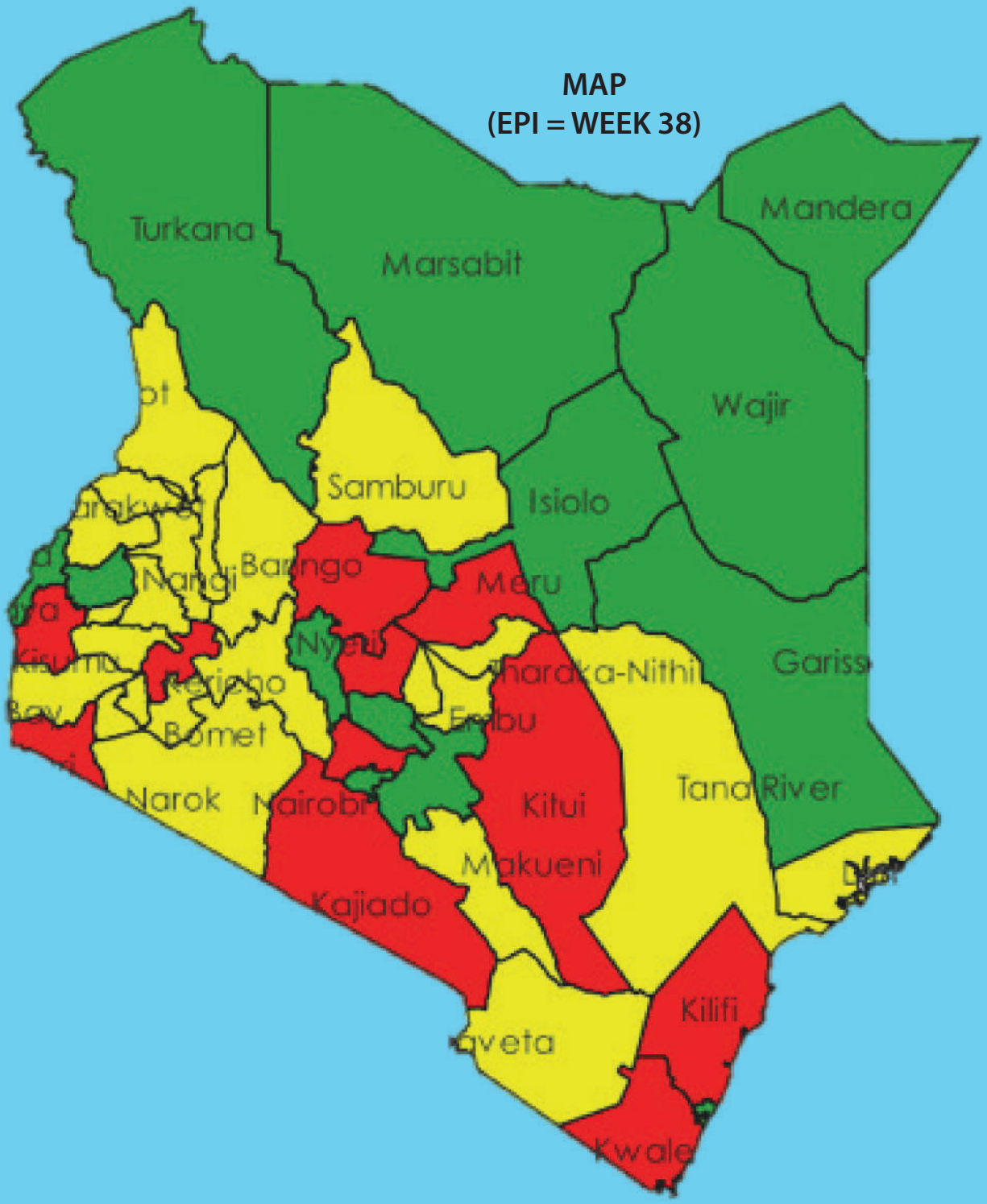
REPUBLIC OF KENYA

MINISTRY OF HEALTH

MAP
(EPI = WEEK 38)



A FIELD GUIDE FOR POLIOMYELITIS SURVEILLANCE

REPUBLIC OF KENYA

MINISTRY OF HEALTH

DIVISION OF DISEASE SURVEILLANCE AND EPIDEMIC RESPONSE

A FIELD GUIDE FOR POLIOMYELITIS SURVEILLANCE

Executive Summary

Surveillance for detecting the transmission of poliovirus is critical to reaching global polio eradication, as high-quality surveillance permits the timely detection of poliovirus transmission due to wild poliovirus (WPV), vaccine-derived polioviruses (VDPVs), and Sabin-like viruses. Despite historical success in polio surveillance, several challenges remain to reach global certification of WPV eradication and ultimately achieving a polio-freeworld.

Polio surveillance has traditionally relied on detection and investigation of Acute Flaccid Paralysis (AFP) cases. This has in recent times been expanded to include Environmental Surveillance (ES) and healthy child sampling in refugee settings. Both complement AFP surveillance and have proven useful in detecting the transmission of polioviruses in specific settings.

Polio surveillance in Kenya is spearheaded by the Division of Disease Surveillance (DDSR) in the context of Integrated Disease Surveillance & Response (IDSR). Over the years the country has made good progress in attaining the key globally tracked polio surveillance indicators at the national level, though significant gaps still exist. Some of the reasons for the suboptimal performance include Health care worker knowledge gaps; infrequent support supervision and suboptimal analysis and use of data for action.

This second polio surveillance guide is a revision of the first edition of 2005. The purpose of the guide is to increase the sensitivity of the surveillance systems to detect polio viruses.

Specifically, to

1. Attain and maintain AFP surveillance systems sensitive enough to detect all polio transmission and to provide evidence supporting the interruption of transmission.
2. Implement an Environmental Surveillance (ES) network expansive enough to contribute to the timely detection of polioviruses.
3. Increase efficiency in collecting, managing, validating, and using data for action.
4. Enhance the effectiveness of surveillance program operations, management, and budget processes.

This guide is intended for use by individuals and organizations involved in polio eradication efforts in Kenya including:(a) health care workers at all levels (including surveillance officers, clinicians, laboratory personnel, and public health workers) (b) county and sub-county health management teams (c) data managers (d) health training and research institutions, and (f) other public health experts, including nongovernmental organizations (NGOs).

Dr. Patrick Amoth, EBS
Ag. Director General for Health

Foreword

In 1988, in the 41st World Health Assembly (WHA41.28) a resolution was passed calling for the global eradication of poliomyelitis by the year 2000. This commitment was reaffirmed in May 1999 during the 52nd WHA meeting (WHA52.22). Globally great strides have been achieved (reducing global wild poliovirus cases from over 350,000/per year in 1988 to less than 50 in 2020 and endemic countries from 125 to 2 over the same period).

Kenya is doing its part towards achieving the global goal for polio eradication through the Expanded Program on immunization by ensuring potent vaccines reach every child at the right age and time. This effort has borne fruit since the country reported the last indigenous wild poliovirus case in 1984. To ensure no polio case goes unnoticed, the country rolled out an Integrated Disease Surveillance and Response from the National through to community level using Acute Flaccid paralysis (AFP) surveillance.

AFP surveillance is one of the 4 global polio eradication strategies. The strategy has been key towards real-time detection of imported wild poliovirus cases in the years 2006, 2009, 2011, 2013 as well as both circulating vaccine-derived polio virus (cVDPV) and vaccine derived polio viruses (VDPV) in 2012, 2018, and 2021. Despite these efforts, the country still has sub-counties and counties with suboptimal AFP surveillance performance. The revised booklet is expected to provide a technical guide for all practitioners at all levels to support detection, reporting, confirmation, and response.

Dr. Daniel Langat,
Head Department of Disease Surveillance and Epidemic Response

Acknowledgement

This Polio Guide is the product of extensive collaboration between the Ministry of Health (MOH) County Governments, WHO, CDC, GPEI, KEMRI, and stakeholders. The work was led by the Division of Disease Surveillance and Response (DDSR) with significant support of the WHO Kenya Country Office EPI team and GPEI Consultants. Additionally, significant input has been provided by various County Surveillance teams, CDSCS and SCDSCs.

This guide is also a result of the long experience of the reviewers in AFP/Polio and VPD surveillance at National, County, Sub County, in health facilities and Community levels, coupled with field experience and lessons learned over several years.

The MOH acknowledges with gratitude the important contribution of technical partners including the World Health Organization, US Center for Disease Control and Prevention (CDC) and Bill and Melinda Gates Foundation (BMGF).

The Polio Guide made extensive references to the WHO's GPEI reference documents, WHO publications on poliomyelitis, and other relevant publications. A list of references is provided in the bibliography. We also wish to recognize all contributions-written and oral that led to the finalization of this document. This document shall act as a final reference Guide for Polio surveillance in Kenya.

Dr. Emmanuel Okunga
Head Division Of Disease Surveillance And Epidemic Response

CONTENTS

LIST OF FIGURES AND TABLES

LIST OF ABBREVIATIONS

ACS	Active Case Search
AFP	Acute flaccid paralysis
AFR	Acute fever and rash
ARCC	Africa Regional Certification Committee
aVDPV	Ambiguous Vaccine-Derived Poliovirus
BMGF	Bill & Melina Gates Foundation
bOPV	Bivalent Oral Polio Vaccine
CDC	Center for Disease Control
CDH	County Director of Health
CHMT	County Health Management Team
CIF	Case Investigation Form
CSF	Cerebrospinal Fluid
CDSC	County Disease Surveillance Coordinator
cVDPV	Circulating Vaccine-Derived Poliovirus
EPID	Epidemiological Identification
ES	Environmental Surveillance
GBS	Guillain-Barré Syndrome
GPEI	Global Polio Eradication Initiative
IEC	Information Education and Communication
IDP	Internally Displaced People
IDSR	Integrated Disease Surveillance and Response
ITD	Intratypic Differentiation
iVDPV	Immunodeficiency Circulating Vaccine-Derived Poliovirus
KEMRI	Kenya Medical Research Institute
MoH	Ministry of Health
mOPV	Monovalent Oral Polio Vaccine
nOPV	Novel Oral Polio Vaccine
NPAFP	Non-Polio Acute Flaccid Paralysis
NPEC	National Polio Expert Committee
NPENT	Non-Polio Enterovirus
NPEV	Non-Polio Enterovirus
ODK	Open Data Kit
OPV	Oral Polio Vaccine
PV2	Poliovirus Type 2
SARS	Severe Acute Respiratory Syndrome
SCDSC	Sub County Disease Surveillance Coordinator
SCHMT	Sub County Health Management Team
SCMOH	Sub County Medical Officer of Health
SIA	Supplemental Immunization Activity
SL2	Sabin Like type 2
RI	Routine Immunization
VDPV	Vaccine-Derived Poliovirus
VPD	Vaccine-Preventable Disease
WHO	World Health Organization
WPV	Wild poliovirus
WPV1	Wild poliovirus type 1

1:

BACKGROUND

1. BACKGROUND

1.1 Global polio eradication initiative

The global polio eradication initiative was adopted in 1988 when the 41st World Health Assembly (WHA) committed the member states of the World Health Organization (WHO) including Kenya to achieving the goal of global eradication of poliomyelitis due to wild poliovirus (WPV). As of December 31st, 2020, five (5) out of six WHO regions were certified polio-free. Globally, only WPV 1 remains in circulation, type 2 and type3 WPV having been eradicated in 2015 and 2019 respectively.

The initiative utilizes four strategies:

i. Routine immunization
ii. Supplementary immunization activities (SIAs)
iii. AFP surveillance
iv. Mop-up campaigns

Surveillance for cases of Acute Flaccid Paralysis (AFP) is the goal standard for detection of ongoing poliovirus transmission and it is critical to reaching the global polio eradication goal. High-quality surveillance enables the timely detection of poliovirus transmission due to wild polio virus (WPV), Vaccine-Derived Polio Viruses (VDPVs), and Sabin-like viruses. Environmental Surveillance (ES) is a complementary system for AFP surveillance, and it has proven useful in detecting transmission of polioviruses in specific settings.

1.2 Epidemiology of poliomyelitis

Infectious agent: The polioviruses are three related enteroviruses: Wild Poliovirus serotypes 1, 2, or 3. All three types can cause paralysis. Polioviruses infect only humans and there is no known animal reservoir.

Communicability: Polioviruses are highly communicable. An infected person will infect all other non-immune persons in the household especially in areas of poor sanitation.

Transmission: The polio virus is transmitted from person to person via the fecal-oral route. The incubation period is 7-10 days with a range of 4-35 days. The virus is shed intermittently in the stool of infected persons and asymptomatic individuals for up to 2 months (60 days). The peak virus shedding is observed 1 week before the onset of paralysis and during the first 2 weeks after onset.

Immunity: Protective immunity against poliovirus infection develops by natural infection or following vaccination with the Oral Polio Vaccine (OPV) or Inactivated Polio Vaccine (IPV). Immunity against polioviruses is type-specific.

Occurrence: Commonly affects children below five years but persons of any age without immunity can get the disease.

Clinical Manifestation: Poliovirus infection occurs in the intestines with spreads to the regional lymph nodes and in a minority of cases to the central nervous system. Infection is mostly asymptomatic, however, 24% of those infected develop mild symptoms of fever, fatigue, headaches, vomiting, stiffness in the neck, and pain in the limbs. Some individuals (approximately 4%) develop a self-limited illness with signs of meningeal irritation (neck stiffness, severe headache). Flaccid paralysis occurs in about 1% of infections.

Paralysis due to poliomyelitis is usually asymmetrical with fever at onset in most cases. The maximum extent of paralysis is reached in a short period, usually 3-4 days. The Lower limbs are more affected than the upper limbs. Paralysis of respiratory and/or swallowing muscles can be life-threatening. Some improvement in paralysis may occur during convalescence but paralysis beyond 60 days is likely to be permanent. The case-fatality ratio for paralytic polio is generally 2% to 5% among children and up to 15% to 30% among adolescents and adults.

Diagnosis: Poliomyelitis can only be distinguished from other paralytic conditions by isolation of the poliovirus from the stool specimen.

Differential diagnosis: The most frequent cause of Acute Flaccid Paralysis (AFP) that must be distinguished from poliomyelitis is Guillain-Barré Syndrome (GBS). Paralysis in GBS is usually symmetrical and may progress for periods as long as 10 days. The fever, headache, nausea, vomiting characteristic of poliomyelitis are usually absent in GBS; high protein and low cell counts in Cerebrospinal Fluid (CSF) and sensory changes are seen in the majority of GBS cases. Other causes of AFP include acute motor axonal neuropathy (China paralytic syndrome), transverse myelitis, traumatic neuritis, infectious and toxic neuropathies, tick paralysis, myasthenia gravis, porphyria, botulism, insecticide poisoning, polymyositis, trichinosis, and periodic paralysis.

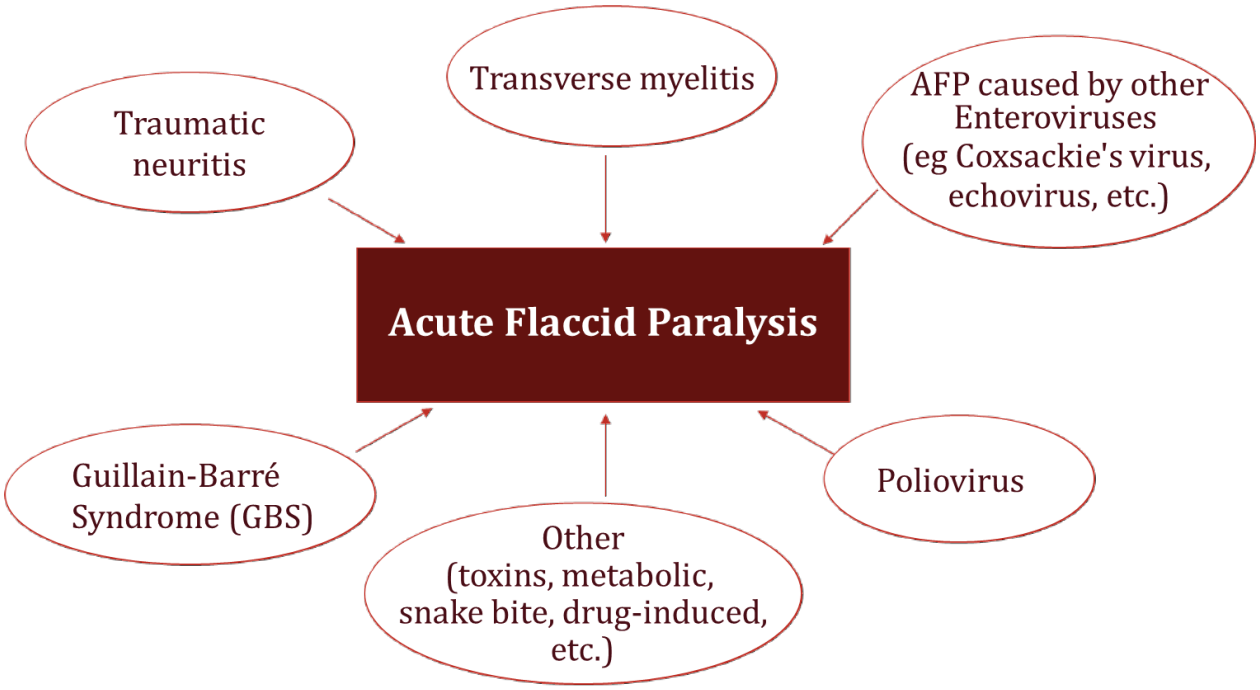


Figure 1: Common differential diagnosis of AFP

1.3 Overview of Polio surveillance in Kenya

The last indigenous case of WPV was reported in 1984. Kenya was certified polio-free in 2005. Between 2006 and 2020, the country had four polio outbreaks. All the outbreaks were due to importations of WPV from neighboring countries of Somalia (2006 & 2013), South Sudan (2009), and Uganda (2011). In addition, the country had VDPV type 2 events in May 2016 and October 2018 from Environmental Surveillance (ES) isolations in Kamukunji, Nairobi. There were also three outbreaks of circulating VDPV2 (cVDPV2) in 2012 (Garissa), April 2018 (ES isolation in Kamukunji, Nairobi), December 2020 (ES isolation and a healthy child in Garissa), and February 2021 (ES Isolation in Mombasa & Garissa).

Table 1: History of Polio Outbreak in Kenya

Outbreak (Event type)	Year	Location of outbreak	Importation from
WPV 1	2006	Garissa	Somalia
WPV 1	2009	Turkana	South Sudan
WPV 1	2011	Migori	Uganda
cVDPV2	2012	Garissa	Somalia
WPV 1	2013	Garissa	Somalia
cVDPV2	2018	Nairobi	Somalia
cVDPV2	2020	Garissa & Mombasa	Somalia
cVDPV2	2021	Garissa & Mombasa	Somalia

Kenya has been implementing case-based AFP surveillance since 1996, through an established surveillance system. The structure has players at all levels of the healthcare system that includes Community informants, Community health volunteers, and community health assistants at the community level; Health facility focal person at facility level; Sub County Disease Surveillance Coordinator (SCDSC) at sub-county level; and the County Disease Surveillance Coordinator (CDSC) at the county level. Currently, there are 47 counties, 306 Sub counties, and 7,300 priority sites.

At the national level, the Vaccine-Preventable Diseases (VPDs) section within the Division of Disease Surveillance and Response (DDSR) coordinates all polio surveillance activities. Additionally, the country conducts environmental surveillance in 17 sites found in five counties of Nairobi – 8, Mombasa – 5, Kisumu – 2, Garissa – 1, and Isiolo – 1. The WHO accredited polio laboratory in Kenya is hosted at the Kenya Medical Research Institute (KEMRI).

2:

SURVEILLANCE FOR POLIO

2. SURVEILLANCE FOR POLIO

2.1 Rationale

Poliomyelitis due to WPV is targeted for eradication; however, the ultimate goal is a polio-free world, including poliomyelitis caused by VDPVs and Vaccine Associated Paralytic Poliomyelitis (VAPP). As it is not easy to distinguish a case of polio among all paralytic illnesses, therefore the term Acute Flaccid Paralysis (AFP) is used instead of polio in surveillance to ensure that no cases of polio are missed.

2.2 Objectives for Polio Surveillance

i. To demonstrate the presence of polioviruses.
ii. To demonstrate the absence of polioviruses.
iii. To ensure that surveillance meets the performance needed for Polio-free certification.
iv. To guide immunization and response activities.

2.3 Types of surveillance used for Polio

The minimum recommended standard for poliovirus surveillance is nationwide, case-based syndromic surveillance for AFP with laboratory confirmation of poliovirus from stool specimens. AFP cases should be identified using both active and passive surveillance in both facility- and community-based detection methods. AFP surveillance is supplemented by environmental surveillance.

Active surveillance: This involves visits to selected priority sites that are most likely to treat AFP patients (such as major hospitals, large paediatric clinics, physiotherapy centers) to identify unreported AFP cases. These also include informal health care providers such as chemists, traditional healers, and bone setters.

Passive surveillance: This involves regular reporting from a network of reporting sites that includes public and private healthcare facilities and clinics. In Kenya, this is done through the Integrated Disease Surveillance and Response (IDSR) weekly reporting.

Community-based surveillance: Trained or sensitized community health volunteers report AFP cases to public health authorities

Environmental surveillance: Testing of sewage samples from a defined catchment area for poliovirus.

3.

ACUTE FLACCID PARALYSIS SURVEILLANCE

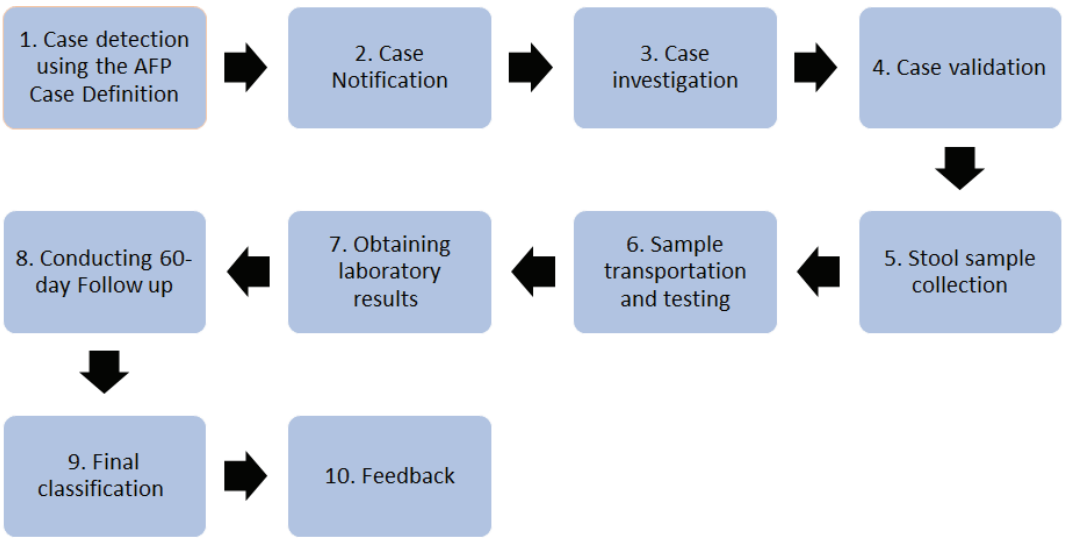
3. ACUTE FLACCID PARALYSIS SURVEILLANCE

3.1 AFP Case definition

An AFP case is defined as any child under 15 years of age presenting with the acute (sudden) onset of flaccid (floppy) paralysis or muscle weakness , or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis.

i. Acute – Rapid progression or short, brief duration, maximum 3-4 days from on-set to maximum paralysis.
ii. Flaccid – Floppy or soft and yielding to passive stretching at any time during illness (not spastic or rigid).
iii. Paralysis – Loss of function in any limb

3.2 Steps in AFP surveillance



3.2.1 Case detection

Using the case definition, AFP cases may be detected by health care providers during day-to-day clinical exercise, during active cases search, retrospective reviews, and voluntary reporting from the community. Supervision or any visit to the health institution is an opportunity to inquire about AFP cases not yet reported.

3.2.2 Case notification

Once one detects an AFP case, they should notify the next level immediately to ensure important activities including immediate case investigation, stool sample collection, outbreak response immunization, and active searches for additional cases in the community are done without delay.

3.2.3 Case investigation

All cases should be investigated by a trained surveillance officer usually a health worker, surveillance focal person in the health facility or SCDSC, within 48 hours of notification and geo-coordinates captured. The health workers investigating the case should take a detailed history including history of travel in preceding one month before the onset of symptoms and conduct a thorough physical examination as well complete the AFP Case Investigation Form (CIF) Annex 1a. The following information should be completed:

1. Basic demographics
2. Clinical illness details
3. Clinical examination findings
4. Hospitalization history related to current illness
5. Immunization history (Number of OPV & IPV doses both routine and SIA)
6. Information on stool specimen collection
7. Investigator's information

Risk factors to identify the source of exposure are also captured in the detailed case investigation form. This includes documentation of any history of travel or history of visitors to the household coming from areas outside the residence within the past 35 days.

The investigator is expected to assign and indicate the Epidemiological Identification (EPID) number on the CIF. The EPID number is a unique identifier for each case and has the following components:

- Country: e.g., KEN for Kenya
- County: e.g., NAI for Nairobi
- Sub County: e.g. EMW for Embakasi West (pick the first 3 letters if the sub county name is a single word. If the sub-county name is two words, pick the first two letters of the first word and the first letter of the second word)
- Year: e.g., 21
- Case id no: e.g., 001 for the first case reported in Embakasi West sub-county in 2021.

This information is then combined as follows: KEN-NAI-EMW-21-001.

All cases identified after two months but less than six months of the onset of paralysis must be investigated. A detailed case investigation form should be completed for these cases and submitted to the program for entry into the database; however, stool samples should not be collected for cases beyond 60 days of onset of paralysis.

3.2.4 Stool collection

The quality of the stool specimen collection determines the ability to isolate the polio virus. The following steps must be followed to ensure the quality of the specimen.

1. Collect two stool specimens from the AFP case at an interval of 24-48 hours apart. This is done to increase the probability of isolating the poliovirus as the virus is shed intermittently in the stool. Stool samples should be collected on clean surfaces to avoid contamination.
2. Collect at least 1 adult "thumb-sized" (8 g) amount of stool
3. Place a stool in a clean wide-mouthed plastic bottle with an external screw-on cap.
4. Label each specimen container with the name, EPID number of the case, number of the specimen (1 or 2), and date of collection using a water-resistant pen.
5. Place the specimen container in a sealed plastic bag.

- Stool samples should be collected within 14 days of onset of paralysis as the excretion of poliovirus reduces thereafter.
- However, specimens should be collected from all cases detected within 60 days (2 months) of paralysis onset as cases still excrete virus for several weeks.
- Collect stool specimens from three contacts if the AFP case is inadequate or a Hot AFP case.
- DO NOT collect stool samples from cases that are detected more than 60 days after the onset of paralysis.

Hot AFP case

A hot AFP case is an AFP case likely due to poliovirus. It is defined as a child with rapid progression of asymmetrical paralysis, aged less than 5 years AND with fever, AND received less than 3 OPV doses.

It is important to identify and rapidly investigate hot AFP cases. In addition, Hot cases are given priority in the laboratory for stool specimen processing. For all hot AFP cases, one stool sample from 3 close contacts should be collected and sent to the polio laboratory as well.

Inadequate AFP case

Adequate stool samples are necessary for the detection of poliovirus in specimens collected. An adequate stool sample in AFP surveillance is defined as **Two stool** specimens (8g each) collected within **14 days** of paralysis onset, **24-48 hours** apart, both received in a laboratory in good condition within **72 hours** of collection.

Good condition is defined as evidence that reverse cold chain was maintained with no evidence of desiccation or leakage of the specimen. Any case that does not meet these criteria is considered inadequate.

3.2.5 Stool storage

1. Stool specimens should immediately be kept at 2-8°C after collection separate from the vaccines and other clean items.
2. If a refrigerator is not available, use a cool box that can maintain the temperature below 8°C until the shipment has been arranged.
3. If stool cannot be transported to the national laboratory immediately, store at – 20°C until transport is available.

- DO NOT store AFP stool samples with vaccines, drugs, or reagents.
- DO NOT use vaccine cool boxes for specimen transport.

3.2.6 Transport of samples to National Polio Laboratory

1. A dedicated specimen carrier with 2–4 well-frozen ice packs should be used for transport. This is called the "reverse cold chain", meaning the transportation/shipment to the Laboratory.
2. A copy of the filled AFP case investigation form must accompany all stool specimens.
3. All samples should be well packaged to avoid spillage and well addressed and the contacts of the person sending the specimen included.
4. Stool specimens should reach the laboratory within 72 hours of collection.

Address the samples to KEMRI Headquarters, Polio Laboratory, off Mbagathi Way, NAIROBI.

3.2.7 Laboratory results

The laboratory should send the results of the stool sample to the national and sub-national levels within 14 days of receipt of the sample.

3.2.8 Sixty (60) day follow up

The sixty-day follow-up is an assessment done to check for residual paralysis in AFP cases. It is especially important for AFP cases with inadequate stool. Assessment should be done by a clinician **60-90 days from the onset of paralysis**. The presence of residual paralysis at this time is further evidence that the cause of paralysis is likely to be due to poliovirus. The follow-up should not be done before the 60th day of the onset of paralysis.

During the 60-day follow-up examination, the investigator must:

- Verify with the family that all the information on the CIF is correct.
- Ask if the paralysis has improved, progressed, or is the same as before.
- Observe how the child moves the limbs or areas of the body that were paralyzed (look for areas of muscle atrophy, mid-thigh skin folds in children and, if possible, watch the child walk)
- Compare present (e.g., mid-arm/mid-thigh) circumference measure ments with the measurements taken at the initial case investigation to detect any wasting.
- Examine the tone, power, and reflexes and verify sensation
- Even mild residual weakness is considered residual paralysis.
- Complete the 60-day follow-up form (Annex 2) and send to the National level.
- Feed the information on the online platform and send the hard copy to the national level
- Introduction of the 60-day form in the KHIS

The outcomes for 60-day follow-up may either be: no residual paralysis, residual paralysis, loss to follow up, or death before follow up.

3.2.9 Classification of AFP cases

Within ninety (90) days of onset of paralysis, all AFP cases must be classified as confirmed polio, polio-compatible, or discarded (i.e., non-polio) by the National Polio Expert Committee (NPEC). NPEC do not need to review/classify all AFP cases but should concentrate on the detailed review of those AFP cases that are 'difficult to classify' because of limited available data (i.e., those with inadequate specimens and either no follow-up or with residual paralysis at follow up), with the goal to either discard them or classify them as 'polio-compatible.'

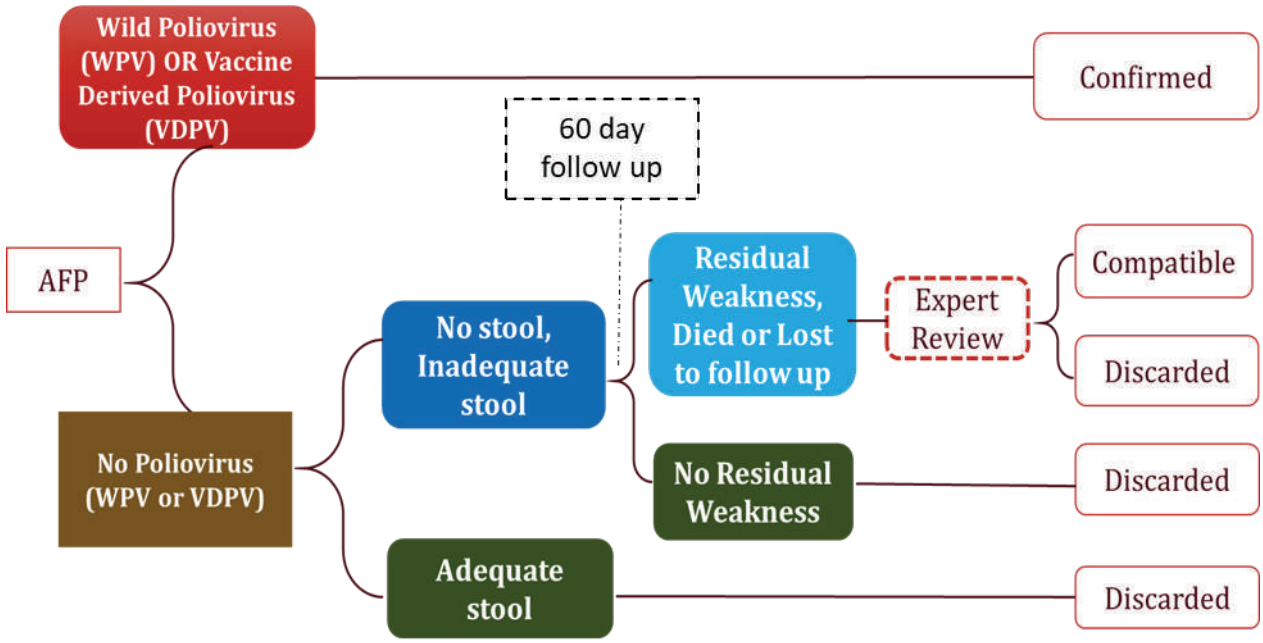


Figure 2: Steps in AFP classification

Confirmed: This is an AFP case with isolation of WPV or VDPV in stool specimens collected from the case or close contact.

Compatible: This is an AFP case with inadequate stool specimens and the following:

i. WPV or VDPV is not isolated from samples from the case or close contacts.
ii. The case has residual paralysis on 60 days follow up or was lost to follow up or died a
iii. Those that the NPEC deem to be clinically and epidemiologically compatible with poliomyelitis.

The NPEC may classify AFP cases as compatible if there is insufficient clinical and epidemiological data to rule out poliomyelitis. An explanatory note should be written for every compatible case.

Discarded: This is an AFP case that was adequately investigated (including the collection of adequate stool specimens) and resulted in any of the following:

i. No laboratory evidence of WPV or VDPV infection
ii. Inadequate specimens were collected and no residual paralysis after 60 days of paralysis onset.
iii. Deemed by the NPEC not to be compatible with poliomyelitis.

Vaccine-Associated Paralytic Poliomyelitis (VAPP): AFP case occurring within 4–35 days of receiving OPV with all the following:

i. Sabin or Sabin-like strain poliovirus is isolated from the stool specimens
ii. Residual paralysis 60 or more days following onset of paralysis
iii. NPEC review determines that there is clinical compatibility with poliomyelitis.

Vaccine-Derived Poliovirus (VDPV): This is an OPV-derived virus strain that has changed over time and is similar to the wild type. A circulating VDPV (cVDVP) isolate is one for which there is evidence of person-to-person transmission in the community and is more frequent in communities with low population immunity. For unclassified VPDV, the priority is to take a blood sample to rule out immunodeficiency VDPV (iVDPV).

Sabin-like: This is any poliovirus isolated from human or environmental samples which are similar to the one in the vaccine.

3.2.10 Feedback

The results of the case investigation including the laboratory results and the 60-days follow-up exam findings should be fed back to the relevant persons in the surveillance network.

At the community and family level: The results of the investigations should be communicated clearly to the community and family by the health worker. This will foster cooperation between the community and the entire surveillance network and possibly improve detection and referral of AFP cases from the community.

At the health facilities and reporting site level: The sub-county level should provide the health worker at the reporting sites with the laboratory results promptly. The health worker is in turn expected to update the facility copy of the CIF with the laboratory results as well as communicate the results to the family and community.

At the sub-county level: the SCDSC should receive regular feedback from the county and national levels. They also provide regular feedback to the health facilities and the priority sites (including the stool condition).

At the County level: the CDSC should coordinate the communication of results from the laboratory and ensure feedback reaches the sub-counties.

At the national level: This level should communicate the results of the investigation to the county level within 14 days of receipt of the samples and guide on the interpretation of the results. In addition, the national level should give regular feedback to the county and sub-county teams on all the various aspects of AFP case investigation surveillance such as the completeness of the CIF and the adequacy of the stool.

At the regional level: The country gives weekly updates to WHO AFRO.

3.3 AFP Contact Sampling

3.3.1 What is contact sampling

AFP cases with inadequate stools require that one stool specimen is collected from three (3) individuals in close contact with the case. Samples should preferably be collected from children in close contact (i.e., those who play with the case, share toys, and share food) with the case who are aged five and below. Siblings and other children living in the same household and/or neighbouring children who played with the AFP case during the period of interest should be preferred for contact sampling.

Stool specimens are typically collected from the community of residence of the AFP case. However, if the AFP case stayed in other communities one week before and/or two weeks after paralysis onset, then the collection of specimens from contacts of the AFP case at these locations may also be warranted.

Stool samples from the contact should be collected ideally within 7 days (but can be collected up to 60 days) of the onset of paralysis of the index AFP case.

3.3.2 The rationale for contact sampling

Most poliovirus infections are asymptomatic. However, infected asymptomatic persons may carry and excrete the virus for periods of 2 months or longer. As polio is highly infectious and spreads fecal-orally, close contacts of AFP cases have a higher chance of being infected.

In instances when the collection of adequate stool specimens is not possible, stool samples from contacts of selected AFP cases are taken to increase the sensitivity of the surveillance system. The purpose of contact sampling is to provide laboratory evidence of poliovirus in an AFP case and provide an additional approach to determine if poliovirus is the cause of paralysis in an AFP case.

3.3.3 Indications for contact sampling.

Contact sampling is indicated in the following situations:

- All AFP cases with inadequate stool specimens. Examples of inadequate stool specimens are: None or 1 stool specimen collected; At least one stool specimen collected > 14 days after paralysis onset; Two stools collected <24 hours or > 48 hours apart; and Poor stool condition
- In certain situations, contact samples may be collected for AFP cases who reside in security-compromised or hard-to-reach areas.
- For Hot AFP cases
- As part of outbreak response activities in affected areas as guided by the national and laboratory teams.

3.3.4 Procedures of contact sampling

Obtain one stool specimen from each of the three close contacts of the AFP case. The guidelines for the quantity of stool to be collected, packing, labeling, and transportation are identical to those for AFP cases.

Complete a separate contact sampling form for each contact (Annex 3). Send the samples together with the form to the KEMRI polio laboratory.

3.3.5 Specimen labeling for contact samples

Each specimen should be labeled clearly as a contact of the AFP case. The unique identification number should be the same as it appears on the AFP case investigation with an added contact indicator ("C") and number (#) suffix (e.g., C1, C2, C3).

For example, in the AFP case from Embakasi West sub-county in Nairobi County detected in 2021 with EPID no KEN-NAI-EMW-20-001, the contact samples will be labeled as follows:

i. First contact KEN-NAI-EMW-21-001-C1
ii. Second contact KEN-NAI-EMW-21-001-C2
iii. Third contact KEN-NAI-EMW-21-001-C3

3.3.6 Interpreting results of contacts

1. Presence of WPV in any stool specimen in one of the three contacts confirms that the index AFP case was infected with WPV.

2. Isolation of a VDPV from an AFP contact confirms the AFP case as a VDPV case if the AFP case had a VDPV negative stool.

Positive AFP contacts are not classified as confirmed poliovirus cases because they do not meet the case definition, which requires acute flaccid paralysis.

3.4 AFP Case Validation

AFP case validation is the process of ascertaining whether the reported AFP cases are true AFP cases. It also provides an opportunity to update case details that were missed out or could not be ascertained during the initial case investigation. Discrepancies between the information collected during the initial investigation and case validation should be used to correct erroneous AFP surveillance data as well as provide corrective feedback to the initial investigator. Such feedback may include re-sensitization of the investigators interviewing techniques and CIF data entry.

Validation should be conducted within 7 days of the initial AFP case investigation (or as soon as possible) by a clinician who did not participate in the initial investigation.

During validation, the clinician should fill both the AFP case validation form (Annex 4) and the online form which includes the following information:

1. Identification and residence/demographics confirmation
2. Clinical history
3. Vaccination history
4. Stool specimen collection
5. Clinical examination at the time of initial investigation and validation.
6. Verifying investigation details
7. Working diagnosis

3.5 Investigation of AFP cases with zero dose

Every AFP case reported as a zero dose and cases with inadequate or unknown vaccination status should be investigated, and immediate corrective actions are taken. All cases with unknown vaccination status are also considered to be zero-dose cases.

The Ministry of Health VPD surveillance desk will regularly share a line list of all AFP cases with zero dose or unknown status to the counties for corrective action with the relevant levels of the surveillance network. Upon receipt of the line list, each sub-county/county disease surveillance team should immediately locate the AFP case and conduct a detailed case investigation to verify the reasons for non-vaccination or missing vaccination.
The following steps should guide the investigation of zero or inadequately vaccinated AFP cases:

1. Review the case investigation form of the case - verify if indeed the case is a zero dose by asking the mother or confirming from the child's vaccination card or facilities' permanent register. If the information on the CIF is incorrect, send the correct information to the AFP/VPD focal person at the MoH and send an updated copy of the investigation form.

2. For cases with zero dose, conduct a detailed investigation and fill the zero-dose investigation form (Annex 5). The form includes information on the case including case details, vaccination status, and an evaluation of the case's access and utilization of immunization services.
3. Conduct a rapid immunization coverage survey in the area from which the case is from. This involves sampling thirty households in the area, with at least one child less than 5 years. A survey form collects the vaccination status (both OPV and IPV) for sampled children.
4. If the investigation confirms the case to be a zero-dose case or the vaccination status cannot be ascertained and the child is below 5 years, arrange for the child to be vaccinated with bOPV and IPV according to the national vaccination schedules.
5. If the rapid immunization coverage survey shows the area has bOPV3 coverage less than 50% or IPV coverage less than 50%, a vaccination out reach must be done in the area.

3.6 Targeted healthy children stool surveys

Targeted healthy children stool survey also referred to as healthy children sampling or community children sampling.

3.6.1 Definition

Targeted healthy children stool survey is the collection and testing of stool specimens from healthy children to determine if there is the community-wide transmission of poliovirus (i.e., outbreak). in Surveillance, a healthy child is defined as:

- Ideally, a child aged <2 years old, although consideration may be given to children aged up to 5 years.
- A child who has not been in contact with the confirmed poliovirus case within the week before or two weeks after paralysis onset (i.e., not a contact).
- Not a child living or residing in the same community or neighbourhood as a confirmed poliovirus case.
- Does not meet the standard case definition for AFP.

3.6.2 Rationale

Targeted healthy children stool sampling is conducted to determine if there is a community-wide transmission of poliovirus. Community-wide transmission indicates an outbreak, which requires mobilization of resources to quickly launch an outbreak response.

3.6.3 Indications

Targeted healthy children stool sampling is useful in a very limited number of situations during an event or outbreak investigation, specifically, those situations when community-wide transmission has yet to be confirmed. In situations where an outbreak has been confirmed, the use of targeted healthy children stool sampling is discouraged as it would be an inefficient and ineffective use of program resources. Any decision to do a targeted healthy children stool sampling should be made in close coordination and collaboration with national surveillance and laboratory colleagues.

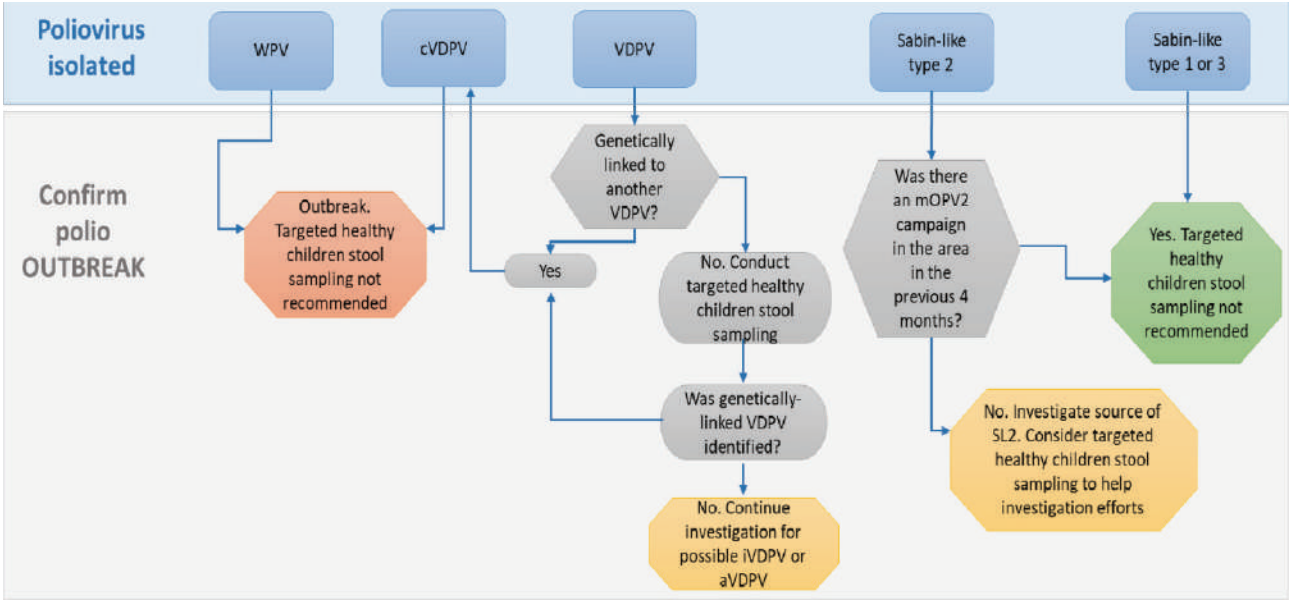


Figure 3: Flow chart for assessing situations for targeted healthy children stool sampling

Table 1: Notes on indications for targeted healthy children stool sampling

Indication	Description	Recommendation
WPV	One case of WPV is an outbreak	No
cVDPV	Circulating VDPVs indicate community transmission	No
VDPV genetically linked to another VDPV	The VDPV will be reclassified as a cVDPV	No

Indication	Description	Recommendation
VPDV is not genetically linked to another VDPV	• Isolation of VDPV from a healthy child in an area where VDPV has previously been isolated confirms community transmission of the VDPV and this information can be used to reclassify the VDV to cVDPV. • Isolation of VDPV from a healthy child in an area where aVDPV has previously been isolated can assist in reclassifying the aCVDV to VDPV. • If no VDPV is detected among the healthy children, the investigation should continue to assess if the VDPV case is possibly an iVDPV or aVDPV case	Yes
Sabin-like 2 virus detected ≤4 months of a mOPV2 campaign	SL2 virus detection is expected during a mOPV2 campaign.	No
Sabin-like 2 viruses detected >4 months after last mOPV2 campaign or no recent mOPV2 campaign	In these instances, an investigation into the source of the SL2 virus is warranted.	Yes
Sabin-like 1 or 3 virus	Detection of Sabin-like 1 and 3 viruses is expected given bOPV use in routine immunization schedules and outbreak response.	No

NB: As healthy children are randomly sampled and are not contacts of an AFP case, a positive polio laboratory result cannot not be used as laboratory evidence of poliovirus (reduce font to 10)

3.6.4 When to conduct stool sample collection for targeted healthy children

Conduct targeted healthy children stool sampling after confirmation that a VDPV is not genetically linked to another known VDPV (i.e., after laboratory test results and sequencing information are available).

Examples of when targeted healthy children may be considered to include

- As a screening tool for internally displaced and refugee children moving from areas of known or suspected virus circulation. The number and frequency of children to be sampled will be advised by the polio eradication program from time to time.
- In a polio event or an outbreak setting as part of initial investigations and to assess possible expansion.
- Silent counties and sub-counties as advised by the national program.

3.6.5 Specimen labeling

Each specimen should be labeled clearly as a targeted healthy children stool sampling specimen. The unique identification number should be the same as the positive poliovirus case with an added targeted healthy children stool sampling indicator ("CC") and number (#) suffix (e.g., CC1, CC2, CC3) e.g., KEN-NAI-EMW-21-CC1

3.6.6 Result interpretation

Positive test results among healthy children are not classified as confirmed poliovirus cases because they do not meet the case definition, which requires acute flaccid paralysis. Results are included as "others" in poliovirus isolation counts.

3.6.7 Procedures

1. Decide on a source population:
    a. Health facility-based sampling (when a child from the targeted area or group visits a health facility for any reason other than AFP).
    b. Community sampling from households or camps.
    c. Can also do purposive sampling based on risk assessment; through analysis of the performance of routine immunization and SIA coverage, poor performing sub-counties can be picked out.
2. Sensitizing and briefing community leaders about polio and the importance of collecting samples.
3. Decide on criteria for enrolment: 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 under-immunized or not immunized).
4. Collecting, storing, and transporting stool specimens is done in the same way as for AFP cases
5. 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 (Annex 6).

4.

AFP SURVEILLANCE NETWORK

4. AFP SURVEILLANCE NETWORK

The AFP surveillance network is a comprehensive list of sites that report suspected AFP cases to health authorities within the sub-county and county. The network should include all formal and informal health care facilities in the private and public sector as well as faith-based and community-based organizations, community-based surveillance (where available), and other key reporters such as traditional healers, veterinarians, and pharmacies/chemists. For each of the sites, a focal person should be identified to coordinate AFP surveillance activities.

4.1 Prioritization of surveillance sites

All Sub Counties must classify their surveillance sites into one of the following priority categories of risk: Highest, High, Medium, and Low. This prioritization should be reviewed every six months (January and July} and the list to be submitted to the next level. Consider the following when conducting prioritization:

1. The rate of attendance of the sites (health facilities, traditional practitioners,etc).
2. Patient caseload that includes bed capacity, OPD attendance.
3. The characteristic/specificity of the sites e.g. type of services available level of facility, presence of paediatric, neurological units, physiotherapy units etc.
4. Likelihood of AFP cases to seek care e.g. alternative healthcare providers such as traditional healers, religious/spiritual healers, bone setters etc
5. Population characteristics –number of special populations like nomads, immigrants,
6. Facility that has detected or missed AFP cases.

4.1.1 Highest Priority sites

These are sites within IDP or refugee camps as well as facilities in IDP/Refugee host communities. Given the high-risk status of these populations, the probability of detecting AFP cases is very high. Surveillance sites classified as highest priority MUST be visited AT LEAST TWICE A WEEK (2-3 days apart).

4.1.2 High Priority sites

High priority Surveillance sites are those that an AFP case would most likely seek care. These include traditional healers, reputed/famous for the treatment of paralysis, bone setter, prayer centres, miracle healers, Teaching and Referral hospital, County hospitals, Sub county Hospital with paediatric unit, a neurology unit, an orthopaedic unit, occupational therapy unit, physiotherapy unit, a community that has had an accumulation of AFP cases, Surveillance sites classified as high priority MUST BE VISITED ONCE A WEEK.

4.1.3 Medium priority sites

A Surveillance site where an AFP case would likely seek care. This can be any health institution or community site where patients with paralysis would go, even if the institution is not famous for treating paralysis. Surveillance sites classified as medium priority MUST be visited AT LEAST ONCE EVERY TWO WEEKS and these are health centres and dispensary with high case loads

4.1.4 Low priority sites

These are all the health institutions that are not classified (highest, high, or medium Priority). Surveillance sites classified as low priority MUST be visited at least ONCE A MONTH.

Table 2: A guide for prioritization of active surveillance sites

Priority	Criteria	Example	Frequency
Highest priority	Very likely to see AFP case	• Centres within IDP or refugee camps • Health facilities within IDP or refugee host communities	Twice a week
High priority	Most likely to see AFP case	• Tertiary level, teaching & referral hospitals, Busy private hospitals, Child specialist doctors, busy general practitioners, well known traditional healers and faith healers reputed/famous for the treatment of paralysis, bone setters, prayer centres, miracle healers, county hospital, Sub county Hospital with either a paediatric unit, a neurology unit, an orthopaedic unit clinic, occupational therapy unit, physiotherapy unit	Once in a week
Medium priority	Likely to see AFP case	• Secondary level health care centres or small clinics or hospital, dispensaries. • General practitioners, some traditional healers and faith healers.	Every two weeks
Low priority	All other	• All other health care centres and potential individual caregivers.	Once in a month

4.2 Active Surveillance for AFP

This is also known as active case search. It is a process in which designated surveillance staff make regular visits to selected health facilities and sites to detect, report and investigate cases of AFP and other VPDs. They collect data from individual cases, registers, medical records or log-books at a reporting site to ensure that no case is missed.

AFP cases at the surveillance sites may be missed for various reasons including:

- Service Providers in surveillance sites are not aware of AFP reporting,
- Clinicians think they can differentiate conditions like GBS from polio on clinical grounds
- AFP cases are so rare that they are simply missed
- Service providers are aware of AFP Surveillance, but not motivated to report cases.
- The misconception that polio has been eradicated.
- Service providers have misconception that AFP surveillance is for other cadres.
- Lack of reporting tools and specimen carriers of AFP surveillance.

The surveillance officer should prioritize the sites for his/her regular visits.

4.3 Steps in Conducting Active Case Search

4.3.1 Visit to Health Facilities:

1. Establish routine work plan for weekly visits.
2. The visit should be done preferably on the same day of the week. If visit is not possible, call contact on the identified day.
3. At the health facility, meet with your focal point.
4. Ask if any cases of AFP have been identified at the facility since the last visit.
5. Conduct record search in the following key areas; Records department, Depart ments that would admit and treat AFP cases e.g. Out-patient department, Maternal and Child Health, Nutrition, paediatric wards, physiotherapy, occupational therapy, paediatric clinic.
6. Key symptoms for record search: Paralysis, paresis (weakness), Flaccid, (floppy) paralysis (in combination with any other words), Weakness (of limb, of unclear origin, etc), "Frequent falls", "Gait disturbance", "Cannot walk"
7. Remember AFP is a syndrome that may present as a result of other illnesses. Look at the registry books for any of these diagnoses listed below which can be associated with AFP (record review).
    a. Poliomyelitis, rule out polio, suspect polio
    b. Guillain-Barre Syndrome - (illness causing slowly progressing (ascending) floppy paralysis of BOTH limbs).

c. Transverse myelitis (rare illness causing floppy paralysis of BOTH lower limbs).
d. Traumatic neuritis/Post injection neuritis (usually due to an incorrect intramuscular injection) Neuritis, Neuropathy.
e. Plegia (paraplegia, hemiplegia etc).
f. Paresis (hemiparesis, paraparesis etc).

8. Ask for the medical records/Clinician notes (if records are kept) for any person under 15 years or where a clinician suspects a patient who has one of the above diagnoses listed with their name in the registers.
9. Look at the medical records of any of these cases with medical person based in the health facility (nurse, clinical officer, physiotherapist, occupational therapist, Community Health Worker, Doctor, other); If cases are identified in the records but are no longer within the facility, get the contact information and try to find them in the community.
10. Discuss Case definition of AFP and procedures with staff of facility at each visit.
11. Remind contact person of 'zero' weekly reporting of IDSR priority diseases, which include AFP.
12. Document on the register number of cases found, include signature and date of active case search.
13. Record on active case search monitoring tool (visitors' book, register) where and with whom you visited.
14. Fill active case search form on the digital/electronic data and submit (Annex 9).

4.3.2 Visit to the Community Focal Points

Community focal points should be visited as per priority level, but at least once a month. These include: Village/Community Leaders (Chiefs, elders, etc), Village Development committee,Traditional/Spiritual Healers/Prayer camps, Community health volunteers, Women's Groups/faith based organisation, NGOs, Cattle Camps, Water points, etc.

- Make regular monthly visits to all community contacts.
- Make sure visits are made to contacts in all parts of the sub county.
- At each visit take time to teach people the basic facts about polio, AFP, and the importance of immunization.
- Ask if your contact has heard about any cases of AFP.
- If you are told about any cases of AFP immediately investigate!
- Record on the digital/electronic reporting Form where and with whom you visited (Annex 9, Q27-31)

5.

IMPLEMENTING QUALITY AFP SURVEILLANCE IN HIGH RISK AREAS/POPULATIONS

5. IMPLEMENTING QUALITY AFP SURVEILLANCE IN HIGH RISK AREAS/POPULATIONS

Implementing high quality AFP surveillance to reach high risk population requires a good plan taking in account the following:

- A good contextual understanding and analysis of the situation.
- A good definition of strategies and objectives.
- A realistic and operational planning of activities
- A regular monitoring and evaluation.

5.1 Analysis of the situation

Conduct an analysis to identify high risk areas/populations and all the available resources to intensify and conduct high quality AFP surveillance activities. Once identified, specific measures must be put in place to cover them with high quality active AFP surveillance, to ensure no poliovirus circulation goes undetected. This is a requirement for certification documentation and plans to set these strategies up must be regularly reassessed in order to meet new challenging groups/areas.

High risk areas include the following:

- Areas that border endemic countries or outbreak countries
- Areas with poor health infrastructure
- Areas with poor surveillance performance
- Areas where there has been laboratory confirmed WPV cases in last 2-3 years.
- Areas with clustering of compatibles
- Areas with insecurity
- Areas that are inaccessible due to poor terrain/road infrastructure

High risk populations include:

- Ethnic or religious minorities
- Nomadic, Migrant populations
- Refugees, internally displaced people
- Groups with contacts in endemic countries
- Vaccine hesitant groups
- Urban slum
- Areas of low immunization coverage

These areas/populations are difficult to access (hard-to-reach) leading to low immunization coverage. The migrant lifestyle of certain populations leads to effective virus transmission. If not approached in a specific way, these areas and populations might constitute the last virus reservoirs and become sources of importations.

5.2 Strategies of quality AFP surveillance

Appropriate strategies must be put in place to reach the hard-to-reach areas and communities, including identification and training of focal persons within such communities and also regular mapping of mobile populations. It is important to find contacts in the communities, where surveillance is conducted to ensure all the areas and communities are touched by the system.

5.2.1 The prioritization of surveillance sites

This is the prioritization of surveillance sites into 4 categories (Highest, high, medium, low) and should be re-evaluate at least every six months (January and July) based on criteria/variables given in above.

5.2.2 Conducting Active surveillance activities

The AFP surveillance system activities should cover the entire population of the country. Every sub county should have a list of active surveillance sites with appropriate geographic coverage. The AFP surveillance team should have a monthly plan to visit the surveillance sites regularly (twice weekly, weekly, bi-monthly or Monthly). Communities should be involved during each field visit. Any AFP case should be immediately reported and investigated.

5.2.3 Training

Regular training of health workers, community health volunteers and community informants is important to increase AFP surveillance awareness. This ensures that AFP cases will be timely detected and lead to timely investigation and response.

5.2.4 Supportive supervision

Supportive supervision by the national, county and other partners will ensure strengthening the capacity to detect and report AFP cases at the health facilities and communities.
The support supervision should put more focus to highest and high priority sites.

5.2.5 Monitoring and evaluation

Regular Monitoring and evaluation is needed at each level to ensure that the activities are well conducted and the performance are steady improved

Use of Digital Technology: AFP surveillance should progressively adopt use of technology in case reporting (e.g. ODK), investigation, validation and follow-up.

5.3 Advocacy, communication and social mobilization (ACSM) for AFP surveillance

Effective advocacy, communication and social mobilization strategies are important to a robust AFP surveillance system. Stakeholders and the community need to understand what AFP surveillance is, why it is important and what role they can play.

Hesitancy to report cases from communities and refusal to provide information on AFP cases are an impediment to effective surveillance. This can be addressed by effective communication and engagement of the relevant community structures.

The following ACSM strategies should be employed to improve and sustain AFP surveillance at all levels:

a) **Advocacy -**This is an organized effort to inform and motivate decision makers, stakeholders and targeted audiences to support AFP surveillance. Relevant stake holders need to be mapped and reached out to. The various stakeholders include line ministries especially the Ministry of Education, political and religious leaders who are key influencers at the community , National Government Administrative Officers (NGAOs), health care practitioners both formal and informal especially community health volunteers, traditional healers and bone setters.

b) **Communication –** This is a process whereby information is passed to the relevant persons. With regards to polio surveillance, it is important that the various players in the surveillance network share information.

There are various means by which to communicate:

- **IEC materials -** The DDSR has developed and disseminated IEC materials which are relevant to the different players. For the community players, a lay case definition has been disseminated, while standard case definitions have been available for health workers. The IEC materials have been developed in various languages.
- **Interpersonal communication (IPC) -** the various players in the surveillance network are encouraged to spread information on polio. IPC is key during investigation of AFP cases as well as providing feedback to affected individuals and the community. Various players in the surveillance network should develop the appropriate IPC skills.
- **Polio champions -** these are individuals affected by polio and are usually instrumental in mobilising the community to participate in immunisation. They can be equally important in passing information to the public on polio surveillance.
- **Mass media -** TV and radio have been used particularly in outbreaks to inform the public to report cases.

- **Hotline -** the public can inquire and report any AFP cases through the Epidemic preparedness and response DDSR hotline (0732353535 and 0729471414).
- **Others -** the use of social media such as WhatsApp, Twitter handle, Facebook and SMS is also proving useful in rapidly sharing information and providing clarifications with various stakeholders. Considering the frequent spread of rumours and misinformation within the social media, the DDSR closely monitors information on polio being shared on these platforms.

c) Social Mobilization is the process of bringing together relevant groups of people for action. With regards to polio surveillance, periodic community mobilisation (for example in community barazas) should provide a platform to inform the community about issues related to polio surveillance and provide clarification.

6.

MONITORING AND EVALUATION AFP SURVEILLANCE PERFORMANCE

6. MONITORING AND EVALUATION AFP SURVEILLANCE PERFORMANCE

6.1 Introduction

Monitoring AFP surveillance performance indicators is key in directing the Polio Eradication initiative (PEI). AFP surveillance in all countries must be of a sufficient standard to rapidly detect all cases of paralysis due to indigenous and/or imported polioviruses. It is the accepted standard to evaluate progress and direct the actions of the program.

6.2 AFP Surveillance Performance Indicators

The two main indicators of AFP surveillance to be consistently monitored are: Non-Polio AFP Rate and Stool Adequacy.

6.2.1 Non-Polio AFP rate

This is a quality indicator that measures the sensitivity of AFP surveillance to detect background illness per 100,000 populations under 15 years in a specified geographical area. The target is 2/100,000 children under 15 years of age per year. This changes to 3/100,000 children under 15 years of age per year during outbreaks to increase the sensitivity of the surveillance system. County and Sub- County performance must be monitored more carefully since national surveillance indicators may mask wide variation in performance, with some critical areas potentially failing to detect expected AFP cases.

6.2.2 Stool Adequacy

This is the proportion of AFP cases with two adequate stools (adequate stool – timely specimen collection of 2 specimens within 14 days of onset of paralysis and arriving at the laboratory in good condition). The target for stool adequacy is 80% or higher.

Table 3: AFP surveillance performance indicators

Indicator	Description	Formula	Target
Program performance			
Sensitivity	Non-polio AFP Rate (NP-AFP	$\frac{\text{\# of discarded < 15 years AFP cases X 100,000}}{\text{\# of children aged < 15 years}}$	≥2/100,000 (≥3/100,000 in outbreaks
Stool Adequacy	% of AFP cases with 2 adequate stool specimens	$\frac{\text{\# of AFP cases with two adequate X100}}{\text{Total number of AFP cases reported}}$	≥ 80%

Indicator	Description	Formula	Target
Completeness of reporting	% of sites reporting on AFP including zero reports	$\frac{\text{\# sites reporting X100}}{\text{of expected reports}}$	≥ 80%
Timeliness of reporting	% of sites reporting AFP data including zero reports on time	$\frac{\text{\# of sites reporting by the deadline X100}}{\text{\# of expected reports}}$	≥ 80%
Timeliness of notification	% of cases reported to the next level within 7 days from onset of paralysis	$\frac{\text{\# of AFP cases reported within 7 days of paralysis onset X100}}{\text{\# of reported AFP cases}}$	≥ 80%
Timeliness of investigation	% of cases investigated ≤ 48 hours of notification	$\frac{\text{\# of AFP cases investigated ≤48 hours of notification X100}}{\text{\# of AFP cases reported}}$	≥ 80%
Timeliness of stool collection	% of AFP cases with two stool specimens collected within 14 days of paralysis and 24-48 hours apart	$\frac{\text{\#AFP cases with two stool specimens collected ≥ 24 hours apart, within 14 days of paralysis onset x 100}}{\text{\# of AFP cases reported}}$	≥ 80%
Completeness of 60-day follow-up	% of inadequate AFP cases with a follow-up exam at 60 days after the onset of paralysis	$\frac{\text{\#AFP cases with inadequate specimens that have a 60-day follow-up exam X 100}}{\text{\#AFP cases with inadequate specimens reported}}$	≥ 80%
Laboratory performance			
Timeliness of stool specimen shipment	% of specimens arriving at polio laboratory within 3 days of collection	$\frac{\text{\# specimens arriving within 3 days of collection x 100}}{\text{\# specimens collected}}$	≥ 80%
Specimens in good condition	% of AFP cases specimens arriving at the polio laboratory in good condition	$\frac{\text{\# of stool specimens arriving in good condition at a WHO accredited laboratory x100}}{\text{\# of stool specimens arriving at lab}}$	≥ 80%

Indicator	Description	Formula	Target
Quality of the reverse cold chain	% Stool specimens from which non-polio enterovirus (NPENT) was isolated	*# of specimens NPENT isolated x 100* / *# of specimen with lab results*	≥ 10%
Timeliness of reporting laboratory results	% of stool specimens for which laboratory results are sent to submitting agencies within a defined period	# Specimens with results available within a defined period at sub county, county and national level x 100 / # of stool specimens collected Timely reporting of results: 1. Within 14 days of specimen receipt for poliovirus isolation. 2. Within 7 days of isolate receipt for intratypic differentiation (ITD); and 3. Within 7 days of intratypic differentiation for sequencing results	≥ 80%

6.3 Indicators for Contact Sampling

Table 4: Indicators for Contact Sampling

Indicator	Description
Process indicators	
Timeliness	This is the proportion of contact specimens collected within **7 days of date of notification** of the index AFP case # of contact samplescollected within 7 days of notification of index AFP case X 100 / Total number contact samples **Target: 80%**
Completeness	This is the proportion of eligible AFP cases with 3 contact samples collected # of eligible index AFP cases with at least 3 contact samples collected X 100 / Total number of index AFP cases eligible for contact sampling **Target: 80%**
Quality indicators	
Age distribution of contacts	This is the proportion of contacts below 5 years of age *# of contacts aged below five years X100* / *Total number of contact sampled* **Target: 80%**
Lab indicators remain the same as for index AFP case	

6.4 Surveillance monitoring meetings

At the County level, the CHMT and SCHMT should hold monthly meetings to address all issues related to the implementation of AFP surveillance. Minutes must be taken followed and forwarded to the supervisory level and archived. This is the time to review all the activities, not only the problems but also what has worked that needs to continue. Above all, this is the time to look at the objectives and assess where the team stands toward reaching those goals by providing onsite feedback to the field team.

At National level, monthly meetings between the programme and the laboratory should be held to review performance. Use of digital platform is encouraged as a mode of holding the meetings.

The National and County levels should have bi-annual surveillance review meetings.

6.5 Surveillance Reviews

AFP surveillance reviews are a good way to assess the performance of the system. These reviews must be conducted regularly. These reviews may be external or internal. The specific objectives of the review should include assessing whether:

1. AFP surveillance was sensitive enough to detect any circulating WPV or cVDPV, i.e., the AFP surveillance system was functioning well at all levels (from sub national to National).
2. Surveillance data was complete, analysed and used to guide disease control interventions and appropriate feedbacks are provided to the subnational level
3. Adequate resources were allocated to the system and those resources, provided for AFP surveillance, were used to strengthen surveillance of other priority diseases.
4. Major gaps identified during previous reviews were addressed.

6.5.1 External Surveillance Reviews

External Surveillance reviews are the best way to assess the system's performance, since the whole system is looked at with a completely independent eye.

6.5.2 Internal/Peer Surveillance Reviews

On a regular basis, countries should consider running Internal/Peer surveillance reviews in parts or entire areas of the country, to assess progress and identify gaps in the system. Internal reviews are conducted on a quarterly basis.

6.6 Risk Analysis

6.6.1 Polio Risk Analysis

As we draw closer to the end of GPEI set goals and to the post-Polio era, it is crucial to strengthen AFP surveillance, i.e. to considerably increase its sensitivity and capacity to detect any circulating poliovirus whether wild or vaccine derived , should it occur. Hence, the necessity of regularly re-assessing the vulnerability of the system and identifying risk areas in order to take prompt and appropriate actions to close any potential gap as quickly as possible. One way of identifying the vulnerability of the system would be to run a quick, but detailed, risk assessment in order to establish high, medium and low risk zones in the entire area (country, county, sub county, catchments area) covered by the AFP surveillance system.

The polio risk analysis exercise should answer the following questions:

1. What is the risk that current WPV/cVDPV transmission (if still exists) will NOT be interrupted?
2. What is the risk of importation of WPV/cVDPV, if transmission still exists in other parts of the world, to the (your) area?
3. What is the risk that WPV/cVDPVD transmission (importation or existing in the area) will NOT be detected promptly, by the AFP surveillance system?

It should, therefore, document the followings:

1. The current risk of persistent WPV/cVDPV transmission (if still occurring) in the area covered by the AFP surveillance system.
2. The current risk of importation/exportation of WPV/cVDPV to currently polio-free areas (your area or your neighbour's), particularly high-risk polio free areas.
3. The risk of failure to detect WPV/cVDPV cases in a timely manner due to gaps in AFP surveillance.
4. The recommendations regarding priority activities to be undertaken to mitigate the documented risks.

The following should take place to complete a risk assessment of the program:

- An in-depth review and analysis of available programmatic data
- Population Immunity Data: Routine Immunization coverage, SIA performance data including coverage, missed children analysis and independent monitoring and evaluation data.
- The detection/prevalence of WPV/cVDPV in the past three years
- Surveillance data: AFP surveillance data, Laboratory performance data, in the past three of years

– An in-depth review of current socio-demographic data, including population distribution data, population movements data, access data e.g.,security, difficult terrain, and proximity (physical border, direct link by air,sea, or road) to an outbreak area, etc.

The combination of these factors will tell us if the risk is very high, high, medium or low.

Example:
A Sub County with a low OPV3 and IPV coverage, Silent for 1 to 2 years or with low AFP surveillance, low performance during past SIAs with proximity to endemic area is obviously at very high risk while the one with good OPV3 and IPV coverage, good SIAs coverage and good AFP surveillance performance is at low risk.

If an area is at high risk, it will be necessary to intensify efforts to reduce the risk: Sub national SIAs, mopping ups, intensification of active AFP surveillance to improve the performance indicators

6.6.2 Areas with AFP Surveillance Gaps

After running a detailed risk analysis, all areas with surveillance gaps and high-risk areas should be critically considered and troubleshooting must be put in place in order to address the issues and resolve the major stumbling block to AFP surveillance.

The following questions should be answered in order to address the gaps in the conduct of the core functions in AFP surveillance, for each area presenting with gaps and/or high risk of poliovirus transmission:

Case detection

- Is the AFP Case Definition clear to the Service providers, is it consistently applied to all suspected cases and throughout the surveillance system?
- Do the personnel involved have a good understanding of the value of the AFP surveillance system; and understand, show interest in, and support, their own surveillance task?
- Do the personnel involved have enough appropriate human and material resources to carry out active AFP surveillance?
- Do the personnel involved receive appropriate training (refreshers) and supervision, including constructive, written feedbacks?
- Do the personnel know how to and conduct regular active case search?

Reporting

- Is the reporting mechanism clear, efficient?
- Are the resources and tools available for reporting?
- Is reporting prompt, timely and complete, are there silent areas?
- Are all relevant sites (persons and institutions) included in the AFP reporting system?

Investigation and confirmation

- Is the investigation being conducted using the updated standard CIF for AFP Case Reporting (Annex 1a) and Integrated case-based surveillance form-MOH 502 (Annex 1b)
- Is the investigation being promptly conducted, observing timelines?
- Is the reverse cold chain rigorously maintained?

Analysis and interpretation

- Is analysis of trends being conducted and tables and graphs available at the site and displayed on the wall?
- What's the status of key indicators? (NPAFP, stool adequacy rate, NPENT), where applicable.
- Is the analysis of data appropriate and used for decision-making at all levels?

Action

- Are appropriate actions taken at each level (feedback, query questionable data, report problems, etc.)?
- Is the feed-back from the higher level timely and documented?
- Has any technical support been provided? Can it be verified; supportive supervision has been done, signed OPD registers, feedback on supervisory books.

7.

AFP SURVEILLANCE TASKS AT DIFFERENT LEVELS

7. AFP SURVEILLANCE TASKS AT DIFFERENT LEVELS

7.1 Community Health Volunteers and informants

Informants include religious leaders, opinion leaders, traditional caregivers, Patient Medicine Vendors/Chemists, Birth attendants, nomadic informants, refugee camp leaders.

i. Sensitization of communities on AFP and polio eradication
ii. Detection and notification of all weakness of any limbs to the nearest health facility or the sub county disease surveillance coordinators
iii. Detection and notification of all other priority diseases or any other unusual events to nearest health facility or the sub county disease surveillance coordinators
iv. To support ease of access to the households of the suspect AFP cases

7.2 Health care Workers in health facilities

i. Detection and notification of AFP cases to the Sub County level
ii. Management of AFP cases, including counselling to parents and caregivers
iii. Prompt investigation of AFP case and filling the AFP Case Investigation form (Annex 1a) with the help of the sub county, if needed.
iv. Document and archive surveillance reports in the health facility, including basic data analysis
v. Collection and assurance of good condition of the stool specimen, including maintaining the reverse cold chain during shipment, until the sample reaches the KEMRI polio laboratory
vi. Sensitization of community health volunteers and informants on AFP surveillance.
vii. Sensitization of waiting patients in health facilities on AFP
viii. Ensure availability and distribution of IEC materials to the community and display at the health facilities
ix. Assist in conducting sixty-day follow-up examination for inadequate cases
x. Provide feedback to community including results of AFP samples.

7.3 Sub-County Disease Surveillance Coordination:

Sub-County Medical Officer of Health (SCMOH)

I. Coordinates and supports all surveillance activities in the Sub County
II. Review and approve monthly work plans including availability of logistics

III. Supervises the surveillance activities of the sub county disease surveillance coordinator
IV. Coordinate monthly review meetings with the health facility in-charges
V. Give progress reports to the County Director of Health/Director Preventive Services

Sub-County Disease Surveillance Coordinator (SCDSC)

I. Develop and ensure implementation of approved surveillance work plans
II. Coordinates surveillance activities amongst health facility personnel, community Health Volunteers and informants.
III. Reviewing and prioritization of surveillance sites biannually and submit to the County level
IV. Conduct active case search using electronic data collection tools (e.g., ODK-Annex 9) on prioritized surveillance sites
V. Detection and notification of AFP cases to the county level
VI. Prompt investigation of AFP case using the AFP Case investigation Form (Annex 1a)
VII. Collection and assurance of good condition of the stool specimen, including maintaining the reverse cold chain during shipment, until the sample reaches the KEMRI polio laboratory
VIII. Collection of environmental surveillance samples (where applicable).
IX. Conduct 60-days follow-up, contact sampling, zero and unknown dose investigation if applicable
X. Supported by the clinician, conduct validation of investigated AFP cases.
XI. Distribute operational guidelines, IEC materials and reporting tools to the health facilities
XII. Document and archive surveillance activities including basic data analysis
XIII. Monitor timeliness and completeness of reports from all health facilities in the sub counties on Kenya Health Information System (KHIS).
XIV. Analyses disease patterns and trends, interpret data, calculate key surveillance indicators, and provide routine reports to the county
XV. Reports suspected outbreaks, through the SCMOH to the County Director of Health
XVI. Notifies all health facilities in the sub county when there is a confirmed Polio virus outbreak
XVII. Shares laboratory results with health facilities and the parents/ guardians of the AFP case

XVIII. Participate in County surveillance meetings, sharing feedback and following up with action points related to the sub county
XIX. Share routine surveillance feedback during the monthly review meetings of health facility in-charges
XX. Sensitization of clinicians (private or public), and community informants on AFP surveillance and polio eradication.

7.4 County Disease Surveillance Coordination:

County Director of Health (CDH)/Director Preventive Services

i. Coordinates and supports all surveillance activities in the county
ii. Review and approve monthly work plans including availability of logistics
iii. Supervises the surveillance activities of the county disease surveillance coordinator
iv. Coordinate monthly review meetings with sub counties disease surveillance coordinators
v. Give progress reports to the County Executive Committee Member (CECM) for Health

County Disease Surveillance coordinator

I. Develop and ensure implementation of approved surveillance work plans
II. Coordinates surveillance activities of the sub county disease surveillance coordinators
III. Review prioritized surveillance sites biannually as submitted by the Sub County disease coordinators and share finalized sites with the national surveillance officer
IV. Conduct active case search using electronic data collection tools (e.g.,ODK-Annex 9) on prioritized surveillance sites.
V. Ensure quality supportive supervision, including providing written feed back and evaluating activities in the field.
VI. Detection and Notification of AFP cases to the national level
VII. Support sub county teams in investigating AFP cases using the AFP Case Investigation Form (Annex 1a)
VIII. Provide all logistical and technical support to the sub counties (reverse cold chain and transport of stool specimen)
IX. Ensure proper implementation and monitoring of environmental surveillance (if applicable)

X. Support 60-days follow-up, contact sampling, zero and unknown dose investigation if applicable
XI. Supported by the clinician, conduct validation of investigated AFP cases
XII. Distribute operational guidelines, IEC materials and reporting tools to sub counties
XIII. Document and archive surveillance activities including basic data analysis
XIV. Monitor timeliness and completeness of reports from all sub counties on Kenya Health Information System (KHIS)
XV. Analyzes disease patterns and trends, interprets data, monitors key surveillance indicators (against set targets) and provides routine reports to the head Division of Diseases Surveillance and response.
XVI. Reports suspected outbreaks, through CDH to the National
XVII. Notifies all sub counties when there is a confirmed Polio virus out break
XVIII. Support investigation of confirmed polio outbreaks
XIX. Shares laboratory results with the sub counties
XX. Participate in National surveillance meetings, sharing feedback and following up with action points related to the county
XXI. Share routine surveillance feedback during the monthly review meetings with Sub County disease surveillance coordinators
XXII. Sensitization of clinicians (private or public) on AFP surveillance and polio eradication
XXIII. Support community sensitization activities and lobby support from local leaders and other key stakeholders

7.5 Polio Laboratory

AFP samples

I. Receive AFP samples from all over the country and logging in the date of sample receipt
II. Assess the condition of the AFP samples and give immediate feedback for samples with bad condition for recollection by the sub counties
III. In case of inadequate samples, the sub counties are reminded to collect contact samples if they had not collected at the same time with the case samples
IV. In the context of high-risk poliovirus importation (e.g., refugees), targeted healthy children stool samples are also processed by the laboratory(annex 6)

V. Cross check EPID numbers and other epidemiologic variables on the Case Investigation forms (CIF)and ensure the labels on the samples correspond with the information on the CIF (Annex 1a)

VI. Samples are processed through chloroform extraction and inoculated in cell cultures to test for growth of polio virus and reported within 14 days. For positive isolates, they are taken through Intratypic Differentiation (ITD) test and reported within seven days.

VII. Any samples yielding PV2 results on ITD are referred for sequencing at the CDC global polio laboratory and reported within 14 days

VIII. Reporting of isolation results to national, WHO, counties and sub counties

Environmental samples

I. Receive environmental sewage samples from environmental sites and logging in the date of sample receipt

II. Ensure adequate volume (one litre) is collected and reverse cold chain is maintained

III. Cross check EPID numbers and other epidemiologic variables on the environmental sample investigation (Annex 7) and laboratory (Annex 8) forms and ensure the labels on the samples correspond with the information on the forms including the time of specimen collection

IV. Samples are processed through chloroform extraction and inoculated in cell cultures to test for growth of polio virus and reported within 21days. For positive isolates, they are taken through intratypic differentiation (ITD) test and reported within seven days.

V. Any samples yielding PV2 results on ITD are referred for sequencing at the CDC global polio laboratory and reported within 14 days

VI. Reporting of isolation results to MOH and WHO

Others

I. Take inventory of laboratory supplies and consumables

II. Conduct weekly laboratory meetings to assess workload and plan accordingly

III. Conduct weekly data cleaning

IV. Attend monthly data harmonization meetings with national surveillance program

V. Secretariat at national polio committees

7.6 National level coordination

Head of Division

I. Overall support to, and coordination of, national surveillance activities

II. Mobilise resources from the government, partners, and other stakeholders
III. Review and approve work plans
IV. Share reports to the Head of Department and other partners including the WHO and GPEI
V. Provide technical and logistical support to National Polio Laboratory National Surveillance Coordinator (Polio Focal Person)

I. Coordination of surveillance activities in the country as delegated by the head of division
II. Serve as the secretariat to the national polio committees
III. Shares the updated country annual progress report with ARCC
IV. Coordinate polio containment activities
V. Develop and implement annual surveillance work plan
VI. Provide technical inputs to county annual work plans
VII. Provision of laboratory diagnosis data to county level
VIII. Facilitates data harmonization between the national surveillance programme and national polio laboratory
IX. Provision and distribution of guidelines, IEC materials and reporting tools
X. Monitor AFP surveillance performance indicators in the country and provide feedback to the lower level
XI. Organize periodic national surveillance reviews
XII. Support outbreak investigation and control
XIII. Periodic review of surveillance strategies and guidelines, training, and supervision
XIV. Ensure quality supportive supervision with written feedback
XV. Ensure proper implementation and monitoring of environmental surveillance
XVI. Tracking the shipping of stool specimen from the field to the KEMRI polio laboratory

8.

ENVIRONMENTAL SURVEILLANCE FOR POLIO

8. ENVIRONMENTAL SURVEILLANCE FOR POLIO

Environmental Surveillance (ES) for polio is the collection and testing of sewage or waste water contaminated with faecal matter for the presence of poliovirus in the laboratory and it is complementary to AFP surveillance which remains the gold standard.

ES has been used successfully in monitoring enteric virus circulation and in assessing the extent or duration of epidemic poliovirus circulation in specific populations. In several countries, WPV has been detected in the environment in the absence of reported WPV from AFP cases.

ES is also a potential tool for monitoring cVDPV. The rationale for ES is based on the characteristics of poliovirus excretion pattern:

i. Infected individuals excrete poliovirus in faeces for periods up to several weeks, whether they are symptomatic or not
ii. Large numbers of excreted polioviruses remain infectious in the environment for varying lengths of time depending on the immediate condition

In addition, ES can provide valuable supplementary information in selected populations with gaps in AFP surveillance, suspicious virus circulation, frequent virus re-introduction, low polio vaccination coverage areas and where the risk of poliovirus importation is high.

8.1 Environmental surveillance in Kenya

Kenya established ES in 2013 in Nairobi. Currently, there are a total of 17 sites across five counties

Fig. 4: Distribution of Environmental surveillance sites in Kenya

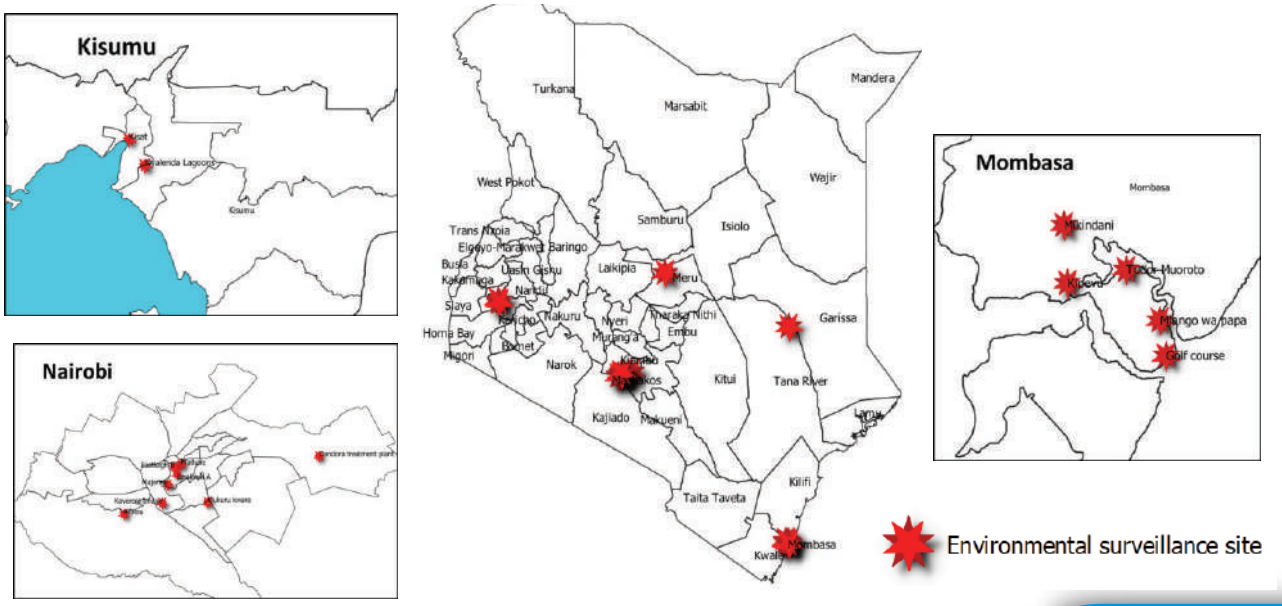


Table 5: Names of environmental surveillance sites in Kenya

COUNTY	SITE
NAIROBI	Eastleigh A
	Eastleigh B
	Kibera
	Mathare
	Kaverera Bridge
	Majengo River
	Dandora Treatment Plant
	Mukuru Kware River
MOMBASA (5)	Mlango Wa papa
	Kipevu
	Mikindani
	Tudor Moroto
	Mombasa Golf Club
	Kisat Treatment plant
	Nyalenda lagoons
	Bouralgy
	Isiolo Treatment Plant
KISUMU (2)	Kisat Treatment plant
	Nyalenda lagoons
GARISSA	Bouragly
ISIOLO	Isiolo Treatment plant

8.2 Planning Environmental surveillance

ES has some inherent limitations and requires additional resources. It should only be implemented after careful planning of all steps in the operation and thorough assessment of the potential benefits. The plan for ES initiation should include the following elements:

(i) Advocacy to relevant stakeholders
(ii) Identification and engagement of human resource needs
(iii) Length and time schedule of sampling
(iv) Details of the actual sampling sites (location and population sizes likely to be represented)
(v) Responsibilities for sampling, instructions for sampling and sample logistics
(vi) Provision of laboratory space, personnel, equipment, and reagents
(vii) Protocols for sample processing and virus identification

(viii) Data management and reporting (contents of reports and reporting channels)
(ix) Training and quality assurance
(x) Monitoring and supervision
(xi) Envisaged consequences of different laboratory results.

8.3 Types of environmental surveillance, length and frequency of sampling

If aimed at providing supplementary evidence for eradication of WPV circulation in a population, a long term, regular sampling programme of a representative population is preferred. This is routine ES. Sampling frequency should, preferably, be twice a month, but at least once a month. Sampling should be continued for at least one year, and preferably three years after the last poliovirus isolation. In certain exceptional conditions however, such as when circulation of poliovirus is suspected, ad-hoc ES sites can be established for a relatively short period of not less than six months to a year. Ad-hoc ES sites are similar to routine sites except for the duration of sample collection.

8.4 Principles of selecting sampling sites

If ES is prompted by known or suspected re-introduction of WPV or appearance of cases caused by cVDPV, the initial plan may cover a shorter period (not less than 12 months) and apply more frequent sampling, targeted to more selected populations. This must always be accompanied by intensified AFP surveillance.

If sewer networks are available, sampling sites should be located at inlets to sewage treatment plants or other major sewers. If sewer network is not available, representative sampling may be difficult to achieve and ES should only be started if the major wastewater flow routes contain human faecal material.

Sampling sites for regular monitoring should represent selected high-risk populations. Preferable size of the source population is 100,000 to 300,000. For smaller populations and close vicinity sampling sites, composite samples can be tested by mixing portions derived from different sites to reduce the laboratory workload. If the source population is larger (>300,000), the consequently reduced sample sensitivity can be compensated by collecting samples that are more frequent. This would however increase the laboratory workload.

Note:

8.5 Sampling principles and sample logistics

Industrial wastes may contain compounds that may be toxic to cell cultures and/or interfere with poliovirus replication. This has to be taken into account when selecting the sampling sites.

Who should collect the samples? Two sample collectors (main collector and backup) should be designated for collecting the samples at each sampling site. This should be organized by the County authorities (Ministries of Health and Environment) and partners. Training, written instructions and adequate logistics should be provided to persons collecting the samples.

8.5.1 Methods of collecting environmental samples

There are two methods for collecting ES samples:

(i) **Grab method:** One litre of raw sewage/wastewater is collected at a selected sampling site, preferably at the peak hours of household sewage excretion/discharge (usually early in the morning).

(ii) **Trap method:** Samples are collected by hanging a bag of non-specific absorbing material in the sewage/wastewater stream. After one or more days, the bag is taken out of the collection site. The absorbed material is eluted in the laboratory and analysed for the presence of polioviruses.

> ***Note:***
> ***A relatively new method of collecting samples known as the Bag Mediated Filtration System (BMFS) has been tried in some countries with promising results***

The preferred sampling method: Grab sampling is preferred to trap sampling, as it is more feasible for quantitative estimation of detection and sensitivity of the system. Polioviruses and non-polio enteroviruses are detected more often with the grab method than in trap sampling.

Collection of grab environmental samples is the preferred collection method used in Kenya and many other countries.

8.6 Sampling sites and persons responsible for sampling

Sampling sites are best located at sewage treatment plants, preferably from the inlet. In the absence of sewer networks however, major open wastewater flow routes can serve as collection sites as long as they contain human faecal materials. The personnel who should collect the samples are preferably trained local sanitary staff.

8.6.1 Specification of environmental sample collection container

A one litre plastic screw tight cap container which should be clean. Sterilization is not essential. The container should be labelled with the EPID number, date and time of sample collection, name and contact number of sample collector.

The container should be accompanied with a completely filled environmental surveillance investigation (Annex 7) and laboratory form (Annex 8).

8.6.2 Sampling procedure at each sampling site

i. Samples should be taken from mid-stream of a predetermined point of collection using a bucket or other suitable means.
ii. Composite samples can also be generated by collecting smaller volumes at intervals to cover known peak hours of household wastewater flow, or to combine samples representing smaller than optimal adjacent population sizes.
iii. A sample of one liter of raw sewage fluid should be transferred from the bucket into the container
iv. The container should be tightly closed, and the outside wiped with a disinfectant before packaging in a cold transport container.
v The container and ES Form should be labelled as follows:
    - Sample Identification Number: ENV-Country code - County code – Sub County code - Site code - Year of collection - Serial number of samples e.g., ENV-KEN-MOM-MVI-MGC-21-001

8.7 Environmental surveillance sample storage and transportation

Sample should be immediately kept in specimen carriers and transported to the polio laboratory within 48 hours of collection at a temperature of +2°C to +8°C . The laboratory should be notified in advance and should acknowledge the receipt of the sample.

Figure 5:Labelling of sample container and sample arrangement in specimen carrier

8.8 Supervision of Sample Collection

For optimal performance of ES, it is expected that at least 90% of samples collected should be supervised by senior government officials and other technical partners using the ES supervisory monitoring checklist on the ODK platform (Annex 10). Feedback on supervisory findings/performance should be shared quarterly with stakeholders including sample collectors. Supervisory findings should inform conduct of intervention measures.

Whenever chemical discharge is suspected during supervision, a detailed investigation should be done to ascertain this suspicion and implement corrective actions.

8.9 Sample processing, monitoring and evaluation

The performance of ES is monitored through certain indicators. This monitoring helps to identify sites with sub-optimal performance which subsequently leads to further investigation to determine the cause of poor performance for intervention. All environmental sampling sites should be geo-located, and catchment areas defined including population size and characteristics.

8.9.1 Laboratory results

i. Detection of enteroviruses in ES samples (>50%).

ii. In populations immunized with OPV, environmental surveillance should also detect Sabin-like strains within 6 weeks following SIAs in the catchment area.

8.9.2 Process monitoring (completeness and timeliness)

- 100% of scheduled samples are collected
- >80% of scheduled samples are collected on the date assigned
- >80% of samples are collected on the time assigned
- >80% of samples must arrive in laboratory within 3 days of collection
- >80% of samples arrive in the laboratory in good condition (no leak age of specimen, with an adequate amount of specimen)

8.9.3 Timeliness of laboratory results

i. > 80% of virus isolation results within 21 days of specimen receipt in the laboratory

ii. > 80% of ITD results within 7 days of isolate receipt in the ITD laboratory

iii. > 80% of sequencing results within 14 days of isolate receipt in the sequencing laboratory

The processing of ES samples in the laboratory contains steps that may generate aerosols. Standard precautions should be taken to avoid cross-contamination of samples. Processing and analysis of environmental samples must not interfere with that of samples collected from AFP cases. Separate space and personnel should be assigned for the work with environmental and AFP samples.

8.10 Reporting and interpretation of laboratory results

The laboratory is to report to MoH and WHO, on the ES sample results. Any confirmed poliovirus isolates must be reported immediately. A decision should be made as soon as possible to respond to any confirmed poliovirus. Any result should be interpreted with caution. The overall performance of ES is correlated with the detection of polio enteroviruses in the samples.

i. At least 50% of concentrated sewage from grab samples should reveal enteroviruses.

ii. In populations immunized with OPV, ES should reveal Sabin strains, especially during and after NIDs and other campaigns.

iii. Persistent negative results in ES samples (<50% enterovirus isolation over a period of six months) should trigger further investigation including field visit to identify the possible causes. Corrective measures should then be put in place and if no improvement is observed after three months of intervention, the site should be considered for closure.

Confirmation of poliovirus from an environmental specimen should raise the same question and lead to similar actions as isolating poliovirus from humans. This should be followed by intensifying AFP surveillance in the community, more frequent and possibly re-designed environmental sampling and preparation for supplementary immunization activities.
Isolation of a poliovirus in an environmental sample usually means that a person or persons are excreting the virus.

Negative results are more difficult to interpret and should be assessed in relation to the sampling design and efficiency of laboratory procedures. Consistently negative poliovirus results for 12 months with monitoring using the recommended methods with acceptable quality indicators suggest that poliovirus is not circulating in the population. If this situation continues for three successive years, poliovirus circulation is highly unlikely in the source population. These conclusions should be drawn with caution if there is a high risk of importation of poliovirus

9.

AFP AND ENVIRONMENTAL SURVEILLANCE IN THE CONTEXT OF NOVEL OPV USE

9. AFP AND ENVIRONMENTAL SURVEILLANCE IN THE CONTEXT OF NOVEL OPV USE

As Kenya prepares for the introduction and use of novel OPV for cVDPV2 outbreaks, there are a list of additional deliverables that must be implemented during the pre-defined time period following nOPV use. These include enhanced AFP and environmental surveillance activities, and these activities are listed in greater detail below.

9.1 Enhanced AFP surveillance

9.1.1 Retrospective and active case search

In addition to the routine active surveillance activities which will continue after nOPV introduction (active case search, healthcare worker sensitizations, case investigations, stool sample collection, etc.), one month after the first nOPV campaign, a one-time retrospective case search over the past 6-month time period will be conducted at all priority sites (or at the very least, high and medium priority sites) in the geographic areas where nOPV was used.

The objective of this exercise will be to detect any missed AFP cases, and also to detect any Adverse Event of Special Interest (AESI) as per the Adverse Events Following Immunization (AEFI) protocol in areas of nOPV use. This exercise will be conducted by health facilities focal points, SCDSC and CDSC in each county. Findings should be reported immediately using the established mechanism and all efforts made to locate the child(ren) of interest for follow up.

9.1.2 Contact Sampling

Although the national program is already very familiar with contact sampling for AFP cases, nOPV use requires contact sampling for all AFP cases. In the nOPV initial use period, defined as the first 3 months after introduction, systematic contact sampling is required for all AFP cases for six months after the last nOPV campaign. Two contacts per AFP case will be sampled and contacts will be selected using the regular criteria. Each contact will provide 1 stool sample.

9.2 Enhanced Environmental Surveillance

Kenya already has an established environmental surveillance system in place. There are currently 17 sites which are sampled once per month. All functional sites will continue to collect samples two times per month for 6 months after last nOPV use.

9.2.1 Laboratory Confirmation of ES Sampling

Since ES is already well established in Kenya, the national polio laboratory will continue to process samples on a monthly basis from all sites.

The national polio laboratory will also be informed that samples will be collected from functional ES sites across the country twice per month for 6 months following last nOPV use.

9.3 Enhanced adverse events of special interest (AESI) Surveillance

Following nOPV use, a one-time retrospective AESI case search, in conjunction with the previously mentioned one-time retrospective AFP case search, will be conducted one month after nOPV use. In addition, AESI active surveillance will continue for 3 months following last nOPV use. Additional training by national surveillance and safety teams should be conducted to sensitize CDSC, SCDSC and health facilities focal points on how to conduct AESI active case search and report adverse findings.

All enhanced surveillance activities will be undertaken by CDSC and SCDSC's in collaboration with health facility surveillance focal persons. Following all these activities, two written deliverables are expected from the national to be submitted to the regional and global level for review:

1. A narrative report documenting findings from the one-time joint retrospective AFP and AESI active case search and
2. Monthly reports for the first three months detailing findings from routine active case search visits and environmental surveillance and on a quarterly basis after that. ES dashboards will continue to be submitted to document results from each sample collection.

9.4 Vaccination Coverage Data from age matched VDPV2 controls

In the event that any VDPV2 is detected in areas where nOPV was used, vaccination coverage data from age-matched controls to the VDPV2 case of interest will be collected. The purpose of this exercise is to quickly assess vaccine effectiveness against paralytic polio caused by type 2 vaccine derived poliovirus.

9.4.1 Definition of VDPV2 cases

- AFP cases with a laboratory isolation of VDPV2 in their stool sample (or isolation of VDPV2 from stool of his/her contact if the AFP case has inadequate stool)
- Who resides or was in an area that used nOPV2 in outbreak response at least once, with date of paralysis onset after the first nOPV2 out break response campaign, and
- With polio vaccination histories (both routine and SIAs) recorded as part of the CIF.

9.4.2 Definition of Community Controls

- Children who likely had the same VDPV2 exposure as the VDPV2 case
- Children who live in the same community as the VDPV2 case at the time of paralysis
- Children who are of similar age (+/- 1 year) to the case

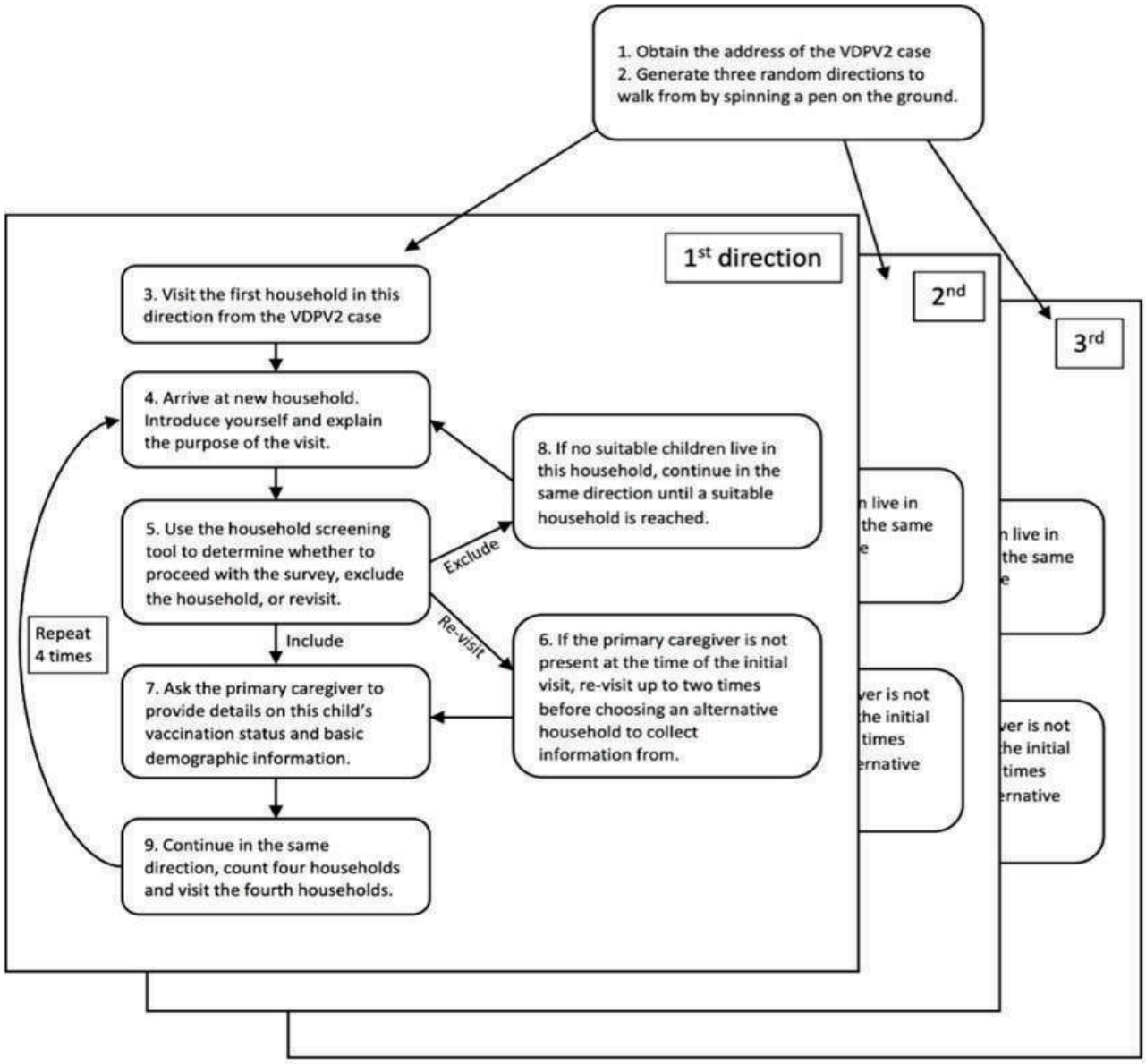
Additionally, in order to be a control, the child and primary caregiver must both be present at the time of the interview (if the selected house is visited twice and either are still not available, choose a new household). Only one child per household will be included as a community control (12 households and 12 community controls will be sampled). Four households will be selected from each of three randomly selected directions of the VDPV2 case. Every fourth house will be sampled in each direction. (Figure 5)

Once households and children are selected, questionnaires will be administered to caregivers on vaccination history and coverage of the selected contact.

A report on findings from each VDPV2 community control sampling will be provided up to one week after the activity has concluded.

Although the diagram below (Figure 5) outlines the steps to conduct this survey, a more detailed briefing on this activity will be provided to surveillance and laboratory teams if and when an actual VDPV2 case is reported. The training at that time will include the specific procedures and step-by-step processes to conduct the survey. The survey tools will be reviewed in detail and put into digital data collection platform for easier data collection and analyses.

However, a short briefing on this and other post-nOPV use surveillance activities will be provided during the surveillance refresher training planned before official nOPV use with all surveillance teams and laboratory personnel, WHO and government surveillance teams from MOH



6: Steps to sample households and children in the selection of age matched VDPV2 controls

10.

ANNEXES

10. ANNEXES

10.1 Annex 1a: Case Investigation Form For AFP

Ministry of Health, Kenya
Acute Flaccid Paralysis Surveillance Case Investigation Form

Official Use Only: _____-_____-_____-_____-_____ _____/_____/_____
EPID Number: Country County sub-County Year onset Case Number Date received by Programme at National level

A. NOTIFICATION/INVESTIGATION:

A1. Name of reporting facility_____ **A2.** Level of facility_____
A3. Notified by:_____ (1=Health worker/focal person in reporting site, 2=Community health volunteer, 3= Community informant 4= Alternative Health care provider(traditional healer, herbalist etc)
A4. Date of Notification____/_____/_____ **A5.** Date of Investigation: ____/_____/_____

B. IDENTIFICATION:

B1. Patient name: _____ **B2.** Sex:☐ F=Female M=Male
B3. Date of Birth (DOB)____/_____/_____ **B4.** Age: _____ years _____months (If DOB Unknown)
B5. County: _____**B6.** Sub County: _____ **B7**. Ward:_____
B8. Village/Estate: _____ **B9.** Major land mark: _____
B10. Name nearest Health Facility_____**B11.** OP number _____
B12. AFP case co-ordinates (WGS 1984 format) : Longitude :_____ Latitude :_____
B13. Name of Parent/Guardian: _____**B14.** Phone number :_____

C. CLINICAL HISTORY

C1. Date of onset of paralysis: ____/____/____
C2. Fever at the onset of paralysis ☐ (1=Y 2=N) **C3.** Progressive Paralysis < 3 days? ☐ (1=Y 2=N)
C4. Is paralysis acute and flaccid ☐ (1=Y 2=N) **C5.** Is paralysis asymmetrical? ☐ (1=Y 2=N)
C6. Site of Paralysis (check all that apply) ☐Left Arm ☐Right arm ☐Left Limb ☐Right Limb ☐other specify _____

C7. Paralyzed limb sensitive to pain? ☐ (1=Y 2=N)

C8. Was there any injection just before onset of paralysis? ☐ (1=Y 2=N), If yes, check site of injection in the table

	Arm	Fore-Arm	Buttocks	Thigh	Leg
Right					
Left					

D. HOSPITALIZATION

D1. Was case admitted: ☐ (1=Yes 2=No) **D2.** Date of admission to hospital, if applicable: _____/_____/_____

D3. IP Number #: _____ **D4.** Name of hospital:_____

E. IMMUNIZATION HISTORY

E1. Total Number of polio vaccine doses (Exclude Birth OPV dose) _____ (99=Unknown)

E2. Date of OPV dose at birth _____/_____/_____ **E3.** Date 1st dose _____/_____/____
E4. Date 2nd dose _____/_____/_____ **E5.** Date 3rd dose____/_____/____
E5. Date 4th ____/_____/_____ **E6.** If more than 4 doses; date of last dose ____/_____/____

E7. Total OPV (bOPV/mOPV2) doses received through SIA: _____(99=Unknown)
E8. Total OPV (bOPV/mOPV2) doses received through RI: _____(99=Unknown)
E9. Total IPV doses received through SIA: _____ **E10.** Total IPV doses received through RI: _____(99=Unknown)
E11. Date of last IPV dose received through RI or SIA: _____/____/_____
E12. Date of last nOPV through SIA _____/_____/_____

F. STOOL SPECIMEN COLLECTION

_____/_____/_____ _____ _____/_____/_____ _____/_____/_____
Date 1st specimen collected Date 2nd specimen collected Date specimen sent to the to the national level

G. STOOL SPECIMEN RESULTS:

G1. Date specimen received at the national level _____/_____/_____

G2. Status of specimen at Reception at the lab ☐ (1=Adequate 2= Inadequate)

G3. _____/_____/_____ _____/_____/_____ ____/_____/_____
Date combined Cell Culture Date Results sent to national EPI Date Results received at national EPI

G4. Final cell culture results ☐ (1 = Suspected polio virus, 2 = Negative, 3 = NPENT, 4 = Suspected poliovirus + NPENT

G5. ____/_____/_____ ____/_____/_____ ____/_____/_____
Date sent from I-C/National laboratory to regional lab Date I-T differentiation results send to EPI Date I-T differentiation results received by EPI

G6. Final Laboratory Result

WPV 1	WPV 2	WPV 3	Discordant sabin	(R)NPENT	NEV

(Y=1, 2=N) (Type 1, 2 or 3) 1=Positive, 2=Negative

G7. Date isolate sent for sequencing _____/_____/____**G8.** Date sequencing results sent to program ____/_____/_____

Immunocompromised status suspected: _____(1=Y, 2=N, 99=Unknown)

FINAL CLASSIFICATION:

1=Confirmed Polio 2=Compatible 3=Discarded 6=Not an AFP case	7=cVDPV 8=aVDPV 9=iVDPV	Sero type (1,2,3)

Investigator Name: _____ Title_____

Email Address_____ Tel:_____

10.2 Annex 1b : Integrated Case Based Surveillance Form (MOH 502)

ED2012

MINISTRY OF HEALTH KENYA

Integrated Case Based Surveillance Form

MOH 502

Use this form for a single case only
Duly complete the form before submission

(To be completed at the National level)
EPID No: ....
Country County District Year
Date form received at national level ___/___/_____

A. Name of Site Reporting & Disease being reported

A1. Health Facility ..... A2. Type .....
A3. District ..... A4. County .....
A5. Disease or condition reported (Tick One)
☐ AFP ☐ NNT ☐ Measles ☐ Meningitis ☐ Plague ☐ VHFs ☐ Yellow Fever ☐ S. PI ☐ Other (Specify): .....

B. Identification

B1. Name of patient .....
B2. Sex: ☐ 1 = Male 2 = Female B3. Age in ☐ Years ☐ Months ☐ Days
B4. D.O.B. ___/___/___
B5. Residence: ☐ Urban ☐ Rural
B6. Tracer information:
a. Parent/Guardian: .....
b. Residence (Village/Hse No): .....
c. Neighborhood major landmark: .....
d. Street/Plot/Estate/S. location: .....
e. Town/City/Location: .....
f. District: ..... County: .....
g. Tel. No of immediate contact: .....

C. Clinical Information

C1. Date of onset of illness ___/___/_____
C2. Date first seen at health facility: ___/___/___
C3. Date Health facility notified District level: ___/___/___
C4. Hospitalized: 1= Yes 2=No Date of Admission ___/___/___
C5. IP/OP No. .....
C6. Vaccination history for disease under investigation [Measles, polio (exclude birth dose of OPV), NNT (TT in mother), Yellow fever, Meningitis and suspected Avian Influenza]
a. Was the patient vaccinated against illness (including campaign)? ☐
1 = Yes 2=No 9= unknown. If yes, no of doses: .....
b. Any vaccination given in the last two months? ☐
1= Yes 2= No 9= unknown.
c. If yes to (b), specify vaccine .....
Date of vaccination ___/___/___
C7. Status of the patient:
☐ Still hospitalized ☐ Discharged ☐ Dead

D. For Acute Flaccid Paralysis (AFP) Case Only
(To be filled by a clinician only)

D1. Date of onset of weakness/paralysis: ___/___/_____
D2. Signs and symptoms: 1 = Yes 2 = No
☐ Fever at onset of paralysis ☐ Sudden onset of paralysis
☐ Paralysis progressed < 3 days ☐ Flaccid (floppy)
D3. Site(s) of paralysis: ☐ Left leg ☐ Right leg ☐ Left arm ☐ Right arm

Name of Clinician .....Tel. No.....

NB: Follow-up Examination MUST be done after 60 days from onset of paralysis using the 60 days follow up form

E. For Neonatal Tetanus Case Only

E1. Delivery practices
a. Where was the baby delivered?
☐ Health facility (Name): .....
☐ Home by trained health worker
☐ Home by traditional attendant
☐ Unknown
b. Was the cord cut with sterile/clean blade? ☐
1=Yes 2=No 9=Unknown
c. How was the cord stump treated or dressed? .....

E2. Baby's symptoms
a. How old (in days) was the baby when this illness began?
☐ Days ☐ Unknown
b. At birth, did the baby suck normally? ☐ 1=Yes 2=No 9=Unknown
c. After the first 2 days of life, was the baby unable to suck? ☐ 1=Yes 2=No 9=Unknown
d. Did the baby have convulsions, stiffness or fits ☐
1=Yes 2=No 9=Unknown
e. Was the case confirmed as neonatal tetanus (if yes to the last 3 questions)? ☐ 1=Yes 2=No 9=Unknown

E3. Treatment
a. Was the baby treated at a health facility? ☐
1=Yes 2=No 9=Unknown
b. Is the mother alive? ☐ 1=Yes 2=No 9=Unknown
(If no, complete case investigation form for maternal deaths)

E4. Case response: *[Sensitize birth attendants and community leaders on safe delivery practices and cord care. Provide booster TT doses to mother of NNT case and women of child-bearing age in community]*
a. Did case response for the mother take place? ☐
1=Yes 2=No 9=Unknown
b. Did case response take place in her community? ☐
1=Yes 2=No 9=Unknown

F. For Measles Case Only

F1. Presence of fever: ☐ 1=Yes 2=No
F2. Date of onset of rash: ___/___/_____
F3. Type of rash: ☐ Maculopapular ☐ Other
F4. Was home of patient visited for contact investigation?
☐ Yes (Date): ___/___/_____ ☐ No

G. laboratory Information

G1. Specimen collection *(To be completed by the health facility)*
If lab specimen was collected, complete the following information and send a copy of this form to the lab with the specimen.
For AFP don't collect specimen if onset of paralysis is more than 60 days old
a. Was specimen collected? ☐ 1=Yes 2=No
If no, why? .....
.....
b. Date(s) of specimen collection: __/__/__ and __/__/__
c. Specimen type: ☐ Stool ☐ Blood ☐ CSF ☐ OPS ☐ NS ☐ Animal tissue ☐ Other (specify): .....
d. Date specimen send to the lab: ___/___/_____
e. Name of the lab: .....
f. Preliminary lab results: .....
.....

H. District Contact Person

H1. Form completed by: .....
Designation: ..... Sign: .....
H2. District contact person details:
Name: .....
Designation: ..... Phone No: .....
Email: .....

Final Laboratory Results
Date sample received: ___/___/___
Final results: .....
.....
.....
Date results released to district/facility: ___/___/___
Reporting date: ___/___/___
Reporting officer: .....

NS: Nasal Swab
OPS: Oropharyngeal Swab
S. PI: Suspected Pandemic Influenza

Comments: _____

10.3 Annex 2: 60-Day Follow-up Form for AFP Cases

Polio Eradication Program, Kenya

EPID Number: _____-_____-_____-_____-_____
Country County Sub County Year Case number

Examiner	Name and title of person conducting follow-up:	Date of follow-up:	
Patient Info	Patient's Name:	Sex:	Date of birth: Age in months:
	Parent/family name:	County:	Subcounty:
	Ward:	Location/Village/Town	Address:
	Date of onset of paralysis:		
Patient Background	Site of weakness or paralysis at initial report: Left Arm [ ] Right Arm [ ] Other:_____ Left Leg [ ] Right Leg [ ] Date(s) specimens were collected: 1st Specimen: 2nd Specimen:		
Stool collection & Lab Results	Wild poliovirus results: Positive [ ] Negative [}		
	Enterovirus results: Positive [ ] Negative [}		
Patient Status	Was the patient found? Yes [ ] No [ ] If no, why: Death [ ] Lost to follow-up [ ] Describe attempt to locate: _____ _____		
60 –day Exam	Is paralysis or weakness still present? Yes [ ] No [ ]		
	If yes, site of paralysis: Left Arm [ ] Right Arm [ ] Other:_____ Left Leg [ ] Right Leg [ ]		
	Is paralysis or weakness floppy? Yes [ ] No [ ]		
	Muscle tone: In paralyzed parts (circle one): Increased Normal Decreased In other parts of the body: Increased Normal Decreased Deep tendon reflex: Exaggerated Normal Diminished/absent Muscle volume: [ ] Normal [ ] Wasted		
	Any Sensory Loss in paralyzed body parts? Yes [ ] No [ ] Provisional Diagnosis: _____ _____		

Comments: _____

Signature: _____

10.4 Annex 3: AFP Contact Sampling Form

Contact Stool Collection Form						
EPID number of contact (index AFP EPID number – C #)	EPID Number: _____-_____-_____-_____-_____C (_____) Country County Sub County Year Case					
Reason for collection	☐Inadequate ☐Hot case ☐Hard-to-reach area ☐Other(specify)_____					
Address	Village		Ward			Sub county
	County		Nearest landmark			
Name of contact						
Age	Date of birth ___/_____/____				Age in months _____	
Sex	Male ☐				Female ☐	
Relation to index case	Household relative	Household non-relative	Out-of-household relative	Neighbour	Playmate/ Schoolmate	Other (Specify)
Period of Exposure to Index AFP cases	☐ ≤7 days prior to onset of paralysis ☐≤ 14 after onset of paralysis ☐14–60 days after onset of paralysis ☐ More than 60 days after onset of paralysis					
Immunization status	# of routine OPV doses _____ # of SIA OPV doses_____					
	Date of last OPV _____					
Stool specimen collection	Date of collection _____ Date sent to laboratory _____					
	Date received at laboratory _____					
Stool condition	Good			Poor		
Laboratory serial #						
Results: P1	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
P2	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
P3	Wild	Sabin	Positive – ITD pending	Negative	Not processed	
NPEV	Positive		Negative	Not processed		
Date culture results sent from lab to EPI						
Date ITD results sent from lab to EPI						
Investigator	Name_____Designation_____ Address_____Tel:_____					

10.5 Annex 4: AFP Case Validation

EPID number: KEN-____- ____-____-____ Date Form Received ___/___/_____

Date Data Entered ____/____/_____

MINISTRY OF HEALTH

ACUTE FLACCID PARALYSIS SURVEILLANCE

DETAILED CASE INVESTIGATION/VALIDATION FORM

I. IDENTIFICATION AND RESIDENCE/DEMOGRAPHICS CONFIRMATION

County: _____ Sub-County: _____ Ward: _____

Town/City: _____ Village: _____ Name of major Landmark: _____

Name of child: _____ Father: _____ Mother: _____

Informant's name (if not parent): _____ Relationship to child: _____

Telephone: Father_____ Mother: _____ Guardian/other _____

Date of Birth: ____/____/_____ Age: years ____ months ___ Sex: _____ Is the family of the child nomadic? _____ **(1=Yes; =No)**
dd mm yyyy (If DOB Unknown) **(M= Male F= Female)**

Has Child or any household member travelled or returned from travel within 30 days prior to onset of paralysis: ____ **(1 =Yes; 2= No)**

From where?: (1) _____ (2) _____ (3) _____ (4) _____

Address where case can be found for follow-up (if different from above): _____ Telephone _____

II CLINICAL HISTORY

Date of Onset of paralysis: ___/___/_____ Fever at Onset ___ **(1 = Yes; 2 = No)** Asymmetric ___ **(1 = Yes; 2 = No)**

Site of paralysis/weakness (**circle affected part**): **RA RL LA LL** Other:_____

Duration from onset to full paralysis: _____ Days. History of Injection in affected Limb_____ **(1=Yes, 2=No)**.

Date of injection if Yes___/___/_____. **Is paralysis flaccid/floppy**? _____ (1=yes, 2 = No)

Admitted to Hospital _____ **(1 = Yes; 2 = No)** Date of Admission: ___/___/_____

Medical Record No. (If Known) _____ Name of Facility:_____

Where else have the parents been seeking help after onset of paralysis before being detected? (*Order from onset*)
(1) Place: _____ Person seen: _____ Date First Seen: ___/___/_____
(2) Place: _____ Person seen: _____ Date First Seen: ___/___/_____
(3) Place: _____ Person seen: _____ Date First Seen: ___/___/_____

III. VACCINATION HISTORY

No. of Routine OPV Doses, best estimate: **(Combination of Card & parent's recall)**_____ No. of IPV Doses _____

SIA OPV Doses, best estimate: ____ Distance (km) to nearest vaccination centre: _____

If Zero OPV dose by RI or SIA, reasons for no OPV received ____ ____ _____
(1=Lack of Information; 2= Problems in Access; 3 = Safety Concerns; 4 = Religious Reasons; 8 = Other ; 9 = unknown Problems)
Date last OPV dose administered (RI or SIA):_____

IV. STOOL SPECIMEN COLLECTION

Date 1st Specimen Taken: ___/___/_____ Date 2nd Specimen Taken: ___/___/_____

Method Specimens Transported to National Lab:_____ **(1 = Staff; 2 = Courier; 3 = Other)**

Specimens kept with ice pack since collection? _____ **(1=Yes; 2=No)** Ice packs changed every 24 hours?_____ (

Are contact specimens needed? ___ (1=Yes, 2=No) (if any criteria below are met, initiate contact specimen collection):
1) 2 stool specimens not collected from AFP case within 14 days after onset of paralysis (e.g. child died, case was reported late)
2) AFP case is a hot AFP case: a) Below 5 years of age, **AND b)** Fever at onset, AND **c)** Less than 4 days from onset to complete paralysis, AND **d)** Asymmetric paralysis (one side of body weaker than other) **AND e)** Has received < 3 doses of OPV.
3) *national surveillance* team requests it to be done

V. CLINICAL EXAMINATION	Findings at Initial Case Investigation; Date: ___/___/____	Findings during validation; Date: ___/___/_____

Tone: (normal, ↑, ↓) Indicate for each limb	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:
Deep Tendon Reflexes: (normal, ↑, ↓) Indicate *for each*	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:
Power (out of 5): Indicate for *each limb*	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:	Right Upper Limb: Right Lower Limb:	Left Upper Limb: Left Lower Limb:
Cranial nerves affected? If yes, indicate which: III, IV, VI (eye movement); V (jaw); VII (facial movement) IX-X (pharynx, gag); XII (tongue)	____ (1 =Yes; 2 = No; 9= Indeterminate) Right	Left	____ (1 =Yes; 2 = No; 9= Indeterminate) Right	Left
Babinski (Present if big toe goes up & rest of toes fan out) Tick as appropriate	Right Lower Limb Left Lower Limb:	Present Absent Present Absent	Right Lower Limb Left Lower Limb	Present Absent Present Absent
Sensation to Painful Stimulation Intact?	____ (1 =Yes; 2 = No; 9= Indeterminate)		____ (1 =Yes; 2 = No; 9= Indeterminate)	

VI. VERIFYING INVESTIGATION DETAILS

Date Case First Investigated: ___/___/____ Name of First Investigator: _____ Title: _____

(1= Dr; 2= RCO; 3= Nurse; 4= Surv. Coord; 5= Other)

Verified as AFP? ____ **(1 =Yes; 2 = No).** Were there any discrepancies from the data on the CIF? ____ **(1 =Yes; 2 = No)**

If Yes, Please describe: _____

Verified by: _____ Title: _____ **(1= Dr; 2=RCO, 3= other (specify) _____)**

Signature: _____

VII. WORKING DIAGNOSIS

Name of clinician who saw case first: _____ Telephone: _____

Initial Diagnosis when case first seen*:: _____ Field Verifier Clinical Impression of Case:* _____

Hot Case Criteria Met? ____ (1 =Yes; 2 = No;) Handled as Hot Case? ____ (1 =Yes; 2 = No;)

Any other notes: _____

_____

After 60 days, before 90 days complete the following and the right portion of the clinical examination:

VIII. FOLLOW-UP EXAMINATION/CLINICAL CONCLUSION

Findings at Follow-Up: ____ (1 = Residual paralysis; 2 = No residual paralysis; 3 = Lost to Follow-Up; 4 = Death before Follow-Up)

If Death, Date of Death: ___/___/_____

Final Clinical Diagnosis Description: _____

Final Clinical Diagnosis: * _____ Date given: ___/___/____

Physician's/Examiner's Name _____ Signature: _____

* 1 =? Clinical polio; 2 = Traumatic neuropathy; 3 = Guillain Barre syndrome/other demyelinating disease/acute motor axonal neuropathy; 4 = Transverse myelitis; 5 = Pott's/other acute spinal compression; 6 = infectious disease of bone/soft tissue of limb; 7 = Transient paralysis of unknown aetiology; 8 = Other known diagnosis; 9 =Indeterminate/Unknown

10.6 Annex 5: Zero Dose/Unknown Vaccination Case Investigation Form

1. Case Identification

1.1. EPID No.: _____/_____/_____/_____/_____
1.2. Name of the child: _____
1.3. Date of birth (dd/mm/yyyy) ___/___/____ or Age _____ Sex: Male/Female
1.4. Mother's Name: _____ Contact telephone no: _____
1.5. Father's Name: _____ Contact telephone no: _____
1.6. GPS Coordinates: Latitude: _____ Longitude _____

2. Present Address:

2.1. Name of Village (nearest landmark): _____
2.2. Name of nearest Health Facility_____
2.3. Is the Health Facility providing immunization services: ☐Yes ☐No
2.4. Distance from village to the nearest health facility providing immunization services ____km
2.5. Ward:_____ Sub County: _____ County: _____

3. Is the sub county of current residence inaccessible? ☐Yes ☐No
3.1. If inaccessible, why? _____

4. If the sub county is not the origin residence,
4.1. What is the of origin:
sub county _____ County:_____Country_____

5. Is the child from Special Population? ☐Yes ☐No
5.1. If yes, select the special population:

☐ Nomads ☐ Urban slum dweller ☐Inaccessible populations ☐ Refugee/IDPs population
☐ Asylum Seeker ☐ Other (specify)_____

6. Where do children in your community receive vaccination service?

☐ Nearest health facility ☐ Outreach/Mobile/Transit point ☐ House to house vaccination
☐ No service at all ☐ Others (Specify) _____

7. AFP Case details
7.1. Date of onset: _____ /_____/_____ Date of notification: _____ /_____/_____
7.2. Name of the person notified: _____
7.3. Title of the person notified: ☐Health worker ☐Community informant☐
Others (Specify): _____

8. Child vaccination history (both card and history):
8.1. Number of Routine OPV doses: _____
8.2. Number of Routine IPV dose: _____
8.3. Number of SIAs OPV doses: _____
8.4. Number of SIAs IPV dose: _____

9. Reason of child not being vaccinated

9.1. Refusal-related issues

☐ Religious/Spiritual reasons

☐ Vaccine not safe /not trusted

☐ Child is unwell

☐ Child not ill, why give vaccine

9.2. Health services deliver-related issues:

☐ Nearest facility is too far

☐ Near facility does not offer routine immunization

☐ Facility is often closed

☐ Too costly

☐ Staff is unfriendly

☐ No time

☐ Vaccine not available at the time of visit

☐ Don't know the time and place of routine immunization

☐ Other (specify): _____

10. Nearest Health facility immunization coverage (get nformation from the nearby HF)

10.1. OPV3 coverage (past 2 years)

10.2. IPV coverage (past 2 years)

11. Conduct Rapid Convenient Survey for Vaccination Coverage Information (Select 30 houses in the area, with at least one <5 years child in each house. Record information for all children under 5 years of age in the survey form at the end). Use the table below for tallying

	6-23 months					24-59 months					Grand Total
	No OPV	OPV 1	OPV 2	OPV 3	IPV	No OPV	OPV 1	OPV 2	OPV 3	IPV	
Male											
Female											
Total											

12. Total number of children under 5 years seen during the survey: _____

13. Proportion of children < 5 years who received OPV3: ____ %

14. Total number of children (aged 6-23 months) checked for OPV3 status:_____

15. Proportion of children 6-23 months who have received OPV3 doses based on recall/card: = _____ %

16. Total number of Children under 5 years found unvaccinated: ___

Once you get zero dose case or unknown case below 5 years

- Child must be vaccinated immediately with bOPV and IPV depending on the age at nearby health facility

If the survey show the area has bOPV3 coverage less that 50% or IPV 50% - the outreach/mobile must be done in the area

Action taken_____

Date Case evaluated (DD/MM/YYYY): _____/_____/_____

Name of investigating officer: _____

Investigator's phone number: _____

Email address: _____ Sign: _____

10.7 Annex 6: Targeted Healthy Children Stool Sampling

EPID number					
Child Information					
Name of Community Child:_____					
Date of birth ___/_____/____ OR Age in months _____			Sex: Male Female		
Number of routine OPV doses _____ Number of routine IPV doses _____					
Number of SIA OPV doses _____ Number of SIA IPV doses _____					
Date of last OPV dose ____/_____/_____ Date of nOPV ____/_____/_____					
Address					
County			Sub County		
Ward			Village		
Nearest landmark					
Health facility type	Hospital	Health Centre	Dispensary	Others	
Health Facility Name:					
Stool Collection					
Date of stool collection ___/____/_____ Date stool sent to KEMRI EPI Lab ____/_____/_____					
Date stool received at KEMRI Lab _____/_____/_____ Stool condition: Good/Poor (circle one)					
Laboratory serial number					
Results					
Results: P1	Wild	Sabin	Positive – ITD pending	Negative	Not processed
P2	Wild	Sabin	Positive – ITD pending	Negative	Not processed
P3	Wild	Sabin	Positive – ITD pending	Negative	Not processed
NPEV	Positive		Negative	Not processed	
Date culture results sent from lab to EPI					
Date ITD results sent from lab to EPI					

10.8 Annex 7: Environmental surveillance investigation form

Country: …… **Country code**:……..

ID Code: ENV/……../……../……../……/…… (*ENV-KEN/CCC/ScScSc/SSS/YY/###)*

CCC: *County Code,* ***ScScSc:*** *Sub-County Code,* ***SSS:*** *Site Code,* ***YY:*** *Year,* ***###:*** *sample number*

County:…….. County code:……

Sub County:…….. Sub County code:……

Site name:……..Site code:……..

Health area/Ward:……..

Village/Settlement:……

Geo-coordinate of site (Latitude & longitude):……

Type of sewage plant or sewage system: ☐ Open ☐ Closed ☐ WWTP (*tick correct response*)

Time of sample collection:…… (hh:mm)

Atmospheric temperature at time of sample collection:……º C

Date of sample collection:…… (dd/mm/yyyy)

Date sample sent to Laboratory :…… (dd/mm/yyyy)

Name Person who collected sample:……Telephone no:……Signature:……

Name of supervisor during collection:……...Telephone no:……Signature:……..

10.9 Annex 8: Environmental Surveillance Laboratory form

Date of sample received at laboratory:…….. (dd/mm/yyyy)

Name of person receiving sample at laboratory:

Signature:

Sample Lab ID No:……

Condition of sample at receipt: (1=Good, 2=Bad 3=Unknown)

If bad/unknown, specify:……..

Temperature of specimen carrier on arrival in lab:…….. .°C

Volume of specimen: (1>1L, 2<1L)

Colour of specimen: (1=clear, 2=cloudy/turbid, 3=dark)

Final cell culture results:……..

ITD results:……..

Sequencing results:

Date results sent out by lab:……..…(dd/mm/yyyy)

Date results received by surveillance (or WHO):……..(dd/mm/yyyy)

Retain a copy of Form by Collector, WHO and send original to National Polio Lab

10.10 Annex 9: Integrated Supportive Supervisory Checklist form (digital/electronic-ODK)

Get coordinate

FACILITY BASED INTEGRATED SUPPORTIVE SUPERVISION

1. Date of Visit:
2. Choose Your IST
3. Name of Country (Where Applicable):
4. Name of the County:
5. Name of the Sub County:
6.Name of the Ward:
7. Designation:
8. Please Choose Your Name:

Type your name

9. Name of Facility Visited:
9a. Type of site Visited:
10. Is it a Priority focal site?
11. Priority level for AFP surveillance
12. Is active case search done by the health facility focal person in the facility every week?
13.Is this Supervision occurring jointly with Government Staff?
14. When was the facility last supervised by the Sub County Staff?
15. When was the facility last supervised by WHO Staff?
15a.Was there written feedback at the end of this supervision?
15b.Did you meet with the head of the health facility?
15c.Does the Focal Person have his/her ToR posted in his/her office?
15d.Does the Focal Person have disease surveillance Monitoring chart/for VPD's?
16. When was the health facility surveillance focal person last trained?
17. Does the health facility Focal person know case Definitions for VPD's?
18. Does the health facility Focal person know specimen collection procedures for VPD's?
19. Does the facility have any of the following specimen collection and transportation tools?
19a. Are revised investigation forms for the 4 VPDs available in the HF?
20. Are there updated case files for all reported cases for the last three years?
21a. Take a Picture of the Updated Case file and Save on your phone
22. Does the facility have physiotherapy unit?
23. Number of unreported AFP cases in the Physiotherapy Unit
24. Are surveillance posters and standard case definitions available in the facility?
24a. Take a Picture of the surveillance poster and Save on your phone
25.Were there unreported cases found during the supervision
26. Number of unreported AFP case(s)

Number of missed suspected measles cases found in the register(s) or during discussions? Number of missed suspected yellow fever cases found in the register(s) or during discussions? Number of missed suspected tetanus cases found in the register(s) or during discussions?

26a. Which surveillance guidelines are available at the facility?

26b.Did you meet those conducting consultations in the health facility?

26c.Does the HF have one or more patient registers with a column for symptoms?

26d.Number of AFP cases validated during the visit?

26e.Number of follow-up examinations done during the visit?

INFORMANT INFORMATION

27. Is there a list of community informants?

28. When was the last community informants' sensitization?

29. Is there a log of calls made to the informants in the last one month?

30. Is there a log of calls made to the Nomadic population focal person?

31. Is the focal person for the nomadic community identified and sensitized?

31i. Have you visited a health community personnel/traditional healers during the visit?

31ii. Select the category of informant you visited

ROUTINE IMMUNIZATION CHECKLIST

32. Is this an RI Implementing Facility

33. Is there an updated (last 6 months) Reaching Every District (RED) micro plan?

34. Is there an Immunization schedule/session plan for routine Immunization?

34a. Take a Picture of the Immunization schedule/session plan and Save on your phone

35. How many static/fixed sessions were planned in the previous month?

36. How many static/fixed sessions were conducted in the previous month?

37. How many outreach sessions were planned in the previous month?

38. How many outreach sessions were conducted in the previous month?

39a. Was any Immunization session Interrupted in the previous month?

39b. What is/are the reason(s) for the interruption or cancellation of immunization session(s)?

40. Does the facility have a vaccination monitoring chart?

40a. Take a Picture of the vaccination monitoring chart and Save on your phone

41. Does the facility have defaulter tracing mechanism?

42. Does the facility have an Immunization in Practice Module available?

43. When was the focal person trained on immunization in practice/EPI?

44.Is there a stock out (No supply) or Low Stock level (inadequate for the month) of the following RI supplies

45. Is there a stock out (No supply) or Low stock level of the following vaccines in the month? 45a. Is there any mOPV and tOPV in the health facility?
45b. Indicate number of Vials
45c. Take a Picture of the toPV vial(s)
45d Take a Picture of the mOPV vial(s)
46. Is there a functional Refrigerator
46a. Status of cold chain monitoring in the last month?
46b. Take a picture of the Cold Chain monitoring chart and Save on your phone
47. What is the current temperature reading?
48. Are Vaccines, diluents and water packs in proper compartment?
49. Condition of vaccines in the refrigerator
49a. Take a Picture of the condition of vaccines and Save on your phone
50. Does the health worker know VVM reading and shake test?
51. Is the RI register utilized properly?
52. Were AEFI cases recorded in the last three months?
53. Is safe injection practiced in the Health Facility?
54. What Method does the facility use for waste disposal
55. Utilization of RI Tally Book
56a. Is there a Vaccine ledger Book at this level ?
56b. Status of available Vaccine ledger Book
57. Are there IEC materials for RI?
58. Is there a functional Facility Management Committee (FMC)?
59. When did the HF receive funding for RI?
60. What is the source of funding for RI?
61. Is there a documented supervision visit with written feedback in the last quarter?

10.11 Terms of Reference (TOR) for Surveillance Focal Persons in the reporting Health Facilities

The surveillance focal person in the reporting sites performs the following tasks:

1. Facilitates detection of AFP and IDSR cases using the standard case definition.
2. Conducts regular weekly AFP and IDSR active case search in the records of out patient department, pediatric ward, physiotherapy, and occupational health units of the health facility and signs in the registers.
3. Completes the AFP AFP and IDSR case notification form and immediately send to the sub country disease surveillance coordinator.
4. Asks the family of AFP or IDSR case if there are other persons with similar signs and symptoms at home or in the village.
5. Supports the SCDSC during AFP and IDSR case investigation.
6. Collection and assurance of good condition of the stool specimen, serum specimen; and other samples based on the IDSR condition; including maintaining the reverse cold chain during shipment, until the sample reaches the National Laboratory
7. Assist the surveillance officers during 60 day follow up of AFP cases.
8. Sensitizes waiting patients in health facilities on AFP and IDSR surveillance.
9. provide feedback of the results to the clinicians and family of AFP/IDSR case.
10. Performs other surveillance duties of a focal person (weekly and monthly reporting).
11. Documents and archives AFP and IDSR surveillance activities in the health facility.

10.12 Terms of Reference (TOR) for Sub County Disease Surveillance Coordinators

The sub county disease surveillance coordinator (SCDSC) carries the following AFP surveillance activities:

1. Coordinates all integrated disease surveillance and response activities in the sub county.
2. Develops surveillance work plan for the sub county and ensures its implementation.
3. Prioritization of surveillance reporting sites every six month.
4. Conducts active AFP and IDSR surveillance visits at reporting health facilities
   and communities as per the monthly surveillance work plan.
5. Detection and Notification of AFP AFP and IDSR cases to the county and national levels.
6. Prompt investigation of AFP AFP and IDSR case following the standard CIF.
7. Collection and assurance of good condition of the stool specimen, including maintaining the reverse cold chain during the shipment until the sample reaches the national polio laboratory.

8. Conducts of basic analysis of surveillance data and use the information to guide planning of performance improvement activities and monitor trends of diseases using the program indicators.
9. Sensitization of clinicians (private and public) and CHVs on the case definitions of AFP and other IDSR conditions..
10. Conducts Validation, 60-days follow-up, zero dose investigation of AFP cases
11. Shares laboratory results feedback of AFP and IDSR to the surveillance focal persons, clinicians and parents.
12. Monitors the timeliness and completeness of reports from all reporting health facilities.
13. Collates and submits weekly and monthly IDSR reports to the county.
14. Documents and archives all surveillance activities at the facility and sub county levels.
15. Conducts additional activities assigned by the CDSC.

10.13 Terms of References (TOR) for County Disease Surveillance Coordinator (CDSC)

The CDSC carries the following AFP surveillance activities:

1. Ensures the development of surveillance work plan and its implementation in the sub counties and reporting sites
2. Coordinates the conduct of outbreak investigation.
3. Coordinates communication of laboratory results from the laboratory and ensures feedback reaches the sub counties.
4. Ensures proper implementation and monitoring of environmental surveillance.
5. Sensitizes clinicians and other health workers in the sub counties and reporting health facilities on AFP surveillance.
6. Supervises the activities of SCDSCs provides technical support and feedback.
7. Monitors surveillance performance using the standard AFP surveillance indicators. This should be done using the following:
   - Calculate AFP surveillance performance indicators.
   - County summary of Sub county AFP surveillance performance indicators.
   - County summary of timeliness and completeness of weekly Sub County report.
8. Analyses disease pattern and trends, interprets surveillance data in conjunction with routine immunization coverage data and produces routine report.
9. Ensures all surveillance reports and activities are well documented and archived at all levels and in his office.

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