AFP Surveillance by Prithwiraj Maiti, R.G.Kar Medical College (28.11.13)


Contents

1. Definitions associated with surveillance.
2. Definition of an AFP case.
3. Background rate of AFP.
4. Purpose of AFP surveillance.
5. Reasons for AFP surveillance instead of polio surveillance.
6. Selection of AFP cases for investigation.
7. Surveillance at local/ district/ state/ national level.
8. AFP surveillance after attaining a Zero polio status.
10. Case verification.
11. Case investigation.
12. Collection, transport and reporting results of stool specimen.
13. 60 days follow up examination.

Definition associated with surveillance

Surveillance:
Surveillance is defined as “the continuous scrutiny of the factors that determine the occurrence and distribution of disease and other conditions of ill health”. Surveillance is essential for effective control and prevention and includes the collection, analysis, interpretation and distribution of relevant data for action. [WHO, 1981]

Types of surveillance:

1. Passive Surveillance:
   Surveillance is passive when data/ reports are sent by designated health facilities or individuals on their own, periodically as a routine.

2. Active Surveillance:
   Surveillance is active when a designated official, usually external to the health facility visits periodically and seeks to collect data from individuals/ registers/
log books/ medical records at a facility to ensure that no reports/ data are incomplete or missing.

**How surveillance can be carried out?**

Surveillance can be carried out as:

- **Institutional surveillance:**
  It refers to the collection of data (actively or passively) from pre-identified and designated fixed facilities regardless of size.

- **Community based surveillance:**
  It refers to the collection of data from individuals and households at the village/locality level rather than from institutions or facilities.

**What can you know from analyzing surveillance data?**

Analysis of surveillance data helps us to know the following:

- Where the disease is occurring (place)
- When the disease is occurring (time)
- In whom the disease is occurring (person).

**Definition of an AFP case**

Acute flaccid paralysis is defined as sudden onset of weakness and floppiness in any part of the body in a child < 15 years of age or paralysis in a person of any age in whom polio is suspected.

**Background rate of AFP**

- In other parts of the world at least one case of AFP (excluding polio) occurs annually for every 100,000 children less than 15 years of age. This is referred to as the “background” rate of AFP among children.

- **The non-polio causes of AFP including (but not limited to) the following causes account for this background rate:**
  - **Guillian-Barré Syndrome (GBS),**
  - **Transverse Myelitis and**
  - **Traumatic Neuritis.**

- Sensitive surveillance for AFP must be able to detect a *minimum* of 1 case per 100,000 children less than 15 years of age.

- In India, where the incidence of conditions such as traumatic neuritis and AFP caused by other non-polio enteroviruses is very high, the background non-
Polio AFP rate is undoubtedly much higher than 1/100,000. For this reason, the operational target of non-polio AFP case detection in India has been set to 2/100,000.

**Purpose of AFP surveillance**

- AFP surveillance helps to detect reliably areas where poliovirus transmission is occurring.
- Thus AFP surveillance helps us to identify areas of priority for focusing immunization activities.
- It is the most reliable tool to measure the quality and impact of polio immunization activities.
- *For polio free certification, it is essential to provide evidence to the certification committee of the absence of wild polio virus transmission through a functioning and sensitive surveillance system for 3 years after attaining zero polio case status.*

*Reasons for AFP surveillance instead of polio surveillance*

- Polio surveillance for a case of disease in a child that “looks like polio” alone is not sufficient because *it is impossible to precisely identify all cases of paralytic polio clinically* due to confusing and ambiguous clinical signs and variable clinical knowledge and skills of doctors.
- To ensure that no cases of polio are missed, all cases of AFP should be reported and investigated.
- *If sufficient non-polio AFP cases are being detected for investigation, it implies that the surveillance is sensitive enough to pick up polio transmission in that area if it was occurring.*

*Selection of AFP cases for investigation*

The principle of AFP surveillance is to identify children below 15 years with the syndrome of Acute Flaccid Paralysis:

- **Acute:** Rapid progression or short, brief duration.
- **Flaccid:** Floppy or soft and yielding to passive stretching at any time during illness.
- **Paralysis:** Severe loss of motor strength.
- **Paresis:** Slight loss of motor strength.
### Surveillance at local/district/state/national level

<table>
<thead>
<tr>
<th>Level</th>
<th>Surveillance activities</th>
</tr>
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</table>
| **Local level** | - AFP surveillance at the local level is institution based through a comprehensive network of reporting sites which includes *reporting units* and *informers’ unit*.  
- They notify the DIO/SMO when they suspect an AFP case. |
| **District level** | - **Routine Activities:**  
The DIO/SMO reports to the State level on the **Tuesday** of each week.  
- **Activities when AFP cases are reported:**  
The DIO/SMO is notified of an AFP case by a reporting unit/informers’ unit/medical officer/pediatrician/other physician/nurse who sees a patient with AFP. |
| **State level** | - On every **Wednesday**, the SEPIO/RC/State SMO collects the information and the linelists from all the districts in the state. |
| **National level** | - At the national level, on **Thursday** at NPSU, the data from the states received in the weekly state linelist is collected, collated and compiled to prepare the national report.  
- This is sent by the Assistant Commissioner (Immunisation), Ministry of Health and Family Welfare, Government of India, New Delhi to the WHO’s South East Asian Regional Office (SEARO) at New Delhi. |

[DIO: District immunization officer, SMO: Surveillance medical officer, SEPIO: State EPI officer, EPI: Expanded Program of Immunisation, RC: Regional coordinator, NPSU: National polio surveillance unit]
AFP surveillance after attaining a Zero polio status

After attaining zero polio cases, it is still critical to continue active surveillance in all areas in the country to detect any WPV case either indigenous or importation for at least 3 years after the last confirmed case. This is also a requirement for certification.

Case notification

- The date of notification is the date the information of the AFP case reaches the district level (DIO/SMO).
- The Ministry of Health & Family Welfare, Government of India issued an official instruction in 1997 that all health facilities, clinicians and other practitioners are required to notify AFP cases immediately to the District Immunization Officer (DIO), by the fastest available means.
• **Immediate notification of AFP cases is essential because important activities including immediate case investigation and stool sample collection, outbreak response immunization and active searches for additional cases in the community should be ensured without delay.**

**Case verification**

• Once a case of acute flaccid paralysis (AFP) is reported by a physician/ health unit/ any other source, the DIO/ SMO/ any other designated official must personally see the case to ascertain if the case meets the AFP case definition.
• If the case does not meet the case definition of AFP, the DIO/SMO should discuss the findings with the RC/ reporting physician/ health worker and record the case as not AFP on the case investigation form.
• The SMO should maintain a separate file of all notified cases that he/she determined not to be AFP.

**Case investigation**

• Upon verification that the case meets the AFP case definition, the DIO/ SMO initiates the case investigation.
• Attempt should be made to ensure a case investigation, within 48 hours of notification, for all AFP cases.
• Any case that has had onset within 6 months of notification should be investigated.

The necessary steps in the AFP case investigation are as follows:

1. Using the case investigation form (CIF) as a guide, obtain the history and conduct a physical examination of the affected child.
2. Fill out the CIF and assign the EPID (unique case identification) number.
3. Determine carefully the travel history of the child and family 35 days prior to the onset of paralysis and **details of visitors from outside during this period to pinpoint the place of infection**, in case AFP is due to polio. The details of travel should be incorporated into the CIF. Cross notify the SMO of the concerned district where the child was probably infected to enable him to take necessary follow-up actions. Also inform state SMO/ SRC/ RC/ NPSU.
4. **Collect 2 stool samples from the child at a minimum interval of 24 hours**; this is done to improve the chances for the detection of poliovirus, which may be shed intermittently. **Stool cultures have the maximum probability of yielding**
A positive result if collected within 14 days (2 weeks) of paralysis onset, so every effort must be made to collect specimens within this interval. The excretion of poliovirus diminishes rapidly after 14 days, but because a small proportion of cases can still excrete virus for several weeks following paralysis onset, stool specimens should be collected from late-reported cases for up to 60 days (2 months) after paralysis onset. DIO/SMO should ensure that all reporting sites initiate stool collection for every AFP case without waiting for the case to be examined by DIO/SMO.

5. Each specimen should be 8 grams (approximately the size of an adult thumb) and stored and transported under proper cold chain conditions.

6. If stool specimens cannot be collected within 14 days of paralysis onset, the DIO/SMO should collect detailed epidemiological and clinical information to be presented to the Expert Review Committee for classification.

7. Collect detailed information on where the patient will be located at 60 days from the time of paralysis onset as cases with inadequate stool specimens or with vaccine virus or wild virus isolations from stool specimens will require follow-up examination between 60 to 90 days following paralysis onset, for the determination of the presence or absence of residual weakness.

Collection, transport and reporting results of stool specimen

When to collect stool specimen from a case of AFP?

- 2 stool specimens must be collected from every AFP case.
- Stool specimens must be collected within 14 days of onset of paralysis to maximize the chances of isolating poliovirus.
- In case samples cannot be collected within 14 days, the specimens should still be collected up to 60 days of paralysis onset.
- The first specimen should be collected at the time of the case investigation.
- If the child is not able to pass stool, leave the stool collection kit and stool shipment carrier with frozen ice packs with the family so that they can collect sample from the child later.
- The second sample should be collected at least 24 hours after the first specimen collection, because virus shedding may be intermittent.

How to collect a stool specimen?

- Use a clean plastic screw-cap container (It is not essential to have a sterilized container).
A label with the name, identification number of the case (the EPID number), the specimen number and the date of collection should be pasted on the side of the container. Use a water-resistant, indelible pen to label the specimen containers.

If possible, collect fresh stool from the child’s diapers, or get the child to defecate onto a clean paper.

Collect a volume of stool about the size of one adult thumb size (8 grams). This amount of stool will allow additional testing, if necessary.

Use the spoon attached to the cap to place the specimen in the sample bottle.

Avoid using laxatives.

Do not fill the container up to the brim.

Do not soil the rim of the container.

After collection, immediately place the container in the stool shipment carrier/ fridge.

Enema is not a preferred method for stool collection.

What do you mean by an “Adequate stool” sample?

Two specimens collected within 14 days of paralysis onset and at least 24 hours apart; each specimen must be of adequate volume (8-10 grams) and arrive at a WHO-accredited laboratory in good condition (i.e., no desiccation, no leakage, with adequate documentation and evidence that the cold chain was maintained.

Transportation of specimens:

- The specimens should be sent to the laboratory in “cold chain”.
- The process of keeping the specimen in the desired temperature of 2-8°C after collection from the child to the time of reaching the laboratory is called the cold chain.
- If there is likely to be a delay in shipment, after collection, the specimens must be placed immediately in a deep freezer or a freezer compartment of a refrigerator.
- As soon as both samples are collected, make arrangements to ship the specimens immediately.
- Plan for the specimens to arrive at the laboratory within 72 hours of dispatch.
- If this is not possible, the specimens must be frozen (at -20°C) and then shipped frozen, preferably with dry ice or with cold packs that have also been frozen at -20°C.
- If a cold chain is not properly maintained at all times during transport, poliovirus will not survive in the stool specimen.

**Stool collection and handling at a glance**

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specimen</strong></td>
<td>8 grams of stools (approximately one adult “thumb-size” amount for each specimen).</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td>Two specimens, taken at least 24 hours apart.</td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>Within 14 days of paralysis onset, and no later than 60 days following paralysis onset.</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Preferably voided stools; by rectal tube if necessary.</td>
</tr>
<tr>
<td><strong>Temporary storage</strong></td>
<td>Less than +8°C.</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Less than +8°C.</td>
</tr>
<tr>
<td><strong>Label</strong></td>
<td>Case Identification (“EPID”) number, date of specimen collection, child’s name and sample number.</td>
</tr>
<tr>
<td><strong>Collection Responsibility</strong></td>
<td>DIO and SMO.</td>
</tr>
<tr>
<td><strong>Storage Responsibility</strong></td>
<td>DIO and SMO.</td>
</tr>
<tr>
<td><strong>Transportation Responsibility</strong></td>
<td>DIO, SMO and SEPIO.</td>
</tr>
</tbody>
</table>

**Do you know what an EPID number/ case investigation number is and what are its contents?**

**EPID Number:**
- Every AFP case must have a unique case investigation number that is used to track the case and to link laboratory data to the case.
- The format for the EPID number is used universally in all countries conducting AFP surveillance for polio eradication.
- The EPID number is the basis for the case-based surveillance database of all AFP cases investigated and tracked as part of the global Polio Eradication Initiative.
- The DIO/SMO is responsible for assigning the case identification numbers.
### Contents of an EPID number:

The case investigation number (also called the “EPID” number) comprises 13 alphabetic characters and digits.

**Example:** IND-AA-BBB-##-##

<table>
<thead>
<tr>
<th>Characters / Digits</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 3 (IND)</td>
<td>3-letter country code (1st administrative level)</td>
<td>IND</td>
</tr>
<tr>
<td>Next 2 (AA)</td>
<td>2-letter state code (2nd administrative level); state where case was detected and investigated.</td>
<td>UP</td>
</tr>
<tr>
<td>Next 3 (BBB)</td>
<td>3-letter district code (3rd administrative level); district where case was detected and investigated.</td>
<td>LNO</td>
</tr>
<tr>
<td>Next 2 (##)</td>
<td>2 digit identification of the year of paralysis onset (according to the Gregorian calendar). Note: If a case with disease onset on 28 December 2005 is reported on 5 January 2006, it is coded 05.</td>
<td>05</td>
</tr>
<tr>
<td>Next 3 (###)</td>
<td>Number of the case detected in that district in that calendar year.</td>
<td>From 001 onwards</td>
</tr>
</tbody>
</table>


This is a case identification number for the first case in 2005 from the district of Chennai in the state of Tamil Nadu in India.

### 60 days follow up examination

- Sixty day follow-up is done between the 60th and 90th day in certain categories of AFP cases to determine the presence/absence of residual 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 60th day follow-up should not be done before the 60th day of onset of paralysis.
In India, the following categories should undergo 60-day follow-up:

✔ AFP cases with *inadequate stool specimen collection*.
✔ AFP cases with *isolation of wild poliovirus*.
✔ AFP cases with *isolation of vaccine-type (Sabin-type) poliovirus*.

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/ same as before.
✔ Observe how the child moves 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 (Ex.: mid arm/ mid thigh) circumference measurements with the measurements taken at initial case investigation to detect any wasting.
✔ Examine the tone, power and reflexes.
✔ Verify sensation.
✔ Even mild residual weakness is considered as residual paralysis.
✔ Complete the 60 day follow-up format and send the form to NPSU, according to established procedures.

**Outbreak response immunization (ORI)**

- After the AFP case investigation and stool specimen collection, ORI is organized in the community and performed as soon as possible.
- Children aged 0-59 months are given one dose of trivalent oral poliovirus vaccine (tOPV) regardless of the number of doses received previously.
- *Usually 500 children below 5 years of age from the locality / village of the AFP case are covered under ORI.*