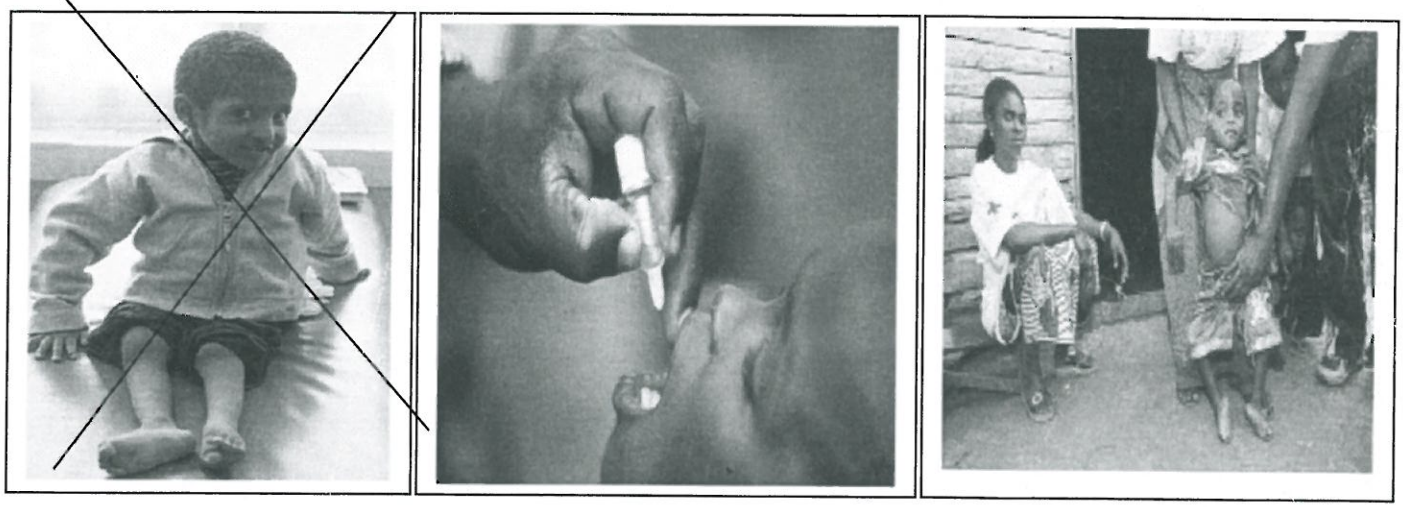
Guidelines for Acute Flaccid Paralysis Surveillance

2nd Draft
(July 15, 2007)

Nigeria



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And

WHO-Nigeria

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ABBREVIATIONS

AFP	Acute flaccid paralysis
ACPE	Advisory Committee for Polio Eradication
AFRO	World Health Organization Regional Office for Africa [African Regional Office]
ARCC	African Regional Certification Committee
CIF	Case investigation form
CSF	Cerebro-spinal fluid
DSNO	Disease Surveillance and Notification Officer
EPID number	Epidemiologic investigation identification number of AFP case
FMOH	Federal Ministry of Health
GBS	Guillain-Barré syndrome
GCC	Global Certification Commission [Global Commission for the Certification of the Eradication of Poliomyelitis]
IDSR	Integrated Disease Surveillance and Response
IPDs	Immunization Plus Days
ITD	Intratypic differentiation [of polioviruses]
LGA	Local government area
mOPV	Monovalent oral poliovirus vaccine (type 1or 3)
NCC	National Certification Committee
NIO	National immunization officer (WHO)
NPEC	National Polio Expert Committee
NPI	National Program on Immunization
NPAFP	Non-polio acute flaccid paralysis
NPENT	Non-polio enterovirus
NPHCDA	National Primary Health Care Development Agency
NSO	National Surveillance Officer (WHO)
OPV	Oral poliovirus vaccine
OPV3	Vaccination coverage by 12 months with 3 doses of OPV
PEI	Polio Eradication Initiative
RI	Routine immunization
RCC	Regional Certification Committee
SC	WHO state office coordinator
SE	State epidemiologist
SIAs	Supplementary Immunization Activities
SVF	State case verification form
tOPV	Trivalent oral poliovirus vaccine (serotypes 1, 2 and 3)
URI	Upper respiratory tract infection
VPD(s)	Vaccine-preventable disease(s)
WHO	World Health Organization
WPV	Wild poliovirus [type 1, 2, 3]
ZC	Zonal coordinator (WHO)

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Chapter 1

I. Introduction

The purpose of this manual is to provide practical guidelines for implementing acute flaccid paralysis (AFP) surveillance in Nigeria. It provides information on the epidemiology of poliomyelitis, polio eradication strategies, and how to investigate cases of AFP. It is primarily intended for State and LGA level polio eradication officers. It is these workers who will be expected to locate, report, and investigate paralysis cases to the State, zonal and national levels.

Ii. Epidemiology Of Poliomyelitis

Causative Agent

There are 3 types of wild polioviruses (type 1, 2 and 3). All three types can cause paralysis. The most frequent cause of epidemic polio is poliovirus type 1. Polioviruses can be isolated from stool samples and typed in a laboratory.

Communicability

Poliovirus is highly communicable. An infected individual will probably infect all other non-immune persons in a household. The transmission of poliovirus is facilitated by crowded living conditions and poor sanitation.

Transmission

Transmission is primarily person-to-person via the fecal-oral route, i.e. the poliovirus replicates in the intestines and spreads through the feces. This mode of transmission is similar to that of cholera, dysentery and other diarrheal diseases. The time between infection and onset of paralysis is 10-21 days. The virus spreads rapidly in non-immune persons and transmission is usually widespread by the time of paralysis onset. The infected person intermittently excretes the virus for one month or more after infection. The heaviest fecal excretion of the virus occurs just prior to the onset of paralysis and during the first two weeks (14 days) after paralysis occurs.

Immunity

Protective immunity against poliovirus infection develops by immunization or natural infection. Immunity to one type of poliovirus does not protect against infection with other poliovirus types. Immunity following natural infection or administration of OPV is believed to be lifelong. Infants born to mothers with high antibody levels against poliovirus are protected for the first few weeks of life only.

Occurrence

Widely endemic in five continents in 1988, polio is now concentrated in parts of sub-Saharan Africa and the Indian sub-continent. Polio most commonly affects children below 5 years of age, but a person of any age who is not immune may be infected.

Reservoir

Poliovirus infects only human beings. There is no animal reservoir and the virus does not survive long in the environment outside of the human body. There is no long-term carrier state.

Global Eradication of Poliomyelitis

What makes it Possible?

- No animal vector
- Effective tool (OPV)
- No chronic carrier state
- Survives poorly in the environment

What makes it Difficult?

- Most infected people do not show any symptoms eg out of 200 infected only 1 person will be paralyzed
- Many other diseases present with similar symptoms

Clinical Course

The incubation period of polio from exposure to the onset of first symptoms is 7-10 days and the time between infection and onset of paralysis is 10-21 days. During the incubation period, the poliovirus multiplies in the throat and intestines. Poliovirus is excreted in a daily cyclical pattern, intensely for the first 15 days, then tapering off after about 30 days.

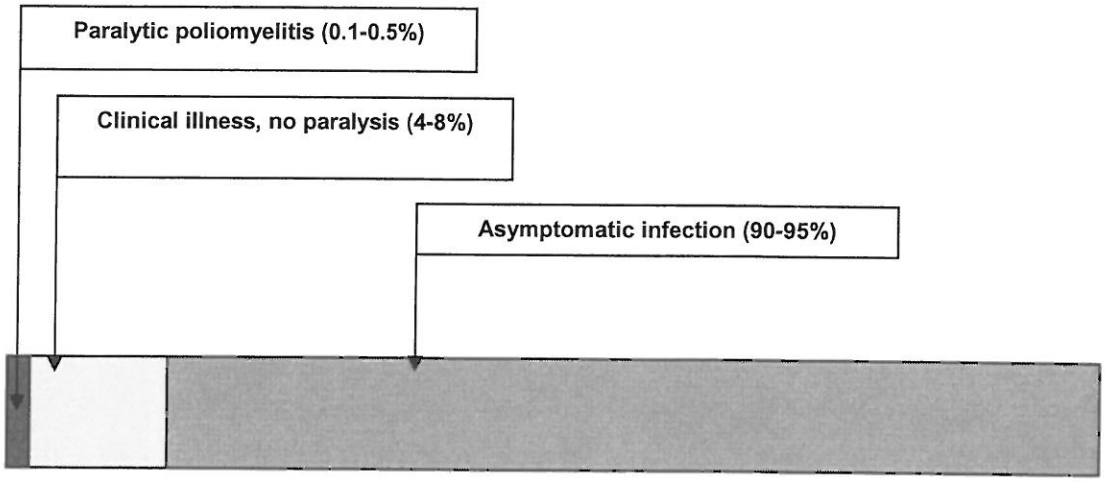
Not every child infected with poliovirus becomes ill. Up to 90-95% of all infected individuals suffer in-apparent infection and appear healthy, yet they can still infect others.

About 4-8% of infections will result in a minor illness known as abortive polio. The illness usually starts after an incubation period of one-two weeks with some or all of the following initial symptoms: fever, headache, stiff neck, muscle pain, nausea, vomiting and diarrhea. These symptoms are not specific and they cannot be distinguished from other mild infections. About 1% of infected children may even present with signs of non-bacterial or aseptic meningitis. Recovery is rapid and complete, and there is no paralysis.

Paralytic poliomyelitis occurs in approximately 1% of infections. It occurs in two phases, minor and major, sometimes separated by several days with no symptoms. The minor phase consists of symptoms similar to that of abortive polio. The major phase begins with muscle pain, spasms, and the return of fever. This is followed by the rapid onset of paralysis that is usually complete within 72 hours. The paralysis is flaccid, the muscles are relaxed, floppy and never stiff. In the most typical situation, patients wake up in the morning, try to stand up from the bed and find that they cannot stand or walk properly. In infants who are too young to walk, the mother may notice that one of the legs has assumed a different resting position, appearing "limp" or "watery."

Clinical Outcome of Poliovirus Infections:

Paralysis is unusual manifestation of Infection



Polio paralysis is usually, but not always, asymmetrical (affecting one side more than the other). It involves the legs more commonly than the arms, and affects the proximal muscles (those closer to the patient's trunk) more commonly than the distal muscles (those further from the patient's trunk). Involvement of all four limbs is rarely observed in infants, but may occur in older patients. The sensory nerves are usually not affected so the sense of touch and pain are normal.

In some cases, polio paralysis causes severe difficulty in breathing, swallowing, speaking, or controlling the bladder and bowels (bulbar poliomyelitis). The risk of death from respiratory paralysis is high. The mortality rate is consistently higher in older patients and lower among infants and young children.

The risk of developing paralytic polio is not the same for all infected persons. Pregnant women are more likely to become paralyzed when infected with a poliovirus. Intra-muscular injections can provoke paralysis in polio-infected individuals.

Over the years, the un-stimulated muscles of a paralyzed patient will atrophy, leaving the affected limb looking thinner than the other or wasted.

Differential Diagnosis

Other diseases such as Guillain-Barré syndrome, cerebral malaria, Potts disease, transverse myelitis, and infections with non-polio enteroviruses can present with symptoms similar to infections with wild poliovirus. Distinguishing characteristics of paralytic polio are asymmetric flaccid paralysis, fever at onset, rapid progression of paralysis, residual paralysis after 60 days, and preservation of sensory nerve function. The only way to confirm that a case of paralysis is due to wild poliovirus is through the isolation of poliovirus from stool specimens.

Chapter 2

III. Strategies to Eradicate Poliomyelitis

There are four main strategies to achieve the goal of polio eradication:

1- Achieve and maintain high (>80%) routine immunization coverage for all children under 1 year of age with four doses of OPV.
2- Conduct NIDs/IPDS as supplementary immunization in countries where polio is endemic and/or the surveillance system is not able to document that wild poliovirus is no longer circulating or is only focal.
3- Establish high quality AFP surveillance with the timely investigation of every case.
4- Conduct "mopping-up" campaigns in areas where polio is reduced to focal transmission.

A brief description of these strategies follows. AFP surveillance, is described in detail in the next chapter.

Routine Immunization

WHO currently recommends that children receive four doses of OPV before one year of age. In endemic countries, a dose should be given at birth or as close to birth as possible. This is called the "birth dose" or "OPV zero." The other three doses should be given at least 4 weeks apart starting from 6 weeks of age.

There are three types of poliovirus: type 1, 2 and 3. Once a person is infected with a specific type of poliovirus, they will have lifelong immunity to that type. Immunization against poliomyelitis with OPV imitates the natural development of immunity and provides reliable protection in fully immunized individuals.

Trivalent OPV (tOPV) contains attenuated (less harmful) live poliovirus of all three types. Each dose consists of a balanced mixture of all three types of poliovirus. However, due to competition among the three types and other viruses in the intestinal tract as well as other factors, each dose of tOPV only produces sero-conversion in about half of non-immune vaccine recipients. Three doses of tOPV given at least four weeks apart provides full protection for about 75% to 85% of vaccinated individuals. OPV efficacy can be raised by administering more than three doses. Polio endemic countries like Nigeria, require many additional OPV doses administered to children to ensure interruption of transmission is achieved.

Monovalent vaccine (mOPV1 or mOPV3) contains only type 1 or type 3 specific vaccine respectively. The monovalent vaccine (mOPV) has better efficacy and is much more effective with each dose as compared to tOPV; however, it is only type specific.

National Immunization Days/Immunization plus days

During NIDs or IPDs, supplemental doses of OPV are given to all children under the age of 5 years in a short time period as possible, regardless of their vaccination status. NIDs are conducted as rounds of mass immunization at least 4-6 weeks apart. Usually, campaigns are held during the low poliovirus transmission season, which is usually the cold or dry season.

During the NIDs/IPDs, vaccination cards should not be requested nor OPV doses recorded because the OPV doses given during NID are considered extra and should not replace the doses received during routine immunization. The primary objective of NIDs is to interrupt transmission of wild poliovirus. By giving OPV at the same time to all children in a large geographic area, transmission of poliovirus is interrupted. To be effective, NIDs must achieve high coverage with OPV and reach previously un-reached

children. Therefore, special efforts are necessary to reach children who are often missed by routine and supplemental immunization.

AFP Surveillance

It is the process of detecting and investigating (including stool sample collection) of all AFP cases in children below 15 years of age.

The goal of AFP surveillance is to identify and document the presence or absence of wild poliovirus in the country. This goal is best achieved by finding all cases of acute flaccid paralysis and testing stool specimens from each case for the presence of wild poliovirus.

Reliable AFP surveillance data will guide targeted immunization activities in areas with continued wild poliovirus circulation. Additionally, surveillance data is accepted as the most reliable way to monitor how effectively routine and supplementary OPV immunization has succeeded in decreasing poliovirus transmission. Ultimately, surveillance data will be the basis for certification of polio eradication. Surveillance for AFP should be sensitive enough to detect polio cases, should they exist. Therefore there is an urgent need to strengthen the surveillance system in the Country.

Mopping-up Campaigns

Mop-up campaigns are supplemental immunization campaigns that are conducted after the AFP surveillance system has reliably established that polio has been reduced from an endemic disease (occurring in a more or less stable manner), to a disease that occurs only in focal areas. They are conducted when a country is in the final stages of poliovirus elimination. Mop-up campaigns should be conducted in high-risk areas whose borders are defined by demographic and epidemiologic criteria, and natural boundaries.

The major difference between mop-up campaigns and NIDs is that mop-up campaigns are conducted in focal areas of polio transmission rather than on a national basis. NIDs are conducted as long as polio is endemic or the situation is unknown because surveillance is inadequate.

Chapter 3

The following section describes AFP Surveillance in some level of depth

1. AFP surveillance

Surveillance for AFP should be sensitive enough to detect polio cases, should they exist. Additionally, surveillance data is accepted as the most reliable way to monitor how effectively routine and supplementary OPV immunization has succeeded in decreasing poliovirus transmission. Reliable AFP surveillance data will guide targeted immunization activities in areas with continued wild poliovirus circulation. Ultimately, surveillance data will be the basis for certification of polio eradication.

2. What is Acute Flaccid Paralysis (AFP) surveillance?

It is the process of detecting and investigating (including stool sample collection) of AFP cases in children below 15 years of age or in any person when clinician suspects polio.

AFP Case Definition:

> **"Any child under 15 years of age with weakness or floppiness of one or more limbs**
>
> **or**
>
> **Any person of any age in whom a clinician suspects polio."**

It is important to remember that AFP is a symptom, not a disease. Health workers should understand the difference between reporting clinically diagnosed polio cases and reporting AFP cases. The AFP case definition should be widely disseminated among health workers. Reporting should be based on 'AFP' cases rather than 'polio cases'.

Goal of AFP surveillance.

The goal of AFP surveillance is to identify and document the presence or absence of wild poliovirus in the country. This goal is best achieved by finding all cases of acute flaccid paralysis and testing stool specimens from each case for the presence of wild poliovirus.

Why surveillance for AFP is needed?

Acute paralysis can result from various causes and diseases including paralytic polio. A sensitive system for detecting and reporting flaccid paralysis is therefore, required to ensure that polio cases are not misdiagnosed or missed. To avoid missing any polio case, all children under 15 years of age with acute flaccid paralysis (AFP) should be reported and their stool specimens tested in the laboratory for the presence of wild poliovirus.

3. How should AFP surveillance be organized?

Establishing a surveillance network is critical for effective surveillance. A focal point or contact person must be designated at every level to coordinate the activities. Every individual responsible for surveillance must be connected to the whole system and

his/her role and relationship with others in the system clearly defined. Also, the surveillance network must cover the entire area under the contact person's responsibilities. No area should be left out of the system. In addition, prioritization should be given to areas AFP cases are most likely to visit.
AFP surveillance should cover all areas and include community-based surveillance, the detection and reporting of diseases from within the community usually by local people (focal persons), leaders, nongovernmental organizations (NGOs) who have received basic instruction on how to recognize an AFP, in a broad way is encouraged. The role of partners working in the field (including faith based health facilities, as well as the role of the private sector, traditional healers and traditional birth attendants) is very important in AFP surveillance.

Where should you visit when conducting AFP surveillance?

- All health facilities in the catchments areas (hospitals, health centres, health post, clinics, feeding and rehabilitation centres, physiotherapy units etc) including private health facilities and private clinics.
- The community (traditional healers, traditional birth attendants, teachers, prayer camps, spiritual leaders etc).

A particular attention, and appropriate strategy, must be put in place to reach the hard-to-reach areas and communities, including identification and training of focal persons within such communities. It is important to find contacts in the communities, where surveillance is conducted to ensure all the areas and communities are covered by the system.

Nature of the surveillance:
The most efficient way to find AFP cases is to introduce **ACTIVE SURVEILLANCE FOR AFP** at the health facilities.

4. What is 'active surveillance for AFP'?

Active surveillance is a process by which surveillance officers visit health care facilities regularly (clinics, hospitals, rehabilitation centers, traditional healers, etc) to search for and investigate unreported AFP cases. Active surveillance is done through a review of health facility records, interviews with health workers and/or visit to wards to review cases. Surveillance sites should be prioritized according to their probability of seeing AFP cases i.e. those sites which have a higher probability of seeing an AFP case should be visited more regularly. Every surveillance officer should have a list of surveillance sites and a schedule of visits for these sites; each surveillance visit should also be documented. Monitoring of active surveillance visits is a certification requirement.
Since passive surveillance has limitations due to its lack of access to some groups within the population, active surveillance often enhances the completeness of a passive surveillance system.

5. Selecting reporting sites

- ***Hospitals and health centers as important sentinel sites.***
  Experience in different countries shows that AFP cases are most likely to be identified in hospitals and health centers, and particularly in pediatric units and physiotherapy centers. Nevertheless, any health facility that sees pediatric patients (children 0-15 years) as either inpatients or outpatients should be included in the active surveillance

system. These facilities include teaching hospitals, pediatric hospitals and general hospitals with pediatric wards, health centers, health clinics, physiotherapy centers, private facilities, MCH centers and rehabilitation centers.

- ***Other places to look for AFP cases outside the hospital.***
  For religious, economic and cultural reasons, parents may prefer to take their children with acute paralysis to religious leaders, traditional healers, spiritual healing sites, private clinics etc. Rehabilitation / physiotherapy clinics located outside the hospitals are also potential sites to find AFP cases. Search for AFP should also be done in such facilities.

- ***Sensitization and mobilization of clinicians and the community.***
  Community leaders and clinicians should be sensitized continuously and mobilized to report AFP cases. Production and distribution of simple key messages for community use helps to encourage community surveillance support. All clinicians and health workers must be oriented on the objectives of AFP surveillance, multiple OPV doses including the reasons for conducting repeated vaccination campaigns of all children under five years of age during NIDs/IPDs regardless of previous vaccination status.

6. How to establish reporting sites and prepare for 'active surveillance'

Briefings to sentinel or reporting sites about AFP surveillance.

Regardless of the frequency of previous visits, not all hospital administration and clinical staff will be familiar with AFP case definition and surveillance. The facility / clinic should be visited to explain the objective of the program and to get permission for health staff to conduct regular active surveillance visits.

Preparing the reporting sites:

Before beginning regular visits, the surveillance person has to identify and rank surveillance sites as high, medium and low priority sites. Prioritization is mainly on the probability of finding an AFP case – the high priority facilities being the ones with the greatest probability of seeing an AFP case based on size and type of patient population, patient volume, and the presence of physicians and specialists.

1) **High priority site:**
   This is a surveillance site and community contacts (informant, focal person, resource person) where an AFP case would **MOST LIKELY** seek care. This can be any surveillance site, including traditional healers, reputed/famous for the treatment of paralysis. It can be a hospital, private clinic (pediatric, neurology, orthopedic, physiotherapy), a community that has had an accumulation of AFP cases, a health center, a health post, etc. Surveillance sites classified as high priority must be visited **ONCE A WEEK.**

2) **Medium priority site:**
   This is a surveillance site and community contacts where an AFP case would **LIKELY** seek care. This can be any health institution where patients with paralysis would go, even if the institution may not be famous for treating paralysis. Surveillance sites classified as medium priority must be visited at least **ONCE EVERY TWO WEEKS**.

3) **Low priority site:**
   All surveillance sites and community contacts that are not categorized as high and medium priority ones will be categorized as low priority sites. Surveillance sites classified as low priority must be visited at least **ONCE A MONTH**.

It is important to note that:

Reporting sites should not be limited to those that are easy to access or nearer to working stations. Prioritized hospitals and other facilities (including the private sector) should be contacted to introduce the concept of AFP surveillance.

A meeting between either the Zonal, state and or LGA surveillance staff and hospital administration (director of hospital) / clinical staff (head of pediatrics) / private physicians should be arranged to explain background, purpose and status of AFP surveillance

A contact person ('focal person') inside the facility should be identified, who will serve as the main contact and the principal source of information about AFP patients admitted or seen in the health facility. 'Focal persons' should be trained on surveillance and on their roles and responsibilities.

The focal persons for AFP surveillance (State/LGA/health facility) including the immunization officers who may visit for active surveillance should be introduced to health facility staff.

7. How to conduct regular 'active surveillance' visits

- ***Responsibilities of staff involved in active surveillance.***

Each LGA and State should designate person(s) responsible for coordinating surveillance activities in specific LGAs and clusters of LGAs, for conducting active surveillance visits and completing case investigation forms. In addition to the WHO NSO/NIO, the person/s responsible for surveillance should perform the following tasks in their areas (specific responsibilities are in chapter 15 of this guideline.

- ✓ Visit the high priority facilities once per week, the medium priority once in two weeks and the low priority once each month.
- ✓ Conduct an active search for AFP cases, and report the result, (including zero reporting) to the next higher level on a weekly basis. They may include other priority diseases like measles, NNT, YF, Cholera and others.
- ✓ Immediately report every AFP case and complete AFP Case Investigation Form (CIF) in five copies :
- ✓ State personnel should verify the completion of the CIF and fax/email copies to the zonal and central offices.

Copies of the case investigation forms are used as follows:

Copy 1, White: Send immediately to zonal data manager and copy Abuja
Copy 2, Pink: Send along with stool specimen to the National Polio Laboratory
Copy 3, Green: Send to the zonal data manager with copy to Abuja after completing the sixty days follow up examination, lab result and any additional information.
Copy 4, Blue: Remains in the surveillance officer's file at state level.
Copy 5, Yellow: Remains in the DSNO's file at LGA level.

- ✓ Investigate each AFP case, and collect two stool specimens 24-48 hours apart within 14 days of paralysis onset. If it is more than 14 days since paralysis onset, stools should still be collected up to 60 days following paralysis onset.

- ✓ Do a follow-up examination 60 days after the onset of paralysis for the inadequate AFP cases i.e. those investigated later than 14 days after onset of paralysis and those samples that were labeled as inadequate for some other reason such as small size, poor reverse cold chain, leakage, etc.

- ✓ Sensitize health workers and communities during active surveillance visits

- ✓ Ensure availability of surveillance forms, specimen collection kits and posters

- ***Activities during active surveillance visit.***

During the active surveillance visit, the following activities should be done:

- Contact the 'focal point' inside the health facility and ask (preferably in the presence of other senior staff) about any children with AFP who were admitted or seen in the outpatient department since the last active surveillance visit;
- Review registers(emergency room, admissions, outpatient department, neurology departments, pediatric ward, etc.) for patients with conditions associated with AFP (chapter 8 below and in Annex 1).
- Visit appropriate outpatient department, wards, particularly the pediatric and neurology wards and the physiotherapy centers to look for AFP cases.
- Hold brief discussions with the clinicians on surveillance especially on the need to hold AFP patients for a few days (2 days) to facilitate stool collection.

- ***Stool specimen collection is easiest in the hospital.***

Because supervision is more effective, collection of stool samples is easier if done in the hospitals. Specimen collection is much more difficult after patients have returned to their homes. This is one of the reasons why regular visits to hospitals for active surveillance are critical and it is more likely that AFP patients are found while they are still in the hospital, and stool specimens can be collected easily. 'Focal points' and physicians in the hospital should be requested that, whenever possible, children with AFP should be admitted for at least two days, to ensure collection of two stool specimens. When admission is not feasible, then there must be clear information on the address of patient to facilitate the collection of the second sample.

Problems encountered during active surveillance visit.

When talking to 'focal points' and other hospital / clinical staff, individuals doing active surveillance should be aware that clinicians need some time before fully understanding the concepts of AFP surveillance. Inform physicians about the need to report cases even though they think they are 'not polio' (i.e., Guillain-Barre Syndrome, transverse myelitis, injection paralysis etc.). If AFP cases found during active surveillance were not reported previously, the 'focal person' should be reminded of his/her reporting responsibility.

- **What to do when a case is found.** If a case of AFP is found during the visit, the case should be investigated immediately using the AFP case investigation form. Stool specimens should be collected, and the case should be immediately reported to

the next level. Advise the mother to seek necessary medical care, including visiting the physiotherapy center.

8. How to find cases of AFP - which patients to look for

- ***Looking for key symptoms and diagnoses.***

Patients with many different underlying problems can present with acute flaccid paralysis (AFP). Persons conducting active case search should be looking for either symptoms (usually listed in emergency room or admission registers, before a clear diagnosis has been made), or for final diagnoses, (i.e., disease names, usually in ward or discharge logbooks, see table below)

	Look out for these clues in your search for AFP cases in the registry book (record review)
Symptoms:	**Paralysis, paresis** (weakness), **flaccid** (floppy) **paralysis** (in combination with any other words)
	Weakness (of limb, of unclear origin, etc.)
	"Frequent falls", "gait disturbance", "can not walk", "can not stand", etc.
Diagnoses: *(always Present with AFP)*	**Poliomyelitis, rule out polio, suspect polio** (polio causes rapidly progressing floppy paralysis of usually **ONE** leg or **ONE** arm)
	Guillain-Barré Syndrome (illness causing slowly progressing floppy paralysis for **BOTH** legs)
	Transverse myelitis (rare illness causing floppy paralysis of **BOTH** legs)
	Traumatic neuritis (usually due to an incorrect intramuscular injection)
Diagnoses: *(Sometimes present with AFP)*	(Muscle) **Hypotonia** (hypotonia means loss of muscle tone due to some other cause)
	Hypokalemic paralysis (weakness due to low potassium in the blood; this often happens during diarrhoea, and is quickly reversible)
	POTT's disease (this is TB affecting the vertebrae of the spine)
	TB meningitis (all other meningitis; meningitis is an infection of the spinal cord cover; encephalitis: an infection of the brain)
	Osteomyelitis (i.e., bone infection of arm or leg, child may not move limb because of pain)

- ***Following up suspicious cases.***

Not every symptom or diagnosis in a register will actually be a case of AFP. When a suspicious case is found in a register (i.e., there is a description of 'weakness' of a limb, etc.), the case needs to be followed up to check if AFP was or is present. If still in the ward, the patient should be seen and examined. If the patient was seen only in the outpatient department, or is already discharged, the medical records should be reviewed. *If the onset of paralysis was less than 60 days ago, the patient should be visited at home for examination and specimen collection.*

Chapter 4

9. How to investigate a case of AFP

After the initial report of an AFP case, case investigation should proceed in the following sequence:

1. **Verify the diagnosis of AFP.**

Is it consistent with the case definition? Is it flaccid (floppy) paralysis? Is it within two months of paralysis onset? Is the patient less than 15 years old? if the patient is above 15 years, did a clinician suspect polio? If the answers to the above questions are "YES), then continue to investigate. If the answers to the questions are **"NO"**, the investigation can stop and you may not need to collect stool specimens.

2. **Complete the case investigation form.**

It is a must to complete all relevant sections of the case investigation. Take particular care to note the exact address of the patient, site of the paralysis, date of onset, date of stool collection and the number of OPV doses received. The investigator must also complete the question at the bottom of the case investigation form that asks *"where has the child been seeking help for this problem before presenting here (in sequence of visit)*

In order to link every case to a specific case investigation form, a unique identifier called EPID number is assigned from the EPID register, which is supplied from the national level.

Assignment of EPID numbers

EPID number is given in sequence by each LGA: ***NIE-xxx-xxx-xx-xxx.*** Each part of the EPID represents the case and laboratory specimens in the following order (country code-state code-LGA code-Year in two digits-chronological order number)

NIE-STA-LGA-YR-001; Year 06 means 2006, 07 means 2007 etc

To ensure that each case is uniquely identified, one EPID number is assigned to only one AFP case and one AFP case has only one EPID number. There is an EPID register in each state by LGA to track the use of EPID numbers.

When to assign an EPID number

- All detected cases up to 60 days following onset of paralysis must be assigned EPID numbers including those who have died.
- Suspected AFP cases that are determined not to meet the AFP definition are not given EPID numbers.
- When a suspected AFP case which has an EPID assigned is later determined not to be a true AFP case, it should not be deleted from the line list, and the number should not be used again.[1] It is recommended to have unused consecutive EPID numbers than reuse a number.

How to assign an EPID number

The year in the EPID number must be assigned according to date of onset of paralysis. AFP cases should be investigated and assigned EPID numbers which refer to the State and LGA where the case normally lives. If the case lived in the LGA where initially investigated during the prior two (2) weeks, then he/she can be assigned the EPID number of that LGA. If not, the location where the child normally resides before the

[1] The database would reflect class= 6, " not an AFP case"

onset of paralysis is the most appropriate location to put as address in the CIF for the purpose of considering where the child was potentially exposed. If there is any doubt as to where a case belongs, completing the investigation will require coordination between LGAs and potentially between States, zones and the national level.

What to do when there is EPID number confusion

- If a case has two EPIDs or one EPID is assigned to two cases, state officers should always consult with the national surveillance office.
- If one AFP case is allotted two different EPID numbers by different LGAs in the State or by different LGAs in different States, the state office in consultation with the national level must determine the appropriate EPID number.
- Any proposed change in EPID numbers should be communicated to the national office preferably by a written explanation. Only under the direction of the national surveillance office should the initial EPID number be crossed off the State EPID register and the case reassigned to different locality.
- To avoid confusion, the dropped EPID number should not be used for any other AFP case.
- If one EPID number is accidentally assigned to two different AFP cases, the case with the later onset should be given new EPID number by the state office and this should be communicated to national level and the LGA DSNO.

3. **Take the history.**
Document a good clinical history and physical examination. The findings will make it easier to determine later whether the case's symptoms were consistent with polio or not.

4. **Do physical examination.**
This should be done together with the attending physician where possible. It is difficult to examine small children. Initially, do not touch the child - much can be learned by just observing. Do 'threatening' parts of the examination last (reflexes, strength testing, etc.)

5. **Collect stool specimen.**
Stool specimen collection is the most important activity during case investigation. It is described in detail below.

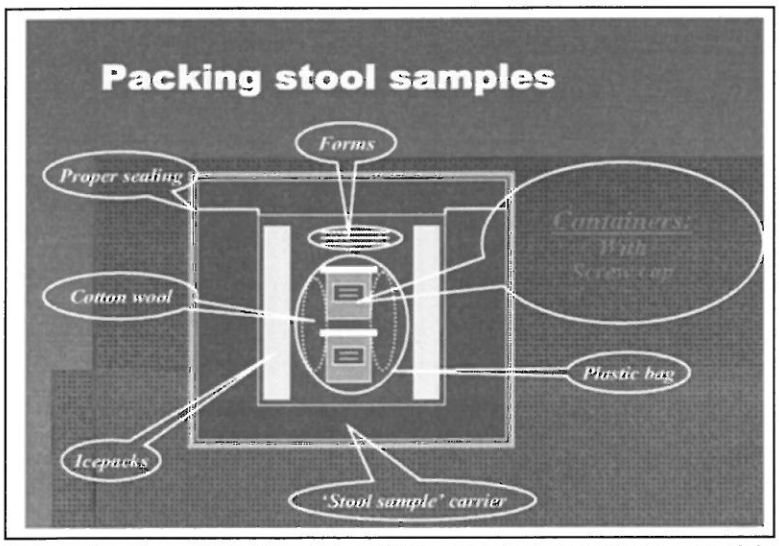
Chapter 5

10. Stool specimen collection and handling

If wild poliovirus is still circulating in an area, the stool specimens collected from AFP cases are most likely sources to isolate them. Investigation of an AFP case is **incomplete without** collecting stool specimens. Therefore, extra care should be taken to make sure that each case of AFP has specimens properly collected, stored, transported and processed.

Collect two specimens, 24- 48 hrs apart, preferably within 14 days of onset. Specimen collection is the most important component of investigating a case of AFP. Two stool specimens must be collected from each AFP case as soon as possible after the onset of paralysis. To have the greatest chance of isolating virus, specimens should be collected within 14 days of onset of paralysis. There should be at least 24 hours between collecting the first and the second specimen. Try to collect the first specimen at the beginning of the case investigation.

Stool specimen collection equipment to use: Special equipment (i.e., screw cap specimen collection containers, labels, zipped plastic bag, carrier boxes for transporting specimens) are normally provided to each DSNO. *If for some reason, the screw cap stool collection tube, labels, zipped plastic bag are not available then use any clean small, dry, leak-proof container, which can be firmly closed. Write the name, the date of collection, and the specimen number (1 or 2) on small pieces of adhesive tape and attach them to the specimens. Old vaccine carriers, or thick-walled styrofoam boxes can be used as specimen carrier boxes.*



Always collect stool specimens even if special collection materials are not available.

Instructions for step-by-step collection of specimens:

The following steps should be strictly followed when collecting specimens from AFP cases:

1. Use the special screw-top specimen container. However, any small, dry, leak proof container (i.e., medicine bottle or photo film containers) can be used.
2. As much as possible, collect fresh stool from the child's pants/diapers, bed pan or try to get the child to defecate onto a piece of paper.

3. Using the small spatula attached to the lid of the container (or a small piece of wood), collect a volume of stool about the size of head of the thumb or two adult thumb nails (about 8 grams).
4. Use spatula to place the specimen in the cap and firmly screw the cap onto the container.
5. the self-adhesive label provided or on a small piece of adhesive tape, (if you don't have a special label) write the **name of the patient, date when the specimen was collected, the number "1" or "2"** to show which one is the first and the second specimen.
6. Attach the label to the specimen container, and put the container into the small plastic bag, then close the plastic bag.
7. Place the specimens immediately in the vaccine carrier (specimen carrier box) with frozen ice-packs and close the specimen carrier box securely and transport to the laboratory (this is the reverse cold chain system). If transportation arrangements were made in advance as they should be, transport the stool samples as soon as possible.
8. A copy of the case investigation form MUST be put into a separate plastic bag (folded-up) to avoid smearing in case of leakage before sending the vaccine/specimen carrier box to the polio laboratory.
9. Wash your hands with water and soap after completion of specimen collection.
10. If the patient cannot produce a specimen, leave the container, vaccine/specimen carrier box and frozen ice packs in the health facility or with the family. Explain in simple languages the specimen collection procedure & then return to collect the container and specimen later.
11. If the specimens can reach the laboratory within 72 hours (three full days) or less after collection, keep them at 4 to 8 degree centigrade during transportation to the lab.
12. In the unlikely event that the specimens cannot reach the laboratory within 72 hours, place them in a deep freezer (best at minus 20 degree centigrade) until shipment within 72 hours can be arranged. The contents of the specimens, whether wild polio, Sabine or non polio entero-virus will survive for a long time in the frozen condition.

11. Stool specimen transport to the polio laboratory

Disease Surveillance and Notification Officers (DSNOs) should make arrangements to transport the stool specimens to the polio laboratory. It may be advisable to notify the laboratory staff if you are taking samples during weekends, holidays or if the time of arrival is after working hours.

Stool Specimen Dedicated Vaccine Carriers

Do not mix vaccine carriers. Avoid *storing* specimens in refrigerators or cold boxes that are used for vaccines or other medicines. If this is unavoidable, be sure to seal the specimens in 2-3 layers of plastic bags and carefully separate them from the vaccines or other medicines. Likewise, for *transporting* specimens, a separate cold box or carrier should be used and labeled clearly that it is for this purpose. Do not use vaccine carriers that are used for vaccine to *transport* stool specimens. If contamination is

suspected, refrigerators, cold boxes, vaccine carriers and ice packs can be disinfected with a solution of 1 part bleach to 10 parts water.

12. 60-day follow-up examination

Importance of follow-up examination:

A follow-up examination must be conducted at least 60 days after onset of paralysis for inadequate AFP cases. Inadequate AFP cases are those cases that are investigated after 14 days from onset of paralysis, cases with only one sample collected, or if the stool specimen was labeled inadequate by the lab due to bad condition for other reasons (small size, leakage, poor cold chain etc). The main purpose of the follow-up is to check whether or not there is residual paralysis. Residual paralysis is typical for paralytic polio but very uncommon for other causes of AFP. Therefore, the follow-up result is important for final classification of cases - i.e., to either classify the case as clinical poliomyelitis (polio compatible), or to discard the case as non-polio AFP. Cases that need follow up, **MUST BE FOLLOWED UP**. They can be easily tracked from the monthly updated AFP line listing which must be readily available at all levels (Zonal, State, and LGA).

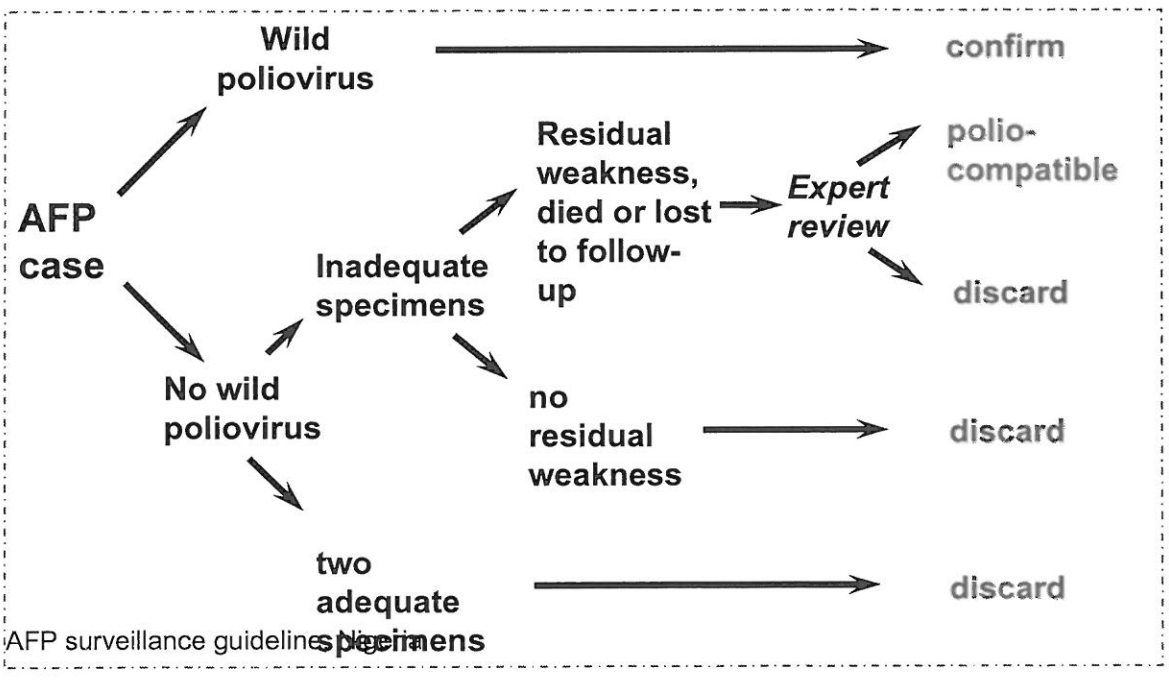
How to conduct the 60-day follow-up.

The same person who first investigated the case is best to do the follow-up. Usually, it will be necessary to visit the case at home. In some cases, it may be possible to bring the child into the hospital for examination by a pediatrician or neurologist. For the follow-up visit, it is required that surveillance staff conducting the initial case investigation note the exact address and any other information (directions) needed to relocate the case.

Final case classification.

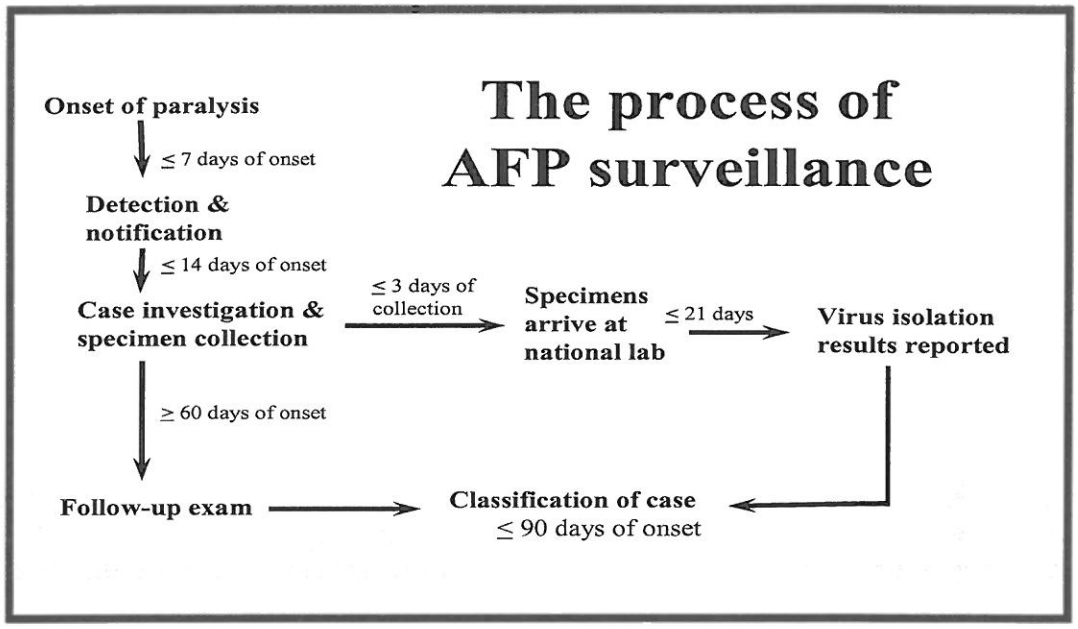
An AFP case from whom a wild poliovirus is isolated from the stool will be classified as **confirmed**. All adequate AFP cases with no WPV will be classified as **discarded**. Inadequate AFP cases (detected or investigated after 14 days of onset of paralysis, or samples arrived at the lab in bad condition) and if they are negative for WPV, or has residual weakness, or died before follow up or lost to follow up will be submitted to the National Polio Expert Committee (NPEC). The NPEC will classify the cases as polio compatible or as discard i.e. non polio AFP.

Figure ..... WHO Virological Classification scheme for AFP cases



The AFP surveillance process summary:

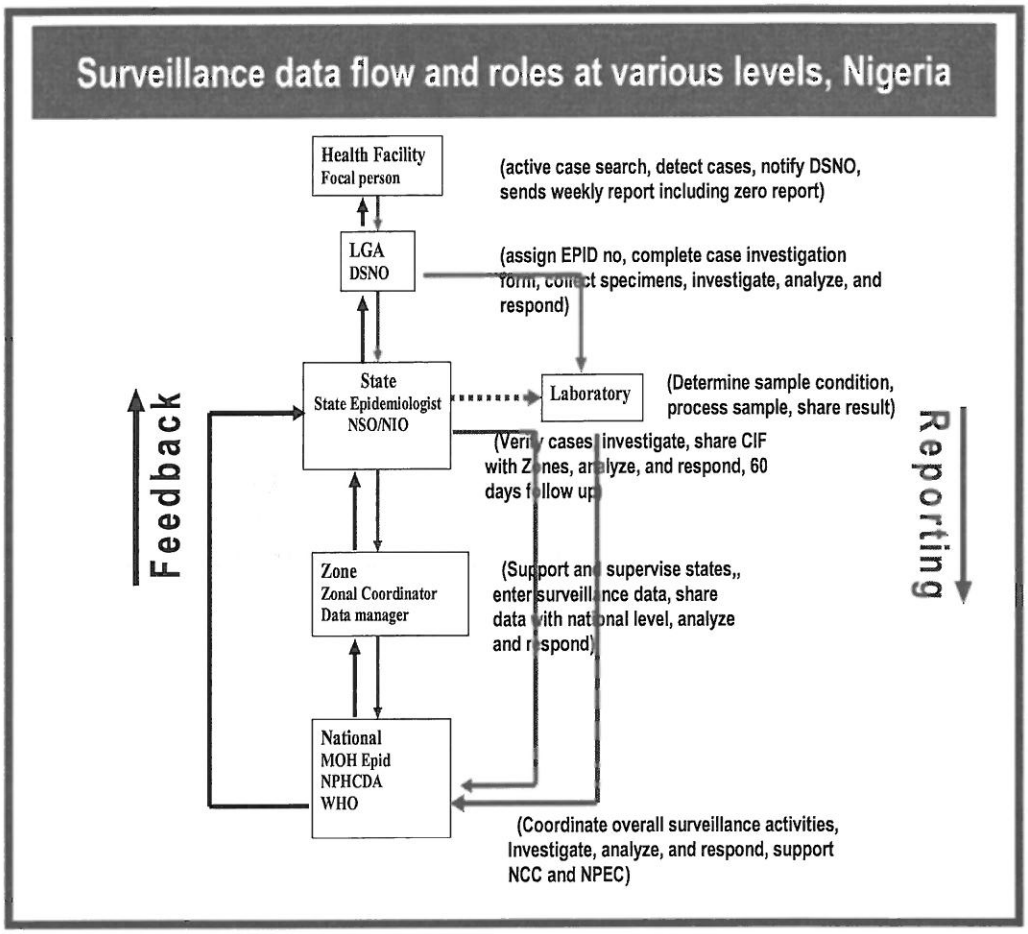
The AFP surveillance process described above is as summarized in the figure below.:



Chapter 6

13. Surveillance data flow and roles at various levels, Nigeria

This section describes how AFP surveillance information flows among the key players and how forms are retained and forwarded among the various points in the surveillance structure.



Each level has its own specific responsibility including reporting to the next level and giving feedback to the lower levels. The surveillance information flow and some of the roles is as summarized below.

13. Roles and responsibilities in AFP surveillance at Different Levels

13.1 Health facility level (clinicians and focal persons)

Clinicians are responsible for detecting and managing AFP cases and they notify the focal person when they see AFP case.

The AFP focal person performs the following tasks:

1. Facilitates investigation of AFP cases using the standard case definition
2. Completes the AFP case notification form and notifies the DSNO at the LGA.
3. Ask the family if there are other persons with similar signs and symptoms in the home or in the Village.
4. Sensitizes waiting patients in health facilities on AFP surveillance
5. Provide feedback of the results to the clinicians, family and the community
6. Perform other surveillance duties of a focal person (zero reporting, weekly reporting etc).

13.2 LGA level

The LGA level is responsible for active case search and sensitization of health workers and communities, and ensures that health facilities detect and report AFP cases; complete the case investigation form and samples are collected and sent to the laboratory. Specific responsibilities include:

PHC Coordinator

1. Coordinates all surveillance activities in the LGA
2. Supervises the LGA DSNO's surveillance activities
3. Facilitates and participates in sensitization of clinicians on surveillance
4. Ensures that data is updated and current at all times and reports to the State Director of Public Health.
5. Ensures that forms and other supplies are available

LGA DSNO:

1. Oversees all the AFP focal persons in the LGA reporting sites
2. Conducts active case search through reviewing clinic records
3. Sensitize clinicians and other health workers on AFP surveillance activities in the LGA
4. Ensures that the AFP case investigation forms are properly completed
5. Distributes guidelines/standard operating procedures and reporting forms to health facilities
6. Ensures that samples are collected and properly stored in the refrigerator before transportation to the laboratory
7. Takes stool samples to the laboratory using the reverse cold chain
8. Analyses disease patterns and trends, interpret data and produce routine reports
9. Reports suspected outbreaks to the State Ministry of Health and WHO
10. Notifies public and private health facilities in the LGA when WPV is confirmed
11. Shares lab results with focal persons, clinicians and others
12. Monitors surveillance indicators regularly in the LGA including timeliness and completeness of weekly reporting (AFP reporting sites) and monthly reporting (all health facilities)
13. Gives regular feed back to reporting facilities, focal persons and communities
14. Participate in State monthly review meetings

13.3 Zonal and State levels

The Zonal and State levels provide overall support, and monitor to ensure that the system is functioning. Specific responsibilities include:

State health department

I. Epidemiologist

1. Ensures the proper implementation of AFP surveillance in the state
2. Supervises the activities of the state DSNO
3. Supervises and provides technical support to LGAs

4. Sensitizes clinicians and other health workers in the state on AFP surveillance activities
5. Coordinates communication of lab results from the laboratory and ensures feedback reaches to the LGAs
6. Monitors the surveillance performance using the standard indicators
7. Analyzes disease pattern and trends, interpret surveillance data in conjunction with routine immunization coverage data and produce routine report
8. As State team give feedback to LGAs during state monthly meeting
9. Reports to the Federal Ministry of Health, Epidemiology Division

ii. State DSNO:

1. Coordinates all disease surveillance activities in the state and assist the State Epidemiologist
2. Distributes guidelines/ standard operating procedures and reporting forms for AFP surveillance and other disease surveillance activities to the LGAs
3. Sensitize clinicians and other health workers in the state on AFP surveillance activities
4. Stimulates reporting through active surveillance
5. Monitors surveillance activities including timeliness and completeness of reporting in the state regularly
6. Conducts outbreak investigation
7. Collects surveillance reports from LGA DSNOs
8. Gives feedback of laboratory results to LGA DSNOs
9. Sends reports to FMOH, Epidemiology Division through the State epidemiologist.

State WHO staff (NSO and NIO) facilitates each step of the AFP surveillance process including conduct of scheduled active surveillance visits, AFP case verification, ensuring completeness of the variables in the case investigation form, maintain updated line listing of AFP cases, timely analysis and interpretation of reported data, sharing the lab results, completing the 60 days follow up, and sharing the final classification of cases. The NSO and NIOs will also provide weekly AFP reports, including 'zero' reports, from the LGAs to the next higher level (zonal and national level) and regularly analyze AFP surveillance data and provide feedback to the lower level.

13.4 National level

The national level is responsible for the following activities:

1. Monitors progress on AFP surveillance performance in the country.
2. Provides technical input and logistic and financial support to Zones and States
3. Produces and distributes forms, guidelines, posters and other educational materials needed for strengthening AFP surveillance.
4. Compile, manage and regularly analyzing national AFP surveillance data
5. Analyzes disease patterns and trends, interpret surveillance information in conjunction with the routine immunization coverage data, and produce routine reports
6. Attend quarterly review of AFP surveillance activities at Zonal level
7. Organize annual national surveillance reviews
8. Support AFP surveillance training workshops at Zonal, State and national levels.
9. Supports the National Polio Expert Review and Certification Committees
10. Facilitates notification of laboratory results to Zonal or State offices
11. Provides feedback (information) to peripheral levels and feed data forward

Chapter 7

14. AFP Surveillance tools

Each level has surveillance tools to complete and share with the next level.

Tools for Focal Person's use at Health Facility Level:

AFP-F001 Immediate AFP Case Notification Form
Used to urgently report details on an AFP case in the instance that the case was not previously reported to or discovered by the DSNO, filed at the LGA office

AFP-F002 Health Facilities Active Surveillance Form
Used after reviewing registers and talking with clinicians, to be maintained and filed at the facility level

AFP-F003 Weekly Health Facility Report
Routinely forwarded to the DSNO weekly and filed at LGA office; a copy is ideally maintained at the facility

Tools for DSNO's use at LGA Level

AFP-LG01 Health Facilities Active Surveillance Form
Used to document activities in active surveillance, weekly in all network reporting sites

AFP-LG02 AFP Line Listing
Details for each AFP case, taken from CIF (AFP C101), maintained at LGA office

AFP-LG03 Weekly LGA Report
Summary of AFP F003, Weekly Health Facility Reports from facilities, sent to the state office and filed there

AFP-LG04 LGA Summary of Timeliness and Completeness of Weekly Health Facility Reports
Summary of submission of AFP F003, Weekly Health Facility Reports by facilities, filed at LGA office with copy sent monthly to the state office and filed there

AFP-C101 AFP Case Investigation Form (CIF)
All fields should be filled, using a hard writing surface, using a ball-point pen and with firm writing force, with

Copy 1, White: *Send immediately to zonal data manager and copy Abuja*
Copy 2, Pink: *Send along with stool specimen to the National Polio Laboratory*
Copy 3, Green: Send to the zonal data manager with copy to Abuja after completing the sixty days follow up examination, lab result and any additional information.
Copy 4, Blue: Remains in the surveillance officer's file at state level.
Copy 5, Yellow: Remains in the DSNO's file at LGA level.

Tools for the State Office use:

AFP-SO01 AFP Line Listing

Details for each AFP case, taken from CIF (AFP C101) and modified by CVF(AFP C102) , maintained at state office continuously for monthly electronic reports to zonal level

AFP-SO02 State Summary of LGA AFP Performance Indicators
Calculated for each LGA from weekly reporting (AFP LG03) and AFP reporting forms AFP C101). Maintained monthly for monthly electronic reports to zonal level

AFP-SO03 State Summary of Timeliness and Completeness of Weekly LGA Reports
Summary taken from LGA weekly reporting forms (AFP LG03), by LGA. Maintained weekly for monthly electronic reports to zonal level

AFP-SO04 Management tool
Used to document activities in active surveillance and supervision, preferably monthly to all priority network reporting sites and sensitization with clinicians. Maintained and filed at the state office, with summary reporting with monthly electronic reports to zonal level

AFP-SO05 Community Investigation Form
This form is used to conduct rapid survey of 10-20 households with young children in the settlement for each AFP case. The results of this and/or the DSNO's investigation form are analyzed by the state and zonal office. The outcome of the rapid survey is used for intervention. The form should be filed at the state office and a copy sent to the zonal office.

AFP-C102 AFP State Case Verification Form (SVF)
Detailed instructions are given in the annex following the form.

- *Original held at state office*
- *Fax or scan and send by email to zonal office*
- *After 60-day follow-up and further diagnosis, page 2 completed; original filed at state office and copy of page 2 sent to zonal level and national office*

Chapter 8

15. Monitoring AFP surveillance performance indicators

Monitoring AFP surveillance performance indicators is the key in directing the Polio Eradication Initiative whether it is sensitive enough to rapidly detect all cases of paralysis due to indigenous and/or imported wild polioviruses. It is the accepted standard to evaluate progress and direct the actions of the program.

15.1 AFP Surveillance Performance Indicators

The three main indicators of AFP surveillance to be monitored regularly are Non-Polio AFP Rate, Stool Adequacy and Timeliness of reporting.

1. Non-Polio AFP rate

- For certification purpose, the standard, accepted main indicators of quality in acute flaccid paralysis surveillance is the sensitivity in detecting background illness (the non-polio AFP [NPAFP] rate, with a target of 2 or higher per 100 000 children under 15 years of age per year). Lower NPAFP rates have failed to detect circulating wild-poliovirus, whereas rates of at least 2.0 or much higher have been found in more sensitive surveillance settings. This is backed by the genetic analysis of relatedness of wild poliovirus isolates obtained in multiple surveillance experiences.
- Monitor sub-national performance more carefully since national, zonal or state level indicators of surveillance may mask wide variation in performance, with some critical areas potentially failing to detect expected AFP cases.

2. Stool Adequacy

Timely specimen collection: 2 specimens collected at least 24 hours apart within 14 days of onset of paralysis and arriving at the laboratory in good condition. Target: 80% or higher

Adequate Stool Sample

Two stool specimens collected 24-48 hours apart, within 14 days since onset of paralysis and arriving at laboratory in "Good Condition ".

** "Good condition" means that upon arrival: There is ice or a temperature indicator (showing < 8°C) in the container, the specimen volume is adequate (>8 grams) there is no evidence of leakage or desiccation (It is important to fill the important case investigation and specimen tracking form,*

3. Timeliness of surveillance report: (Target ≥ 80%)

The timeliness of surveillance report includes "zero" reporting when cases are not seen. This is calculated as follows:

$$\frac{\text{Number of weekly reports received before the specified deadline}}{\text{Number of weekly reports expected, based on number of reporting sources}} \times 100$$

4. Completeness of surveillance report (Target ≥ 90%)

The completeness of surveillance report includes all reports from all reporting sites including zero reports when cases were not seen. This is calculated as follows:

$$\frac{\text{Number of weekly reports received from the reporting sites}}{\text{Number of weekly reports expected, from all reporting sites}} \times 100$$

5. AFP Surveillance Index

Because of the need to compare progress over time and/or for multiple countries or sub-national areas, program managers/surveillance officers can use a tool to facilitate the detection of serious errors in national (or sub-national) surveillance performance by use of both primary indictors in combination: **"the surveillance index"** (Table below). The multiplication product of the annualized non-polio AFP rate and percent adequate stools (as timely specimen collection provides an index that allows more rapid comparison, but each component still must be individually scrutinized to ensure that specimen collection, in particular, meets the target.

By multiplying the two indicators and using targets of 2.0 NPAFP rate and 80% stool adequacy, any state /LGA with less than 1.6 is failing to meet expectations. Using the index in maps particularly helps in identifying areas of risk, which are even more concerning if there is clustering of such risk areas, or if on the borders of administrative responsibilities, such as state or country lines.

Table ____ AFP surveillance index

AFP Surveillance Index = (NPAFP rate) * (% stool adequacy) **e.g., NPAFP of 2.0 and % stool adequacy of 75% = 1.5 index**	
Surveillance Index Interpretation Guideline	
<1.0:	**Serious deficiencies in detection, with or without deficiencies in timely specimen collection**
1.0-1.5:	**Insufficient AFP performance**
1.6-2.4:	**Sensitive AFP surveillance on average***
>2.5:	**Strong AFP surveillance on average***
*** Pending careful review of each performance indicator and examination of sub-national data**	

The surveillance index is a management tool only. It does not replace the use and analysis of each surveillance performance indicator. Full interpretation of the index requires reviewing NPAFP rate and timely specimen collection individually at every administrative level.

The 10 indicators of Acute Flaccid Paralysis (AFP) surveillance and laboratory performance

AFP Surveillance performance indicators

Indicators	Target
1. Non-polio AFP rate in children <15 years of age. The non-polio AFP rate is an indicator of surveillance "sensitivity". If it is < 2/100 000 then the surveillance system is probably missing cases of AFP.	**≥ 2/100,000**
2. Percent Stool Adequacy:	**≥ 80%**
3. Timeliness of monthly reporting.	**≥ 80%**
4. Completeness of monthly reporting.	**≥ 90%**
5. Reported AFP cases investigated ≤ 48 hours of report	**≥ 80%**
6. Reported AFP cases with a follow-up exam at least 60 days after paralysis onset to verify the presence of residual paralysis or weakness:	**≥80%, 100% by 90 days**
7. Specimens arriving at national laboratory < 3 days of being sent	**> 80%**
8. Specimens arriving at the laboratory in **"good condition "** "Good condition" means that upon arrival: There is ice **or** a temperature indicator (showing < 8°C) in the container the specimen volume is adequate (>8 grams) there is no evidence of leakage or desiccation	**> 80%**

Laboratory Performance Indicators	Target
9. Specimens with a turn-around time ≤ 28 days The turn-around time is the time between specimen receipt and reporting of results	**≥ 80%**
10. Stool specimens from which non-polio enterovirus was isolated This is an indicator of the quality of the reverse cold chain and how well the laboratory is able to perform in the routine isolation of enteroviruses.	**≥ 10%**

In addition to monitoring the surveillance performance indicators, the surveillance person is encouraged to produce the following:

- ✓ Bar chart of AFP cases by month by their final classification
- ✓ Map the distribution of AFP cases by final classification. This will help to identify silent areas, clustering of AFP cases, of compatibles and of wild polioviruses.
- ✓ Map distribution of NPENT and Sabin viruses
- ✓ Show on a map the areas with Orphan viruses: Orphans are defined by the % identity (genetic distance) to the closest match of other known virus sequences – the cutoff for orphan status is a 1.5% or greater difference in identity to its closest match (the closest match must be of an earlier onset/specimen date).
    - o Example: a newly sequenced isolate from NIE (onset date 2/13/2007) which has as its closest match at 98.4% identity (a 1.6% difference) a known sequence from NIE (onset date 1/7/2007) would be classified as an orphan virus. Meaning the virus was not detected but was circulating in the last 18 months. Orphans are indicators of surveillance gaps for a prolonged period.
- ✓ Monitor the OPV doses (vaccination history) of NPAFP cases between 6-35 months and 6 – 59 months olds and of WPV cases.

Examples of charts are available in Annex V.

In addition to these AFP surveillance indicators the certifications committees require the monitoring of two main components:

1. Monitoring routine/passive surveillance reports:

- Total number of expected reports.
- Total number of reports received
- Total number of reports received on time.

2. Monitoring active surveillance visits:

- Total number of active surveillance priority sites.
- Total number of Active surveillance visits expected.
- Total number of active surveillance visits actually conducted

The formulae to calculate the above indicators are shown in Annex 3.

3. Quarterly surveillance monitoring meetings

Regular meeting between AFP surveillance team, the laboratory technicians (if available) should take place 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 well 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.

4. Surveillance Reviews

AFP surveillance reviews are good ways to assess the performance of the system. These reviews must be conducted regularly, and the objectives of the review should include among others to determine if:

- AFP surveillance was sensitive enough to detect AFP cases and any circulating wild poliovirus, .i.e the AFP surveillance system was functioning well at all levels (from peripheral to central)
- Surveillance data was complete, analyzed and used to guide disease control interventions and if appropriate feedbacks are provided to the peripheral level
- Adequate resources were allocated to the system and those resources provided for AFP surveillance were used to strengthen surveillance of other priority diseases
- Major gaps identified during previous reviews were addressed

5. 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. Internal/Peer Surveillance Reviews

On a regular basis, zones/state should consider to do Internal/Peer surveillance reviews in parts or entire areas, to assess progress and identify gaps in the system.

16. Feedback

At different levels of the surveillance network, AFP surveillance activities require regular feedback based on the results of the case investigation, the laboratory results and the 60-days follow-up exam;

- **At the community and family level:**

After Case investigation, a feedback should be given to the community and family by the investigator. This will foster cooperation and collaboration for future AFP reporting. Lab results must be communicated to the family as part of the regular feedback.

- **At the health facilities and reporting site level:**

The focal person and reporting clinicians at these reporting sites, should get feedback from the LGA level (where he/she sent the investigation form, specimens and other related documents) and should also provide regular feed back to the community and family as mentioned above.

- **LGA level:**

The cluster supervisor for each LGA has to share feedback with the DSNO and other key LGA staff on the performance, what is going on well and what needs to improve and the lab results of the reported cases. The DSNO has to be informed on the quality of the case investigation forms and his own performance as compared to other LGAs in a motivating manner.

- **State and zonal level:**

While the state team is expected to give feedback to the LGA, the state coordinator has to review performance of each cluster supervisor and guide the state team to prioritize the most critical areas in risk and performance. The coordinator in collaboration with the state team has to ensure that each DSNO is aware of the strengths and gaps in surveillance. Based on this, DSNOs will know where to prioritize in the coming month's activities. The zonal level should monitor each state's monthly performance of the surveillance and laboratory indicators, stool condition, vaccination doses of NPAFP cases between 6-36 months and 6 – 59 months olds and of WPV cases, lab results, final classification of cases etc and give feedback on strengths, gaps and the way forward.

- **At the national level:**

The AFP surveillance team should give regular feed back to the zonal and state staff on all the components of AFP surveillance (surveillance performance, epidemiological situation, data management, lab results, stool condition, etc.)

Chapter 9

17. The Role of laboratories in AFP Surveillance

The laboratory plays a central role in the confirmation of polio cases and in the identification of circulating strains of the polioviruses and their genetic sequences. Effective diagnostic virology depends upon the correct timing and collection of specimens from AFP cases and their transport to the laboratory under optimal conditions. This requires close cooperation between laboratory, surveillance and clinical staff. Regular communication between these groups is mandatory in order to guarantee quality results. Specific responsibilities of the lab include:

- Receipt of specimens and completing date samples arrived at the lab
- Determine the sample condition on arrival at the lab
- Cross-checking of EPID numbers and epidemiologic variables/data
- Virus isolation & Identification
- Reporting of isolation results to the program (NPHCDA, WHO, other partners involved)
- Shipment of isolates to the reference laboratory

In order to facilitate exchange of information and other ideas, the polio laboratories and the key players of the program have to hold coordination meeting regularly.

- Quarterly meeting between lab and data managers (data harmonization)
- Planning and monitoring meetings
- Monthly meetings between program and the laboratory. These meetings should address among other things, timeliness in obtaining ITD results, data analysis and queries, availability of laboratory supplies and consumables and other technical issues related to quality of specimen collection and processing (Stool condition, Non polio enterovirus rates etc).

Minutes of the meeting should be shared with partners and WHO AFRO to ensure sustained support and follow-up action.

18. Documentation of activities and information/data

Polio-free certification is the ultimate goal of all efforts mentioned above. Countries should document all information related to their PEI activities. This includes vaccination information from routine and campaigns, active case search visits (management tools), analysis and quality of surveillance information, clinical and epidemiologic information of "hot" AFP cases and reports of investigations of confirmed outbreaks as well as all other information listed in the various chapters of this guideline. Such information and data are documented to justify that circulation of WPV has been adequately interrupted. This information will be submitted to the national and WHO AFRO polio certification committees for review. In-order to facilitate the polio free certification process, all AFP surveillance focal persons should keep documentation of such activities.

19. Importation of wild poliovirus into polio free areas

Preparedness for an Effective Response

Globally, detection of wild poliovirus in a polio-free country is a public health emergency. Nigerian States are at different levels of interrupting WPV circulation. For example, most of the southern states have not had a confirmed polio case for more than 2 years. Sequencing of the virus genome will reveal if the virus has been circulating or is imported. Those that are free of WPV must prepare to respond appropriately to importations and to contain re-emergence or re-infection and maintain the polio-free status.

Possible situations of poliovirus importation include:

1. Imported case of poliomyelitis: when wild poliovirus is isolated from the stool specimens of any person (with or without AFP) with history of recent travel to a polio endemic area.
2. When genetic sequencing of the virus isolated from a polio case is most closely associated with virus circulating in another country.
3. Wild poliovirus is isolated from sewage or other environmental samples.

Importation of wild poliovirus cannot be prevented until global polio eradication is achieved, but its spread within the country or state can be controlled.

The main lessons learned from recent importation into polio-free areas include:

⇒ High quality surveillance is the key for early detection of virus. There is absolute necessity of maintaining high quality AFP surveillance for several years after interrupting transmission
⇒ Mobile groups play a key role in virus importation
⇒ Areas affected by cross-border movements or risk of distant importation must be identified, (including areas away from national borders)
⇒ Special immunization and surveillance efforts in hard to reach, high-risk, minority, and cross-border populations are needed
⇒ High population immunity achieved by routine and supplementary immunization activities limits virus spread

A plan for responding to poliovirus importation should be prepared and periodically updated. In the Nigerian context, the polio free States in southern Nigeria should have a plan for responding to poliovirus importation from those having WPV. The key elements of the plan should include:

1. Mechanism for ongoing monitoring and early detection of importation,
2. Ability to rapidly investigate the importation
3. Activities to enhance surveillance for AFP and wild poliovirus,
4. Ability to conduct an immediate and appropriate immunization response, and
5. Activities to document interruption of transmission.

20. Monitoring and detection of importation

High quality AFP surveillance system forms the basis for monitoring and early detection of importation

- A High Quality AFP Surveillance should satisfy the following criteria
  - Non-polio AFP rate of at least 2/100,000 children under 15 years of age per LGA, per annum

- At least 80% of AFP cases have adequate stool specimens (two stool specimens each >8gm in size collected within 14 days of paralysis onset, at least 24 hours apart and received in the lab in good condition)
- Appropriate geographic representation i.e., AFP cases with adequate specimens are representative of the population distribution in general

Quality of AFP surveillance should be monitored at the sub-national and sub state levels and should be ensured in border areas, hard to reach areas and in areas resided by minorities, mobile population and high risk populations

- Mobile and minority high-risk populations should be identified in border areas, as well as in other locations, where these groups may reside. Strategies to access these populations through routine and supplementary immunization activities should be planned. Special surveillance activities should cover such populations in order not to miss any AFP case.
- Countries should ensure prompt cross-border notification of any cross border AFP case through the most efficient and direct route. Notification could be done through the respective WHO and UNICEF country offices, as well as State health departments.
- All State and or LGA level staff in border areas should be oriented or trained on proper epidemiological investigation of AFP cases including history of travel and contacts.
- Complete clinical and epidemiological investigation of all AFP cases should be done to identify "high-risk AFP cases" (hot cases). ***A case should be considered high-risk whenever AFP is discovered in any child under five years of age with incomplete immunization status, OR belonging to a high risk group (resistant to immunization, minority group, displaced, migrant or refugee populations, etc.), OR have had contact with persons from polio-endemic areas or countries, AND presents with symptoms typical for poliomyelitis (fever at onset, short progression period, asymmetric paralysis, etc.*** When such an AFP case is discovered, two stool specimens should be collected as soon as possible, arrangements must be made for the immediate transportation of specimens, and the laboratory may be alerted to test the specimens as a priority, immediately upon arrival in order to shorten the time from onset to test results.
- Laboratories should immediately notify NPHCDA when any poliovirus is isolated

21. Rapid Investigation of importation

Any wild poliovirus isolation should lead to an immediate investigation. A full clinical, epidemiological and virological investigation should be initiated immediately to determine the source of the virus. Case investigation should include the collection of all relevant travel and contact/exposure history and other relevant information and epidemiological data needed to establish whether the individual came in contact with the virus in a polio-endemic area/country. Specimens should also be collected from contacts and all wild polioviruses should be submitted to a WHO-accredited specialized laboratory to assist with the determination of the geographic origin of the virus through genetic sequencing. Surveillance quality and vaccination coverage in the area should be assessed.

After thorough investigation, cases must be classified as imported or indigenous. If the genomic sequencing data shows that the virus is closely related to virus circulating in another country and this finding is consistent with epidemiologic data, the virus can be

considered as an importation. However, if sequencing data shows that the virus is not closely related to previously detected virus or is related to virus previously circulating in the country (whether it is also circulating in other countries or not) the virus should be considered indigenous unless there is convincing epidemiologic evidence to the contrary and good surveillance in the local area.

Enhanced surveillance

Detection of a confirmed polio case in a polio-free country or state in the Nigerian situation should be followed immediately by enhanced surveillance for AFP and polioviruses to:

- Ensure that it is not a reflection of missed ongoing indigenous transmission through checking the quality of surveillance including active retrospective search for cases and re-testing of specimens.
- Exclude re-established virus transmission due to importation through active search for cases and widening surveillance activities to include contacts.
- Determine the extent of virus circulation and the impact of control measures.

The following actions should be conducted:

- Immediate notification by telephone, to all State surveillance units and major hospitals in the state to inform staff that a wild poliovirus has been detected, and to alert staff of the possibility of other cases. States must remind all LGAs that 100% timely and complete active surveillance reports, including zero reports, are required from every LGA without exception. Full information should be provided on names, addresses, telephone, fax and e-mail addresses of the surveillance responsible persons in the State department of health and WHO state office. The details of proper case investigation and stool collection should be emphasized.
- State and Zonal staff should begin immediate enhanced active surveillance by visiting all LGAs surrounding the case and the AFP reporting and non reporting sites within that State to conduct active searches for unreported AFP cases.
- Monitor reports at Zonal and State level;
  - Weekly reports from all LGAs by telephone.
  - Weekly review of situation by experts using mapping and other means of documenting the functioning of surveillance.

22. Immunization Response

Any importation of wild poliovirus should be followed by an immediate ***large scale*** supplementary immunization response within 4 weeks of notification of the confirmed case. This would require availability of stockpile of OPV vaccine. The recommended vaccine for immunization response is mOPV depending on the virus type.

The target population and magnitude of immunization response should be determined by:

- Evidence of ongoing transmission,
- Extent of circulation,
- Local vs. distant importation,
- General population versus under-vaccinated minority group.
- Potential for widespread transmission, such as in areas with poor sanitation, urban overcrowding and areas with low immunization coverage where the potential for rapid spread of poliovirus is high.