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ORIGINAL ARTICLE

EVALUATION OF POLIO IMMUNIZATION COVERAGE AND ACUTE FLACCID PARALYSIS SURVEILLANCE IN EAST JAVA, INDONESIA, 2018-2022

Evaluasi Cakupan Imunisasi Polio dan Surveillance Paralisis Flaksida Akut di Jawa Timur, Indonesia, Tahun 2018-2022

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ABSTRACT

Background: Indonesia has successfully eradicated wild poliovirus since 2005 using robust immunization and AFP surveillance programs. However, circulating vaccine-derived poliovirus type 2 has challenged these commitments, followed by the 2024 outbreak in East Java. **Purpose:** The study aims to analyze the polio eradication initiative by assessing polio immunization coverage and AFP surveillance in East Java. **Methods:** A descriptive, quantitative study design and retrospective analysis of polio immunization coverage and AFP surveillance indicators from the Provincial Health Office, East Java, from 2018–2022. The data was collected and analyzed using Excel, EpiInfo7, and Health Mapper software. **Results:** OPV4 coverage ranged from 89.95% to 100.76%, while IPV coverage ranged from 73.98 % to 94.18% from 2018 to 2020; the proportion of districts and cities for IPV coverage increased from 0% in 2018 to 44.74% in 2022, below the 95% WHO target. Of the 826 cases of AFP reported, 820 (99.27%) were actual AFP cases <15 years of age, with most (49.02%) being <5 years of age. Non-polio AFP rates ranged from 0.80 in 2020 to 2.59 in 2022 per 100,1000 <15 years of age, with the proportion of districts and cities slightly declining from 55.26% in 2018 to 50% in 2022. The annual mean percentage of AFP-adequate specimens is 61.15%, with the proportion of districts and cities significantly declining from 31.58% in 2018 to 10.53% in 2022, below the 80% target. **Conclusion:** IPV immunization coverage and AFP surveillance

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indicators are below the WHO-recommended targets across districts and cities in East Java.

ABSTRAK

Latar Belakang: *Indonesia telah berhasil eradikasi virus polio liar sejak tahun 2005 melalui program imunisasi dan surveilans AFP. Namun, munculnya virus polio tipe 2 yang berasal dari vaksin memberikan tantatangan baru dengan adanya KLB pada awal tahun 2024 di Jawa Timur.* ***Tujuan:*** *Penelitian ini bertujuan untuk menganalisis eradikasi polio dengan menilai cakupan imunisasi polio dan surveilans AFP di Jawa Timur.* ***Metode:*** *Desain penelitian deskriptif, kuantitatif dan analisis retrospektif cakupan imunisasi polio dan indikator surveilans AFP di Dinas Kesehatan Provinsi Jawa Timur tahun 2018–2022. Data dikumpulkan dan dianalisis menggunakan aplikasi Excel, EpiInfo7, dan Health Mapper.* ***Hasil:*** *Cakupan OPV4 berkisar antara 89,95% hingga 100,76%, sedangkan cakupan IPV berkisar antara 73,98% hingga 94,18% pada tahun 2018 hingga 2020; proporsi kabupaten dan kota untuk cakupan IPV meningkat dari 0% pada tahun 2018 menjadi 44,74% pada tahun 2022 (target WHO sebesar 95%). Dari 826 kasus AFP yang dilaporkan, 820 (99,27%) merupakan kasus AFP aktual berusia <15 tahun, dengan sebagian (49,02%) berusia <5 tahun. Angka AFP non-polio berkisar antara 0,80 pada tahun 2020 hingga 2,59 pada tahun 2022 per 100.1000 penduduk <15 tahun, dengan proporsi kabupaten dan kota sedikit menurun dari 55,26% pada tahun 2018 menjadi 50% pada tahun 2022. Persentase AFP dengan spesimen adekuat sebanyak 61,15%, dengan proporsi kabupaten dan kota menurun signifikan dari 31,58% pada tahun 2018 menjadi 10,53% pada tahun 2022 di bawah target 80%.* ***Simpulan:*** *Indikator cakupan imunisasi IPV dan surveilans AFP berada di bawah target yang direkomendasikan WHO di seluruh kabupaten dan kota di Jawa Timur.*

INTRODUCTION

Poliomyelitis, commonly called Polio, is a contagious infectious disease caused by poliovirus that can be transmitted from one person to another. The symptoms of poliovirus can range from mild to severe, and in some cases, it can lead to permanent disability, such as flaccid paralysis or death. Mild disease symptoms Predominantly, children under five are mainly susceptible to the poliovirus infection, although the disease can occur across all age groups. One in every 200 cases of poliovirus infection results in permanent paralysis of the lower extremities, with a 5-10% mortality rate (1). Despite the efforts and contributions made by the World Health Organization (WHO) and most countries to eradicate wild and vaccine-derived poliovirus, it remains a threat to global public health. Unfortunately, the world has yet to see a cure for poliovirus. However, safe polio vaccination with Oral Poliovirus Vaccine (OPV) and Inactivated Poliovirus Vaccine (IPV) has proven to be successful in preventing it (2).

The Global Polio Eradication Initiative (GPEI) was launched at the World Health Assembly in 1988, and WHO, partners, and member states adopted the initiative Since adopting the GPEI, the reported wild poliovirus cases have reduced by 99% globally. This achievement is a result of the robust immunization and AFP surveillance through four strategies: Consistent routine polio immunization (OPV) program, Supplementary polio immunization programs (National immunization days), polio immunization mopping-up programs in unreachable and low coverage communities, and active acute flaccid paralysis (AFP) surveillance and report (2,3). They have been proven to interrupt the transmission of both Vaccine-derived and wild poliovirus.

Vaccination, including Polio, is one of the most effective interventions introduced by the WHO to reduce the burden of vaccine-preventable morbidity and mortality worldwide (4). Timely administration and completeness of polio immunization among children under five years of age help interrupt the transmission of vaccine-derived and wild poliovirus by creating complex immunity among the population (5). The WHO set immunization coverage at 95% to attain global immunity.

Acute flaccid paralysis (AFP) is a medical condition that affects children under fifteen years; it is characterized by flaccid, with a sudden weakness or reduced muscle tone of the limbs (6). AFP and polio cases present similar clinical symptoms, which is why the WHO and member states have accepted robust AFP surveillance as one of the essential strategies to measure progress toward global polio eradication. A sensitive AFP surveillance system should have the ability to detect all suspected AFP or polio cases and collect adequate stool specimens at ≥80% for laboratory investigation. The WHO has developed a set of indicators to measure the quality and accuracy of the AFP surveillance system being able to detect Wild polio transmission, such as non-polio AFP rates (≥2) per 100,000 population under 15 years and adequate specimens (≥80%) (7,8).

Since adopting the GPEI in 1988, Indonesia's government has shown strong will and commitment to the global eradication of wild poliovirus. In 1991, the polio eradication initiative through the Expanded Program on Immunization (EPI) was introduced in Indonesia. With the introduction of a robust AFP surveillance system in 1995, Indonesia achieved polio elimination in the same year, followed by eradicating the wild poliovirus in 2005. However, decentralizing all health programs through Political reform in 1998 presented a significant challenge to the immunization program across Indonesia (4). The Indonesian government works with partners and stakeholders to increase immunization coverage and enhance AFP surveillance (9). Circulating Vaccine derived poliovirus type two (cVDPV2) continue to hunt Indonesia. According to the polio risk transmission assessment conducted Indonesia Ministry of Health in 2023, which revealed that 23 provinces (76.50%) are at high risk, 9 provinces (23.50%) were medium risk, with Bali and Yogyakarta as low risk provinces (10).

This study represents a comprehensive understanding of Polio eradication activities implemented in East Java from 2018-2022 before the cVDPV2 outbreak in 2024 and presents all indicators for polio immunization and AFP surveillance. Polio immunization coverage has been below the national target of 95% in several districts and sub-districts in East Java, and polio incidence can substantially decrease by promoting and supporting the consistent implementation of immunization programs. This effort will ultimately aid in its eradication, creating safer and healthier communities. Also, in recent years, Indonesia has reported vaccine-derived polio outbreaks in some provinces. In November 2022, 5 cases were reported in Aceh; in early 2023, 8 cases were reported in West Java (11). The recent vaccine-derived poliovirus type 2 (cVDPV2) outbreak in Central and East Java has raised considerable concern and burden on the fight against polio eradication in Indonesia. It is significant to emphasize that most health workers in provinces, districts, sub-districts, and communities are committed to the goal of polio eradication through polio vaccination and AFP surveillance (12).

With the low polio immunization coverage and poor AFP surveillance performance across several districts and sub-districts in East Java, providing a comprehensive analysis of immunization coverage, which is known to protect children against the wild polio virus, and AFP surveillance, known as the gold standard for measuring polio eradication initiative progress, will provide a clear understanding of the progress and drawbacks made in East Java's polio eradication initiative.

METHODS

Study Area

East Java province is located in the eastern part of Java Island and covers an area of 47,803,39 km2. The province comprises 29 districts and nine cities, 666 sub-districts, 8,501 sub-district sections, and 508 Islands. East Java has an estimated population of 40,156,672, of which 19,819,764 are male, 20,336 are 908 females, and 11,000,000 (28%) are children (15). There are 410 hospitals, 1990 clinics, 969 health facilities (puskesmas), 109 traditional health facilities, and 85,111,40 Integrated Healthcare Center (posyandu) across East Java. The health section has a total of 274,043 human resources, of which 180,772 (65.96%) are healthcare workers and 96,271 (34.04%) are health support staff.

Study Design and Data Source

This study is a descriptive, quantitative study design and retrospective (secondary) trend analysis of data on Immunization coverage and AFP surveillance indicators, as recommended by WHO, from 2018 to 2022. This study includes aggregated data collected on immunization coverage of Oral Polio Vaccines (OPVs) and Inactivated Polio Vaccines (IPV) from the official website (https://imunisasi.dinkes.jatimprov.go.id/). We also extracted all AFP-reported, investigated, and laboratory-confirmed cases under 15 years of age from the AFP database at the East Java Provincial Health Office. The cases were classified as either Vaccine or Wild polio based on laboratory confirmation. Non-polio AFP cases present flaccid paralysis that is not caused by poliovirus. Polio Immunization refers to administering vaccines (IPV &OPV) to protect individuals against poliovirus infection. Polio immunization and AFP surveillance data were also extracted from the East Java Health Profile for all 38 districts and cities throughout the study period. The study included the total number of actual AFP cases reported and indicators, including non-AFP polio rate at ≥2 per 100,000 population and adequate specimens at ≥80% in 37 districts and cities and a silent district throughout the study period.

Immunization Program in East Java

The East Java provincial health office and other stockholders are responsible for implementing and monitoring immunization programs, including polio, and responding to emergencies and outbreaks. Through the expanded Immunization program, polio immunization structures are well established with knowledgeable staff across most health system levels and a functioning vaccine cold chain management system. Each health facility is provided with the immunization register where the child's immunization history is recorded; this information is then recorded and transmitted using the online immunization portal. Each health facility must administer and report all OPV doses at 95% of the WHO target; IPV dose administration and reporting are yet to be compulsory in East Java.

AFP Surveillance Program in East Java

Case-based and laboratory surveillance is the main activity to identify nonpolio AFP cases in Indonesia. Additionally, environmental surveillance and hospital record review (HRR) are implemented in certain provinces in Indonesia, including East Java. Cases of AFP are typically reported from health facilities (Puskesmas). When a suspected AFP or polio case is identified, a case-based form is completed for each individual, and information on demographics, paralysis, immunization status, specimens, and laboratory results are collected. It is classified as a non-polio AFP or polio case only after this information is reported and analyzed. The health facilities report suspected cases to the district and city health office. Two stool samples are collected at 24-48 hours intervals and sent to the laboratory for confirmation. The laboratory results are then communicated through a WhatsApp group comprising all surveillance officers and AFP actors. Once confirmed, the case is reported via the East Java online AFP platform. As recommended by WHO, the AFP program in East Java reports on all surveillance indicators, including AFP rate at ≥2/100,000, non-polio AFP rate < 15 years at ≥2/100,000, reporting completeness at ≥90%, reporting timeliness at ≥80%, adequate specimen at ≥ 80%, a repeat visit 60 days after paralysis ≥80%, specimen send and arrive at laboratory ≤3days at ≥ 80%, specimen send and arrive at laboratory in eligible conditions at ≥80%, and specimen result received from laboratory ≤ 14 days at ≥80%.

Data Management and Analysis

We extracted data on polio immunization coverage and AFP surveillance indicators from 2018 to 2022 and entered it into an Excel spreadsheet. The data was then compared with all available sources to ensure consistency and validity. The extracted data was merged, manipulated, and analyzed using Microsoft Excel version 2021 and Epi info seven software. We presented descriptive statistics for immunization coverage and AFP surveillance indicators in chats. Using spatial analysis to assess the trend performance of districts and cities for IPV coverage and AFP surveillance indicators, we stratified each indicator by district and year, using Health Mapper version 4.3, 2008 software.

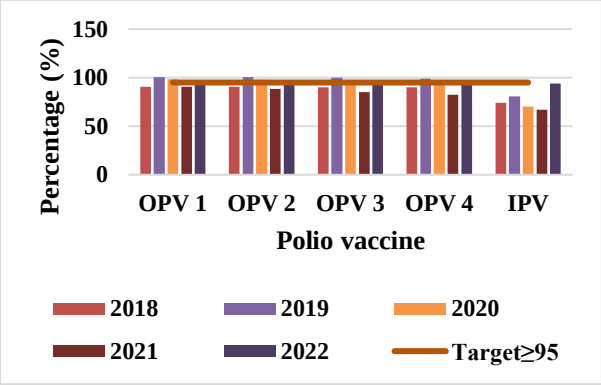
Ethical Considerations

The study obtained ethical approval from the Faculty of Public Health Ethics Committee, Universitas Airlangga, with number 18/EA/KEPK/2024. The Surveillance and Immunization Unit, Provincial Health Office, East Java, also granted their approval. Confidentiality was maintained throughout all study levels to ensure patient and data security.

RESULTS

Polio Immunization Coverage

In 2019 and 2020, the number of doses of oral polio vaccine (OPV) surpassed the national target, with OPV1 and OPV2 reaching 100.76% and 100.29%, respectively. However, in 2018, 2021, and 2022, OPVs doses were slightly below the national target of 95%. Throughout the study period, the coverage of inactivated polio vaccine (IPV) also fell below the national target, with 73.98% in 2018, 80.52% in 2019, 70.49% in 2020, and 67.15% in 2021. Interestingly, there was a significant increase from 67.15% in 2021 to 94.18% in 2022, but still below the target of 95%.

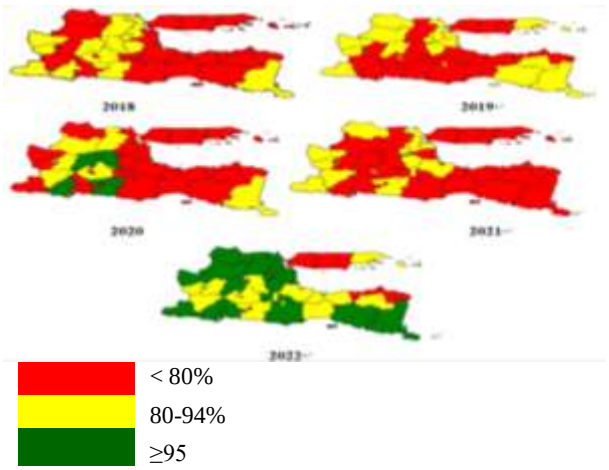


Source: Provincial Health Office, East Java, 2018-2022

Figure 1. Percentage Distribution of Polio Immunization Coverages in East Java, 2018-2020

Special Distribution of IPV Immunization Coverage by District/Cities in East Java, 2018-2022

IPV immunization coverage across various districts and cities in East Java from 2018 to 2022. Figure 2 visually represents the coverage, with green, yellow, and red colors indicating high, medium, and low coverage. Low coverage is below 80%, medium coverage is between 80% and 94%, and high coverage is 95% and above. In 2018, 23 out of 38 districts and cities (60.53%) reported low coverage, while 15 (39.47%) reported medium coverage. Districts and cities should have shown higher coverage. In 2019, 20 districts and cities (52.63%) reported low coverage, 17 (44.74%) reported medium coverage, and only Madiun town (2.63%) reported high coverage. In 2020, 28 districts and cities (73.68%) had low coverage, six (15.79%) had medium coverage, and four districts (10.53%), including Trenggalek Regency, Blitar Regency, Jombang Regency, and Nganjuk Regency, reported high coverage. In 2021, 24 districts and cities (63.16%) reported low coverage, 13 (34.21%) reported medium coverage, and Mojokerto town reported high coverage (2.63%). In 2022, there were significant improvements in several districts, with 17 districts and cities (44.74%) reporting high coverage, 17 (44.74%) reporting medium coverage, and four districts (10.53%) reporting low coverage. Despite the progression of 2022, low IPV coverage persisted throughout the study period (2018-2022) in some districts and cities, including Situbondo Regency, Bangkalan Regency, Sampang Regency, Pamekasan Regency, and Blitar City.



Source: Provincial Health Office, East Java, 2018-2022

Figure 2. Distribution of IPV Immunization Coverage by District/Cities in East Java, 2018-2022

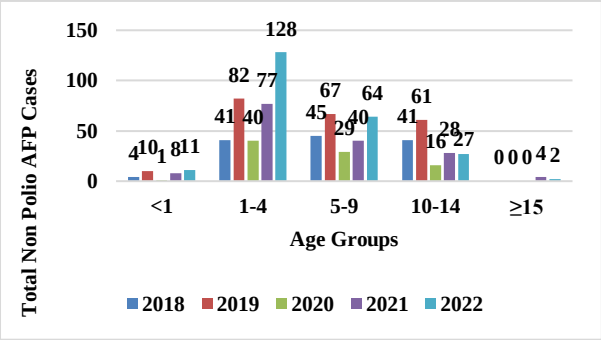
AFP Surveillance

Distribution of AFP Cases by Age Group in East Java, 2018-2022

Figure 3 shows the distribution of AFP cases by age group in East Java from 2018 to 2022. Out of the 826 total AFP cases reported, 49.02% were under five years old, 29.88% were between 5 and 9 years old, and 21.10% were between 10 and 14 years old. Most AFP cases were reported in 2022, with 232 (28.09%), followed by 220 (26.63%) in 2019 and 157 (19.01%) in 2021.

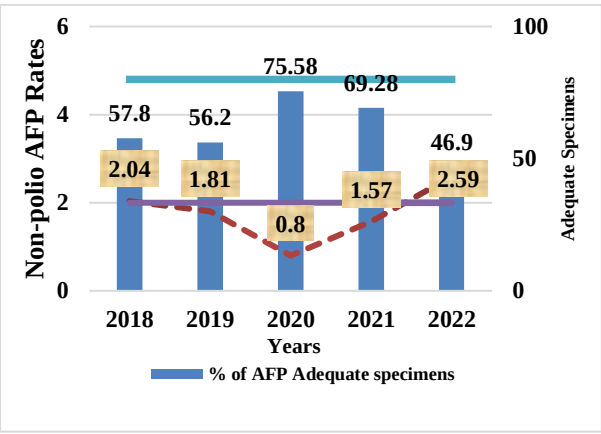
Trend of Non-Polio AFP Rate and Adequate Specimens in East Java, 2018-2022

Figure 4 outlines the trend of non-Polio AFP rate and adequate specimens in East Java from 2018 to 2022. Non-polio AFP rates varied over the years, reaching 2.04 in 2018, lowest at 0.8 in 2020 and highest at 2.59 in 2022, surpassing national target of ≥2. However, the percentage distribution of AFP cases with adequate specimen collection in East Java fell short of the national target of ≥80%. There was a slight improvement in 2020 (75.58%), but it declined to 46.90% in 2022.



Source: Provincial Health Office, East Java, 2018-2022

Figure 3. Distribution of non-Polio AFP cases by age group in East Java, 2018-2022

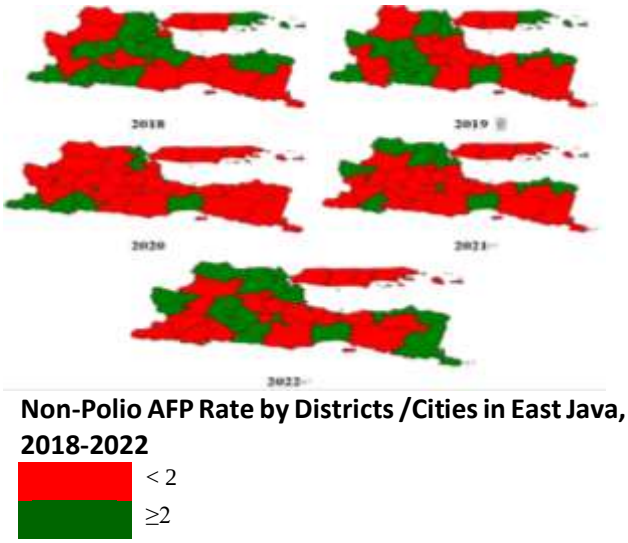


Source: Provincial Health Office, East Java, 2018-2022

Figure 4. Non-Polio AFP Rate and Adequate Specimen in East Java, 2018-2022

Spatial Analysis of Non-Polio AFP Rate by Districts /Cities in East Java, 2018-2022

Figure 5 shows the distribution of the non-Polio AFP rate by district and cities in East Java from 2018 to 2022. The districts and cities with non-Polio AFP rates below the national target of ≥2 is in red, and those above the target are in green. In 2018, 44.74 % (17) of districts and cities were below the ≥2 target, while 55.26% (21) met the national target. In 2019, 55.26% (21) of districts and cities were below the ≥2 target, while 44.74% (17) were above it. In 2020, 76.32% (26) of districts and cities were below the ≥2 target, while 23.68% were above it. In 2021, 68.42% (26) of districts and cities were below the ≥2 target, while 31.57% were above it. Finally, in 2022, there was an even distribution, with 50% (19) of districts and cities above and 50% (19) below the ≥2 national target. Notably, several districts and cities such as Bangkalan, Bojonegoro, Jember, Bondowoso, Jember, Jombang, Kota Mojokerto, Probolinggo City, Malang, Mojokerto, Pamekasan, Pasuruan, Ponorogo, Probolinggo and Sampang, consistently fell below the national target of ≥2.

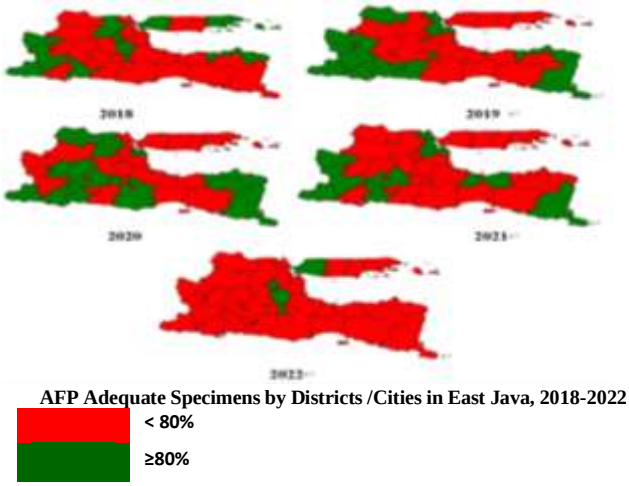


Source: Provincial Health Office, East Java, 2018-2022

Figure 5. Non-Polio AFP Rates by Districts/ Cities in East Java, 2018-2022

Spatial Distribution of AFP Adequate Specimens by Districts and Cities in East Java, 2018-2022

The data presented in Figure 6 shows the percentage distribution of AFP Adequate Specimens collected by districts/ cities in East Java from 2018 to 2022. Red indicates a district or city that fell below the national target (inadequate specimens), while green represents a district or city that surpassed the national target of 80% (adequate specimens). In 2018, 26 districts and cities (68.42%) collected inadequate specimens, while 12 (31.58%) collected adequate specimens. In 2019, 21 districts and cities (55.26%) collected inadequate specimens, while 17 (44.74%) collected adequate specimens. In 2020, 23 districts and cities (60.53%) collected inadequate specimens, while 15 (39.47%) collected inadequate specimens. In 2021, 28 districts and cities (73.68%) collected inadequate specimens, while 10 (26.32%) collected adequate specimens. In 2022, most districts and cities (34 out of 38), accounting for 89.47%, collected inadequate specimens, while only 4 (10.53%) collected adequate specimens. None of the 38 districts and cities consistently met the national target of 80% throughout the study. Inconsistent reporting trends observed, specifically, Sidoarjo, Jombang, Jember, Bojonegoro, Pasuruan, Lumajang, Sampang, Kediri City, Malang City, and Pasuruan City consistently fell below the national target of 80%. There was no report for Pamekasan throughout the study period.



Source: Provincial Health Office, East Java, 2018-2022

Figure 6. Distribution of AFP Adequate Specimens by Districts /Cities in East Java, 2018-2022

DISCUSSION

Polio Immunization Coverage in East Java

This study discovered a fluctuating polio immunization coverage across East Java, with some districts and cities failing to reach the national target of 95%, especially for OPV4 and IPV coverages. In 2018, this study reported OPV4 and IPV coverages to be 89.95% and 73.98%, respectively. This finding aligned with the report of Indonesia's Ministry of Health, which stated that the coverage for OPV4 and IPV was 67.6% in 2018, below the recommended 95% coverage (13). In 2020, there was progress in OPV4 coverage but not in IPV coverage, with 96.62% and 70.49%, respectively. The Ministry of Health in Indonesia reported similar progress for OPV4 but not in IPV coverage, with 86.80% and 37.70%, respectively. In 2021, OPV4 coverage decreased to 80.12%, while IPV coverage increased by 67.15%; similar to our study, a decrease in OPV4 to 80.20% and an increase in IPV coverage to 66.20% (14). Consistent with this study, in 2020, the Indonesia Ministry of Health, in a bulletin, revealed that from 2016 to 2019, there was a decrease in OPV4 coverage from 91.90% in 2016 to 81.30% in 2019, there was an increase in IPV coverage, ranging from 19% in 2016 to 68.40% in 2019, but still below the national target of 95% for both vaccines (10). In 2018, the WHO conducted a risk assessment in Indonesia, classifying East Java as a medium-risk province for polio outbreaks. In response to the recent outbreak in East Java, according to the Indonesia Health Ministry, only 47.50 % of children aged 0-7 received polio vaccines during the National Polio Immunization Sub-week. The polio immunization coverage in East Java and across Indonesia is not achieving the national target of 95%, which could be attributed to various reasons, such as the decentralization of the health system, as each province is fully responsible for the implementation of its health programs, government's priorities in other areas, and vaccine rejection and hesitancy (4,15). This study found a decrease in the coverage of OPVs and IPV during the peak of the COVID-19 pandemic in 2021, with IPV showing the lowest coverage of 67.15%. Similarly, an Indonesia study found a similar impact of the COVID-19 pandemic on immunization; this reduction in immunization coverage poses a significant threat to the polio eradication initiatives in Indonesia (16).

Significant progress has been made in achieving polio immunization coverage in East Java, but there is still a need for robust intervention in OPV4 and IPV. Presently, IPV vaccination and reporting are not mandatory in East Java. Studies have shown that the transition from OPV to IPV or a combination of both has helped reduce the spread of Wild and Vaccine-derived poliovirus; the recommended dose of IPV (two or three) can offer up to 99% protection (1,17). Combining IPV before OPV has been found to reduce vaccine-derived paralytic polio linked with serotypes (18) and respond to cVDPV outbreaks (20). The success story of the rollout and switch to IPV vaccination in Yogyakarta has shown a limited threat to the transmission of wild and vaccine-derived polio infection (19). Therefore, we recommended mandating the rollout and reporting of IPV immunization coverage by health facilities to achieve the national target of 95% coverage across East Java.

AFP Surveillance Indicators in East Java

Acute flaccid paralysis (AFP) surveillance is a highly effective program for eradicating wild poliovirus globally. Indonesia is among the countries committed to achieving a polio-free world. The World Health Organization (WHO) has set specific criteria for certifying a polio-free status, including detecting and investigating all cases of non-polio AFP in individuals under 15 years. This study has shown that most cases of AFP occur in children between the ages of 1 and 4 years, accounting for 44% of cases, and in 5 and 9 years, accounting for 29.70% of cases. Similar results in studies conducted in Surabaya, Indonesia (20), Lebanon (21), Morocco (22), Jordan (23), and Zambia (2) showed that most AFP cases occurred in children aged 1 to 4. Consistent with our

research, results reported from a study conducted East Java, Indonesia (24) reported most AFP cases were found in children under six.

The distribution of non-Polio AFP rates in this study varied significantly. In 2018 and 2022, the rates were above 2/100,000 (2.04 and 2.59), while in 2020 and 2021, they were at their lowest, with rates of 0.8 and 0.57 per 2/100,000 individuals, respectively. Consistent with the results of this study, the Indonesian outbreak response assessment in 2023 also reported varying rates of non-polio AFP cases. The rates were above 2/100,000 in 2018 and 2022 (2.42 and 3.49, respectively) and below 2/100,000 in 2020 and 2021 (0.82 and 1.54, respectively) (12). The lowest rate of non-polio AFP cases in 2020 was 0.64/100,000. The sharp drop in non-polio AFP rates observed in 2020 and 2021 may be attributed to the COVID-19 pandemic, which has significantly impacted the polio surveillance system in Indonesia and globally (16). The COVID-19 pandemic led to a decline of approximately 34% of reported AFP cases worldwide. These findings highlight the dynamic nature of AFP prevalence and the need to maintain rates above the national target of 2/100,000 —an annual mean of 61% of all districts and cities below the target from 2018 to 2022. A similar study conducted in East Java in 2019 revealed that 25 districts and cities (65.70%) still need to meet the 2/100,000 target (24).

The study on AFP adequate specimen collection in East Java faced significant challenges as the percentage distribution of adequate specimens was below the 80 % target, decreasing from 57.80% in 2018 to 46.90% in 2022. Research shows a considerable drop in specimen adequacy from 85.9% in 2018 to 70.90% in 2021 (2). The Indonesian Outbreak Response Assessment of 2023 also presented comparable results, with adequate specimens decreasing from 78.40% in 2018 to 73.30% in 2022 (12). None of the districts and cities consistently met the ≥ 80 % target of AFP adequate specimens in East Java throughout the study period, with 68.42 % in 2018, 55.26% (2019), 60.53% (2020), 73.68% (2021), and 89.47% (2022) of total districts and cities below the ≥ 80 % target. Similar results were shown in research conducted by Rasyidi et al (24) in East Java, reaching 56.30% (2018) and 56.20% (2019), way below the ≥ 80 % target.

Contrary to this study, adequate specimen collection above 80% was shown in studies conducted in Nigeria (6), Zambia (2), Uganda and Sudan (26), and East and Southern African Countries (7). This might be a result of the attention given to Polio eradication and the sensitivity of the AFP surveillance program in detecting and investigating AFP cases in those countries. Throughout this study, we observed that the national target of ≥80% for obtaining adequate specimens in East Java was not achieved; this could be attributed to disparities in logistics, inadequate knowledge among healthcare workers (HCW), collapse of active community surveillance of AFP involving volunteers and poor hospital/ clinics participation in AFP surveillance leading to the late notification of AFP cases and collection of two samples 24-48 hours apart, as well as cold chain management until the specimen reaches the laboratory. All samples collected for suspected AFP cases are sent to the WHO-accredited polio laboratory in Surabaya and analyzed for different poliovirus variants.

East Java faces a significant challenge in meeting the critical indicators of AFP surveillance. We observed a considerable disparity among districts and cities regarding AFP surveillance indicators. Some districts and cities have not reported for one or two years, while Pamekasan did not report throughout the study. Such inconsistencies and silent districts create a gap in polio surveillance in the province, which becomes more significant at sub-levels. The disparities among districts and cities could come from various factors, including vaccine rejection, inadequate knowledge, poor data management at district and city levels, lack of funds, and heavy workload on surveillance officers who monitor many programs, leading to the neglect of AFP surveillance. Therefore, providing adequate logistics, enhancing the skills of HCWs, promoting active participation of community volunteers and hospitals/ clinics, timely laboratory results, and improving communication and coordination among all these actors will improve the sensitivity of AFP surveillance in East Java.

Research Limitation

Using secondary data from the Provincial Health Office, East Java, from 2018–2022, vaccination data for AFP cases <15 years reported in this study are incomplete, with data available for 2021 and 2022. This gives us a shallow understanding of the effect of immunization status on AFP cases. Surveillance officers at all levels of the AFP surveillance system in East Java should be compelled to collect and report immunization data of all AFP cases to address the problem.

CONCLUSION

The Polio eradication initiative in East Java faced significant challenges with the inconsistency in polio immunization coverages and the AFP surveillance indicators of most districts and cities failing to meet the WHO recommended targets. The poor performance of inactivated polio vaccine (IPV) coverage put the province at high risk of subsequent poliovirus outbreaks. IPV enrollment and reporting are yet to be mandatory in East Java. Despite much improvement in the AFP rate, adequate specimen collection was consistently below the WHO target throughout the study period. The lack of active surveillance from silent districts and cities for AFP surveillance leaves the province not to detect possible poliovirus transmission.

Considering the recent cVDPV2 outbreak in East Java, the need for robust polio immunization and AFP surveillance activities is imminent. Therefore, we recommend mass camping followed by mandatory IPV enrollment, health promotion, and education activities to ensure children receive immunization at the right age. Proper coordination at all levels of the surveillance system and environmental surveillance, especially for silent districts and cities, is required to strengthen AFP surveillance in East Java.

CONFLICT OF INTEREST

No conflict of interest reported.

AUTHOR CONTRIBUTIONS

AT was responsible for proposal development, data collection, management, analysis, and manuscript writing. AH contributed to the research by reviewing and editing the manuscript. HS Helped with data collection and management. WW provided an overview of the Polio eradication initiative in East Java, which included immunization and AFP surveillance.

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