

Evaluation of Tuberculosis Surveillance System in North Sumatra Provincial Health Office 2022

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ABSTRACT

Tuberculosis Global Report 2021 TB was being the major death caused by one infection agent. Result of health problem analysis in North Sumatra Provincial Health Office, TB was chosen as the first priority with main determinant low treatment coverage TB. The purpose of this study is to know the implementation of surveillance TB system based on system approach and evaluate based on surveillance attribute in North Sumatra Provincial Health Office 2022. The type of research is descriptive with evaluation design. Subject of the research was surveillance TB system has been implemented in North Sumatra and Deli Serdang Health Office District in 2021 with TB officer in Health Office. Data collected by interview with TB officer using questionnaire and supported by document study. Evaluation was doing by system approach and based on surveillance attribute. The data interpreted by narration and table. Results of evaluation system component TB in Health Office in Provincial and District obtained that implementation system of TB was appropriate with surveillance guidelines and TB control guidelines by Ministry of Health. Based on attribute evaluation, from 9 attributes Health Office Provincial and District got 5 attributes with good results means that TB surveillance program was simple, acceptable, good data quality, sensitive, and stable but the surveillance program was not flexible, low predictive value positive, not timeliness, and not representative. Based on the evaluation results, TB surveillance system in North Sumatra Provincial Health Office and Deli Serdang District Health Office has a good system based on input, process, and output. Based on attribute surveillance, its still need some improvements in terms of increasing predictive value positive by doing screening people before TCM examination and analysis of cases by person place and time so the data would be representative and describe the real condition

KEYWORDS

Evaluation; surveillance system; tuberculosis

INTRODUCTION

Tuberculosis (pulmonary TB) is one of the infectious diseases that causes a decrease in health conditions and one of the main causes of death in the world. Pulmonary TB is caused by mycobacterium tuberculosis whose transmission occurs when a person infected with TB releases bacteria into the air (coughing, sputum). This disease usually has an impact on the lungs but can also have an impact on other areas. About 90% of TB cases are found in adulthood and more cases in men than women (World Health Organization, 2021).

It is estimated that there are 10 million new TB cases in the world in 2019 where 56% of cases in men (age > 15 years), 32% in women, and 12% in children (ages 0-14 years). The

area with the most TB cases in 2019 was the Southeast Asian region (44%), African region (25%) and the West Pacific region (25%). In the whole three cases of TB cases donated by 8 countries with the most TB burden, namely: India, Indonesia, China, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa (World Health Organization, 2021a).

Tuberculosis is the main cause of death in the world caused by an infectious agent, the main cause of death of people with HIV and the cause of death is due to antibiotic resistance. Although it can be prevented and treated, in 2019 as many as 208,000 deaths in people with HIV-TB. The highest death case report was reported from the African and Southeast Asian regions (World Health Organization, 2021a).

The mortality rate due to TB globally decreased by 45% from 2000 to 2019, but still had not reached the SDGs 2030 target that the decline in death due to TB was 90%. Only European regions are in accordance with the target to reach a decline of 35%, namely by reducing the death of TB karwna by 31% from 2015 to 2019 (World Health Organization, 2021).

Indonesia is ranked 2nd with the highest TB sufferers in the world after India. In 2020 the number of tuberculosis cases found by 351,936 cases, decreased when compared to all TB cases found in 2019, which was 568,987 cases. The highest number of cases was reported from the provinces with a large population, namely West Java, East Java and Central Java. Tuberculosis cases in the three provinces almost reached half of the total number of tuberculosis in Indonesia (46%). Based on Indonesia's health profile in 2020, Indonesia's Treatment Coverage (TC) was 41.7%. This figure is still far from the target set by the Ministry of Health, which is 80% (Kementerian Kesehatan RI, 2020).

The results of the analysis of health problems conducted at the North Sumatra Provincial Health Office in 2022 were obtained by TB as a priority for health problems in North Sumatra Province. Determinants of the problems in the TB program are related to the low scope of the discovery and treatment of TB cases in 2021 (34.48% of the 80% target). TB TREATMENT TB in North Sumatra Province in 2021 experienced a decline compared to the previous year, namely in 2020 treatment coverage of 35.77%.

TB prevention activities are carried out in an integrated manner through collaboration activities between related programs. One effort to overcome TB through TB surveillance activities. TB surveillance is a continuous systematic monitoring and analysis of data and information about the incidence of TB diseases or health problems and conditions that influence it to direct effective and efficient prevention measures (Kementerian Kesehatan, 2016).

The importance of surveillance system evaluations actively and passively is carried out to ensure that health problems are monitored effectively and efficiently. Evaluation is also important in presenting recommendations to improve the quality, efficiency, and use of the surveillance system. Based on the background above, this study aims to determine the description of the implementation of the TB surveillance system based on the system approach and evaluate performance based on surveillance attributes at the North Sumatra Provincial Health Office in 2022.

RESEARCH METHODS

This research is a study with a descriptive study design with an evaluation study design. The study was conducted at the North Sumatra Provincial Health Office in May to August 2022. The research subjects were the TB surveillance system implemented in the North Sumatra Provincial Health Office throughout 2021. Respondents in this study were TB program officers at the North Sumatra Provincial Health Office and TB program officers in the Deli Serdang District Health Office. This study uses primary data and secondary data. Primary

data is collected by interview with respondents using research instruments, namely questionnaires and secondary data using document studies and supporting literature.

Evaluation is carried out based on a system approach and surveillance attributes. Based on the system approach, the evaluation carried out consists of input, process, output. Based on the surveillance attributes, the evaluation conducted consists of simplicity, flexibility (flexibility), acceptability, data quality (data quality), sensitivity (sensitivity), positive predictive value (positive prediction value), timeliness (data accuracy), representative (stability). The evaluation of the system is carried out by comparing the conditions in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office with the provisions set by the Ministry of Health in the surveillance. Evaluation of surveillance attributes, namely simplicity, flexibility, acceptability, data quality, sensitivity, positive predictive value, timeliness, and stability are divided into two categories, namely good if the total value is $\geq 80\%$ and not good if the total value $< 80\%$. The division of categories in these attributes is based on guidelines from the Ministry of Health regarding the implementation of health surveillance. Representative attributes are divided into two, namely representative if the analysis is carried out based on people, places, and time; and not representative if the analysis is incomplete based on people, places, and time.

Data analysis is carried out descriptively, which describes the system components and surveillance system attributes and presents them in tables and narratives.

RESULTS AND DISCUSSION

Overview of the TB surveillance system in the North Sumatra Provincial Health Office based on the system component is explained in the results below:

Input

The assessment of the input component is carried out on aspects of man, money, and materials that exist to conduct TB surveillance activities. The following is the input component assessment table in the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office:

Table 1. TB surveillance system features based on input components

Assessment Category	Assessment Criteria	North Sumatra Provincial Health Office	Deli Serdang Regency Health Office
Man	Available	Available	Available
	Not available		
Money	Available	Available	Available
	Available		
Material	Not available	Available	Available
	Not available		

The implementation of health surveillance starts from data collection activities, data processing, data analysis, and dissemination to produce objective, measurable, can be compared between time, between regions, and between community groups as decision making material (Kementerian Kesehatan, 2014). The results of information from TB surveillance activities play a role in the TB control program as information and knowledge that guides in determining strategies, planning, implementation, monitoring, and evaluation of the TB program (Kementerian Kesehatan, 2016).

Based on the Minister of Health Regulation No. 45 of 2014 it is said that the implementation of health surveillance must be supported by the availability of human resources that have competence in the field of epidemiology, adequate funding, and the

necessary infrastructure including the use of appropriate technology. The TB surveillance activity is under the coordination of the Head of the Transmitted Disease Management Section in the Field of Disease Management. Human resources available at the North Sumatra Provincial Health Office for TB programs are 5 people consisting of 1 general practitioner, 1 nurse, 1 analyst, 2 epidemiologists in accordance with Permenkes No. 67 of 2016 concerning Tuberculosis Prevention, Personnel Standards in the Province have a 1 Wasor if oversees more than 20 regencies/cities. Human resources in the Deli Serdang District Health Office have 2 TB officers consisting of 1 graduate of Master of Management and 1 graduate of environmental health in accordance with Permenkes No. 67 of 2016 that the area that has > 20 Fasyankes to have more than 1 Wasor. TB officers at the North Sumatra Provincial Health Office and the Deli Serdang District Health Office have a training history as TB officers, but TB officers in the Deli Serdang District Health Office are double jobs outside the TB program.

In accordance with Permenkes No. 67 of 2016, the financing of TB Prevention Program activities is obtained from the Government Budget (APBN, APBD), grants, and health insurance. Both in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office received sources of financing from the APBN, APBD, and grant funds. All facilities used in the implementation of surveillance activities in accordance with Kepmenkes No. 1116 of 2003 but the facilities used by the Deli Serdang District Health Office still use private property in supporting TB surveillance activities.

Man (Person or Human Resources)

Based on the results obtained, the availability of human resources or TB program officers is available at the North Sumatra Provincial Health Office and also Deli Serdang District Health Office. The number of TB officers in the North Sumatra Provincial Health Office was 5 people who overshadow 33

Regency/city, in addition to serving as a Wasor of TB officers, there are also a role as logistics management staff and TB surveillance staff. TB officers of the North Sumatra Provincial Health Office have a training history held by the Ministry of Health in the form of TOT Training, TB-RO Training, TB-DOTS, TB-DM,

TB-HIV, as well as laboratory training. None Double Job Double Job TB Health Service Officers. Meanwhile TB officers in Deli Serdang District Health Office numbered 2 people who overshadow 34 Health Center. TB officers in the Deli Serdang District Health Office have a training history both organized by the Ministry of Health and by the North Sumatra Provincial Health Office. TB officers in there underwent a double job, namely for the malaria program and leprosy program (Frambusia). There are no obstacles or problems related to officers at there both.

Deli Serdang was due to the assistance of TB officers from the Global Fund assistance fund, which helped reduce the burden on TB officers at the Health Office.

Money

The availability of funds for the implementation of TB surveillance both in North Sumatra Provincial Health Office and in the Deli Serdang District Health Office comes from The Indonesian Budget, Regional Government Budget, and also grant funds. Funds in the North Sumatra Provincial Health Office come from the The Indonesian Budget, namely the Specific Allocation Fund in the health sector, the Regional Government Budget and also the grant funds, namely assistance from the Global Fund. While in Deli Serdang District Health Office, the existing budget came from Indonesia Budget, namely the Specific Allocation Fund in the health sector, Health Operational Assistance,

Regional Government Budget, and also grant funds, namely assistance from the Global Fund. The availability of existing funds for the TB surveillance is not enough for the North Sumatra Provincial Health Office and is sufficient for the Deli Serdang District Health Office. Constraints in the disbursement of funds at the North Sumatra Provincial Health Office are considered quite difficult because of the existing bureaucracy and hamper the implementation of activities, meanwhile there are no obstacles in the disbursement of funds at the Deli Serdang District Health Office.

Infrastructure

Facilities and infrastructure that support TB surveillance activities in the North Sumatra Provincial Health Office and also the Complete Deli Serdang District Health Office and meet the requirements. Equipment used such as recording devices, namely computers/laptops and equipment, communication devices, namely mobile phones and their networks and supporters such as WA Group, Email, and others, transportation tools used are vehicles both two -wheeled and four -wheeled vehicles. Facilities in the North Sumatra Provincial Health Office are some of them are giving/assistance such as transportation facilities, namely cars given by the Ministry of Health and also aid laptops from the Global Fund.

Process

The data collection process at the North Sumatra Provincial Health Office and the Deli Serdang District Health Office was carried out passively. The following is the input component assessment table in the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office:

Table 2. TB surveillance system description based on the process component

Assessment Category	Assessment Criteria	North Sumatra Provincial Health Office	Deli Serdang Regency Health Office
Data collection	Done	Done	Done
	Not done		
Data processing	Done	Done	Done
	Not done		
Data analysis	Done	Done	Done
	Not done		

TB case recording is done by inputting the patient's name to the SITB account (TB Information System Software) and since using a SITB account every recording is done with real time. The North Sumatra Provincial Health Office and the Deli Serdang District Health Office conduct data collection every month to monitor the recording that has been carried out by TB officers in each existing facilities to see whether there are still records that are lacking or have not carried out further activities in handling TB cases such as laboratory examinations, recording of patient drug taking, and others. Data processing and analysis is carried out every quarter and year both by the North Sumatra Provincial Health Office and the Deli Serdang District Health Office with the results of data analysis obtained as a monitoring tool for all Fasyankes in carrying out TB surveillance activities. The obstacles in the implementation of the collection to data analysis are SITB servers that are often down so it is difficult to access when working hours.

Based on Permenkes No. 45 of 2014 data collection is carried out in an active and passive way. Data collection conducted at the North Sumatra Provincial Health Office and the

Passive Deli Serdang District Health Office, namely reports obtained from reports inputted by TB officers in Fasyankes. The data inputted by the TB officer to the SITB account must be complete and there should be no empty. The role of the North Sumatra Provincial Health Office and the Deli Serdang District Health Office is to monitor the filling of data conducted by TB officers in Fasyankes.

Data processing is done by recording data, validation, coding, transform and grouping based on place, time, and people. The results of data processing in the form of tables and graphs according to age, sex, place and time variables. Each of these variables is presented in the form of the right epidemiological size (rate, ratio and proportion). Good data processing will provide specific information of a disease and or health problems. Next is the presentation of processed data in informative, and interesting form. This will help data users to understand the situation presented. Data Processing of the North Sumatra Provincial Health Office and Deli Serdang District Health Office has been carried out and presented in the form of tables and graphs. However, the size of the epidemiology (rate, ratio, and proportion) has not been presented in the form of real numbers.

Data analysis is carried out by descriptive and/or analytic epidemiological methods to produce information in accordance with the established surveillance objectives. Data analysis is not based on epidemiological variables but is related to the achievement of indicators of the program so that the surveillance activities carried out tend to be more directed to the achievement of control program objectives.

Output

The results of data collection activities to data analysis are presented in the form of epidemiological information and disseminated both to cross programs and across sectors. The following is the Assessment Table of Output Components in the TB Surveillance System in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office:

Table 3. Overview of the TB surveillance system based on the output component

Assessment Category	Assessment Criteria	North Sumatra Provincial Health Office	Deli Serdang Regency Health Office
▪ Epidemiological Information	Available	Available	Available
	Not Available		
▪ Information dissemination	Available	Done!	Done!
	Not Available		

Epidemiological information available based on people, places, and time is available through the SITB account based on the results of recording carried out by TB officers in Fasyankes, the epidemiological information is presented in the form of tables and graphs which are then written into reports to be disseminated. Dissemination of information from the Health Office to the relevant Fasyankes is carried out every quarter to monitor the achievement of the results of the activities that have been carried out. Dissemination of cross-sectoral information with related parties such as professional organizations, social service, BPJS is carried out every year using data to achieve the results of activities that have been carried out. The North Sumatra Provincial Health Office sends a letter to the Head of the District/City Health Office in North Sumatra Province as a result of the TB program coverage every year.

Dissemination is done by conveying information to units that need to be followed up; convey information to the program manager as a source of data/surveillance report in

accordance with statutory provisions; and provide feedback to data sources in order to improve data quality. Information dissemination can be conveyed in the form of bulletins, circulars, periodic reports, meeting forums, including scientific publications. Information dissemination is done by utilizing information technology facilities that are easily accessible. Information dissemination can also be carried out if the surveillance officer is actively involved in planning, implementing and monitoring the evaluation of health programs, by delivering the results of the analysis.

Implementation of information dissemination in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office is carried out in quarterly and yearly. Dissemination of information is carried out in a quarterly manner to Fasyankes who input to the SITB account to see the results of the activities carried out. Dissemination of information is carried out by the North Sumatra Provincial Health Office every year by sending a letter to the Head of the Provincial Health Office related to the achievement of the results obtained for one year. Dissemination of information by the Deli Serdang District Health Office by monitoring and evaluating the Fasyankes in its area every quarter. The description of the TB surveillance system in the North Sumatra Provincial Health Office based on the surveillance attributes is explained in the results below:

Simplicity

Simplicity refers to the operational ease of the existing surveillance system. The following is a description of the simplicity of the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office based on the results of interviews with surveillance officers:

Table 4. TB Surveillance System Features Based on Simplicity Attributes

Activities	North Sumatra Provincial Health Office	Deli Serdang Regency Health Office
▪ Validation of data on the results of recording activities	Easy	Easy
▪ Suspected TB, TB treatment activities, TB case tracking activities	Easy	Easy
▪ Monitoring of cross testing	Easy	Easy
▪ Availability of TB Program Personnel	Easy	Easy
▪ Logistics availability	Easy	Easy
▪ Recording and reporting	Easy	Easy
▪ Analysis and interpretation	Easy	Easy
▪ Information dissemination	Easy	Hard
▪ Monitoring and evaluation	Hard	Easy

Based on the results of the interviews conducted, the total value of simplicity attributes at the North Sumatra Provincial Health Office and the Deli Serdang District Health Office was 16 out of 18 (89%) so that it was categorized as simple.

Based on the Centers for Disease Control and Prevention (CDC) guidelines in the Guidelines for Evaluating Public Health Surveillance Systems, simplicity, the simplicity of the public health surveillance system refers to the structure and ease of operation (6). The surveillance system is better as simple as possible and still achieves the goal. Based on the evaluation results, it was found that the surveillance system in the North Sumatra Provincial Health Office was classified as simple and the surveillance system in the Deli Serdang District Health Office was classified as not simple. The results of interviews with surveillance officers obtained information that for officers in the Health Office it

was very easy because recording was carried out online so that the role of the Health Office for follow-up and monitoring if there were deficiencies or emptiness in data filling. According to the TB surveillance officer at the Health Office Constraints in existing surveillance activities, namely evaluation monitoring and feedback activities that are difficult because due to limited costs for the implementation of money activities, it is difficult to gather parties who will participate, as well as coordination with TB officers in Fasyankes that have no response again after monitoring the results of recording carried out to the SITB account.

Research conducted at the Tulungagung Regency Health Office and the Mojokerto District Health Office obtained the evaluation results that the existing TB surveillance system was categorized as simple. While research conducted at the Gresik Regency Health Office, the Blitar City Health Office, and the Jember District Health Office is categorized as not simple. Some things that affect the simpleness of the TB surveillance system are the availability of TB program officers and the availability of inspection laboratory (Ersanti, A., Nugroho, A., and Hidajah, A., 2016).

Flexibility

Flexibility refers to the ability of the surveillance system to adjust changes in the reporting system with an increase or additional costs, energy, and time. The following is a description of the flexibility of the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office based on the results of interviews with surveillance officers:

Table 5. TB surveillance system features based on flekxibility attributes

Activities	Charge		Power		Time	
	Province Health Office	Regency Health Office	Province Health Office	Regency Health Office	Province Health Office	Regency Health Office
Validation of data on the results of suspected TB recording activities, TB treatment activities, TB case tracking activities	There aren't any	There aren't any	There are any	There are any	There are any	There are any
Monitoring of cross testing	There aren't any	There aren't any	There are any	There aren't any	There are any	There are any
Availability of TB Program Personnel	There are any	There aren't any	There are any	There aren't any	There are any	There aren't any
Logistics availability	There are any	There aren't any	There are any	There aren't any	There are any	There are any
Recording and reporting	There aren't any	There aren't any	There aren't any	There aren't any	There aren't any	There aren't any
Analysis and interpretation	There aren't any	There aren't any	There aren't any	There aren't any	There aren't any	There aren't any
Information dissemination	There aren't any	There are any	There aren't any	There are any	There aren't any	There are any
Monitoring and evaluation	There are any	There are any	There are any	There are any	There are any	There are any
Feedback	There aren't any	There aren't any	There are any	There aren't any	There are any	There aren't any

Based on the results of the interviews conducted, the total value of the flexibility attribute at the North Sumatra Provincial Health Office was 12 of 27 (44%) so that it was categorized as an inflexible, and the Deli Serdang District Health Office the total value obtained was 17 of 27 (63%) so that it was categorized as inflexible.

Based on the CDC guide in the Guidelines for Evaluating Public Health Surveillance Systems, the flexibility of the public health surveillance can adapt to changes in information or operating conditions with a little additional time, energy, and costs. Based on the evaluation, the results were obtained that the surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office was classified as inflexible. Changes in the recording and reporting of TB have several times changes starting from manual recording and then moving to the SITT account and since 2020 switched to using a SITB account. According to surveillance officers at the Health Office, the addition of costs in surveillance activities is not significant because it is facilitated by the Ministry of Health, only the addition of costs occurs when going to carry out activities that invite other parties such as money activities. The addition of energy and time that is significantly felt by TB officers in the Health Office is due to using a SITB account as a tool for recording and reporting where the server is often down so it must be accessed outside of working hours and adding energy and time in surveillance activities.

Research conducted at the Blitar City Health Office and the Jember District Health Office obtained evaluation results that the existing TB surveillance system is classified as flexible. Research conducted at the Gresik Regency Health Office, the Mojokerto District Health Office, and the Tulungagung District Health Office are classified as inflexible. Some of the things that cause the inexpensive Surveillance Surveillance System due to changes in recording and reporting from manual to the web system so that supporting supporters and training of officers in implementing the web (Handayani, I., Hidajah AC., and Ratgono A, 2019)

Acceptability

Acceptability refers to the willingness of individuals or organizations to participate in the implementation of surveillance activities. The following is a description of the TB surveillance system acceptability in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office based on the results of interviews with surveillance officers:

Tabel 6. TB Surveillance System Features based on Acceptability Attributes

Activities	Availability of participating	
	Province Health Office	Regency Health Office
Validation of data on the results of suspected TB recording activities, TB treatment activities, activities	Available	Available
TB case tracking	Available	Available
Monitoring of cross testing	Available	Available
Availability of TB Program Personnel	Available	Available
Logistics availability	Available	Available
Recording and reporting	Available	Available
Analysis and interpretation	Available	Available
Information dissemination	Available	Available
Monitoring and evaluation	Available	Available

Based on the results of interviews with TB surveillance officers in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office, the results were obtained that TB officers were willing to be active in surveillance activities with a total value of 9 of 9 (100%) so it could be concluded that based on acceptability attributes,

surveillance systems in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office were categorized as acceptable.

Based on the CDC guide in the Guidelines for Evaluating Public Health Surveillance Systems, acceptability reflects the willingness of people and organizations to participate in the surveillance system. Based on the evaluation results, the results were obtained that the surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office was classified as acceptable. Surveillance officers are willing and participate in existing surveillance activities and acts as the manager of the TB Program (Wasor) who divides the area according to mutual agreement to monitor the results of recording and reporting carried out both by the Regency/City Office and also Fasyankes.

Research conducted at the Blitar City Health Office, Tulungagung Regency Health Office, Jember District Health Office obtained an evaluation result that the existing TB surveillance system is classified as acceptable. The TB surveillance system in the Blitar City Health Office, the Gresik Regency Health Office, and the Mojokerto District Health Office is categorized as not acceptable. The thing that influences the uncertainty of the surveillance system is that the practical doctor or private clinic is still not involved in surveillance activities so that reporting related to the discovery of cases is still low. The surveillance system will significantly be more effective if the community and cross - sectoral can contribute to surveillance activities (Ersanti, A., Nugroho, A., and Hidajah, A, 2016).

Data Quality

Data quality is a surveillance system indicator that describes the completeness and validity of data recorded in the surveillance system by assessing the percentage of data that is not clear and incomplete on the surveillance form. The following is a description of the reporting of the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office based on the results of interviews with surveillance officers:

Tabel 7. TB surveillance system features based on data quality attributes

Report	Province Health Office	Regency Health Office
Report TB.07	Complete, Clear	Complete, Clear
Report TB.08	Complete, Clear	Complete, Unclear
Report TB.11	Complete, Clear	Complete, Clear
ReportTB.12	Zero, Clear	Complete, Clear
Report TB.13	Complete, Clear	Complete, Clear
ReportTB.14	Zero, Clear	Complete, Clear

Based on the results of interviews conducted with TB surveillance officers obtained data quality in the North Sumatra Provincial Health Office obtained a value of 10 from 12 (83.3%) including the category of good data quality and for the Deli Serdang District Health Office obtained a value of 11 from 12 (91.6%) and can be categorized as good data quality.

Based on the CDC guide in the Guidelines for Evaluating Public Health Surveillance Systems updates, data quality reflects the completeness and validity of the data recorded in the Public Health Surveillance System. Based on the evaluation results, it was found that the quality of existing data in the North Sumatra Provincial Health Office and the

Deli Serdang District Health Office was classified as good data quality. This is supported that the completeness and validity of the existing data is worth $\geq 80\%$ in accordance with the Ministry of Health No. 1116 of 2003. The completeness and validity of the existing data is supported by the SITB system that will provide alert (warning) if there is an empty and unclear data when recording or if there are things that should have been inputted but have not been input Sitb.

Research is in line at the Jember District Health Office, Blitar City Health Office, Mojokerto District Health Office, and Tulungagung District Health Office, the results of good data are obtained. This is influenced by the use of SITT/SITB applications that cannot process the report if the data filled in is incomplete or double. Data quality problems tend to be found and varied throughout the country and affect the quality of data sources. The observations state that the problem of the quality of this data source makes routine reports often biased, incomplete, delays, and data quality, and data manipulation (Uddin L, Wahyuni CU, Setiawan AY, 2021).

Sensitivity

Sensitivity refers to the ability of surveillance systems in capturing accurate data and information when there is a case change in the validation of Data Validation of TB Reasoning, Treatment of TB Cases, TB case tracking; Recording and reporting, as well as analysis and interpretation. Based on the results of interviews with TB surveillance officers in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office, the results were obtained that the recording was carried out by TB officers in Fasyankes and TB officers in the Provincial and Regency Health Office to collect data every month to be monitored if there was an increase in the number of case discoveries and deficiencies in filling reports on the SITB account so sensitive.

Based on the CDC guide in the update guidelines for evaluating public health surveillance systems, sensitivity can be measured from two levels, first at the level of case reports, sensitivity refers to the proportion of cases of a disease (or other events related to health) detected by the surveillance system. The second level of sensitivity is the ability to detect extraordinary events, including the ability to monitor changes in the number of cases from time to time. TB is not a disease that is at risk to bring out an outbreak or extraordinary event, therefore the sensitivity here is measured by monitoring TB surveillance activities, namely the validation of the suspected TB discovery data, the treatment of TB cases, TB case tracking; Recording and reporting, as well as analysis and interpretation. The activity was monitored by all TB officers to see changes in the number of cases, see the final results of treatment, as well as for logistics needs also based on reports recorded to SITB accounts so that it can be concluded that the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office is categorized as sensitive.

The evaluation results conducted at the Tulungagung Regency Health Office found that the TB surveillance system has a good sensitivity. TB forms used by TB officers to record and report play a role in detecting the number of cases each month starting with the discovery of suspected TB, confirmation of TB cases, laboratory examinations, and up to information dissemination. While the evaluation results conducted at the Blitar City Health Office obtained the results that the TB surveillance system is not sensitive due to the frequent late delivery of reports, which hampering the data processing that causes the results of data processing does not indicate the actual number of cases (andayani I, Hidajah AC, Ratgono A, 2019)

Positive predictive value

The positive prediction value is the ability of the surveillance system to detect cases of TB suspects from all suspected cases being examined. The following is a description of the positive predictions of the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office based on the results of interviews with surveillance officers:

Tabel 8. TB surveillance system description based on positive predictive value attributes

TCM examination positivity level	Province Health Office	Regency Health Office
	33.96%	34.75%

In 2021 for the North Sumatra Provincial Health Office there were 11,197 cases of TB suspects from 32,966 suspected cases examined. For the Deli Serdang District Health Office there were 1,370 cases of TB suspects from 3,942 suspected cases examined. The results of the positivity of the Molecular Fast Test (TCM) examination in the North Sumatra Provincial Health Office amounted to 33.96% were the result of a positive TB suspect case based on the results of the examination of the total examination with TCM and for the Deli Serdang District Health Office of 34.75%. From the results obtained, it can be concluded that the positive prediction value of the TB surveillance in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office is categorized as bad.

Based on CDC guidelines in the Guidelines for Evaluating Public Health Surveillance Systems updates, positive prediction values are the proportion of the correct reported cases to have a relationship with health related events under surveillance monitoring. Positive prediction values are obtained by calculating all positive TB cases (sensitive drugs and drug resistance) divided by all TCM examinations. The evaluation results conducted at the North Sumatra Provincial Health Office obtained a positive prediction value of 33.96% which was categorized as bad. The positive prediction value in the Deli Serdang District Health Office based on the results of the TCM examination was obtained at 34.75% and categorized as the existing PVP value was not good. The low positive prediction value is due to the total examination carried out not only on the suspected TB, but also includes the number of contacts based on the results of the investigation.

Based on the Investigation Technique Investigation of TB patient, which includes contacts is a person who is exposed to or contact with index cases such as people in the house, rooms, one dormitory, one workplace, one class, or one dayote/care. Contact investigations are carried out by getting a minimum of 20 close contacts from one case of index. The number of TCM examinations conducted does not distinguish between suspected TB and close contact so that the number of examinations is large but slightly with positive results. The policy that supports that one case of index must be obtained at least 20 close contacts without specifications related to the duration and distance when contact and require close contact to be examined causing low screening at the beginning so that all are examined both those that are shaky or not (Kemenkes RI, 2017).

Evaluation results conducted at the Gresik Regency Health Office obtained that the TB surveillance system has a good predictive value positive. While the evaluation conducted at the Tulungagung Regency Health Office, the results were obtained that the PVP value was low or not good because many examination samples were not appropriate so the results obtained by the error. Research conducted in Makassar in 2018 the results of positive value predictions using TCM of 73.3%, and the results of examination with

TCM at Palembang Regional Hospital in 2018 positive prediction value of 27.19% and the results of the examination at Dr. Sobirin Musi Regency in 2018 obtained a positive prediction value of 31.4%. The results of studies in Sorong Regency in 2014-2018 for test results using TCM obtained positive results of 30.62% (468 of 1528 examined) (Kristina K, Lolong DB, Sari DP, 2020).

The examination method that is widely used in endemic TB countries is microscopic examination. However, the method has a low sensitivity, is unable to determine the sensitivity of the drug, and has different qualities because it is influenced by the level of technician skills in conducting examinations. Based on Permenkes No. 67 of 2016, one of the ways to enforce TB diagnosis using TCM tools. Laboratory tests using TCM tools are relatively faster and easier compared to culture examination and sensitivity tests with conventional methods that take 3-4 months. The use of TCM is a priority for TB examination because it has several advantages, namely: high sensitivity, the results of the examination can be known within approximately 2 hours, can be used to determine the results of resistance to rifampicin and low biosafety levels (Kementerian Kesehatan RI, 2017)

TCM sensitivity and specificity diagnose pulmonary tuberculosis 88% and 99%, while sensitivity and specificity for detecting resistant rifampicin are 95% and 98%. TCM examination using Xpert MTB/RIF can detect 90.3% of cases of TB culture confirmation compared to microscopic examination of 67.1% (Boehme et al, 2011).

Representative

Representative refers to the data in the Health Office is the same as the data in the field or data reported by Fasyankes according to people, places, and time. Based on the results of interviews conducted with surveillance officers in the North Sumatra Provincial Health Office and Deli Serdang District Health Office, data entered by TB officers in Fasyankes to SITB accounts will be recorded and grouped according to the characteristics of people (age, sex), places (domicile of residence), and time (initial treatment until completion) so But the information disseminated is not in accordance with epidemiological information (not based on people, places, and time). The information conveyed is more related to the results of the achievement of program indicators such as the scope of the discovery of patients, the success rate of treatment, the scope of the discovery of the case of TB children, the percentage of TB patients who know HIV status. In addition to assessing the presence of existing data requires comparative data with existing data in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office to assess whether the current data can represent real conditions in the community, but at the time of the study the comparative data was not obtained so that it could be concluded that the data in the North Sumatra Provincial Health Office and the Deli Serdang District Office were categorized as not representative.

Based on the CDC guide in the Guidelines for Evaluating Public Health Surveillance Systems, the Public Health Surveillance System is said to be representative if it accurately describes the occurrence of health -related events from time to time and case distribution based on people and places. The representative of the data in the Health Office illustrates how the situation also exists in the community. The data inputted to the SITB account has been categorized automatically both according to the variables of people (age, sex), place, and time. However, the data available at SITB has not been used and further analyzed, only data related to program indicators analyzed further and there is also no research in line that supports the representative of TB data in the Provincial and District Health Office so that it can be categorized that the existing data is not representative.

Evaluation results at the Tulungagung Regency Health Office, Blitar City Health Office, Mojokerto District Health Office, it was obtained that the data in the Representative Health Office (describing according to people, places, and time). Evaluation at the Jember Regency Health Office obtained that the existing data is not representative because it has not been analyzed according to the epidemiological variable and there is still a difference between the data recorded and those in the field. If the surveillance report is not representative, it can affect the prevention programs carried out (Hargono, A., 2014).

Timeliness

Timeliness is a picture of the timeliness, completeness, and validity of the recording and reporting of the results of the TB surveillance activities. The types of reports in the North Sumatra Provincial Health Office and Deli Serdang District Health Office are TB.07 reports, TB.08 reports, TB.11 reports, TB.12 reports, TB.12 reports, TB.13 reports, TB Reports.14. From the six reports based on the Timeliness assessment consisting of timeliness, completeness and validity of the report both reports by the North Sumatra Provincial Health Office and the Deli Serdang District Health Office complete and valid but not on time. From the assessment results obtained a value of 12 of 16 total values (75%) for the North Sumatra Provincial Health Office and the Deli Serdang District Health Office. Reports inputted by TB officers in Fasyankes are gathered every quarter to do Monev but there are still many officers who have not filled on time so that it becomes an obstacle in future planning. The Provincial and Regency Health Office conducted a follow-up to the officers in Fasyankes to fill in data on the SITB account. It can be concluded that the timeliness (timeliness) of reporting in the North Sumatra Provincial Health Office and Deli Serdang Regency is categorized as not on time.

Based on the CDC guide in the update guidelines for evaluating public health surveillance systems, the timeliness describes the speed of steps in implementing the surveillance system. Based on Permenkes No. 67 of 2016 the recording and reporting in the District/City Health Office and in the province namely TB.07, TB.08, TB.11, TB.12, TB.13, TB.14 which must be reported every month. Report accuracy standard $\geq 80\%$ based on Kepmenkes No. 1113 of 2003 and based on the results of the evaluation conducted obtained the timeliness of reporting at the North Sumatra Provincial Health Office and Deli Serdang Regency by 75%. Timeliness consists of timely, complete, and valid. The most obstacle related to timeliness is that TB officers in Fasyankes are late to input into the SITB account on the grounds that the server is down, a less supportive network, and the dual load owned by the TB officer.

Research conducted at the Gresik Regency Health Office and Jember Regency obtained that the TB surveillance reporting system was on time but there were other problems related to validity. Although reporting is good, there is still a incomplete or discrepancy of the data that is entry. Evaluation results at the Blitar City Health Office and Mojokerto Regency that the reporting of the TB surveillance is still not on time. TB officers in Fasyankes are late in filling the report to the SITB website so that the information results cannot describe the actual number of cases. Good timeliness occurs because there is an application/software used by an agency in reporting activities. Applications that continue to be upgraded in facilitating TB reporting activities but the obstacle is TB officers in Fasyankes who are late for filling (Asif, M., Baig, M., & Shah, M, 2015)

Stability

System stability refers to the stability or ability of the facilities or devices used to support

the surveillance system. Based on the results of interviews with TB surveillance officers at the North Sumatra Provincial Health Office and Deli Serdang District Health Office that recording and data collection was carried out through the SITB application that could be accessed at any time to provide the information needed. However, the SITB system is often difficult to access during working hours so that TB officers at the Health Office access SITB accounts outside working hours to monitor the results of recording by TB officers in Fasyankes. The facilities used to access SITB accounts are laptops and supporting networks (WiFi). The evaluation results were obtained by the stability of the existing system in the North Sumatra Provincial Health Office and the Deli Serdang Health Office obtained 100% of the assessment indicators so that it could be concluded that the TB surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office was categorized as stable.

Based on the CDC guide in the Guidelines for Evaluating Public Health Surveillance Systems, stability refers to reliability (the ability to collect, manage, and provide data well without failure) and availability (the ability to operate when needed). Manual reporting using the form by TB officers has switched to SITT accounts since 2015, and in 2020 switched to using a SITB account that was operated using a laptop and supporting networks (internet). The results of interviews with TB officers obtained information that SITB accounts rarely experience errors only when accessed during working hours and many who access the down server become a solution used by TB officers in the Health Office is to access SITB accounts outside working hours but this rarely happens. According to TB officers since the use of SITB accounts, recording and reporting have become more effective and efficient because they have been inputted to SITB accounts so that they can be accessed anytime and anywhere without fear of the data will be lost or deleted. Based on this statement it can be concluded that the surveillance system in the North Sumatra Provincial Health Office and the Deli Serdang District Health Office is classified as stable.

Evaluation Results at the Jember District Health Office and Tulungagung Regency obtained that the surveillance system was considered stable, while the evaluation results in the Blitar City Health Office, Gresik Regency, and Mojokerto Regency were obtained that the existing TB surveillance system was considered unstable. The instability of the existing surveillance system is due to the beginning of the use of SITT applications that often experience errors and takes > 24 hours for improvement. Events errors are things that cannot be avoided from a system so that efforts are needed to increase knowledge and skills from officers related to the completion of the system that experiences an error (Ersanti, A., Nugroho, A., and Hidajah, A, 2016).

CONCLUSIONS

1. Based on the results of the evaluation conducted at the North Sumatra Provincial Health Office and the Deli Serdang District Health Office, it can be concluded that the implementation of TB surveillance activities has been supported by appropriate TB officers, the available budget, as well as complete and adequate evaluation of data collection, and the data analysis is also made to monitor and also the validation of data recording results carried out in SITB accounts, processing and data analysis carried out annual to evaluate the achievement of activities and disseminate information to related parties.
2. Based on the evaluation with the surveillance attribute approach, of the 9 attributes that exist in the North Sumatra Provincial Health Office have 5 attributes with good results, namely simple systems, good acceptability, good data quality, high sensitivity and stable

systems, 4 other attributes have bad values so that the TB surveillance system is not flexible, not representative, positive prediction value is not on time. Evaluation results at the Deli Serdang District Health Office from 9 attributes, 5 attributes with good value, namely the system is considered simple, has acceptability, good data quality, good sensitivity and a stable system, 4 other attributes have a bad value, namely the existing surveillance system is considered to be unlexible, the value of positive predictions is not good, not representative, and reporting is not timely.

3. To overcome the deficiencies that exist in the suggestion surveillance system given, namely: 1. Perform screening to close contact to be examined to increase the specificity of the examination carried out and do different calculations for suspected TB with close contact that is examined
4. Surveillance officers at the North Sumatra Provincial Health Office and Deli Serdang District Health Office conducted data analysis according to epidemiological variables, namely based on people, places, and time so that they can monitor in increasing the number of cases and data produced more representative and describe the conditions in the community
5. Increasing cooperation and commitment of the North Sumatra Provincial Health Office and Deli Serdang District Health Office with all health service facilities in reporting on time TB cases so that the surveillance system can run well

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