Evaluation of the Acute Flaccid Paralysis Surveillance System of Polio Free in East Java, Indonesia, 2019

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Abstract

Background: Proving that the wild polio virus no longer exists in Indonesia, the symptoms must be found that resemble polio. These symptoms are found in patients with AFP (Acute Flaccid Paralysis). AFP surveillance is an observation made of all cases of acute paralysis or AFP in children aged <15 years who are vulnerable to polio. The priority problem that is still found in the East Java Provincial Health Office regarding AFP surveillance is the reduction in the discovery of non-polio AFP cases and adequate specimens.

Aims: The purpose of this study was to analyze the implementation of AFP surveillance activities in the East Java Province Health Office in 2019.

Methods: Data collection was carried out by primary and secondary to study the AFP surveillance overview. Primary data were obtained from in depth interviews with AFP surveillance program holders in East Java Provincial Health Office. Secondary data is processed using Microsoft Office Excel, Epi Info and Quantum GIS.

Results: The result is in 2019 the rate of non-polio AFP and the percentage of adequate specimens in East Java Province has under the target. In 2019 there was a decrease compared to the previous year, the non-polio AFP rate was 1.64 and the percentage of adequate specimens was 56.2%. Only as many as six districts / cities in East Java Province had pass these two indicators.

Conclusion: The lack of visits and reports from both the hospital and the community is one of causative factor. Intensive and routine AFP surveillance is needed to monitor the emergence of polio cases

Keywords: *Keywords: AFP, surveillance, polio, adequate specimens.*

Introduction

Poliomyelitis is an infectious disease caused by the poliovirus. Polio virus predilection can cause paralysis, muscle atrophy and even irreversible paralysis to death in children. Since this disease causes paralysis, polio is one of the important diseases to be eradicated globally(1). The polio eradication program was launched by the World Health Organization (WHO), known as the Global Polio Eradication Initiative (GPEI). GPEI in Indonesia is known as 'Eradikasi Polio' (Erapo) or Polio Eradication which aims to break the chain of transmission of the polio virus globally through coordinated efforts nationally and internationally. The program is based on evidence that humans are the only reservoir of the polio virus(2). Poliomyelitis cases are mostly non-paralytic or not accompanied by clear clinical manifestations. A small portion (1%) of cases of poliomyelitis that causes paralysis (Paralytic Poliomyelitis) requires observations focused on cases of poliomyelitis through AFP surveillance (Acute Flaccid Paralysis)(3).

AFP (Acute Flaccid Paralysis) surveillance is an observation made of all cases of acute paralyzed paralysis or AFP (Acute Flaccid Paralysis) in children aged <15 years who are vulnerable to polio. In 2005 there was an

outbreak of polio which resulted in an increase in public awareness of all the paralysis that occurred, so that the discovery of AFP cases instead of polio increased by more than 2/100,000 even though the specimen was adequately less than 80%. The discovery of this case shows a minimum estimate of non-polio AFP cases in Indonesia. Based on this, since 2006 non-polio AFP rate was set 2/100.000 children aged less than 15 years[3].

The problems that are still found in the East Java Provincial Health Office regarding AFP surveillance are:

a. The reduced discovery of the non-polio AFP case

b. Decreased percentage of adequate specimens (Target ≥80%)

c. 60 days return visits is under the target

d. The percentage of completeness of the AFP report is still low

Based on four problems above, the East Java Provincial Health Office determines two issues that are priority and important to study in order to obtain an evaluation in assessing the performance of AFP surveillance in East Java Province. The decrease in finding of non-polio AFP cases and adequate specimens are a priority issue in AFP surveillance.

Material and Methods

This study was sourced from the East Java Provincial Health Office. Secondary data collection was obtained from AFP surveillance performance reports that have been processed by the East Java Provincial Health Office. All data is processed using Microsoft Office Excel and Epi Info to determine the distribution of cases based on time, place, and person. In addition, secondary data processing is used to determine the percentage of AFP surveillance performance that pass the target or under the target. Distribution of non-polio AFP cases by place in all districts/cities of East Java Province is described using the Quantum GIS application. Quantum GIS is an open source software that can be used for spatial data processing and geographic information system application development, so that the data used is data that has coordinates or location instructions internationally namely longitude and latitude[4]. Primary data collection to study the surveillance overview and evaluation was obtained from in-depth interviews with AFP surveillance program holders and surveillance coordinators in the East Java Provincial Health Office. In addition, a study of Minister of Health Decree document No. 483 of 2007 was conducted.

Results

Overview of AFP Surveillance Recording and Reporting System

1. Collecting Data

The earliest implementing units in the AFP case finding were Puskesmas (Primary Health Care) and Hospitals in the sub-district, district/city areas. Primary health care and local hospitals reported cases as sources of AFP surveillance reports. Reporting no later than the 10th of every month. The AFP case is cumulative and will be identified based on AFP surveillance performance. The District/City Health Office also sends the FP1 form (AFP Case Tracking Form) to the East Java Provincial Health Office.

2. Data Processing

Data obtained from the District/City Health Office is collected and processed using Ms. Office Excel and Epi Info by the East Java Provincial Health Office. The purpose of the grouping is to facilitate data analysis according to epidemiological variables, namely people, place, and time.

3. Data Analysis

The East Java Provincial Health Office conducted an analysis of AFP case data using the Ms Office Excel and Epi Info applications. These results are also presented in the form of AFP surveillance performance. A spatial analysis was also made about the distribution of non-polio AFP cases and adequate specimens and classified according to good, moderate, poor and very poor categories.

4. Data Dissemination

The East Java Provincial Health Office follows up or give feeds back to the District/City Health Office every three months by sending back AFP case data, weekly report attendance, and AFP surveillance performance analysis. It is aims to make District Health Office to check the data and immediately report if it has been not

reported.

Benefits of AFP surveillance

The benefit of AFP surveillance is the data collected can detect at least 1 (one) AFP case among 100,000 children aged <15 years. A very strong AFP surveillance system is very important to detect early wild poliovirus as the ultimate goal of eradicating polio[5].

Analysis Results

Secondary data obtained will be processed to determine the distribution of cases based on time, people, and place variables.

a. The distribution of non-polio AFP cases by age group in East Java in 2016-2019 is as follows:

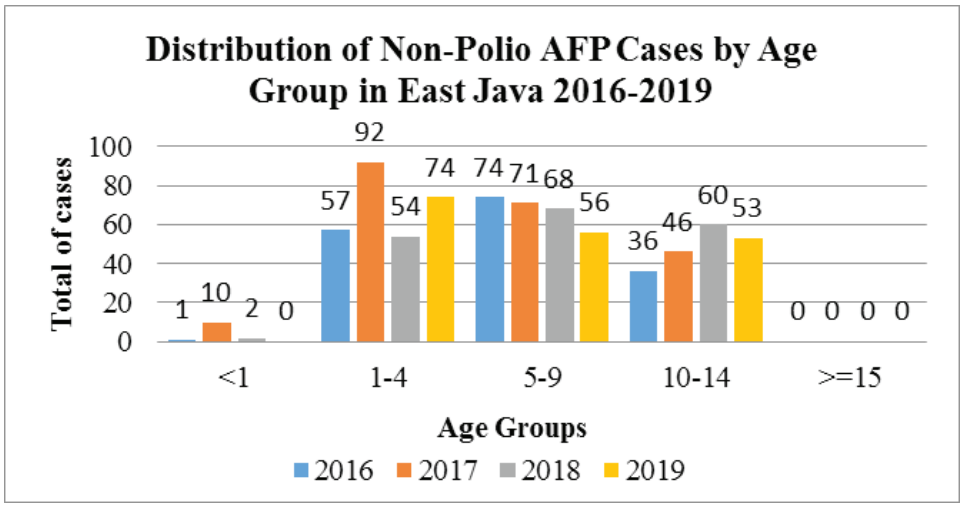

Figure 1. Distribution of Non-Polio AFP Cases by Age Group in East Java 2016-2019. Source: AFP Surveillance Report on East Java Provincial Health Office, 2016-2019.

Figure 1 shows the distribution of non-polio AFP cases by age group. Age of children is grouped into five categories, namely the age group <1 year, age 1-4 years, age 5-9 years, age 10-14 years, and age ≥15 years. The case of non-polio AFP in East Java Province throughout 2016-2019 tends to attack the 1-4 years and 5-9 years age groups.

b. The distribution of non-polio AFP rates in 2014-2019 are as follows:

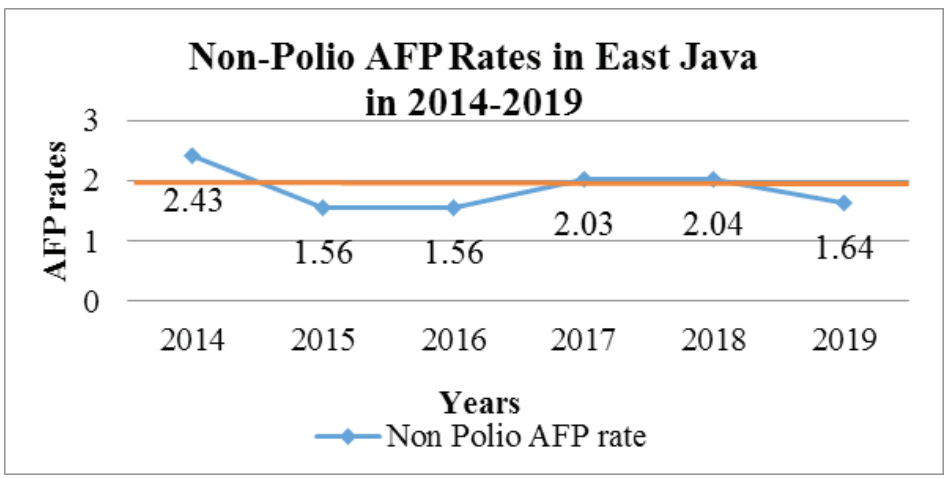

Figure 2. Non-Polio AFP Rates in East Java in 2014-2019. Source: AFP Surveillance Report on East Java Provincial Health Office, 2014-2019

The target of non-polio AFP rate for people aged <15 years is ≥ 2/100,000. The non-polio AFP rate from 2014 to 2019 tends to fluctuate.

c. The percentage distribution of adequate specimens for 2014-2019 is as follows:

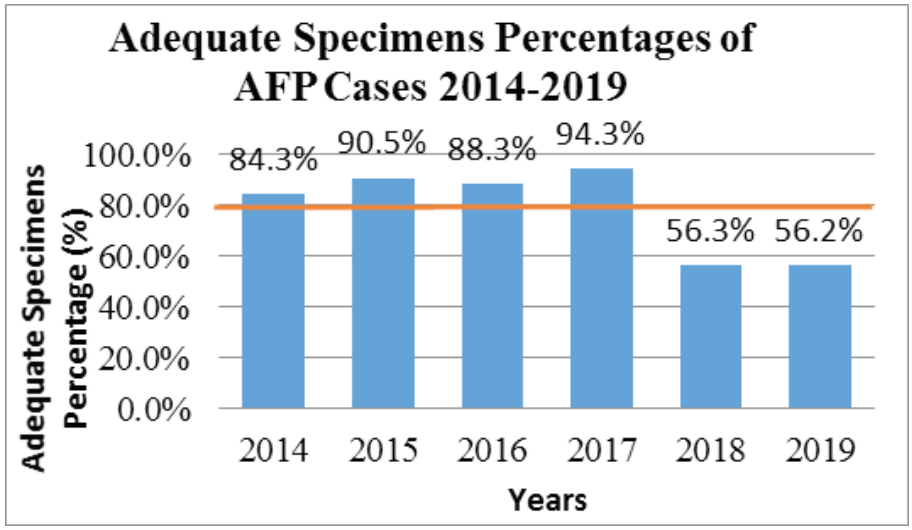

Figure 3. Percentage of Adequate Specimens of East Java Province in 2014-2019. Source: AFP Surveillance Report from East Java Provincial Health Office 2014-2019.

The target specimen examination results received from the laboratory within ≤ 14 days is ≥ 80%. From 2014 to 2017 the percentage of adequate specimens passed the target of ≥80%. But in 2018 and 2019 the percentage of adequate specimens has under the target, the percentage <80%.

d. Distribution of non-polio AFP rates based on districts/cities in East Java Province in 2019:

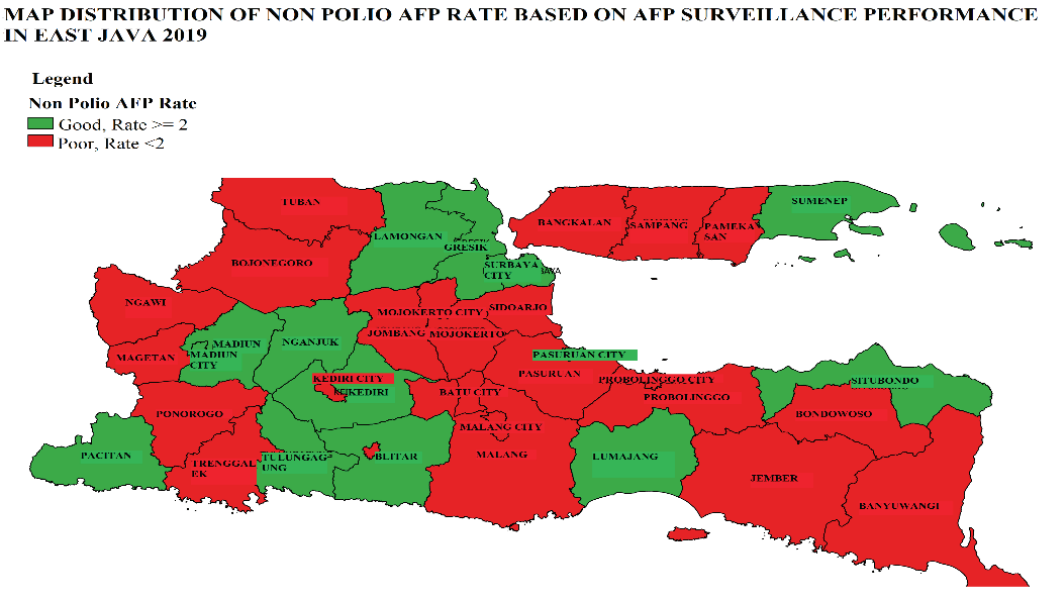

Figure 4. Map Distribution of Non-Polio AFP Rate Based on AFP Surveillance Performance in East Java in 2019. Source: AFP Surveillance Report on East Java Provincial Health Office, 2019.

Districts/cities with case finding rates ≥2/100.00 are depicted with a map of the area in green and have been categorized well. Districts/cities with case finding rates <2/100,000 are depicted on a red map and are categorized as poor.

e. The percentages distribution of adequate specimens by districts/cities in East Java Province in 2019:

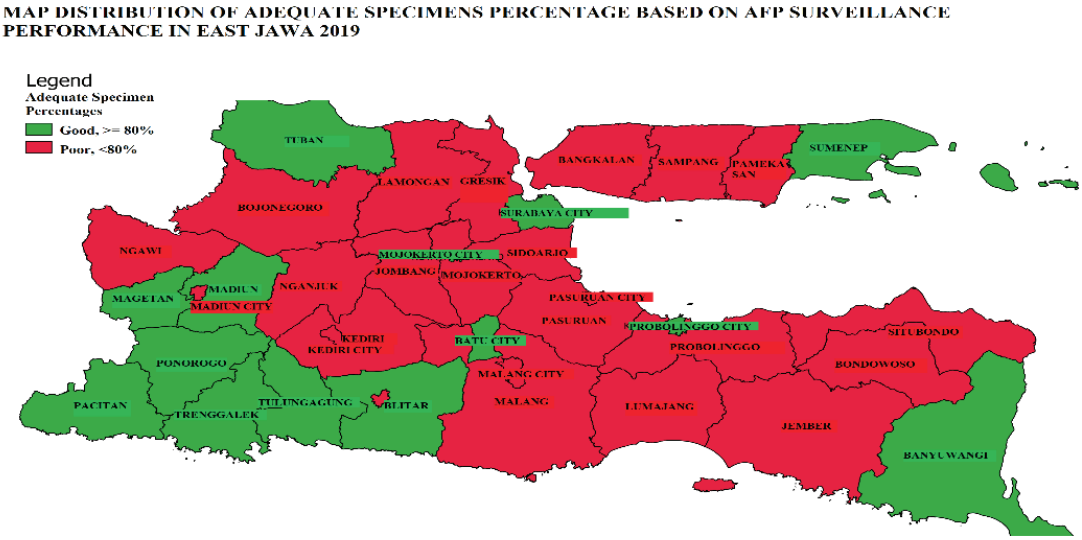

Figure 5. Map Distribution of Adequate Specimen Percentage Based on AFP Surveillance Performance in East Java in 2019. Source: AFP Surveillance Report on East Java Provincial Health Office, 2019

Figure 5 shows the percentage of good adequate specimens ≥80% on the map above marked with a green zone. A total of 15 districts/cities are categorized well in the percentage of adequate specimens. As many as 23 districts/cities still lack adequate specimens.

Discussion

AFP and Non-Polio Cases of East Java Provincial Health Office

a. Distribution of Non-Polio AFP Cases by Age Group in 2016-2019

Figure 1 shows the distribution of non-polio AFP cases by age group in the East Java Provincial Health Office in 2016 to 2019. The results show that the distribution of cases most occurred in the 1-4 year age group and 5-9 year age group. These results are consistent with research by Soltani *et al* that most AFP cases occur in the 0-5 years group[6]. Research conducted by Momen and Shakurnia (2016) in Iran also shows that more than half of non-polio AFP cases occur in the age group under five years[7].

b. Distribution of non-polio AFP rates in 2014-2019

Based on AFP surveillance data from the East Java Provincial Health Office, the distribution of non-polio AFP rates exceeded the target (≥2/100,000) occurred in 2014, 2017 and 2018. In 2019 the non-polio AFP rate has under the target. Research conducted by Dhiman et al in India shows that the rate of AFP not polio in 2004 to 2017 greatly exceeded the target (≥2/100,000)[8].

c. Distribution of Adequate Specimen Percentage for 2014-2019

Specimens sent to the laboratory and arrive at the laboratory are in eligible conditions with a target of ≥ 80%. Adequate specimen examination which includes examination of stool can contain poliovirus. The polio virus in feces is not only found in children who have just been immunized but in children who are not immunized but are infected with the polio virus through the oral faecal of immunized children[9]. Figure 3 shows that the percentage of adequate specimens in 2014 to 2017 has been more than 80%. But in 2018 and 2019 the percentage of adequate specimens is less than 80%.

d. Distribution of Non-Polio AFP Rate by Districts/Cities in East Java Province in 2019

Figure 4 shows the distribution of non-polio AFP rates per district/city in the East Java Provincial Health Office. A total of 25 districts/ cities were declared bad in the non-polio AFP rate in 2019. 13 regencis/cities were declared good in the non-polio AFP rate, which pass the target of ≥2/100.000.

e. Distribution of Adequate Specimens by Districts/Cities in East Java Province in 2019

Specimens from the AFP case were categorized as good if at least two stool specimens were obtained within 24 hours apart within 14 days after the discovery. The specimen is then sent to a WHO accredited laboratory, and the specimen must be in good condition[10]. The quality of AFP surveillance is conventionally evaluated, one of which is collecting adequate faecal specimens. Collection of specimens in a number of areas requires collection of kits. If it is not available it becomes very difficult to assess the presence of a virus[11].

Distribution of AFP cases by Districts/cities based on the performance of AFP Surveillance in 2019

East Java Provincial Health Office classifies districts/cities in several categories. The category is good if the Non-polio AFP rate is ≥2 and the specimen is adequate ≥80%. The category is moderate if the Non-polio AFP rate is ≥2 and the specimen is adequate <80%. The category is less if the Non-polio AFP rate <2 and the specimen is adequate ≥80%. The category is very less if the Non-polio AFP rate <2 and adequate specimens <80%.

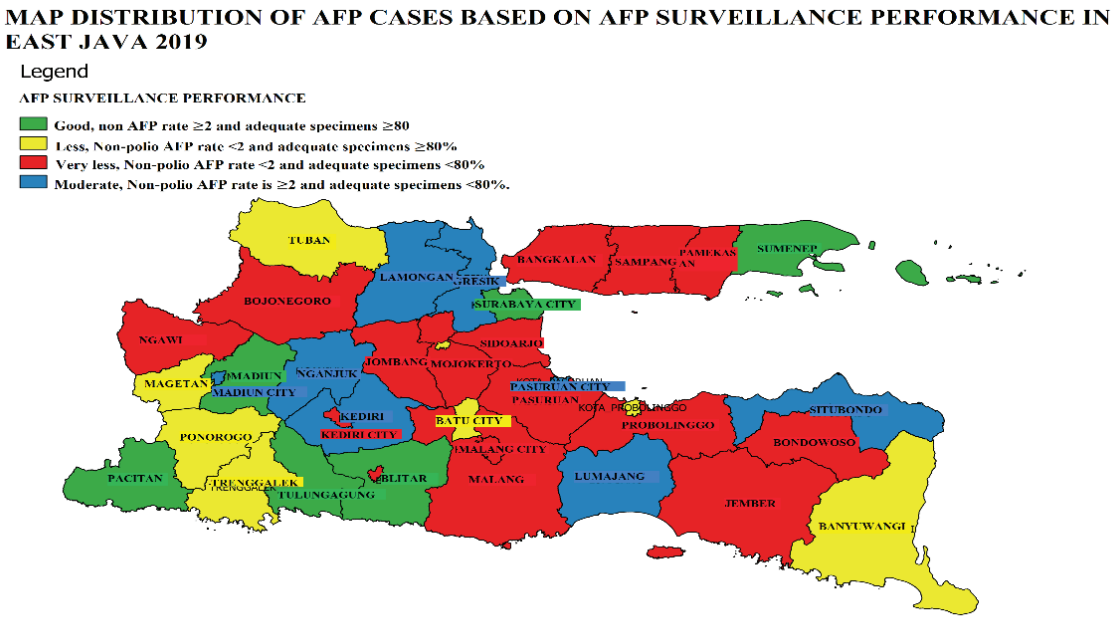

Figure 6. Map Distribution of AFP Cases Based on AFP Surveillance Performance in East Java 2019.

Source: AFP Surveillance Report on East Java Provincial Health Office, 2019

Figure 6 shows that 16 districts are still very lacking, marked by a red zone with a non-Polio AFP rate <2 and an adequate specimen <80%. A total of eight districts are categorized moderate with non-polio AFP rate ≥2 and adequate specimens <80. A total of six districts/cities have been declared good, with marked green zones, non AFP rate ≥2 and adequate specimens ≥80. Districts that have been declared good are Sumenep, Surabaya, Madiun, Pacitan, Blitar, and Tulungagung.

The AFP non-polio AFP rate and the percentage of adequate specimens that exceed the target is very important in assessing AFP surveillance performance. The non-polio AFP rate has been proven in administering doses of polio vaccine. This can be causatively related to OPV vaccination[8].

Factors Causing the Reduction in AFP Case Discovery and Adequate Specimens

Weaknesses found in the conduct of AFP surveillance in the East Java Provincial Health Office include the lack of socialization, training and development for AFP surveillance officers in primary health care, hospitals, and district/city health offices. The one of effectiveness in AFP surveillance depends on the community reporting a disease. The lack of socialization about the AFP case to the communities also becomes a weakness in conducting AFP surveillance.

Conclusion

To prove that the wild polio virus no longer exists in Indonesia, symptoms must be found that resembles polio. These symptoms are found in patients with AFP. The non-polio AFP rate in East Java Province in 2019 is 1.64 (target ≥2/100,000). All specimens for virus isolation must be collected as soon as possible after symptoms appearance. In 2019, most districts/cities have adequate specimen which is not reaching 80%.

The East Java Provincial Health Office classified districts/cities into several categories based on non-polio AFP indicator and the percentage of adequate specimens. The results showed that 16 districts are still said to be very lacking. A total of eight districts have been said to be moderate, and six districts/cities have been declared good. AFP surveillance must be carried out intensively and routinely to produce good surveillance performance in finding AFP cases as indicators of polio eradication.

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a. Improved implementation of HRR (Hospital Record Review) by the East Java Provincial Health Office optimally by increasing coordination with stakeholders.

b. Supervision by the East Java Provincial Health Office can be carried out routinely and optimally to evaluate the achievement of performance indicators for each District/City Health Office. Implementation of supervision can also improve coordination between relevant parties.

c. Increased collaboration with local governments, hospitals, health centers, in an effort to strengthen commitment and support for the implementation of AFP Surveillance.

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