

## Quality of TB Surveillance System in Health Office of Mojokerto District Based on System and Attributes

<sup>1</sup>Riky Hamdani, <sup>2</sup>Arief Hargono, <sup>3</sup>Purwo Atmodjo,

<sup>1&2</sup>Department of Epidemiology, Faculty of Public Health, Airlangga University, Indonesia

<sup>3</sup>Sumber Glagah Leprosy Hospital, Indonesia

### Abstract

**Background:** Tuberculosis (TB) is one of the health problems in Mojokerto. The number of TB cases in Mojokerto district was 78/100,000 in 2015 and case detection rate value hasn't reach 70% yet. Those problems would not actually happen if the surveillance gose well. The purpose of this study was to describe the problem of TB surveillance system based on the system and attributes as well as provide an alternative solution. **Method:** This research was a descriptive study with evaluation study design. This study was conducted in 21 Public Health Centers (PHC) and Mojokerto District Health Office. Data were collected through interviews with TB officer in 21 PHC and Mojokerto District Health Office, using questionnaires, and document analysis against TB data reports. Weaknesses were found in the TB surveillance system based on system components were 28,57% of officers still have not got the training, all officers holding >2 programs, the lack of computers and internet availability, the report accuracy was only 30% and completeness report only 80%, the data did not analyze by officers. While the weakness of TB surveillance systems on attributes were the lack of patient awareness in the check-up, the feedback was more than 3 months, the damage of information systems tuberculosis integrated > 1 time in a year and repair duration more than 1 week. **Suggestion:** Problem of TB surveillance system in Mojokerto regency contained in the system and attributes. Alternative issues for strengthening the surveillance system are the Department of Health training to health center officers, and monitoring as well as referrals to PHC that have problems in reporting.

**Keywords:** Tuberculosis, Surveillance, System, Attribute.

### I. INTRODUCTION

Tuberculosis has become one of the diseases that tackling it becomes a global commitment in SDGs. TB control in Indonesia uses DOTS strategy since 1995 which aims to break the transmission and reduce the incidence of TB in the community<sup>1,2</sup>. To assess the progress or success of the TB control program, several indicators were used. Indicators used in national TB prevention were Case Detection Rate (CDR) and Success Rate (SR)<sup>1</sup>. The minimum target achievement of national CDR is 70% and the minimum target achievement of national SR is 85%<sup>1,2</sup>. Indonesia is now ranked second under India and above China with the country with the highest TB burden in the world. By 2014, there were 9.6 million new TB cases (133 per 100,000 population) and 1.5 million deaths due to TB, including 0.4 million deaths among people who were HIV positive<sup>3</sup>.

East Java Province is one of the largest contributors to the number of pulmonary TB patients in Indonesia. In 2012, the CDR rate was 63.03% with the number of new cases (positive and negative) as many as 41,472 patients and new positive Acid-Fast Bacillus (AFB) as many as 25,618 cases. In 2012, there are 20 districts/cities that have not achieved the 70% CDR target<sup>4</sup>.

Mojokerto is one of the district in East Java that have not reach the CDR Target. The number of TB cases in Mojokerto District from 2011-2015 always decrease every year. The number of cases in 2011 reached 106/100,000 population while in 2015 fell to 48/100,000 population. In 2011 the CDR reached 65% of target while the CDR until September 2015 only reached 29.34% of target<sup>5</sup>. The CDR in January 2011 - September 2015 can be seen in Figure 1 below:

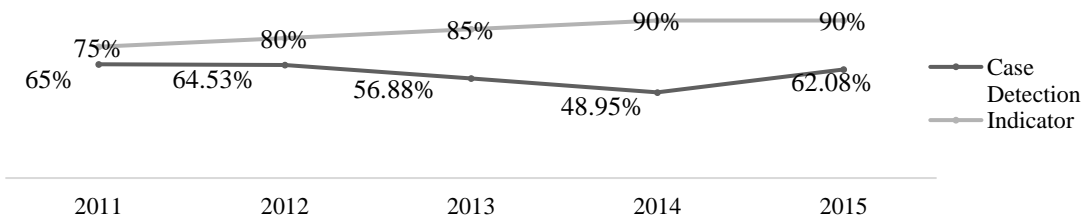


Figure 1. New Case Detection Rate of Pulmonary Tuberculosis in 2011-September 2015

The emergence of these problems will not actually happen if the implementation of epidemiological surveillance in the region goes well. According to Nelson and Sifakis (2007), surveillance is not only used to count the number of cases, but also as a tool to describe the population at risk, eradicate the disease, and prevent the spread of disease. Through the availability of data or the valid and accurate information will certainly produce the control programs or disease eradication that more effective and efficient<sup>6</sup>.

Supporting the success of tuberculosis prevention programs requires epidemiological data of TB disease. The data can be obtained through TB epidemiology surveillance. TB surveillance serves to provide valid data for health management to determine appropriate action in TB control<sup>7</sup>. As well as contributing to help improve case management as well as monitoring of TB programs<sup>8</sup>.

Therefore, it was required an evaluation of the implementation of TB surveillance in Mojokerto DHO based on surveillance system and surveillance attribute. The surveillance system should be periodically evaluated and need to generate recommendations for improved quality, efficiency and expediency of surveillance based on the evaluation results (CDC, 2001). The purpose of this study was to describe and evaluate the system components and attributes of TB surveillance in Mojokerto DHO 2016.

## II. METHODS

This research was a descriptive research with evaluation study design by assessing system component and attributes of TB surveillance in Mojokerto DHO. System components consist of input, process and output while attribute components consist of simplicity, flexibility, acceptability, sensitivity, representativeness, timeliness, data quality, and stability. The research informant was the Head Section of Health Eradication of Mojokerto DHO, TB officer of Mojokerto DHO and 21 PHC officers at in Mojokerto District. Primary data was collected by interviewing informants using questionnaire and observation. While the secondary data was obtained through document study or archive of TB epidemiology surveillance data in Mojokerto DHO and Public Health Center. Data analysis was analyzed descriptively. The results obtained are National Guidelines of TB Control Program in 2014, Minister of Health of the Republic of Indonesia Decree No.1116/SK/VIII/2003 on Guidelines of the Implementation of Health Epidemiology Surveillance System and Guidelines of Public Health Surveillance System Evaluation by CDC in 2001.

## III. RESULT

### A. Input

Table 1. Description of Input Components of Tuberculosis Surveillance System at PHC and DHO in Mojokerto

Component		Level	Criteria
Quality of human resources		DHO	Qualify
		PHC	Not eligible
Quantity of human resources		DHO	Not eligible
		PHC	Qualify
Fund		DHO	Less
		PHC	Less
Facilities of surveillance	Computer hardware	DHO	Available
		PHC	Available
	Communication tool	DHO	Available
		PHC	Available
	Operating procedure	DHO	Available
		PHC	Available
	Application program	DHO	Available
		PHC	Available
	Transportation	DHO	Available
		PHC	Available
	Form	DHO	Available
		PHC	Available

Assessment of the input component of the TB surveillance system at the Mojokerto DHO was conducted on human resources, funds and facilities in Mojokerto DHO to support TB surveillance system. Description of Input Components of Tuberculosis Surveillance System at PHC and DHO in Mojokerto can be seen in Table 1.

**B. Process**

Data collection at DHO and PHC levels was collected passively and collected once every 3 months, this was in accordance with the Minister of Health of the Republic of Indonesia Decree No.1116/SK/VIII/2003 on Guidelines for the Implementation of Health Epidemiology Surveillance System. Processing and analyzing TB surveillance data were only done at DHO level while at PHC level are just doing data collection. However, the analysis conducted at DHO level was still not optimal due to the delay of several PHC in collecting data. The accuracy was only 30% and completeness report only 80%, while the accuracy standard is 80% and completeness standard is 90%.

**C. Output**

The data information produced by Mojokerto DHO and PHC are in accordance with the existing indicators in the epidemiology and can be utilized by other parties. Dissemination of information has been done by the DHO once every three months to the East Java Provincial Health Office (PHO) through Integrated tuberculosis information system (ITIS) and PHC also has been doing every 3 months to the DHO even though there are some PHC that experienced delays. Feedback is done by the DHO through *WhatsApp Application* in reminding for any PHC that has not done data reporting.

**D. Simplicity**

The simplicity of a surveillance system includes simplicity in terms of structure and ease of flow of reporting and operation. The surveillance system should be designed as simple as possible, but still achieving the desired goals<sup>12</sup>. The evaluation results of simplicity components on TB Control Program in Mojokerto DHO can be seen in Table 2.

Table 2. The Evaluation Results Of Simplicity Components on TB Control Program in Mojokerto DHO

Criteria	Results	Classification
Diagnosis	Diagnosis is easy because in the diagnosis of TB, clinical symptoms are seen there are symptoms of cough more than 2 weeks.	Simple
Availability of personnel and infrastructure	There is a lack of staff in TB program management	Not simple
Data collection and reporting flow	Easy	Simple
Use of Laboratory	Using Lab results in diagnosis enforcement	Not simple

**E. Flexibility**

A flexible surveillance system can adapt to changes in required information or implementation situations without a meaningful increase in the need for cost, labor and time. Flexible systems can accept, for example, newly identified disease and health problems, change of case definitions, and variations from reporting sources<sup>12</sup>.

The evaluation results of flexibility components on TB Control Program in Mojokerto DHO can be seen in Table 3.

Table 3. The evaluation Results of Flexibility Components on TB Control Program in Mojokerto DHO

Criteria	Results	Classification
Implementation of ITIS	There is no additional cost, power and time	Flexible
Implementation of TB-HIV case finding	There is an additional need for funding the procurement of reagents and additional time for diagnosis	Not flexible

**F. Acceptability**

Acceptability describes the willingness of a person or organization to participate in conducting surveillance systems. The evaluation results of acceptability components on TB Control Program in Mojokerto DHO can be seen in Table 4.

Table 4. The Evaluation Results of Acceptability Components on TB Control Program in Mojokerto DHO

Criteria	Results	Classification
TB check up	Less willing	Not acceptable
Supervisor taking medicine	Willing	Acceptable
Participation in data collection	Willing	Acceptable
Participate in carrying out data collection	Willing	Acceptable
participation in information dissemination	Willing	Acceptable
Participation in feedback	Feedback is done only 6 months and attendance done with social media through Whatsapp	Not acceptable

#### G. Sensitivity

Sensitivity is the ability of the system to be able to capture accurate information data<sup>12</sup>. The sensitivity in TB surveillance aims to detect the proportion of cases and monitor change of case at any time, especially in the quarter. Indicators used in sensitivity assessment are seen from timely data processing. Data processing has been done regularly in three months. However, the delay in some PHC in sending the report becomes obstacle in doing data processing so that the data processing done quarterly routinely sometimes does not show the actual number of cases. In addition, lack of funding for case detection also affected the sensitivity of the TB system, as lack of funding led to less optimal TB case finding by officers, which resulted in the number of cases found not showing actual cases.

#### H. Representativeness

Representative means it can accurately describe various events or health events at all times including their dissemination in the population by time and place<sup>12</sup>. Data processing by Mojokerto DHO and PHC in Mojokerto District were representative because those has been processed based on the place and time.

#### I. Timeliness

Timeliness means the rate of speed or delay between the steps that must be taken in a surveillance system. In addition, the time required to determine trends (trend), outbreak, or assess the influence of efforts to overcome<sup>12</sup>. The evaluation results of Timeliness components on TB Control Program in Mojokerto DHO can be seen in Table 5.

Table 5. The Evaluation Results of Timeliness Components on TB Control Program in Mojokerto DHO

Criteria	Results	Classification
Case finding of the reporting unit	There is still a reporting unit reporting data over 3 months and the case finding is only 62.08%	Not on time
Analysis and interpretation of data	Always done every 3 months	On time
Information dissemination and feedback	Information dissemination is done once every 3 months & feedback monitoring and evaluation is done only 2 times a year	Not on time

#### J. Data quality

The quality of data in TB surveillance in Mojokerto DHO is high because of the absence of data gaps found. The absence of this data void is due to the reporting system using the ITIS system. The use of this ITIS system does not allow officers to not fill all the existing formats because the system will not input when there is a data void in the format.

#### K. Stability

The stability in TB surveillance system is still unstable, because there is still an error in the system and the recovery takes more than 24 hours. The average time required in system repair is approximately 1 week.

#### **IV. DISCUSSION**

##### **A. Input**

Human resources at the DHO has one TB officers who have been trained. The quality of human resources at the level of the Health Service has qualified in quality but still not qualified in quantity. Because in Mojokerto District has 27 PHC, ideally 1 TB officer only handle 20 PHC. At the level of Microscopic Referral Public Health Centers (MRPHC) and Satellite Public Health Centers (SPHC) in terms of quantity of 100% human resources have been eligible but 28.57% of officers still have not received training.

The number of personnel in Mojokerto District is accordance with Minister of Health of the Republic of Indonesia Decree No.364/MENKES/SK /V/2009 in terms of quantity. However, based on the quality of TB Disease Control Division Officer was still not enough because there are still many officers who have a high enough workload, so the Implementation of TB Control Program still less than the maximum. Based on its main tasks and functions, none of the TB officers specifically handle TB surveillance. All officers have additional tasks such as Hajj officers, treasurers and some programs that exist in the PHC.

The funding of TB surveillance at the DHO level or at the PHC level is still inadequate. This is because the TB surveillance fund only comes from regional budget in Mojokerto District and has to be subdivided with HIV and Leprosy program. The lack of funds for TB surveillance implementation had an impact on the lack of home visits in terms of contact tracking and counseling. The importance of funding factors to health development programs delivered by Akhirani (2004) which states the existence of a link between funding factors and health development. The amount of fund allocation is one of strategic element in health development. The availability of a number of specific funds and a good utilization of the funds allocation and efficient usage will support the success of health development<sup>9</sup>.

##### **B. Process**

Data analysis is performed to see the development and program progress after data are collected and presented. Analysis suggests why these findings arise and what factors are dominantly causing this<sup>10</sup>. According to Bhisma murti (2007), continuous and systematic data analysis can generate epidemiological information that really needed in epidemiological surveillance. The results of the analysis that ultimately produce epidemiological information need to be disseminated to those responsible for the prevention of disease and other health problems<sup>11</sup>.

##### **C. Output**

Epidemiologic information generated in the form of existing indicators in the TB Control program. Several indicators included in the TB control program were CDR, SR, Suspect screening rate, the proportion of positive AFB of TB patients among the suspected sputum examination, the proportion of positive AFB of TB patients among all pulmonary TB patients was recorded/treated, proportion of childhood TB patients among TB patients, case notification rate (CNR), conversion rate, cure rate, error rate<sup>1</sup>.

##### **D. Simplicity**

The implementation of TB surveillance in Mojokerto District Health Office was still not simple because there was a lack of staff in terms of program management quality and the use of the Lab in terms of making the diagnosis. However, in terms of the reporting and diagnosis of TB surveillance are simple.

Diagnosis of TB is easy because in the diagnosis of TB, clinical symptoms seen only symptoms of cough more than 2 weeks. In the diagnosis of tuberculosis besides being seen from clinical symptoms in patients, diagnosis of laboratory results was also performed to determine BTA (+) in TB patients. So that required laboratory services in the diagnosis<sup>1</sup>.

##### **E. Flexibility**

In general, ITIS program to implement the TB surveillance system in Mojokerto regency has not been flexible because there is still need training and computer procurement for the implementation of this system so that required additional cost in system implementation. However, the ITIS program is considered to be more accelerating in the implementation of TB surveillance, especially for the implementation of data collection.

The implementation of TB-HIV case finding is still not flexible in the implementation of TB surveillance in the Mojokerto DHO. Case finding of TB-HIV cases requires additional costs, especially for procurement of reagents for HIV testing. In addition, the procurement of reagents also require a very expensive cost so that usually PHC only

given a maximum of 20 reagents. In addition, the DHO also stated that the addition of time in the implementation of TB-HIV case finding due to HIV testing also requires laboratory confirmation in diagnosis enforcement.

#### ***F. Acceptability***

Acceptability in Mojokerto District still not acceptable because there are still some indicators that were not acceptable such as the patient's willingness to check themselves and the lack of frequency in feedback. Acceptability were seen only from indicators of Supervision of taking medicine willingness, data collection and participation in information dissemination.

According to the concept of Health Belief Model (HBM), the first condition that determines a person to behave towards his health is if a person feels threatened by a disease. These feelings are threatened when there is a perceived vulnerability and severity caused by the disease. So the ability to recognize the symptoms of the disease is very important in this case<sup>13</sup>.

The success of pulmonary TB treatment is largely determined by the regularity of taking anti-tuberculosis drugs<sup>14</sup>. This can be achieved by the presence of a medication watchdog who monitors and reminds people with pulmonary TB to take medication regularly. The supervisor of taking medicine is very important to assist the patient to achieve optimal results<sup>15</sup>. Collaboration of health workers with families who are appointed to assist when the patient is taking medication, as well as factors that need to be evaluated to determine the level of success<sup>16</sup>.

#### ***G. Sensitivity***

According to Romaguera, et al (2000), sensitivity measurements require the validity of the data that has been collected<sup>17</sup>. According to Nelson and Sifakis (2007), a well-sensitive surveillance system is essential to monitor disease trends<sup>6</sup>.

#### ***H. Representativeness***

According to Nelson and Sifakis (2007), presentation of endemic infectious disease data is essential for assessing the progress or decline of health status in a community. If surveillance reports are not representative, they can affect disease prevention programs<sup>6</sup>.

#### ***I. Timeliness***

Based on the indicators assessed, the timeliness in the surveillance system was still not accurate, it was seen from the presence of PHC that delay in reporting case and still not reaching CDR target. Based on Minister of Health of the Republic of Indonesia Decree No.364/MENKES/SK/V/2009, TB reporting indicators minimally conducted quarterly with case detection at least 70%. In addition, there was still a lack of feedback frequency that done only 2 times a year in the form of evaluation monitoring. Based on Minister of Health of the Republic of Indonesia Decree No.364/MENKES/SK/V/2009, the minimum feedback is done at least every 3 months<sup>1</sup>.

#### ***J. Data quality***

Data quality is an important part of representation. Data quality describes the completeness and validity of the data recorded in the public health system. Data quality can be seen from the "unknown" or "empty" percentage of items on the surveillance form. High quality data will have a low percentage of such responses<sup>12</sup>.

#### ***K. Stability***

Stability refers to the ability to collect, manage, and provide data without error and the ability of the system to operate when needed<sup>12</sup>.

### **V. CONCLUSIONS**

The problems found on input, process and output components in TB surveillance system in Mojokerto District. The problems of input found on the human resources of the Fund. Human resources problems caused by multiple tasks and lack of training. The problems at the funds is no funds specifically for the TB program. The greatest problems of the process is the completeness and timeliness. The accuracy was only 30% and completeness report only 80%, while the accuracy standard is 80% and completeness standard is 90%. Problems in the output are still lack of frequency of feedback in the implementation of monitoring and evaluation. Problems based on the attributes of TB surveillance system were still not simple, not flexible, not acceptable, not sensitive, not timely and the lack of stability data.

## VI. RECOMMENDATION

1. Provide training for P2TB officers who have not received training on TB control, eradication and surveillance programs.
2. Strengthen commitment and cooperation and good communication between District Health Officers and provincial officers to improve timeliness and completeness of reports in TB surveillance.
3. Perform the procedure either the collection, analysis, recommendations to feedback in TB surveillance systems in accordance with standard operating procedures in a timely manner.
4. Conduct monitoring and guidance on PHC that still have problems in TB surveillance report
5. Improve communication with the Provincial Health Office and the Ministry of Health in improving the IT IS.

## ACKNOWLEDGMENTS

The Authors sincerely say thanks to the chief of Health Office and TB officers of Public Health Center in Mojokerto District who have taken part in this research.

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