window of opportunity for access. Even with populations that are stably within reach, political or cultural factors may impede community acceptance and access to healthcare and vaccination services. Overall, these conditions impact a country's ability to conduct immunization and surveillance activities.

In its July 2017 meeting, the Global Commission for the Certification of Poliomyelitis Eradication (GCC) emphasised that acute flaccid paralysis (AFP) surveillance remains the “gold standard” for polio surveillance. However, with access-compromised areas and hard-to-reach populations and areas, traditional AFP surveillance indicators should be supplemented by assessments “beyond the indicators”. Furthermore, additional surveillance strategies will be necessary in and around such areas where traditional AFP surveillance is not possible, to provide evidence that virus can be detected if circulating. During the certification process, it will be essential to gather specific information on access-compromised areas and hard-to-reach populations. This information will include the results of additional surveillance activities and feedback on the quality of these activities. It will also include detailed quarterly risk analyses conducted by regional and country teams to identify surveillance challenges or gaps and plan appropriate mitigating measures.

AFP surveillance as a technical field has refined traditional methods, enhanced newer strategies, and developed innovative approaches to support poliovirus detection and response – and it has achieved this amidst difficult challenges. Such adopted strategies carry lessons that need to be documented to allow for the sharing of best practices and the exchange of experience, where needed.

This document thus details supplemental AFP surveillance strategies – their design, scale, and impact – to promote their use and to advance the development of additional indicators that will play a crucial role in certifying global WPV eradication. The guidelines are provided for country teams, mid-level managers, and surveillance staff at all levels.

2. Risk assessment and mapping

All countries need to identify, map, and estimate population sizes for high-risk, access-compromised, and hard-to-reach areas and populations. These areas and populations require special plans and additional strategies and resources. They also require regular updates. All risk assessment, identification, and mapping should be developed in close coordination with Ministries of Health and authorities at all levels of the country, where possible, and adapted to meet the particular country context.

The process of risk assessment and mapping includes:

1. Mapping all access- and security-compromised areas with regular updates from all available data on accessibility, using 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, nongovernmental organizations (NGOs), and other sources.
2. Mapping all hard-to-reach areas which may need special logistical planning.
3. Mapping all hard-to-reach and/or underserved populations: refugees, internally displaced populations (IDPs), economic migrant populations, nomadic populations, fishing communities, mining communities, border communities, ethnic minority populations, and others.
4. Mapping and profiling all resources in the area: healthcare providers and facilities (public and private, for-profit and non-profit, military and civilian), key community actors (leaders, traditional healers, faith leaders), NGOs, humanitarian agencies, and Medical Corp of the military, if required in a few special situations.
5. Using distinct indicators to assess risk, identify gaps, and rank administrative units, such as district and subdistricts. This risk analysis should include:
 - Risk of missing poliovirus transmission
 - Risk of importation
 - Risk of transmission and spread of virus
 - Risk of vaccine-derived poliovirus (VDPV) emergence
6. Developing plans to address these risks, close gaps, and ensure reach and geographic and demographic representativeness of surveillance. The following sections in this document highlight different strategies and activities that can be included in the country plans, including monitoring the plan's implementation by looking at disaggregated data (see section 14).

3. Coordination

Definition	Coordination is the process of involving all stakeholders for the purposes of delivering services in a given population or area.
Rationale	Conducting surveillance in hard-to-reach areas poses different and complex challenges requiring effective engagement of all stakeholders to avoid duplications, capitalize on all possible opportunities, ensure effective use of resources, and minimize barriers to the implementation of activities.
Procedure (Steps)	<p>As an activity area, coordination involves:</p> <ol style="list-style-type: none"> 1. Identifying stakeholders, including social services sector (e.g., health; education; water, sanitation, and hygiene [WASH]; and veterinary services), relevant UN agencies and NGOs, and key influencers (e.g., tribal, religious, or political leaders) 2. Identifying the strengths/interest of different stakeholders, assessing the merits and demerits of their involvement or engagement 3. Identifying sector leads and focal points 4. Defining different coordination and engagement processes for different categories of stakeholders <ul style="list-style-type: none"> ○ Note: While coordination often falls under country-specific teams, cross-border coordination within countries and between neighbouring countries is important for cross-notification of cases.
Challenges and Anticipated Issues	<p>Coordination faces challenges such as:</p> <ul style="list-style-type: none"> • Competing priorities • Differing areas of interest for partners and a desire to own particular parts of the process • Lack of effective communication • Undue expectations of communities that can threaten participation and trust • Lack of negotiation skills • Lack of supervision and accountability framework
Enabling Factors and Tips for Success	<p>Optimal coordination is facilitated by:</p> <ul style="list-style-type: none"> • Transparency and visibility of all activities • Strong organizational skills • Clear division of tasks • Joint planning to achieve a common goal • Working as one team • Speedy feedback and communication

4. Negotiation

Definition	<p>Negotiation is a discussion aimed at reaching an agreement.</p> <p>Note: The below refers mainly to conflict-affected areas but it can be adapted to other situations in which negotiation is necessary.</p>
Rationale	<p>Conflict-affected and hard-to-reach areas and populations usually pose complex challenges, which may be met through effective negotiations aimed at reaching an agreement with one or more factions to support the ability to conduct surveillance. Negotiation helps to reduce barriers, strengthen engagement and collaboration, minimize tension, resolve differences, provide potential opportunities, use resources efficiently, and ensure the security and safety of frontline workers and beneficiaries.</p>
Procedure (Steps)	<p>As an activity, negotiation involves the following steps to open a dialogue:</p> <ol style="list-style-type: none"> 1. Identify stakeholders: partner agencies and local actors, social sector service, key influencers, NGOs, and UN agencies. Negotiation for conflict areas should also include parties of conflict (e.g., security forces and rebels or insurgents, if applicable). 2. Identify any shared interests and points of divergence for each stakeholder 3. Define different negotiation approaches and channels 4. Select an appropriate team of negotiators from all stakeholders, particularly local key influencers
Challenges and Anticipated Issues	<p>Negotiation can have challenges, such as:</p> <ul style="list-style-type: none"> • The groups identified for engagement may not be invested with the power to decide. • In some situations, negotiations may have to start without formal approval. • It may be challenging or impossible to supervise and monitor activities, meet the expectations of every stakeholder, and ensure accountability that, if not upheld, may jeopardize future negotiations. • Negotiations may become complicated when the process must proceed with each faction separately due to multiple groups in conflict. • Groups may not have skills in dialogue. • It may be difficult and time-consuming to build and sustain trust across parties. • The dynamic of the situation may compromise the negotiation. • A win-win situation may be difficult to achieve. • Sustainability of the agreement may be difficult to attain. • Additional resources may be required.
Enabling Factors and Tips for Success	<p>It is essential to ensure neutrality and keep activities related to surveillance apolitical. Public health staff care about protecting all children, no matter who they are or where they live. With this in mind, a successful, productive negotiation is also facilitated by:</p> <ul style="list-style-type: none"> • Knowledge of the political, cultural, and social background of the area. • The availability of a motivated team of skilled negotiators. • A willingness to negotiate on behalf of the parties involved.

	<ul style="list-style-type: none">• Consistency and reliability of all partners, working as one team with one voice.• Transparency as a guiding principle for ensuring confidentiality and building confidence.• Anticipating demands and accurately assessing your capacity to meet those demands; do not offer or promise what you cannot meet and make sure you can live up to your agreements.• In some situations, it is important to keep the negotiations to a low profile.• Flexibility with caution is important.
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5. Adjusting surveillance reporting network

Definition	Adjusting a surveillance reporting network refers to the adaptation of surveillance reporting networks and adjustment of population figures in response to changes on the ground.
Rationale	Conflicts usually result in population movements within countries and across borders, which may produce a disruption of services, loss of staff, or change in access for surveillance. In addition, surveillance sensitivity needs to be adjusted for any significant change in population in a given area due to any reason. The surveillance reporting network needs to adapt and respond to the changes in demography, infrastructure, and access in order to maintain the ability to detect AFP cases that show the presence or absence of polioviruses in an ever-changing environment.
Procedure (Steps)	<p>Adjusting surveillance depends upon the situation.</p> <ol style="list-style-type: none"> 1. Start by describing the change on the ground. <ul style="list-style-type: none"> – Have a clear understanding of the disruption: its nature, extent, and anticipated duration, if possible. – Profile the affected populations (whether leaving or entering the area – e.g., IDPs, refugees, nomads), the itineraries of mobile populations, and any change in access (newly accessible or inaccessible areas). – Detail changes in populations size. 2. Identify the impact of the disruption on the infrastructure of the area (e.g., means of communication, buildings, health institutions). 3. Map and profile any available resources (including health facilities, OCHA, and other UN agencies, Red Cross, Médecins Sans Frontières [MSF], NGOs, international NGOs [INGOs] and professional bodies), their capacities and willingness to participate. <p>Examples of adaptations include:</p> <ul style="list-style-type: none"> • Reviewing and revising the list of surveillance reporting sites and their prioritization to include new reporting sites or exclude some existing ones based on: <ul style="list-style-type: none"> – Workload (including cessation of activity) and expertise of health facilities – Health-seeking behaviour of a community (if there is no data, conduct a focus group discussion) • Identifying new focal points from different groups/communities as part of the network (e.g., nomads, IDPs, refugees, immigrants) • Collaborating and coordinating with existing partners or stakeholders (e.g., Emergency Warning and Response Network [EWARN], Health Cluster, etc.) to obtain up-to-date information on the situation in the area and to identify a focal point in the area, from either the partner agency or from within their beneficiary communities • Expanding the reporting network through community-based surveillance (CBS, see section 7), which sensitizes the community for self-reporting through local communication channels and, where possible, new technologies (e.g., designated toll-free number or social media) and uses volunteers from inaccessible areas (e.g., local villagers, taxi drivers, market vendors)

	<ul style="list-style-type: none"> • Performing remote communication and regular calls with focal points at reporting sites to remind them about detection and reporting of AFP cases, and to follow up on cases and provide feedback • Intensifying surveillance and establishing more reporting sites around the inaccessible areas, if functional reporting sites are impossible in inaccessible areas • Getting focal points out of the inaccessible area for orientation and training • Transferring AFP cases and contacts to accessible areas for investigation and follow up • Taking each available opportunity to enter the area if/when made accessible (e.g., lull in conflict, clearing of roads, UN convoy)
<p>Challenges and Anticipated Issues</p>	<p>Adjusting surveillance has challenges such as:</p> <ul style="list-style-type: none"> • Difficulty accessing accurate population figures or estimates • Getting cooperation and acceptance from new partners, especially community-based traditional healthcare providers • Getting updated/current and relevant information (e.g., population movement) • Difficulty trusting and validating the data • Security challenges • Transportation challenges • Communication challenges • Capacity to adjust and implement among the actors
<p>Enabling Factors and Tips for Success</p>	<p>Adjusting surveillance is facilitated by:</p> <ul style="list-style-type: none"> • The availability of partners • Up-to-date information and its sharing, which supports planning and sensitizing partners • Triangulation and cross-checking of data • Research on population movement and behaviour trends • Collaboration with community leaders and security agencies in fully or partially inaccessible areas • Contingent plans based on anticipated movements and changes
<p>Monitoring & Evaluation</p>	<ul style="list-style-type: none"> • Number and type of reporting sites before and after disruption (approximately 4 months before and after) • Completeness of reporting from health facilities and reporting sites (including focal points) • Demographical representativeness of the reporting sites. • Comparison of surveillance indicators after population adjustment with indicators observed before the changed situation

6. Ad hoc active case search for AFP cases

Definition	<p>Ad hoc active case search (ACS) is an extraordinary, ad hoc surveillance activity conducted to identify unreported AFP cases.</p> <p>ACS is done through retrospective case search in health facility records and interviews of healthcare providers (facility-based) and community leaders and parents (community-based). As an ad hoc activity, ACS enhances routine active surveillance activities in the short term under certain criteria, such as a new event or outbreak or when other concerning surveillance gaps are identified.</p>
Rationale and Indications	<p>ACS is done to enhance the sensitivity of detecting AFP cases in areas that experience either suboptimal surveillance or new epidemiological risks. This activity can help identify gaps in the AFP surveillance system when new events or outbreaks occur – and it can help supplement activities during the beginning of a response plan.</p> <p>Conditions that may warrant ACS include:</p> <ol style="list-style-type: none"> 1. Activities where opportunities to look for AFP cases exist, such as during house-to-house searches, while canvassing to collect geospatial data, while vaccinating newly accessible populations (e.g., refugees or IDPs from inaccessible areas), or during supplementary immunization activities (SIAs) as part of clinic record review. 2. Events, outbreaks, and other triggers <ol style="list-style-type: none"> a) In a polio event or outbreak setting (collapse) <ol style="list-style-type: none"> i) As part of the investigation, retrospective case searches and facility-based ACS are implemented. ii) As part of enhanced surveillance by activating AFP case finding and record review b) Other trigger indications <ol style="list-style-type: none"> i) A disconnect between environmental surveillance (ES) and AFP surveillance (i.e., when WPV or VDPV is detected in ES and not through AFP) ii) Clustering of polio-compatible cases in time and space 3. While AFP surveillance implementation or enhancements are being made, ACS can fill a surveillance gap in the short term: <ol style="list-style-type: none"> a) Sizable population arrival and settlement, such as IDP, refugees, and nomads coming from high-risk areas with a recent outbreak or polio event b) New access to previously inaccessible areas c) Silent districts or areas d) Low-performing surveillance areas* e) When surveillance reviews identify gaps in surveillance performance <p>* - While facility-based case search may be recommended in such instances, community-based case search is not recommended unless warranted by further review.</p>
Procedure (Steps)	<p>Setting up ACS can be resource-intensive, so it is important to have clear parameters, including the geographic scope, target population, and time period of interest (typically previous 6 months). For example, geographic scope for ACS will be defined in review of information from any outbreak-</p>

	<p>related risk assessments, current epidemiology, and genetics of new polio cases or other important risk factors to identify unreported cases. When there are positive environmental surveillance samples but no AFP case, the geographic scope may be more complex because of the catchment area, requiring additional planning considerations.</p> <p>ACS involves all or a subset of the following activities, depending on the situation. The steps below can be considered in setting up ACS activities, but it is important to be focused so the search doesn't become larger and more resource-intensive than needed. Activities should be consistently documented throughout the entire process.</p> <ol style="list-style-type: none"> 1. Conduct an analysis of AFP surveillance indicators 2. Decide if the search will be facility- and/or community-based (usually both) 3. Develop tools (e.g., checklist, reporting formats) for recording the active search process and outcome 4. Conduct subgroup analysis to determine if surveillance is reaching all subsets of a population 5. Consider enlisting the help of NGOs for inaccessible areas 6. Provide training to those who will conduct searches 7. Develop reporting channels for identified AFP cases 8. Establish a strong supportive supervision and monitoring mechanism at the field level <p><i>Additional Steps for Facility-based ACS</i></p> <ol style="list-style-type: none"> 1. Identify and profile all healthcare facilities within and outside the reporting network (public, private, traditional) 2. Retrospective case searches should look for unreported AFP cases up to 6 months after paralysis onset. (Interview health providers, review health facility registers, make visits to wards.) <p><i>Additional Steps for Community-based ACS</i></p> <ol style="list-style-type: none"> 1. Map and profile areas and populations and identify leaders or contact persons 2. Ensure community engagement for information gathering and facilitation (e.g., IDPs/refugees: identify IDP/refugee elders, Camp Management Committee, IDP host community informants, etc.) 3. House-to-house case search, community case search <p>All AFP cases identified through ACS should be added to the line list and should follow the AFP case investigation guidelines, including stool specimen collection within 60 days of paralysis onset and contact sampling guidelines.</p> <p><i>Frequency</i> ACS is to be done when indicated such as:</p> <ul style="list-style-type: none"> • This is generally an ad hoc activity to be done when new events/outbreak are identified as part of initial response.
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	<p>Other situations where this activity could be considered, if not a resource/programme burden:</p> <ul style="list-style-type: none"> • When a window of opportunity opens in fully or partially inaccessible areas • Every 3 to 6 months in recently accessible areas with disrupted healthcare infrastructure
Challenges and Anticipated Issues	<p>ACS has challenges such as:</p> <ul style="list-style-type: none"> • Lack of resources: untrained personnel or supervisors, poor documentation, or inadequate financial resources • Security issues • Lack of access to, poor quality or non-availability of health facility records • Logistical constraints in reaching communities and health facilities
Enabling Factors & Tips for Success	<p>ACS is facilitated by:</p> <ul style="list-style-type: none"> • Community engagement • Presence of NGOs in inaccessible areas • Careful, in-depth analysis to prioritize (as needed) the right areas, populations, or health facilities based on reporting patterns • Knowledgeable and motivated field staff, experienced supervisors • Good documentation of the active case search
Interpretation of Results	<ul style="list-style-type: none"> • The detection of unreported AFP cases demonstrates gaps in the AFP reporting network. • Retrospective review of records in facilities within the reporting network will reflect whether regular active surveillance of designated sites was conducted. • Interviewing traditional healthcare providers and/or private sector practitioners will reflect whether the local surveillance team has been orienting and contacting them. It may also highlight the need to revise the reporting network.
Monitoring & Evaluation	<ul style="list-style-type: none"> • Number of unreported AFP cases detected through ACS (1) with onset less than 60 days and (2) with onset more than 60 days to 6 months (or older) • Number of communities and health facilities that had unreported AFP cases found in the process • Assess impact of this activity on overall surveillance system, document any changes in routine active surveillance or reporting networks, and develop and implement improvement plans, where needed

7. Community-based surveillance

Definition	<p>Community-based surveillance (CBS) is a surveillance approach in which trained community members are engaged to report suspected AFP cases, based on the simple case definition, to a designated focal person. As such, CBS can provide an additional link between communities and the facility-based surveillance system.</p> <p>It is important to note that CBS case detection activities occur outside a health facility, and those performing case detection activities are community members and not medical professionals.</p>
Rationale and Indications	<p>CBS can increase sensitivity and timeliness of AFP case detection. It may also increase community engagement and acceptance.</p> <p>CBS is recommended on a case-by-case basis where health facility-based surveillance cannot be performed or is not functioning optimally, particularly in high-risk populations or areas where there are high risks of undetected poliovirus transmission, importation, or VDPV emergence. Such conditions include:</p> <ul style="list-style-type: none"> • Security-compromised areas • Special populations (e.g., refugees, IDPs, economic migrants, urban slums, fishing communities, mining communities, religious communities, nomads, ethnic and linguistic minorities, and remote or scattered populations) • Populations who rely on traditional healing practices and who are less likely to seek care at a health facility
Procedure (Steps)	<p>CBS involves the following activities:</p> <ol style="list-style-type: none"> 1. Map high-risk areas and populations and assess how well covered those populations are by the current AFP surveillance system. 2. For all high-risk areas, identify and profile all healthcare facilities and providers (public and private), all humanitarian agencies (UN, etc.), and all NGOs. 3. Identify key community actors (local and religious leaders, traditional healers) to engage and gain their support for CBS. Sensitize and brief them about polio and the detection and reporting of AFP cases. 4. Jointly with community leaders, select community volunteers based on: education level, knowledge of the area, affiliation with certain communities and population groups, residence within the assigned community, age and gender suited to the community culture and norms, outspoken and good character invested with community trust and acceptance. 5. Train the community volunteers using simple educational materials focused on case definition, recording and reporting policies, stool collection and handling procedures, and roles and responsibilities. 6. Community volunteers will actively search for AFP cases in the community through rumours, home visits, or visits to traditional healers and religious leaders. They will also keep records of vaccination status and basic demographic data for every family and child visited, whenever possible.

	<p>7. Once the community volunteer has identified a case of AFP, he/she will report the individual to the designated focal point. The surveillance officer will follow up to confirm that the AFP case meets the case definition, initiate investigation and specimen collection, and notify the district health authority. In the event the surveillance officer cannot complete the investigation in a timely manner, the community volunteer may need to support the surveillance officer and interview the AFP case and collect and transport stool specimens for testing.</p> <p>8. Establish an oversight structure that supports community volunteers by conducting regular supervisory visits and providing feedback to the volunteers.</p> <p>9. Conduct periodic refresher trainings of community volunteers to ensure they maintain their knowledge and skills.</p> <p>Note: In hard-to-reach areas, options for proper storage facilities should be identified ahead of initiating CBS. Similarly, options for transportation of stool specimens to a designated health facility or polio focal person should be explored.</p>
<p>Challenges and Anticipated Issues</p>	<p>Challenges to CBS include:</p> <ul style="list-style-type: none"> • Cost: Depending on how community volunteers are rewarded, CBS can be costly. Its sustainability must be addressed at the beginning of the project. • Difficulties in finding the 'right' community volunteers. Many local, national, and global programmes compete for suitable volunteers and may have different rewards. • Limited ability or inability to perform monitoring and supportive supervision. • Difficulties for surveillance officers to conduct AFP case investigation quickly in inaccessible areas and among some special populations. <p>Other considerations include:</p> <ul style="list-style-type: none"> • The need for a coordinated approach between surveillance field and laboratory in anticipation of expected workload. • Similarly, a need to ensure a constant relationship between CBS and the formal public health system. • The community volunteer must have a way to communicate with the surveillance officer (telephone, petty cash, or other means). • CBS requires a system for tracking volunteer activities and AFP cases reported to the public health system. • CBS requires forms, protocols, and training adapted to low-literacy users.
<p>Enabling Factors and Tips for Success</p>	<p>CBS is facilitated by:</p> <p><i>General</i></p> <ul style="list-style-type: none"> • Building community trust (through engagement in the volunteer selection process, recognition and motivation of volunteers, provision of feedback, respect of local social/cultural norms) and engaging local actors and partners invested with community trust • Messaging through popular local media (radio, mobile messaging)

	<p><i>Community volunteers</i></p> <ul style="list-style-type: none"> • Using a simple case definition and periodic refresher training • Offering flexibility to support investigation of AFP cases outside their areas (transportation cost for examination and/or specimen collection) • Providing a strong supervisory structure and regular feedback • Maintaining support and offering no discouragement if reported individuals suspected with AFP do not meet the AFP case definition
<p>Monitoring & Evaluations</p>	<p>Monitoring activities can be done with the help of existing partners and community networks (e.g., community mobilizers) and through engagement of local government authorities.</p> <p>Assess initial CBS performance by reviewing changes in AFP reporting 4 months before and 4 months after CBS is implemented</p> <ul style="list-style-type: none"> • Number of AFP cases reported in the lowest administrative unit • Percent of AFP cases reported by CBS versus other reporting sites <p>Assess ongoing CBS performance</p> <ul style="list-style-type: none"> • Completeness and timeliness of weekly/monthly reporting, including zero reporting • Percent of “true AFP” vs “not an AFP” cases reported by CBS • Percent of AFP cases reported within 7 days of paralysis onset • Percent of AFP cases investigated within 48 hours of notification • Percent of AFP cases with adequate stool specimens collected

8. AFP contact sampling

Definition	AFP contact sampling is the collection and testing of stool samples from contacts of AFP cases. A contact of an AFP case is defined as a child (preferably younger than 5 years of age) who likely had direct contact with the AFP case in the week prior to the onset of paralysis and/or in the two-week period after onset of paralysis.
Rationale and Indications	<p>AFP contact sampling is done to increase the sensitivity of the surveillance system to detect circulating polioviruses (wild and/or vaccine-derived) and, during an outbreak, to gain a better understanding of the geographic extent of the transmission.</p> <ul style="list-style-type: none"> • Individuals in direct contact with AFP cases have a higher likelihood of asymptomatic infection than people who do not have contact with an AFP case, if poliovirus is circulating. An infected asymptomatic individual may carry and excrete the virus up to two months and sometimes longer. • The analysis of data from countries implementing this strategy has illustrated the benefit of the system in early identification of new or ongoing virus circulation. • There are AFP cases for which stool specimens could not be collected or were not collected in a timely manner, particularly in areas with low-performing AFP surveillance or in hard-to-access, conflict-affected areas. • There is also a small proportion of AFP cases due to poliovirus infection for which specimens that are adequate are not found to be poliovirus positive. <p><i>Indications</i></p> <ul style="list-style-type: none"> • Stool samples should be collected from contacts of AFP cases that had inadequate stool samples (i.e., did not satisfy the definition of adequate stool samples which is 2 stool specimens collected within 14 days of paralysis onset, collected at least 24 hours apart, both received in a WHO-accredited laboratory in good condition [with a temperature below 8°C, a volume of 8 grams or above, no desiccation or leakage, and proper documentation]). • In those security compromised or hard-to-reach areas, contact samples should be collected for all reported AFP cases due to the difficulty in reaching those groups. • In populations where poliovirus transmission is highly suspected, contact samples may be collected for all reported AFP cases in close coordination and agreement with the laboratory for a limited period of not more than six months. • In a polio event or in an outbreak setting, contact sampling of all reported AFP cases may be warranted for specific geographic areas and/or for a limited time. This may be required to enhance the probability of detecting additional cases that may not otherwise be identified, or to better document the geographic extent and duration of an outbreak. The decision to expand contact sampling should be made in close consultation with and agreement of the laboratory for a limited period of not more than six months.

<p>Procedure (Steps)</p>	<p>AFP contact sampling should be conducted within 7 days from notification of the AFP case and should be done up to 2 months after onset of paralysis of the index AFP case.</p> <p>AFP contact sampling involves the following activities:</p> <ol style="list-style-type: none"> 1. Explain the purpose of collecting stool samples to parents/guardians of the contact. 2. Identify potential contacts. Selection priority should be given to the following contacts: <ol style="list-style-type: none"> a) Children in frequent, direct contact with the AFP case, such as siblings, household members, playmates, and young neighbouring relatives; and b) Younger children (preferably younger than 5 years of age) 3. Collect one stool sample each from three separate contacts. 4. Adhere to AFP surveillance protocols for the collection, storage, and transportation of stool specimens. 5. Complete a separate laboratory request form for each contact. Similar to AFP cases, this form is sent to the laboratory along with the specimen while a copy is maintained in the AFP surveillance file of the AFP case. Each specimen should be labelled clearly as a contact of the AFP case. The unique identification number should be the same as the AFP case with an added contact number suffix—e.g., C1, C2, or C3. <p>Note: Data collection, management, and monitoring of contact sampling data are integral parts of the AFP surveillance system to ensure quality and timeliness. ** If stool specimens have been collected > 14 days from onset of paralysis but arrive the lab in poor condition, field staff should be notified, and contact specimens collected.</p>
<p>Challenges and Anticipated Issues</p>	<p>Challenges to AFP contact sampling include:</p> <p><i>General</i></p> <ul style="list-style-type: none"> • Delayed or lack of feedback on AFP case sample condition between laboratory and field • High refusal to collect stool specimens in some geographic areas • Need for flexibility among field and laboratory staff to prioritize sample collection and testing <p><i>Hard-to-reach areas</i></p> <ul style="list-style-type: none"> • Limited accessibility may likewise limit the surveillance team from reaching the affected area. Innovative options should be explored, including moving AFP cases and their contacts to neighbouring, accessible sites and considering stool collection from older children. • Transportation/storage challenges may be overcome by local solutions, such as negotiating with local bus drivers, local NGOs, and other groups that move in the areas.
<p>Enabling Factors & Tips for Success</p>	<p>AFP contact sampling is facilitated by:</p> <ul style="list-style-type: none"> • Coordinating with the laboratory in anticipation of increased workload • Identifying and profiling humanitarian agencies (UN, etc.) and NGOs in hard-to-reach areas, as they can support collecting, storing, and/or transporting stool samples, especially in security-compromised areas

	<ul style="list-style-type: none"> Engaging in intensive community health education, especially in outbreak settings, to help raise community awareness about polio and acceptance of contact sampling
<p>Interpretation of Results</p>	<ul style="list-style-type: none"> Negative results from AFP contacts don't exclude the possibility of circulating poliovirus in the community. Isolation of WPV from a contact confirms the AFP case as a WPV case if the index AFP case had a WPV negative stool. Isolation of a VDPV from an AFP contact confirms the AFP case as a VDPV case if the index AFP case had a VDPV negative stool. If there is an isolation of a WPV or VDPV from an AFP contact with a poliovirus positive stool, the positive contact will not be listed as a case of poliomyelitis but the isolate will be added to the WPV/VDPV count.
<p>Monitoring & Evaluation</p>	<p><i>Process indicators</i></p> <ol style="list-style-type: none"> Timeliness of AFP contact sampling: percent of AFP contact specimens collected within 7 days from date of notification of the AFP case. Target: minimum 80%. Completeness of contact sampling: percent of eligible AFP cases with three contact samples collected. Target: minimum 80% <p><i>Outcome indicators</i></p> <ol style="list-style-type: none"> Percent of AFP cases confirmed as polio as a result of WPV or VDPV isolated from contacts Identification of newly infected administrative units – e.g., districts <p><i>Other indicators (quality)</i></p> <ol style="list-style-type: none"> Age distribution of contacts: At least 80% of contacts should be younger than 5 years of age Timeliness of specimens shipped to the lab: Percent of contact specimens sent to a WHO-accredited laboratory within ≤ 3 days Good condition: 90% of stool samples received in good condition as reported by the laboratory for all samples collected from contacts Non-polio enterovirus (NPEV) and Sabin-like virus isolation

9. Targeted healthy children stool surveys

<p>Definition</p>	<p>Targeted healthy children stool surveys are the collection and testing of stool samples from high-risk healthy children where there is a high degree of suspicion of circulating poliovirus. For this purpose, a healthy child is considered to be a child who is:</p> <ul style="list-style-type: none"> • not suffering from AFP, • under 5 and under 2 when possible, and • not a close contact of an AFP case.
<p>Rationale and Indications</p>	<p>Note: This supplemental strategy is not a substitute for good surveillance and not for use in silent districts.</p> <p>Targeted healthy children stool surveys may support the detection of poliovirus circulation in a context of silent circulation and when there is a high degree of suspicion of transmission.</p> <p>Targeted healthy children stool surveys are implemented either in a specific area and/or specific populations at a high risk of poliovirus circulation. They may be implemented in the following areas:</p> <ul style="list-style-type: none"> • As a screening tool for internally displaced children and refugee children moving from areas of known or suspected virus circulation • In a polio event or an outbreak setting as part of initial investigations of all polio events: <ul style="list-style-type: none"> – Collect 20 samples from healthy children of same age group living in the community, in another part of the village, or in a nearby village (and not in close contact to the confirmed case) – Investigation of a positive environmental sample: collect 20-40 community stool samples from the catchment area
<p>Procedure (Steps)</p>	<p>Targeted healthy children stool surveys involve the following activities:</p> <ol style="list-style-type: none"> 1. Deciding on a source population: <ul style="list-style-type: none"> • Health facility-based sampling (when a child from the targeted area or group visits a health facility for any reason other than AFP) • Community sampling from households or camps 2. Sensitizing and briefing community leaders about polio and the importance of collecting samples 3. Deciding on criteria for enrollment: the child should be from vulnerable communities most susceptible to infection among the population groups as described above—e.g., younger children (preferably younger than 5 years of age and underimmunized or not immunized) 4. Determining the number of children to be sampled (20 to 40) 5. Collecting only one stool specimen from each healthy child 6. Collecting, storing, and transporting stool specimens in the same way as for AFP cases 7. Completing a specific “targeted healthy children stool survey” form for each child and sending it to the laboratory along with the specimen. Each specimen should be labelled clearly as a ‘healthy children stool survey’ with a specific unique identification number.

<p>Challenges and Anticipated Issues</p>	<p>Healthy children stool surveys have challenges such as:</p> <ul style="list-style-type: none"> • Inaccessibility may limit the ability of the surveillance team to reach the affected area or transport samples. • Lack of community awareness may produce suspicions regarding the intention of the survey, and thus result in high numbers of refusal. • Diverted health staff may struggle to collect stool specimens, especially if samples are collected from communities. • Increased number of stool specimens can affect laboratory workload.
<p>Enabling Factors & Tips for Success</p>	<p>Healthy children stool surveys are facilitated by:</p> <ul style="list-style-type: none"> • Coordination with the laboratory in anticipation of increased workload • Identifying and profiling humanitarian agencies (UN, etc.) and NGOs, as they can support in collecting samples in many instances, especially security-compromised situations • Community sensitization in advance of collection of stool from healthy children
<p>Interpretation of Results</p>	<ul style="list-style-type: none"> • A positive result (WPV or VDPV) shall be considered evidence of transmission in the specified area and will prompt programmatic action as per outbreak response guidelines. • Positive healthy children will not be listed as cases of poliomyelitis but the isolate will be added to the WPV/VDPV count and used for all analysis, including genetic sequencing and genetic diversity analysis conducted by the Global Polio Laboratory Network (GPLN). • A negative result may not be interpreted as the absence of poliovirus. It simply indicates that at the time of collection there was no virus shed by the sampled children.
<p>Monitoring & Evaluation</p>	<p><i>Process indicators</i></p> <ul style="list-style-type: none"> – Percent of collected samples out of planned – Arrival at the lab within 3 days and stool in good condition <p><i>Outcome indicators</i></p> <ul style="list-style-type: none"> – NPEV and Sabin-like isolation rates – Isolation of WPV or VDPV – Identification of newly infected administrative units—e.g., districts
<p>References</p>	<ul style="list-style-type: none"> ○ GPEI. Standard Operating Procedures: Responding to a poliovirus event or outbreak. Version 2.3. May 2017. (http://polioeradication.org/wp-content/uploads/2017/05/POL-SOPs-Part-2-260517-.pdf). A new version of this document is in preparation. ○ Desphande JM et al. Prevalence of antibodies to polioviruses and enteroviruses excreted by healthy children in Bombay. <i>Indian Journal of Medical Research</i> 1995; 158:707-12. (www.ncbi.nlm.nih.gov/pubmed/7729847) ○ Sutter RW et al. Outbreak of paralytic poliomyelitis in Oman: Evidence for widespread transmission among fully vaccinated children. <i>Lancet</i> 1991; 338:715-720. (www.ncbi.nlm.nih.gov/pubmed/1679866) ○ Tambini G Et al. Direct detection of wild poliovirus circulation by stool surveys of healthy children and analysis of community wastewater. <i>J Infect Dis</i> 1997; 168:1510-4. 32. (www.ncbi.nlm.nih.gov/pubmed/8245537)

10. Environmental surveillance

Definition	Environmental surveillance (ES) for poliovirus is the routine collection and testing of environmental (sewage) samples from designated locations draining target populations.
Rationale and Indications	<p>Infected individuals can excrete poliovirus in faeces for up to several months, often in the absence of clinical symptoms of polio infection. Large numbers of excreted poliovirus particles remain infectious in the environment for varying lengths of time, depending on the immediate conditions (e.g., ambient temperature).</p> <p>ES can help:</p> <ul style="list-style-type: none"> • Increase the sensitivity in detecting poliovirus circulation • Document persistence of poliovirus transmission • Provide supportive documentation for the certification of polio eradication <p>Indications:</p> <ul style="list-style-type: none"> • In polio-endemic settings, ES supplements AFP surveillance in identifying residual poliovirus transmission and can provide evidence to document interruption of poliovirus circulation. • In countries with outbreaks following importation of WPV or emergence of VDPVs <ul style="list-style-type: none"> – Inside known infected communities: <ul style="list-style-type: none"> ○ To assess transmission of VDPVs or WPV ○ To assess persistence of transmission and sufficiency of outbreak response activities ○ If mOPV2 is used in the response, to monitor persistence and potential transmission of Sabin 2 virus – Outside known infected communities: <ul style="list-style-type: none"> ○ To monitor potential transmissions (e.g., spread from infected communities) and guide the scope of response ○ If mOPV2 is used in the response, to monitor exportation of vaccine-related virus • In polio-free countries, ES is useful in areas at highest risk of WPV importation (or VDPV emergence) and spread, as well as those at risk of failing to detect WPV importation or VDPV emergence due to weak AFP surveillance. • Following OPV components withdrawal (tOPV-bOPV switch and bOPV cessation), ES helps to provide early detection of the emergence of new VDPV, document the elimination of Sabin-like viruses, and monitor the effectiveness of containment in accredited facilities.
Procedure (Steps)	<p>ES should be initiated in full coordination with WHO regional office teams, WHO headquarters, and GPLN teams, following careful evaluation of the advantages of environmental surveillance in the context of global, regional, and national surveillance goals.</p> <p>ES involves the following activities:</p> <ul style="list-style-type: none"> • Choosing an area within a country based on the epidemiology and risk.

	<ul style="list-style-type: none"> • Assessing suitability of ES sites in the targeted area. Sites for collection should be carefully selected, optimally from converging sewer networks with flowing water located upstream and away from industrial sites. Pit latrines should not be considered as ES sites. • Developing a comprehensive ES plan to address: schedule of sampling; details of sampling sites; sampling responsibilities; logistics; laboratory requirements (space, personnel, equipment and reagents, protocols of laboratory procedures); data management and reporting; training and quality assurance; and the envisaged consequences of different laboratory results. • Where ES is possible, establishing monthly or biweekly collection. <p>ES can either be set up as a permanent deployment, or on an ad hoc temporary basis. Permanent deployments are typically guided by global and regional ES expansion plans. Ad hoc deployments are justified in some special circumstances and are detailed more in Section 11.</p>
<p>Challenges and Anticipated Issues</p>	<p>ES has challenges such as:</p> <ul style="list-style-type: none"> • Representative sampling may be difficult to achieve in the absence of a network of confluent sewers • Difficulty in finding appropriate sampling sites – e.g, unavailability of sewage network and use of pit latrines in many of the hard-to-reach areas • Limited access for regular sewage collection in inaccessible areas • Collecting, maintaining reverse cold chain, and transporting ES sample may require creativity • Need for optimal coordination between the surveillance team and the laboratory team • Other challenges include difficulty tracking source of infection and response planning
<p>Enabling Factors & Tips for Success</p>	<p>ES is facilitated by:</p> <ul style="list-style-type: none"> • Existence of a (national) ES plan, including designation of roles and responsibilities for all actors • The selection of appropriate sites • Coordination with the laboratory • Identification and training of dedicated sample collectors • Supportive and accountable supervision for sample collection • Allocation of adequate field and laboratory resources • The identification of a reliable mechanism and means of transport for the samples to the laboratory • Prioritized testing of samples from inaccessible or hard-to-reach areas
<p>Interpretation of Results</p>	<ul style="list-style-type: none"> • Results are limited to geographic scope of catchment area. • Repeated sampling increases the probability of detecting low-level transmission of WPV or cVDPV in a population. • Positive results indicate viral excretion in the community but cannot pinpoint the exact source of the virus (the infected individuals or subcommunities) • As with AFP surveillance, negative results (WPV and VDPV) from an ES site do not rule out circulation. The degree to which negative samples support evidence for absence of poliovirus circulation in the

	<p>catchment area depend on the quality and sensitivity of the site (see Monitoring and Evaluation section).</p> <ul style="list-style-type: none"> • Negative laboratory results (to all viruses including NPEV) can be used to assess the appropriateness of selected ES sampling sites and quality of the reverse cold chain, as well as the effectiveness of laboratory procedures.
<p>Monitoring & Evaluation</p>	<p>All sites should be geolocated, and catchment areas defined (population size and characteristics).</p> <p><i>Laboratory results</i></p> <ul style="list-style-type: none"> – Detection of NPEV in ES samples ($\geq 50\%$) – In populations immunized with OPV, environmental surveillance should also detect Sabin-like strains within 6 days following SIAs in the catchment area ($\geq 50\%$) <p><i>Process monitoring (completeness and timeliness)</i></p> <ul style="list-style-type: none"> – <u>100%</u> of scheduled samples are collected – $\geq 80\%$ of samples are collected on the time assigned – $\geq 80\%$ of samples must arrive in laboratory within 3 days of collection – $\geq 80\%$ of samples arrive in the laboratory in good condition (no leakage of specimen, with an adequate amount of specimen - litre or filter) – Timeliness of laboratory results <ul style="list-style-type: none"> ○ $\geq 80\%$ of virus isolation results within 21 days of specimen receipt in the laboratory ○ $\geq 80\%$ of ITD results within 7 days of isolate receipt in the laboratory ○ $\geq 80\%$ of sequencing results within 14 days of isolate receipt in the laboratory
<p>References</p>	<ul style="list-style-type: none"> ○ GPEI, Environmental Surveillance Implementation Working Group (ESIWG). Polio Environmental Surveillance Enhancement Following Detection of Vaccine-Related Type-2 Poliovirus. Version 9.1. May 2018. ○ GPEI. Guidelines on Environmental Surveillance for the Detection of Polioviruses. March 2015. (polioeradication.org/wp-content/uploads/2016/07/GPLN_GuidelinesES_April2015.pdf).

11. Ad Hoc environmental surveillance in access-compromised areas

Definition	Ad hoc environmental surveillance is the targeted collection and testing of environmental (sewage) samples from several designated sites in different cities or areas under special circumstances and for a limited period.
Rationale and Indications	<p>Infected individuals can excrete poliovirus in faeces for up to several months in the absence of clinical symptoms of polio infection. Large numbers of excreted poliovirus particles remain infectious in the environment for varying lengths of time, depending on the immediate conditions (e.g., ambient temperature, etc.).</p> <p>Ad hoc ES can help increase the sensitivity in detecting poliovirus circulation, particularly by enhancing surveillance in security-compromised and hard-to-reach areas, in newly accessible areas when there is a high index of suspicion of virus transmission, and around the arrival of new populations to safer places (such as IDP camps).</p> <p>Ad hoc ES should not replace AFP surveillance, and efforts to strengthen AFP surveillance should be the priority. However, ad hoc ES can be considered only under special circumstances and following careful review of the situation.</p>
Procedure (Steps)	<p>Ad hoc ES should be initiated in full coordination with WHO regional office teams, WHO headquarters, and GPLN teams (including the laboratory) following careful evaluation of the advantages of ad hoc ES in the context of regional and national surveillance goals.</p> <p>Ad hoc environmental surveillance involves the following activities:</p> <ol style="list-style-type: none"> 1. Conducting assessment of possible suitable collection sites in inaccessible and hard-to-reach areas (such as flowing water contaminated with household sewage). Site characteristics should be similar to standard ES deployments. 2. Procuring logistics and raising laboratory capacity 3. Identifying and training sample collectors 4. Collecting one sample per selected site 5. Repeating rounds of collection – either biweekly or monthly 6. Establishing duration of collection, at a minimum 6 months
Challenges and Anticipated Issues	<p>Ad hoc environmental surveillance encounters many of the same challenges as traditional ES deployments.</p> <ul style="list-style-type: none"> • Representative sampling may be difficult to achieve in the absence of a network of confluent sewers. • Difficulty in finding appropriate sampling sites – e.g., unavailability of sewage network. • Collecting, maintaining reverse cold chain, and transporting ES sample may require creativity. • Need for optimal coordination between the surveillance team and the laboratory team. <p>There may be additional logistical challenges in sample collection and transportation in access-compromised or hard-to-reach areas.</p>

	<ul style="list-style-type: none"> • Limited access for regular sewage collection in inaccessible areas • Limited appropriate sampling sites – e.g., pit latrines used in many of the hard-to-reach areas <p>For ad hoc deployments, site quality is difficult to establish, which can complicate interpretation of negative results.</p>
<p>Enabling Factors & Tips for Success</p>	<p>Ad hoc environmental surveillance is facilitated by:</p> <ul style="list-style-type: none"> • The selection of appropriate sites • Well-motivated sample collectors who are identified in advance of the activity and included in site selection • Engagement and discussion with stakeholders, including the laboratory • Detailed field and laboratory plan, including budget • Supervision of sample collection • Allocation of adequate field and laboratory resources
<p>Interpretation of Results</p>	<ul style="list-style-type: none"> • Results are limited to geographic scope of catchment area • Positive results indicate viral excretion or importation in the community • As with AFP surveillance, negative results (WPV and VDPV) from an ad hoc ES site do not rule out circulation. The degree to which negative samples support evidence for absence of poliovirus circulation depend on the quality and sensitivity of the site (see Monitoring and Evaluation section).
<p>Monitoring & Evaluation</p>	<p>All sites should be geolocated, and catchment areas defined (population size and characteristics).</p> <p><i>Laboratory results</i></p> <ul style="list-style-type: none"> – Detection of NPEV in ES samples ($\geq 50\%$) – In populations immunized with OPV, environmental surveillance should also detect Sabin-like strains, within 6 weeks following SIAs in the catchment area ($\geq 50\%$) <p><i>Process monitoring (completeness and timeliness)</i></p> <ul style="list-style-type: none"> – <u>100%</u> of scheduled samples are collected – $\geq 80\%$ of samples are collected on the time assigned – $\geq 80\%$ of samples must arrive in laboratory within 3 days of collection – $\geq 80\%$ of samples arrive in the laboratory in good condition (no leakage of specimen, with an adequate specimen – litre or filter) – Timeliness of laboratory results <ul style="list-style-type: none"> ○ $\geq 80\%$ of virus isolation results within 21 days of specimen receipt in laboratory ○ $\geq 80\%$ of ITD results within 7 days of isolate receipt in the laboratory ○ $\geq 80\%$ of sequencing results within 14 days of isolate receipt in the laboratory
<p>References</p>	<ul style="list-style-type: none"> ○ GPEI, Environmental Surveillance Implementation Working Group (ESIWG). Polio Environmental Surveillance Enhancement Following Detection of Vaccine-Related Type-2 Poliovirus. Version 9.1. May 2018. ○ GPEI. Standard Operating Procedures: Responding to a polio virus event or outbreak. Version 3. In preparation.

12. Innovation

Definition	The generic definition of innovation is “the application of better solutions to meet new/existing requirements.” In a polio surveillance context, the definition of innovation may extend to “non-conventional” methods and possibly technologies to improve the surveillance processes for challenging situations in hard-to-reach or security-compromised areas. Innovation can also mean transferring good ideas into great results.
Rationale and Indications	<p>Due to the challenges experienced in high-risk areas/populations, new methods of approach may have to be devised to ensure service delivery and the continued utilization of available resources. However, this should not distract the programme from first ensuring that full advantage has been taken from the traditional surveillance approaches.</p> <ul style="list-style-type: none"> • Innovation in surveillance has been used specifically to improve timeliness, collection, storage, and dissemination of data and to improve monitoring and supervision activities.
Examples	<ul style="list-style-type: none"> • Mobile applications and mobile data collection to improve data quality and ensure real-time documentation of transmission with geolocation and tracking: <ul style="list-style-type: none"> – Collecting information and geolocation of AFP cases (case investigation form) – Documenting and tracking active surveillance visit and supervisory visits – Documenting and tracking community-based surveillance (AVADAR - Auto-Visual AFP Detection and Reporting System) – Tracking stool specimen from collection to arrival at the lab (Somalia) • GIS mapping to locate catchment areas and population <ul style="list-style-type: none"> – Use of digital elevation maps (DEM) to locate the best site for environmental surveillance – Use of GIS and satellite imagery to map out surveillance network and AFP cases to ensure that all population is covered by the surveillance network (Nigeria and Somalia) • SMS-based surveillance <ul style="list-style-type: none"> – Send mobile message or SMS to informants to stimulate AFP reporting – SMS and Unstructured Supplementary Service Data (USSD) for reporting AFP cases
Procedure (Steps)	<p>Innovation involves the following steps:</p> <ol style="list-style-type: none"> 1. Define the problem – Identify what goal needs to be achieved, what issues or challenges obstruct achieving the goal, and what resources it would take to achieve the desired result with the least resistance 2. Use case examples – Identify similar challenges faced by other teams and the solutions used to handle them 3. Explore the context – With a clear understanding of the operating environment, define a tailor-made solution for the problem at hand

	<ol style="list-style-type: none"> 4. Deploy awareness and testing – Conduct a pilot while fully involving the community and other actors in the area. Monitor closely to assess reaction, impact, and improvement points 5. Roll-out - After a successful pilot, note any improvement points and roll out the project to the rest of the surveillance area 6. Monitor and assess impact – Review and understand the impact of the innovation and document everything
<p>Challenges and Anticipated Issues</p>	<p>Innovation encounters challenges such as:</p> <ul style="list-style-type: none"> • There is no standard solution; innovation does not always have a one-size-fits-all strategy. • There may be no buy-in from partners, community, or programme supervisors. • Solving one issue may risk creating another. • Lack of resources, especially for tools • Lack of sustainability of the new approach • Lack of full understanding of problem • Limited staff capacity to use the new approach
<p>Enabling Factors & Tips for Success</p>	<p>Innovation is facilitated by:</p> <ul style="list-style-type: none"> • Bottom-up research of the problem: understanding fully what issues are being faced on the ground • Conducting small-scale tests • Involving the community and partners • Exploring various solutions to a single problem • Adapting to a specific environment • Thinking creatively, having flexibility, and taking risk • Receiving mentorship and regular feedback • Assuring utilization of output • Promoting the product and assigning an advocate/champion
<p>Monitoring & Evaluation</p>	<ul style="list-style-type: none"> • Compare impact before and after new methods <ul style="list-style-type: none"> – Percentage of positive change (if measurable) – Contribution to the programme • Assess the outputs against the objectives • Survey community feedback • Track and document <ul style="list-style-type: none"> – Number of new ideas implemented – Number of discontinued projects – Speed of implementation – Lessons learned from failures and successes
<p>References</p>	<ul style="list-style-type: none"> ○ Kazia, AM, Ashraf, L. Jafria. The use of mobile phones in polio eradication. <i>Bulletin of the World Health Organization</i>. 2016;94:153–154 doi: http://dx.doi.org/10.2471/BLT.15.163683 (www.who.int/bulletin/volumes/94/2/15-163683.pdf) ○ Ojabo, D. eHealth Africa Pilots AVADAR Surveillance System to Track Progress Toward Polio Eradication. <i>eHealthAfrica</i> (website). January 16, 2017. (www.ehealthafrica.org/blog/2017/01/16/2017116aha-pilots-avadar-surveillance-system-to-track-progress-toward-polio-eradication) ○ Takane M, Yabe S, Tateshita Y, Kobayashi Y, Hino A, Isono K, Okayasu H, Diop OM, Tadono T. Satellite imagery technology in public health: analysis of site catchment areas for assessment of poliovirus circulation in

	<p>Nigeria and Niger. <i>Geospat Health</i>. 2016 Nov 21;11(3):462. doi: 10.4081/gh.2016.462. (www.ncbi.nlm.nih.gov/pubmed/27903060)</p> <ul style="list-style-type: none">○ Touray K, Mkanda P, Tegegn SG, et al. Tracking Vaccination Teams During Polio Campaigns in Northern Nigeria by Use of Geographic Information System Technology: 2013–2015. <i>J Infect Dis</i>. 2016; 213(Suppl 3): S67-S72. doi:10.1093/infdis/jiv493. (www.ncbi.nlm.nih.gov/pmc/articles/PMC4818548)
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13. Stool sample handling and transport

Definition	Stool sample handling and transport is the process of collecting, labelling, packaging, shipping, and tracking stool specimens following programme standards. Tracking is the process of following stool condition and reverse cold chain from the point of collection until the sample reaches the laboratory.
Rationale and Indications	<p>Adequate sample handling and transport is crucial to ensure virus viability and sustain the ability to detect WPV/VPV circulation or other important viruses.</p> <ul style="list-style-type: none"> • In access-compromised and hard-to-reach areas, it is challenging to ensure optimal reverse cold chain, appropriate handling, and timely transport of samples. Measures should be in place to test programme capacity in maintaining reverse cold chain along the route of stool shipment to the laboratory.
Procedure (Steps)	<p>Sample handling and transport involves the following activities:</p> <ol style="list-style-type: none"> 1. Identifying staff/community members responsible for stool collection 2. Rehearsing the standard procedures of stool collection, storage, and transport with surveillance staff; training community members on stool collection, labeling, packaging, storage of stool specimen and reverse cold chain 3. Providing suitable stool containers to monitor and maintain cold chain during long, interrupted travel of stool specimens (e.g., having temperature-monitoring devices or stool carriers that have a side energy unit to freeze specimens and can operate on a car battery) 4. Ensuring the availability of all resources and necessary equipment: ice packs, gloves, absorbing material, temperature monitoring devices and car 5. Engaging early communication between sender, logistician, and laboratory workers 6. Receiving feedback on the quality of stool specimens 7. Using a system to track specimens from point of collection to receipt in the laboratory 8. Ensuring feedback of results to the initial informer
Challenges and Anticipated Issues	<p>Sample storage and handling encounters challenges in access-compromised and hard-to-reach areas such as:</p> <ul style="list-style-type: none"> • Shortage of cold chain or out-of-order equipment (stool carrier, ice packs, refrigerator, deep freezers) • Insecurity • Destruction or loss of equipment • Cost of shipment • Cost and availability of temperature monitoring devices • Delays in transport especially if laboratory is in another country
Enabling Factors & Tips for Success	<p>Sample storage and handling is facilitated by:</p> <ul style="list-style-type: none"> • Community engagement in stool collection • Competent training

	<ul style="list-style-type: none">• Partner support• Effective communication channels
Monitoring & Evaluation	<ul style="list-style-type: none">• Number of WPV/VDPV• % of specimens with NPEV and Sabin-like virus• % of specimens with temperature monitoring sheet/temperature recording device.• % of stool specimens reported by laboratory in good condition/bad condition• % of samples received in the laboratory within 3 days of collection

14. Special monitoring and evaluation activities

Definition	Special monitoring and evaluation activities are tools that help identify gaps in surveillance and supplement classic surveillance indicators.
Rationale and Indications	<p>The purpose of special monitoring and evaluation activities is to:</p> <ul style="list-style-type: none"> • Identify gaps in surveillance that may not be observable using classic surveillance indicators • Provide additional confidence regarding the quality of surveillance data • Provide additional data to certification commissions <p><i>Indications</i></p> <p>These M&E activities should be part of overall surveillance monitoring everywhere but specifically:</p> <ul style="list-style-type: none"> • For all areas or populations facing access challenges or are hard-to-reach • For special high-risk population groups • For areas or populations where, for whatever reason, additional confidence in surveillance is needed
Procedure (Steps)	<p>Areas of special concern should be prioritized when implementing these strategies.</p> <p>Special monitoring and evaluation strategies include:</p> <ol style="list-style-type: none"> A. Case validation B. Population adjustment C. Process indicators D. Data quality checks E. Tracking silent areas and assessing surveillance in low population areas F. Disaggregated/group-specific analysis G. Tracking access and action at the lowest level H. Targeted surveillance reviews <p>Specific procedures are established for each as detailed below.</p>

<p>A. Case Validation</p>	<p>Procedures for the validation of AFP cases reported from areas of concern must be put in place by each country.</p> <ul style="list-style-type: none"> • Target a minimum of 80% of cases. • Case validation should be conducted by senior officers, and regularly by secondary and tertiary supervisors. • Cases should be validated within 14 days of reporting, and independently of case investigation. • Focus should be given to critical data: date of onset, place of onset, and areas visited prior to onset, stool collection dates/processes, routine immunization (RI) and SIA doses, healthcare-seeking history, and collection of appropriate contact samples. • AFP surveillance data must be updated based on validation findings, and discrepancies systematically recorded. • Validation should not unduly affect the reporting of cases. <ul style="list-style-type: none"> – In areas facing access challenges or are hard-to-reach, the programme should collect stool samples for laboratory examination even if a reported AFP case may be excluded as non-AFP through validation. – A pediatrician/clinician must be consulted by surveillance personnel before labelling an AFP case as non-AFP. – Excluded cases must be properly documented and included in the AFP database with non-AFP classification.
<p>B. Population Adjustment</p>	<p>It is important to:</p> <ul style="list-style-type: none"> • Obtain population estimates for administrative levels as well as communities and special populations. • Consider different sources of data and use the most reliable: government (census, elections), UN/quasi-UN agencies (OCHA, UN Development Programmes [UNDP], UNHCR, IOM), SIA target population, satellite imagery extraction. It may be necessary to use population movement (refugee, IDP, returnee) to update available populations. • Considering the difficulty in obtaining consensus amongst various stakeholders, special effort should be made to obtain an approval for operational use only. Negotiation and consultation with senior government officials should be instituted if required.
<p>C. Process Indicators</p>	<p>It is important to measure the process of activity implementation in areas and populations with access challenges, particularly when standard surveillance indicators make it difficult to assess surveillance in small populations, or over short periods of time. Below are some examples:</p> <ul style="list-style-type: none"> • Human resources <ul style="list-style-type: none"> – % of each relevant administrative and/or operational unit with a focal person for surveillance – % of focal persons trained in the past 24 months – Focal persons per population, or per AFP case – Retention rate • Monthly surveillance review meetings <ul style="list-style-type: none"> – % of conducted meetings and minutes shared with relevant national-level (or if required, multicountry) coordination entity • Active surveillance site visits

	<ul style="list-style-type: none"> – % of workplans submitted for active surveillance site visits with a map showing distribution of sites and prioritization – % of planned visits implemented (weekly) – On a regular basis, senior officers who are able to access areas of concern should review a proportion of visits for quality. A supervisory checklist should be completed and submitted. • Weekly zero reporting <ul style="list-style-type: none"> – A clear map showing number and distribution of sites – Timeliness and completeness of zero reports – Senior officers to assess authenticity of submitted data • For both active surveillance and zero reporting, in areas where it is feasible, the use of electronic data collection with GPS should be encouraged • Supervisory visits <ul style="list-style-type: none"> – % of planned supervisory visits implemented – % of investigations/validations conducted by secondary and tertiary supervisors • Laboratory <ul style="list-style-type: none"> – % of samples with feedback from the laboratory on stool condition – Timeliness of reporting of results • Environmental surveillance <ul style="list-style-type: none"> – Number of suitable ES sites in area of concern – Number/proportion of site visits where sampling was supervised by senior officer • Expert Review Committee (ERC) or equivalent held at least one meeting every month to review indeterminate cases • Community surveillance <ul style="list-style-type: none"> – Frequency of reporting (as per plan) – Geographic distribution – Number of visits and proportion of visits implemented (as per plan) – Knowledge: percentage trained
<p>D. Data Quality</p>	<p>There are at least three reasons for poor or inaccurate data</p> <ol style="list-style-type: none"> 1. Data was collected inaccurately or incompletely 2. Poor documentation, record keeping, or data management 3. Data falsification <p>Data quality issues may be identified through desk or field reviews.</p> <p>Flags for data quality issues include:</p> <ul style="list-style-type: none"> • Missing data: Incomplete or poorly entered Case Investigation Forms (CIFs) may lead to misinformation. Supervisors hence need to review each CIF that is produced. • Surveillance indicators <ul style="list-style-type: none"> – Too good to be true? Explore for unrealistic outcome indicators • SIA OPV doses, RI OPV doses: compare with SIA data, RI data, other data sources (depending on utility) and compare with a child's age • Clustering of AFP cases <ul style="list-style-type: none"> – Can be associated with an event, but may be a sign of underlying gaps in surveillance – Clustering in date of notification should be carefully reviewed

	<ul style="list-style-type: none"> • Residual weakness (RW) reporting: what fraction of AFP cases have RW, and how many have final diagnosis, how many were referred to ERC, how many were discarded by ERC • High number of “compatible” cases in an otherwise polio-free area, very low “compatible” cases in areas with ongoing transmission
<p>E. Silent Areas</p>	<p>A silent district or silent area is the district or area that did not report a single AFP case in a period varying from 6 months up to 12 months or more, depending on the population size and the expected AFP case reporting and taking into consideration that the non-polio AFP rate (NPAFP) is 2/100,000 or more depending on the polio eradication situation (certified polio-free, endemic, outbreak).</p> <ul style="list-style-type: none"> • Measure and track the number and proportion of silent lowest admin level • Estimate the expected number of cases: <ul style="list-style-type: none"> – Use the local provincial/state NPAFP to estimate expected number of cases and not the “standard 2 per 100,000” – Trend of reporting in the area of concern (expected from historical data) – Review population movements • In areas with small populations, consider: <ul style="list-style-type: none"> – Adjusting timescale—for example, if district was silent for 12 months (and has a small population), review data for 24 months, 36 months, and so on – Combining data from neighboring districts • Map silent areas and review closely for clustering or contiguity • Action to be taken should include: <ul style="list-style-type: none"> – Issuing an alert or other communication that highlights the identified potential surveillance gap, – Reviewing the surveillance functioning and process (including active surveillance) and sensitizing the surveillance network – Conducting full surveillance review (if required) – Triggering an active case search to fill a surveillance gap in the short term
<p>F. Group Specific Analysis</p>	<ul style="list-style-type: none"> • Adjust all data collection, collation tools, and electronic data systems to facilitate the process of data analysis for specific geographies or population groups of concern • Obtain required denominator data for: <ul style="list-style-type: none"> – Each area of concern – Each special population group • Provide analysis <ul style="list-style-type: none"> – By accessibility – For hard-to-reach areas – By population type • Conduct trend analysis
<p>G. Tracking Access and Action at Lowest Level</p>	<ul style="list-style-type: none"> • Develop spreadsheets for settlements with access issues or special populations • Quantify population, resources, action taken, and performance at the lowest level

<p>H. Targeted Surveillance Reviews</p>	<ul style="list-style-type: none"> • Triggers for review: silence, data quality flags, virological risk (e.g., suspicion of silent circulation or isolation of long chains), and certification requirements. • Conduct surveillance reviews with special focus in areas of concern and encompassing populations of interest • Simple desk, enhanced desk, and/or full reviews (desk and field reviews) may be conducted. • Reviews may be conducted by local team (district and or province) or by external team (from national or international teams). • In addition to (or as a substitute to) reviews, supportive missions may be planned. • In countries and areas with conflict and access issues, national independent groups from the areas of concern and outside an accessible area are called in for training and debriefing after completing the review.
<p>Challenges and Anticipated Issues</p>	<p>Special monitoring activities encounter challenges such as:</p> <ul style="list-style-type: none"> • Varying interest among many stakeholders • What makes a population of special concern may also inhibit programme capacity to conduct special monitoring activities • Difficulty in obtaining reliable population targets • Data systems not properly configured <ul style="list-style-type: none"> – Missing variables (supervision, surveillance review, data validation) – Lack of standardization of administrative levels – Inability to capture subpopulations or special populations
<p>Enabling Factors & Tips for Success</p>	<p>Special monitoring activities are facilitated by:</p> <ul style="list-style-type: none"> • Regular surveillance review meetings. • In each meeting, careful review of surveillance data from areas of concern/special populations. • Looking beyond the indicators for potential negative flags, to ensure “green is green.” “Good surveillance indicators” are not always equivalent to “good surveillance,” and detecting areas and/or population subgroups with poor surveillance system is especially difficult if indicators all point to a “strong system.” Send teams to evaluate the area, if possible. • Using electronic data collection systems, if possible. • Zero tolerance for data fudging.
<p>Interpretation of Results</p>	<ul style="list-style-type: none"> • The goal of any additional monitoring is to ensure the programme has capacity to look beyond the indicators and ascertain the true quality of surveillance using supplementary evaluation processes. • Outcomes should be used to help make a decision on the reliability of the surveillance system in assuring the absence of WPV and/or VDPV circulation in the assessed area.
<p>Monitoring & Evaluation</p>	<ul style="list-style-type: none"> • All process indicators (see above) should be assessed and reported for geographic areas of concern/special populations (segregated analysis). • Cases validation: proportion of cases validated by secondary and/or tertiary supervisor; proportion of cases where critical data was updated due to the outcome of validation.

	<ul style="list-style-type: none">• Number of targeted surveillance reviews conducted by the national and/or regional surveillance team.• Number of silent areas that have been evaluated.
References	<ul style="list-style-type: none">○ Curry D, Bisrat F, Coates E, and Altman P. Reaching beyond the health post: Community-based surveillance for polio eradication. <i>Development in Practice</i>. 2013. 23:1, 69-78, DOI: 10.1080/09614524.2013.753410 (www.tandfonline.com/doi/full/10.1080/09614524.2013.753410)

15. Special population groups

Definition	Special population groups are groups that are “not served or are underserved” from the regular health delivery system. They may be mobile or reside in hard-to-reach areas.
Categories	<ol style="list-style-type: none"> 1. Mobile population: nomads and seasonal migrants (e.g., agricultural or mine workers, brick kilns, construction workers, etc.) 2. (a) Refugees and IDPs in camps and (b) those living in the host communities 3. Special populations in settled areas (e.g., cross-border population, urban slums, islanders, fishermen, etc.)
Identification & Mapping	<p>It is important to identify and profile these populations:</p> <ul style="list-style-type: none"> • Geographic location, population size, route of movement, timing/seasonality of movement • Access to health services, health-seeking behaviour, ability of the current surveillance network (HFs, community-based) to detect AFP cases within the special populations • Identification of service providers (public and private, including NGO's, faith-based organizations, etc.) • Immunity status • Availability of communication activities targeting these special population
Rationale for AFP Surveillance in the Special Groups	<p>These populations may have more susceptibility to the disease and more likelihood of missing and spreading transmission</p> <ul style="list-style-type: none"> • Underserved populations may not be covered by the surveillance system. • There is likely lower population immunity due to low vaccination. • High movement makes them prone to spread the virus to vulnerable populations.
AFP Surveillance Strategies Applicable to the Special Population	<p><i>1. Populations living in security-compromised areas</i></p> <ul style="list-style-type: none"> • Access mapping and analysis with identification of key partners and factions and population dynamics and change • Access negotiating • Sensitizing and briefing armed forces and relevant partners and community about polio and case reporting • Revising surveillance network and identifying and training appropriate focal points for case reporting— i.e., community-based surveillance as appropriate • Conducting periodic active case search in community and healthcare facilities • Contact sampling around AFP cases (one sample, 3 contacts) • Conducting healthy children stool surveys and ad hoc environmental surveillance, to be decided in coordination with WHO country and regional teams (see sections 9 and 11) • Ensuring access tracking and segregated data analysis
	<p><i>2. Nomadic populations</i></p> <ul style="list-style-type: none"> • Mapping and profiling with identification of leaders or contact persons to serve as surveillance focal point • Determining itineraries of the population and mapping healthcare facilities and providers along the route • Sensitizing population and providers

	<ul style="list-style-type: none"> • Conducting market sensitization along the route and close to water points and camps • Establishing regular contact with the focal point for reminders on reporting and provision of feed back • Conducting active case search in large gatherings of nomadic groups during SIAs and mobile outreach services • Collecting contact sampling around AFP cases (one sample, 3 contacts) • Conducting healthy children stool surveys to be decided in coordination with WHO country and regional teams <p>A similar approach will be used for other mobile population groups as appropriate – e.g., seasonal migrants such as agricultural or mine workers, brick kilns, or construction workers.</p>
	<p><i>3a. Refugees/IDPs in camps</i></p> <ul style="list-style-type: none"> • Identifying focal point for AFP surveillance in camps (IDP or refugee camps) to include in the surveillance network • Profiling new arrivals (origin and immunization status) • Conducting active case search in HFs of camps and during SIAs • Collecting contact sampling around AFP cases (one sample, 3 contacts) • Collecting healthy children sampling (new children under 5 yrs.) • Installing a permanent vaccination/surveillance team <p><i>3b. Informal IDPs and refugees in host community:</i></p> <ul style="list-style-type: none"> • Identifying key informants from the community to include in surveillance network • Providing appropriate job aids • Initiating community IDP and refugee tracking (tracker team) • Determining health-seeking behaviour • Adjusting surveillance network • Conducting active case search during SIAs and mobile activities • Collecting contact sampling around AFP cases (one sample, 3 contacts) • Collecting healthy children sampling (HFs used by IDPs or refugees)
	<p><i>4. Special populations in settled areas include cross-border populations, urban slums, islanders, fishermen, mining workers, etc.</i></p> <p><i>Cross-border populations</i></p> <ul style="list-style-type: none"> • Mapping official and non-official border crossings • Mapping seasonal movements • Estimating population flow averages • Mapping and profiling villages/settlements, special populations, security and access, gathering places on both sides • Mapping areas of one district/country only accessible from the neighboring district or country • Mapping of surveillance network on both sides • Identifying organizations working at border entry and exit points (e.g., immigration, port health services, police) • Providing orientation and sensitization of populations and healthcare providers on both sides • Using supplemental strategies <ul style="list-style-type: none"> – Active case search on both sides in the community (entry points, permanent vaccination sites, markets) and in health facilities – If there are security-compromised areas or special populations as refugees or IDPs, implement the specific proposed activities/strategies

	<p><i>Urban slums</i></p> <ul style="list-style-type: none"> • Profiling communities and their origin • Studying health-seeking behaviour and modification of surveillance network • Conducting active case search • Consider adding ES sites
Challenges and Anticipated Issues	<p>Special population surveillance encounters challenges such as:</p> <ul style="list-style-type: none"> • Difficulties with mapping and population estimates • Lack of coordination with stakeholders • Lack of community involvement • High cost of additional resources and logistics (trainings, transportation, supervision, monitoring) • Lack of security
Tips for Success	<p>Special population surveillance is facilitated by:</p> <ul style="list-style-type: none"> • Special teams dedicated to surveillance in special population • Close coordination with partners (UNHCR, IOM, INGOs, civil society, veterinary services, etc.)
Monitoring and Evaluation	<ul style="list-style-type: none"> • Conduct a segregated analysis to ensure surveillance coverage and quality by population groups (starting with appropriate data collection) • Conduct regular mapping and risk assessment • Review/assess implementation of plans • Engagement of partners for independent monitoring
References	<ul style="list-style-type: none"> ○ Curry D, Bisrat F, Coates E, and Altman P. Reaching beyond the health post: Community-based surveillance for polio eradication. <i>Development in Practice</i>. 2013. 23:1, 69-78, DOI: 10.1080/09614524.2013.753410 (www.tandfonline.com/doi/full/10.1080/09614524.2013.753410)