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Evaluation of Tuberculosis Disease Surveillance System in DKI Jakarta Province in 2024: Structure, Function and Attribute Analysis

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Abstract. Indonesia ranks second worldwide in tuberculosis cases. Surveillance components for tuberculosis reporting have been facilitated by SITB. Program improvement recommendations should be implemented by smaller units, such as Public Health Centers, by analyzing data and disseminating it to relevant parties, with recommendations also made at the provincial level. This evaluation aims to describe the implementation of tuberculosis surveillance in DKI Jakarta. This descriptive study uses a mixed-methods approach of observation and structured interviews conducted in DKI Jakarta from April to June 2024. Data were sourced from SITB tuberculosis reports and in-depth interviews with nine tuberculosis officers from the Health Sub-Office, Public Health Centers, and hospitals. Surveillance system evaluation covered system structure, core functions, support functions, and system attributes based on WHO guidelines. System structure aspects related to legal aspects, networks, and partnerships are functioning well, although hospitals lack specific implementers. Core functions like detection, data collection, reporting, dissemination, and feedback operate optimally, though analysis and result interpretation are suboptimal. Support functions involving training and resources also need improvement. System attributes such as simplicity, completeness, representativeness, acceptability, and usefulness are optimal, but timeliness remains a challenge. Recommendations include increasing human resource capacity, reporting accuracy, and coverage of preventive therapy.

Keywords: Tuberculosis, System, Surveillance, Evaluation

1. Intriduction

Tuberculosis is a disease caused by infection with the bacterium *Mycobacterium tuberculosis* in the lungs. This condition is sometimes referred to as pulmonary TB. Tuberculosis bacteria that invade the lungs cause respiratory problems, such as chronic coughing and shortness of breath. TB patients usually also experience other symptoms such as night sweats and fever. Treatment of tuberculosis usually takes months with strict medication rules to prevent the risk of antibiotic resistance. If not treated immediately, tuberculosis can be fatal. The Mycobacterium tuberculosis bacteria can infect other parts of the body, such as the kidneys, bones, joints, lymph nodes, or brain membranes, a condition called extra-pulmonary TB. Indonesia is the second country with the highest TB cases in the world after India. Data from 2021 shows that there are around 969,000 TB patients in Indonesia. This disease can be fatal for sufferers if not treated immediately. However, TB is a curable and preventable disease (Astari et al. 2022).

In DKI Jakarta Province in 2020 the total TB case finding was 29,980 cases, in 2021 it increased to 35,110, in 2022 it increased again to 54,639 cases and until November 2023 there were 49,141 cases. Meanwhile, the number of reported death cases (sourced from Puskesmas

and Hospitals in DKI Jakarta Province) in 2020 was 1,554 cases, decreased slightly to 1,538 cases in 2021, decreased again to 1,315 cases in 2022 and decreased again to 1,286 cases until October 2023. With a CFR value of 5.18% in 2020, 4.38% in 2021, 2.41% in 2022 and 2.62% in 2023 (Depkes RI 2023).

From the results of the situation analysis conducted in 2023, it was found that several problems may be the cause of the high number of tuberculosis cases and deaths from tuberculosis in DKI Jakarta Province. Some of them include the lack of optimal capacity of human resources who master risk communication related to TB patient assistance, recording and reporting from health facilities, especially clinics that have not been networked with the Health Office, most case findings are in health facility visits not from close contact surveys, the non-achievement of successful treatment of tuberculosis from a target of 90% was only achieved by 80.5%, the achievement of the RO TB Treatment Success Rate in 2022 was 50% while the national target was > 80%, there was still a loss to follow up with a 2022 figure of 3,997 cases, one of the main indicators of the TB program was the coverage of TB cases.997 cases, one of the main indicators of the TB programme is the coverage of the provision of tuberculosis preventive therapy to household contacts, the achievement indicator is 48% in 2022 but the achievement is only 2.3%, the coverage of the provision of Tuberculosis Preventive Therapy to household contacts aged <5 years in 2022 is targeted at 65% but only achieved 5.6%, the achievement of TB patients who know their HIV status in Indonesia in 2022 is 63% of the target of 70%, and the non-achievement of the Percentage of Case Index conducted TB Contact Investigation of DKI Jakarta Province in 2022 targeted at 90% was only achieved 17% (Kementrian Kesehatan 2023).

Based on the description above, the author considers the case of tuberculosis disease to be a problem raised in the Evaluation of the Surveillance System in DKI Jakarta Province so that problems in the surveillance system can be identified and improvements can be made in the future.

2. Methods

2.1 Research Design

This evaluation of the tuberculosis disease surveillance system used an assessment method with qualitative and quantitative approaches and was presented descriptively. Quantitative data analysis was conducted using descriptive statistics to measure the achievement of surveillance indicators. This evaluation will describe the implementation of the tuberculosis disease surveillance system based on aspects and attributes of the surveillance system. The quantitative approach was conducted through a review of tuberculosis surveillance reports in health care facilities in DKI Jakarta Province. The qualitative approach was conducted through interviews using a questionnaire.

2.2 Population

The population counted in the Tuberculosis surveillance system evaluation activity is all health service units in DKI Jakarta Province in 2023. The health service units are Puskesmas, Hospitals and Clinics both owned by the government and private sector that reported Tuberculosis cases in January 2021-December 2023 in DKI Jakarta Province.

2.3 Sample

The sampling method taken was purposive sampling by involving the network under the DKI Jakarta Provincial Health Office. Where the criteria for officers who understand Tuberculosis surveillance consist of Tuberculosis Program Holders at the DKI Jakarta Provincial Health Office, Thousand Islands Health Office, North Jakarta City, East

Jakarta City, Koja Hospital, Cengkareng Hospital, Cilincing Health Centre, Kelapa Gading Health Centre, Kramat Jati Health Centre, and Cakung Health Centre.

2.4 Types and Methods of Data Collection

Primary Data

Data collection is carried out by direct interviews with selected respondents, this technique is carried out using a list of questions to be answered with the aim of knowing the variables related to system aspects, main functions, supporting functions and surveillance attributes to respondents.

Secondary Data

Data collection was conducted by observing documents related to tuberculosis surveillance at the health office and surveillance personnel of selected health facilities.

3. Results

The results of the evaluation of the tuberculosis disease surveillance system in DKI Jakarta Province are described in several indicators. These include the condition of TB disease in DKI Jakarta Province, the achievement of surveillance objectives, surveillance performance indicators, and the structure of the TB disease surveillance system.

3.1 TB Condition in DKI Jakarta Province

Based on SITB data for DKI Jakarta Province in 2023, the total number of TB suspects and all positive TB cases found was 60,420 cases (111%). Where 59,217 cases of Drug Sensitive TB and 1,203 cases of drug resistant TB. Meanwhile, in terms of population, the number of TB cases is 535 out of every 100,000 population. In addition, according to the Indonesian TB dashboard, the success rate of TB treatment in 2023 is 81%. This figure is measured by counting the number of TB patients who recover and complete treatment among all TB cases reported and treated.

Despite the achievement of the 2023 case finding target, the treatment success rate for Drug Sensitive TB and drug resistant TB has not reached the target set by the Ministry of Health. The target of 90% for successful treatment of drug-sensitive TB was only 81%. Meanwhile, the successful treatment of drug resistant TB was targeted at 80% and only 58% was achieved. This is also in line with the number of patients treated with patients found. The treatment start rate for patients with drug-sensitive TB was targeted at 100% and only 86% of patients treated were found. The treatment initiation rate for Drug Resistant TB patients was targeted at 100% and only 78% was achieved.

3.2 Achievement of Tuberculosis Surveillance Objectives

According to Minister of Health Regulation No. 67/2016 on Tuberculosis Control, TB surveillance is one of the activities to obtain epidemiological data required in the information system of the TB control programme. To achieve the goal of Tuberculosis Surveillance, the DKI Jakarta Health Office has conducted surveillance activities that result in the availability of information on the situation, trends of tuberculosis disease, and its risk factors as well as problems related to tuberculosis disease and its influencing factors, the implementation of early vigilance against the possibility of an outbreak and its impact, the implementation of outbreak investigation and response, and the delivery of tuberculosis disease information to interested parties(Reid et al. 2019).

3.3 Tuberculosis Surveillance Performance Indicators

DKI Jakarta Province became the fifth province with 60,420 TB cases (111%), with 59,217 cases of Drug Sensitive TB and 1,203 cases of drug resistant TB. Other performance indicators are still below the target, namely for the success rate of treatment of Drug

Sensitive TB at 81% of the target of 90%, the success rate of treatment of Drug Resistant TB at 58% of the target of 80%, the achievement of positive numbers of Drug Sensitive TB who started treatment (Enrollment TB SO) at 86% of the target of 100%, The positive rate of drug-resistant TB who started treatment (RO TB enrolment) was 78% of the target of 94%, the coverage of tuberculosis preventive therapy (TPT) in household contacts was 5.5% of the target of 58%, and the achievement of the index of cases (all cases) conducted contact investigations was 21% of the target of 90%.

3.4 Structure of Tuberculosis Surveillance System

The surveillance system consists of legal aspects, surveillance networks and partnerships, and implementation (organisational structure).

Regarding the legal aspects based on the results of interviews with TB program holders at puskesmas, hospitals and sub-districts, it was found that there were 2 officers (22%) who did not know the regulation while 7 officers (78%) knew the regulation.

Based on SITB data DKI Jakarta Health Office in 2023 has 1138 networks. Which consists of 196 Hospitals (17%), 331 Puskesmas (30%), 602 DPM / Clinics (53%) in DKI Jakarta.

TB Surveillance Implementers in sub-districts, health centres and hospitals all have surveillance officers (100%).

3.5 Main Functions

The Main Functions consist of Detection of Risk Factors and Cases, Collection and Recording, Reporting, Data Analysis and Interpretation, Dissemination, and Response or Feedback.(Zignol et al. 2012; Qin et al. 2021)..

An indicator of good detection of risk factors and cases is the detection of TB cases carried out with criteria in accordance with the technical guidelines for TB control. TB case finding in DKI Jakarta Province in 2023 exceeded the target of 60,420 cases (111%).

Collection and recording of TB cases at SITB, out of 9 respondents, 2 officers (22%) have not collected and recorded cases, and 7 officers (78%) have collected and recorded TB cases.

Reporting of TB cases out of 9 respondents, 2 respondents (22%) did not report cases properly and on time, and 7 respondents (78%) reported cases properly and on time.

Data Analysis and Interpretation has been carried out but out of 9 respondents, 3 respondents (34%) have not analysed and interpreted data, and 6 (66%) have analysed and interpreted data.

Dissemination has been done but out of 9 respondents 1 respondent (11%) has not disseminated, while 8 respondents (89%) have disseminated..

Likewise with Response or Feedback, it is known that 1 respondent (11%) has not done feedback on the results of the report, while 8 respondents (89%) feedback on the results of the report.

3.6 Supporting Functions

Supporting Functions consist of Standards and Guidelines, Training, Supervision, Monitoring and Evaluation, and Resources(Organisation 2020, 2021).

In Standards and Guidelines, out of 9 respondents, 3 respondents (34%) did not have TB disease guidelines/standards, while 6 respondents (66%) had TB disease guidelines/standards.

A total of 4 respondents (44%) had never attended TB disease surveillance training, while 5 respondents (56%) had attended TB disease surveillance training.

Supervision, monitoring and evaluation are carried out by the Dinas, Sub-Department and Puskesmas at least twice a year or every semester. However, from the

results of the interview there were still 1 respondent (11%) who did not have Supervision, Monitoring and Evaluation. Meanwhile, 8 respondents (89%) had been supervised, monitored and evaluated by either the Dinas or Sudin.

Resources are indeed very necessary to carry out TB disease surveillance. Surveillance officers, especially TB surveillance, out of 9 respondents, 5 respondents (56%) already have surveillance officers, while 4 respondents (44%) do not have surveillance officers.

3.7 Surveillance System Attributes

Surveillance System Attributes consist of Simplicity, Completeness, Timeliness, Acceptability, Representativeness, and Usability.

Of the 9 respondents, 8 respondents (89%) considered the operational definition of TB disease, data collection procedures, recording and reporting of TB cases, data collection, methods of processing and analysing data, methods of delivering information/data on TB cases easy to do. While 1 respondent (11%) considered it not easy to do.

In supporting data completeness, 8 respondents (89%) routinely collected, registered and recorded cases, while 1 respondent (11%) did not routinely collect, register and record cases.

Timeliness in reporting is very important in the surveillance system. 3 respondents (34%) did not record and report cases on time, while 6 respondents (66%) recorded and reported cases on time.

Acceptability reflects the willingness of individuals and organisations to participate in the surveillance system. It was found that all networks (100%) have participated in the TB disease surveillance system.

Data quality is an important part of being representative. Data quality is also influenced by the clarity of surveillance forms, the quality of training and supervision of people completing surveillance forms, and the care taken in data management. Based on the interview results, 7 respondents (78%) stated that the networks under them reported TB cases routinely and had described all TB cases in the work area. Meanwhile, 2 respondents (22%) stated that the networks below them had not reported TB cases routinely and had not described all TB cases in the work area. This occurred because there was still a delay in reporting TB cases from the network.

Based on the results of the interviews, 8 respondents (89%) stated that TB surveillance is useful for controlling TB cases, can see trends in TB disease problems, can be used to see the success of TB control programmes, can be used as a reference in conducting programme planning, and can be used as research data to find prevention and control of TB disease, While only 1 respondent (11%) did not state that TB surveillance is useful for controlling TB cases, can see trends in TB disease problems, can be used to see the success of TB control programmes, can be used as a reference in conducting programme planning, and can be used as research data to find prevention and control.

4. Discussion

Evaluation of the TB surveillance system in DKI Jakarta Province shows that the system has made a major contribution to case finding and the collection of necessary epidemiological data. Based on data from the Tuberculosis Information System (SITB) in 2023, the number of TB cases found reached 60,420 or equivalent to 111% of the case finding target. DKI Jakarta recorded 535 TB cases per 100,000 population, indicating that TB remains a significant health problem in the region. Although the case finding target was achieved, the evaluation revealed

that treatment success was still far from the Ministry of Health's target. Treatment success for drug-sensitive TB (OS-TB) reached only 81% of the 90% target, while treatment success for drug-resistant TB (DR-TB) was even lower at 58% of the 80% target. The significant difference between cases found and those receiving optimal treatment indicates the need for improvements in treatment programme achievements to reduce transmission and improve population-level health outcomes.

TB surveillance in DKI Jakarta has performed various functions in TB control, particularly through the provision of situational information, trend monitoring, and risk and outbreak detection. These functions are very important in public health management, especially for developing more targeted policies and intervention programmes. Although surveillance has fulfilled its role in collecting data and reporting, the effectiveness of this system still needs to be improved, especially in implementing early vigilance and response to the risk of outbreaks.

In terms of performance, Jakarta ranks fifth nationally in TB case finding. However, several other performance indicators such as TB-SO treatment success, coverage of Tuberculosis Preventive Therapy (TPT) for household contacts, and coverage of contact investigations, are still far below the target. For example, the coverage of TPT for household contacts is only 5.5% of the target of 58%, and the coverage of contact investigations is only 21% of the target of 90%. These shortcomings in the coverage of preventive services indicate that TB management has not been optimal in breaking the chain of transmission, and strategies are still needed to increase achievements for better TB control effectiveness.

Structurally, the TB surveillance system in Jakarta is well established through legal, networking and organisational aspects. The evaluation shows that most surveillance officers in puskesmas, hospitals, and sub-districts have understood the applicable regulations. The TB surveillance network in DKI Jakarta covers 1,138 health facilities consisting of hospitals, health centres, and clinics. Although this network is already quite extensive, consistent and optimal implementation in the field still needs to be encouraged so that every element in the system can work well. This is especially important because some surveillance officers still show limitations in understanding or applying existing rules and procedures.

The implementation of the main surveillance functions, such as detection of risk factors and cases, data collection, analysis, and dissemination, has been going well, but there are still obstacles in some aspects. Based on interviews, some officers have not recorded and reported cases in a timely manner, and others have not been consistent in data analysis and interpretation. These issues suggest that the core functions of TB surveillance in Jakarta need to be improved to ensure consistency in implementation in the field. High case detection rates demonstrate the system's ability to find cases, but timely collection and reporting and consistent data analysis will strengthen the response to TB dynamics in the community(Burke et al. 2021; Dodd et al. 2021).

The supporting functions of surveillance, such as standards and guidelines, training, supervision, monitoring, and resource availability, also require development.(WHO 2021). In terms of guidelines, some officers still do not have specific guidelines or standards in handling TB, and almost half of surveillance officers have never attended TB surveillance training(Siregar 2018; Kurniawan, Rintiswati, and Pramono 2015). Although supervision and monitoring are conducted at least twice a year, there are reports from some officers that they have not received any supervision. In addition, the lack of human resources in the surveillance field is still an obstacle(Kurniawidjadja et al. 2021). However, some health facilities in Jakarta

still lack specialised staff for TB surveillance, which affects the effectiveness and speed of case management.

Important attributes of surveillance systems, such as simplicity, comprehensiveness, timeliness, acceptability, representativeness, and usefulness, were rated favourably(JUSTUS, Salibi, and Tzenios 2023; Boes et al. 2020). Most officers found the system easy to use, although some still felt that the procedures were not simple enough. Data representativeness was also considered good, but some officers reported delays in reporting cases from lower networks. TB surveillance is considered useful for TB case control, trend monitoring, programme planning, and research, although a small number of officers were unsure of the benefits of surveillance.

Overall, the TB surveillance system in DKI Jakarta has yielded positive results in terms of case finding, but improvements are still needed in terms of treatment and prevention coverage. Strengthening the basic and supporting functions of surveillance, as well as improving resource capacity and training, will be critical to achieving the TB control targets set by the Ministry of Health.(Kruk et al. 2018). Implementation of stronger networks and supervision is also expected to improve data quality, reporting speed, and effectiveness of TB control in DKI Jakarta.

5. Conclusion

Overall, this evaluation shows that the TB surveillance system in DKI Jakarta has achieved significant results in case finding, but still needs improvement in aspects of treatment and surveillance coverage. Strengthening the basic and supporting functions of surveillance, as well as increasing resources and training officers, is needed so that TB control targets can be achieved as expected by the Ministry of Health. In addition, strengthening networking and supervision is also important to ensure complete, timely and representative data to support effective TB control.

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