

## INDICATORS OF ACUTE FLACCID PARALYSIS (AFP) IN DISTRICT FAISALABAD

Muhammad Nawaz<sup>1</sup>, Abid Rashid<sup>2\*</sup>, Mudassir Ashraf<sup>3</sup>, Armaghan Anjum<sup>4</sup> & Benish Ali<sup>4</sup>

**Abstract:** Acute Flaccid Paralysis (AFP) survey system is a progressive systemic gathering, examination and explanation of information regarding acute flaccid paralysis cases and the distribution of information to those who want to be familiar with in order to take necessary action. Objective of the study was to assess indicators of AFP surveillance in District Faisalabad and to describe trends of indicators in successive two years. Material & Methodology: Descriptive study which includes 273 subjects reported cases of sudden onset of floppy paralysis in under fifteen years' age children from Government, private hospitals, zero reporting sites and during active search for AFP cases. Data was collected by using a structural checklist. Results: During the years 2014 & 2015 the AFP case reporting was well above WHO standard i.e. 1 out of 100,000 live children of age less than 15 years. Cases stated within a week of beginning of paralysis were 79% in 2014 and 84% in 2015. All the stated AFP cases were examined within 2 days after report were 98% during these two years. Completeness of Zero reports was 99% in 2014 and 99% in 2015. The Timeliness of Zero reports was 99% in 2014 and 99% in 2015. Conclusion: All AFP surveillance indicators in District Faisalabad were well above the standard set by WHO except one i.e. Report of AFP cases within a week of the beginning of paralysis was 79% in 2014. All Zero and active search sites are working efficiently and submitting reports in time.

**Key Words:** AFP surveillance, Faisalabad, Polio eradication

- 1 Department of Public Health, Directorate of Medical Sciences, Government College University Faisalabad-Pakistan
  - 2 Directorate of Medical Sciences, Government College University, Faisalabad
  - 3 Department of Eastern Medicine, Directorate of Medical Sciences, Government College University Faisalabad-Pakistan
  - 4 Department of Orthotics and Prosthetics, Directorate of Medical Sciences, Government College University Faisalabad-Pakistan
- Corresponding author**  
email: drabidrashid37@gmail.com

### INTRODUCTION

Acute Flaccid Paralysis surveillance is one of the four basic approaches of the Polio Eradication Initiatives. The polio eradication approaches give emphasis to AFP surveillance rather than polio surveillance (1). Even if the core purpose of AFP surveillance is to identify the existence of circulating wild-type poliovirus, data gained from surveillance has other important uses. AFP records are the last measure of a nation's development towards polio eradication (2). After Global Polio Eradication Initiative (GPEI) started their work in 1988, governments and their partners organized a considerable amount of resources to achieve the aim by the year 2000 (3). Nations demonstrated executing National Immunization days (NIDs) and expanded observation of Acute Flaccid Paralysis (AFP) at all steps of the medical delivery system so as to achieve the objective. GPEI has presented

great development as presented by the lessening of instances of poliomyelitis by > 99% and the extinction of type 2 wild poliovirus which extinct since it was last segregated in 1999 (4).

Poliomyelitis is an extremely infectious disease produced by poliovirus. One out of 200 diseases can bring about irreversible loss of motion. There is no treatment for poliomyelitis, it can only be stopped by immunization which is given numerous times and nearly save child's life. Poliomyelitis is one of the infections that can be eradicated because an active vaccine is accessible (5).

The overall extinction of poliomyelitis as set by the World Health Assembly in 1988 is well in headway, however the last phase has perceived to be provocative. Within 2 decades or more, after the worldwide objective of polio virus extermination was set, the number of endemic countries has reduced from more than 125 to 4 (Afghanistan, India, Pakistan and Nigeria) and the expected

number of polio cases has decreased from 350,000 to under 1,351 in 2010 (6).

Poliomyelitis is acute infectious viral disease affecting human beings, primarily young children. It is caused by 3 serotypes of Poliovirus (Poliovirus types 1, 2, and 3), belonging to the genera Enterovirus and Picornaviridae family (7).

The Polio Eradication Initiative started their work in Pakistan in 1994 with extraordinary achievement, the amount of affirmed wild polio cases dropped from 1015 to 32 cases in 1997 (8). During 1997 AFP observation was extended and fortified through the nation and computerized research center database was built up at National Institute of Health (NIH) Islamabad and AFP surveillance database in Islamabad office and Provinces (9). The AFP surveillance is calculated by two key factors. One is the rate of non-polio AFP. The second factor is the collection of adequate fecal test samples from 80% or more than 80% of AFP cases. Stool competency refers to collection of two fecal test samples with 24 or more than 24 hours apart in 2 weeks' onset of paralysis and the entry of these specimens in great form at a WHO-authorized research center (10).

AFP surveillance information is last measure of a nation's advancement towards polio extinction. National Immunization Days were held twice every year since 1994 adopting fixed sites strategy but many children remained unvaccinated. In this way, in 2000 Polio extermination actions were increased and Pakistan started holding additional campaigns every year by adopting door to door technique (11).

In one study in Italy, transmission of poliovirus has been stated at the minimal levels ever documented, the widespread of infection from endemic nations endures. The yearly incidence rate of AFP was 0.87/100,000 children having less than 15 year of age in 2012, 1.42/100,000 in 2013, 1.02/100,000 in 2014, and 0.47/100,000 in

2015; according to WHO indicators, the sensitivity of AFP Surveillance was adequate in 2013 and 2014. Completeness of case investigation raised progressively during the study period to achieve the WHO standards in 2014 (92.3%) and 2015 (100%). Completeness of follow-up increased from 72.7% in 2012 to 100% in 2014 (12-13)

The first study conducted in Iraq from 1997- 2011 about AFP surveillance shows incidence of 2.5/100,000 population (14). Despite intensive attempts by global polio eradication program to eliminate polio, wild poliovirus is as yet prevalent in India together with Afghanistan, Pakistan and Nigeria (15).

This study will help in improving the surveillance system in the District Faisalabad.

#### OBJECTIVES:

1. To assess the indicators of AFP surveillance in District Faisalabad.
2. To describe trends of indicators in successive two years

#### MATERIAL AND METHODOLOGY:

##### Study Design:

Descriptive study

##### STUDY PERIOD:

2 Years

##### Study Population:

1. **Sampling method:** 273 reported cases of sudden onset of floppy paralysis in under 15 years age children from all Government, private hospitals, zero reporting sites and during active search for AFP cases.
2. **Sample size:** 273 reported case of AFP in District Faisalabad during 2 years
3. **Inclusion criteria:** Children less than 15 year of age with acute flaccid paralysis.
4. **Exclusion criteria:** Children greater than 15 year of age with spastic paralysis.

##### Data Collection:

A structural checklist was used and data was collected from cases files and monthly report files.

##### Data Analysis:

Data was collected according to checklist and analysis done by using the software Epi info, for numerical variables, frequency and percentages. For categorical variables, cross table done by graphs, bar charts and figures.

**Human Subject Protection:**

1. Confidentiality: Confidentiality of every information and record will be maintained
2. Permission to access data: from Executive District Officer Health, District Faisalabad

**RESULT:**

During 2014, 133 cases of AFP were reported while non-polio AFP rate was 2.1 and during 2015, 140 cases of AFP were reported while non-polio AFP rate was 2.2, as shown in figure 1. Out of 133, incidence of AFP was higher in male (55%) than female (45%) as shown in figure 2. During 2015, 140 cases of AFP were reported; incidence of AFP was higher in male (57%) than female (43%) as shown in figure 3. Table 1 shows descriptive statistics about the status of stool specimens during 2014 and 2015. The completeness of zero reports and the time lines of zero reports were 99% during 2014 and 2015 which represent in Table 2. During 2014 and 2015, the cross notified AFP cases from other district were 12% (16) and 11% (16) respectively, as shown in Table 3. Cases stated within a week of beginning of paralysis were 79% in 2014 and 84% in 2015. All the reported AFP cases were examined within 2 days after report were 98% and 98.5% during 2014 and 2015 respectively. Adequacy of stool samples was 83% in 2014 and 87% in 2015. AFP cases with 60 days follow up examination were 90% in 2014 and 94% in 2015. AFP cases died were 9.8% in 2014 and 6% in 2015 as shown in figure 4.

**DISCUSSION:**

Acute Flaccid Paralysis surveillance is one of the four essential methodologies of the Polio Eradication Initiatives. This approach gives emphasis to AFP observation rather than polio surveillance. The method is very delicate and needs gathering any case with even a little probability of being polio and after that utilizing culture to affirm the presence of the infection.

AFP surveillance indicators are the measures of AFP surveillance performance. These indicators have some targets and achievement of these targets is the last extent of a nation's progress towards polio extinction i.e. rate of non-Polio AFP in children less than 15 year of age. (Target

$\geq 1/100.000$ ). The percentage of non-polio AFP is a symbol of surveillance affectability. If it is less than  $1/100,000$  then the surveillance method is possibly missing cases of AFP (16). The AFP cases review of 2014 and 2015 of district Faisalabad show Non-polio AFP rate 2.1 & 2.2 respectively. This shows that the district is doing well and is more than the set target of Non-polio AFP rate  $> 1/100.000$ . Internationally to eradicate the polio from the country this indicator should be more than the set target. The studies show that the countries which were not touching the target were missing the AFP cases and were not able to get rid of polio. The countries performing well with the set target and maintaining the target were able to be polio free. This target is maintained for successively three years and to fulfill one of the requests of the Regional Commission for the authorization of poliomyelitis Eradication to be confirmed polio free.

AFP cases Investigation within 2 days of the beginning of paralysis (target greater than 80%), every stated case of AFP is a public health emergency, so it should be examined within 2 days to get full information for further necessary action (17). AFP cases not investigated in time may be missed or lost and this will create problem and transmission of polio virus cannot be stopped. This indicator of Faisalabad is more than the set target of  $> 80\%$  (2014/98% & 2015/98.5%) showing that the surveillance system is working well. The studies show that the cases investigated immediately after notification were helpful in stopping the polio transmission.

AFP cases detected of within a week of the beginning of paralysis was lower than the target in 2014 (79%) due to the non-availability of surveillance team members because of training in Lahore, otherwise it was 84% in 2015. So every AFP case should be reported within a week of the beginning of paralysis, otherwise it will be missed or lost. To minimize the missed opportunity for AFP cases all public and private hospitals are included in active search for AFP cases and are visited regularly. All public and private hospitals responded quickly to AFP cases and notified AFP cases to District Health authorities.

Two feces test samples AFP cases with within 2 weeks of the beginning of paralysis give information

about the presence of polio virus or its absence This indicator of Faisalabad is more than the set target of > 80% (2014/83% & 2015/87%) showing that the surveillance system is working well and in majority two feces test samples of AFP cases were collected within 2 weeks. The collection of feces test samples of AFP cases after 2 weeks of the beginning of paralysis reduces the chance of separating poliovirus from samples. The studies show that the isolation of polio virus from the stool samples shows the sensitivity of surveillance system, otherwise polio virus continue to circulate and lead to epidemic.

Reported AFP cases with a subsequent examination no less than 60 days after paralysis beginning to confirm the presence of remaining paralysis or weakness (Target  $\geq$  80%). This indicator of Faisalabad is also more than the set target of > 80% (2014/90% & 2015/94%) showing that the surveillance system is working well and in majority of AFP cases, 60 days follow up examination was carried out to confirm the presence or absence of remaining paralysis or weakness. AFP cases that ought to experience

60 days follow up incorporate insufficient or no feces test sample cases, with separation of wild poliovirus from the stool and separation of vaccine virus from the stool or associated case with poliomyelitis on beginning examination (Hot case).

Feces test samples received at Laboratory within 3 days of collection of the samples. This indicator of Faisalabad is more than the set target of > 80% (2014/95% & 2015/97%). This shows that the collection and dispatch procedure of stool samples, maintaining cold chain, is very good. To detect the polio viruses from the stool samples, the samples should be collected and dispatched with care; otherwise detection of polio virus is not possible (18).

Feces test samples received at the Laboratory in good form (Target  $\geq$  80%). This indicator of Faisalabad is more than the set target of > 80% (2014/95% & 2015/97%) shows that the collection and dispatch procedures were adopted properly with frozen ice packs, required temperature of the container, and adequate volume of sample with adequate documentation. In case of leakage and

desiccation of sample, proper results cannot be obtained.

Feces test samples with virological outcomes with a pivot time 28 days (Target  $\geq$  80%). This indicator of Faisalabad is also more than the set target (2014/95% & 2015/97%). It shows the efficiency of the system. This is an indication of the nature of reverse cold chain i.e. the samples constantly kept at temperature < 8°C during transportation from the field to the research facility and how well the laboratory can perform routine separation of enteroviruses.

Completeness of weekly Zero reports (Target > 80%). This indicator of Faisalabad is more than the required target i.e. 99% in both 2014 & 2015, showing that the reporting system is also working properly.

In one study conducted in Spain, the most recent case of new wild poliovirus happened in 1988. Ever since the cases identified by the surveillance system are either cases accompanying with vaccine or imported cases (19).

In China, which remains polio free for greater than 10 years, an epidemic arose in Xinjiang Uygur Autonomous Region, China in 2011 after the importation of wild poliovirus (WPV) beginning from neighboring Pakistan (20).

In Ghana, the latest case of native wild poliovirus was recorded in 1999, however endured two more episodes in 2003 and 2008. With the help of World Health Organization (WHO) recommendations, spread of virus was hindered through high routine vaccination with exposure of live-attenuated oral polio vaccine (OPV), supplementary immunization activities (SIA) and operational acute flaccid paralysis (AFP) surveillance (15, 21).

Timeliness of weekly Zero reports (Target > 80%) This indicator of Faisalabad is more than the required target i.e. 99% in both 2014 & 2015, showing that the reporting system is also working properly.

The review of all the indicators and other relevant documents show that the AFP surveillance system is working well according to the set targets and the district is maintaining with letter and spirit. The surveillance team is working very efficiently.

## CONCLUSION

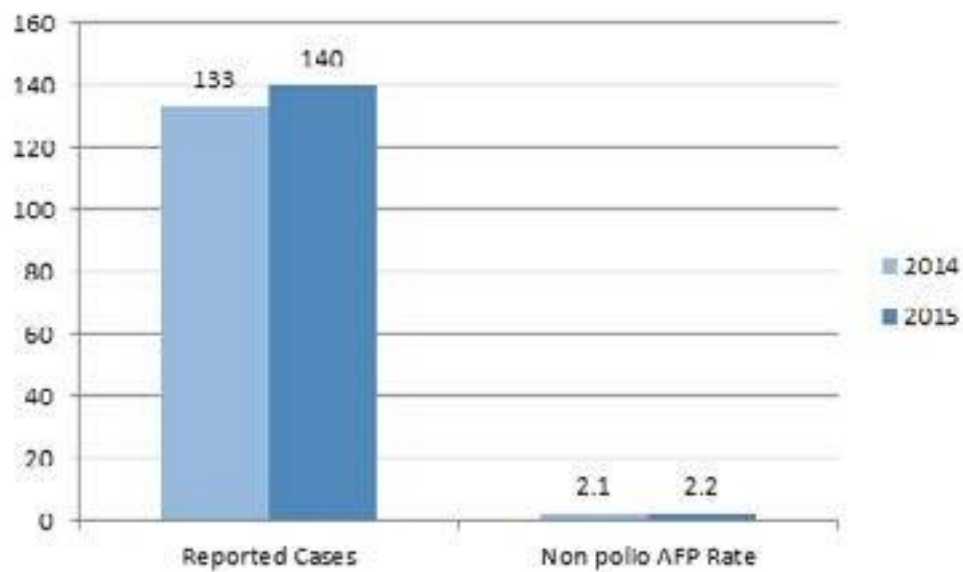
AFP surveillance system in the District Faisalabad

is well established. District Health department and WHO's representatives are working with dedication. All AFP surveillance indicators for the years 2014 and 2015 were well above the standard set by WHO except one i.e. notification of AFP cases within a week of the beginning of paralysis was 79% in 2014. All zero and active search sites are working efficiently and submitting reports in time to the district health authorities.

The knowledge of the medical and paramedical staff working for the system was good and updated. Orientation trainings of the medical and paramedical staff are being carried out from time to time, so no AFP case is missed or is sometimes cross notified.

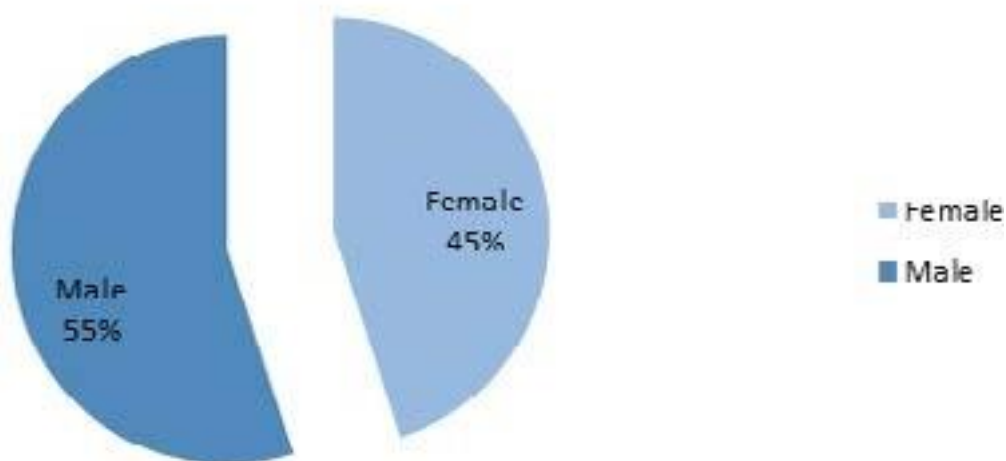
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**Figure 1:** Summary of AFP Cases Reported During 2014 & 2015

### Gender Distribution



**Figure 2:** Gender Distribution of AFP cases in 2014



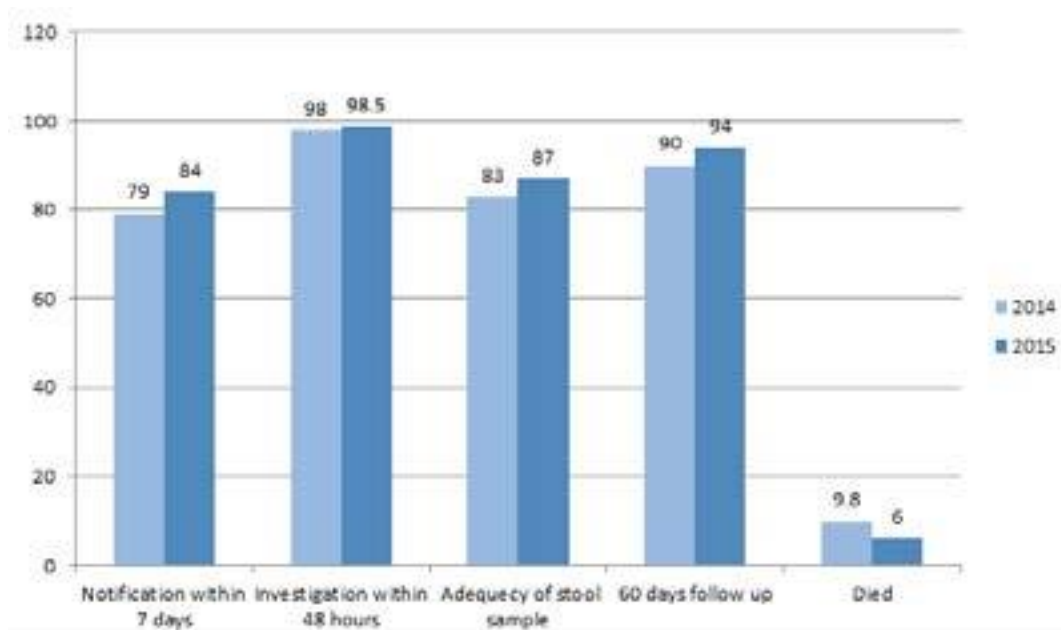
**Figure 3:** Gender Distribution of AFP cases in 2015

**Table 1:** Status of Stool Specimens during 2014 & 2015

| Status of Stool Specimens                             | 2014      |                | 2015      |                |
|-------------------------------------------------------|-----------|----------------|-----------|----------------|
|                                                       | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Stool specimens arriving inLaboratory within 72 hours | 126       | 95             | 136       | 97             |
| Stool specimens in good condition                     | 126       | 95             | 136       | 97             |
| Stool specimens with laboratoryresults                | 127       | 95             | 136       | 97             |

**Table 2:** Completeness and Timeliness of Zero Reports during 2014 & 2015

| Years | Completeness of zero reports (%) | Timeliness of zero reports (%) |
|-------|----------------------------------|--------------------------------|
| 2014  | 99                               | 99                             |
| 2015  | 99                               | 99                             |



**Figure 4:** AFP Surveillance Indicators for the Years 2014 & 2015