Evaluation of Diphteria Surveillance System Based on Surveillance Components in East Java Provincial Health Office

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Abstract
Background: *East Java is the second province in Indonesia which has the highest number of diphtheria new cases. There were 67 cases (26,5%) new cases of diphtheria in Indonesia from East Java. In an effort to improve the surveillance system, it is required a study to describe, evaluate and indentify problems in diphteria surveillance system implementation based on surveillance components.* **Method:** *This study used the evaluation study design. Data were collected through interviews with three surveillance officer in East Java Provincial Health Office, observation and document analysis. Data were anayzed descriptively.* **Results:** *The Problems found by this study were the accuracy of Surveillance Integration Report from the reporting units was 25%, the accuracy of EWARS was 56%, the completeness of EWARS was 69%, the monthly absences was not given to reporting units, and the epidemiology studies bulletin was just published 4 times in a year.* **Conclusions:** *There was a shortage on each component of Diphteria surveillance system in East Java Provincial Health Office which cause the incompatibility of input, process, and output components with the indicator of Health Epidemiology Surveillance System. Therefore, East Java Provincial Health Office required to strengthen the commitment on the diphteria surveillance procedures to reporting units, give an evaluation and feedback to the reporting units, and develop a simple electronic information system to improve the accuracy of reporting.*
Keywords: Diphteria, Surveillance System, Surveillance Components

I.   INTRODUCTION

Diphtheria is a disease that can be prevented with vaccine, and still be a public health problem in several countries in the world. The disease is caused by infection with the bacteria Corynebacterium diphtheriae[1]. This disease generally affects toddlers (1-5 years). The diphtheria incubation period is 2-5 days that can be transmitted through respiratory droplet infection or through vomit, the skin can diphtheria through the wounds in the hand[2,3].

Region division with the highest incidence of diphtheria in the world according to the World Health Organization (WHO) is South-East Asia Region (SEARO). Indonesia as one of the countries in the SEARO has the highest incidence of diphtheria after India[4]. East Java is the province with the highest incidence of diphtheria in Indonesia in recent years. All counties or cities in East Java in 2011 and 2012 have experienced an diphtheria outbreak[5].

The number of cases in East Java can be seen in Figure 1. Diphtheria cases in 2011 were discovered as many as 665 cases. The discovery of cases increased in 2012 as many as 955 cases. This value has been decreased in 2013 and 2014 as many as 643 cases and 442 cases. Diphteria case finding in has been decreased in 2015. The number of cases as many as 319 cases with 67 confirmed cases. The number of cases was 106 cases until April in 2016[6].
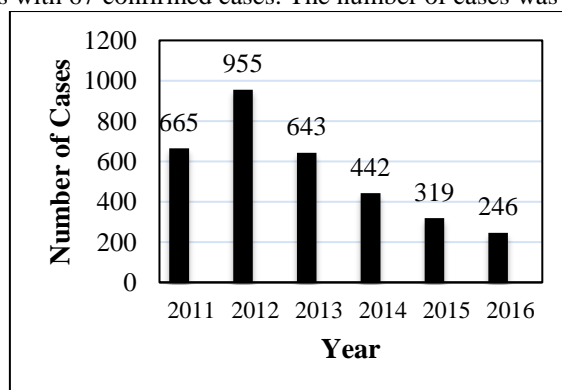

Figure 1. Diphtheria Cases Finding in East Java in 2011-2016 (April)

One of diphtheria disease control is to strengthen the diphtheria surveillance system. The purpose of diphtheria surveillance system are to provide the data and epidemiological information as the basis for health management to make decision in planning program, implementation, monitoring, diphtheria program evaluation, and to increase

the awareness and response to outbreaks in order to handle the outbreak immediately and accurately by national, provincial and district/city[7].

The emergence of these problems will not occur if the implementation of epidemiological surveillance in the area goes well. Surveillance is not only used to calculate the number of cases, but also as a tool to describe the risk groups, to evaluate the vaccine, eradicate the disease, and prevent the spread of disease. The availability of valid and accurate data or information are going to produce the control and eradication programs effectively and efficiently[8].

The surveillance system should be reviewed and evaluated periodically to formulate the recommendations for improving the quality, efficiency and expediency[9]. Therefore, it was necessary to evaluate the diphtheria surveillance system in the East Java Provincial Health Office based on system components such as input, process and output. Based on this background, the purpose of this study were to evaluate the diphtheria surveillance systems based on components system and identify the problems on these components.

II. METHODS

This research was a descriptive study with evaluation study design. Subjects of this study were the diphtheria surveillance component consists of input, process and output in East Java Provincial Health Office. The respondents were 3 surveillance officers. Data were collected through interviews using questionnaire and a tape recorder, document analysis on the recording and reporting diphtheria report, and observed the availability of facilities.

The data were analyzed descriptively. The results obtained were compared with the Minister of Health Republic of Indonesia Decree No.1116/ Menkes /SK/ VIII/ 2003 about the guidelines for the implementation of epidemiology surveillance system and the Minister of Minister of Health Republic of Indonesia Decree No.1479/ Menkes/SK/X/2003 about the Guidelines for the Implementation of communicable and Non-communicable Diseases Integration Surveillance System[7].

III. RESULTS

A. Input

Human resources is one of the input components. Surveillance officers in East Java Provincial Health Office in Epidemiology Surveillance section consists of 6 people. There were 4 officers that has the duties to carry out the diphtheria program. Each officer has their own tasks such as data collection, operating the Early Warning Alert and Response System (EWARS), and processing the diphtheria integration report. Three officers have a master degree and received the diphtheria training. Officer who operating the hava a bachelor degree. The availability of facilities in East Java Provincial Health Office can be seen in Table 1.

Table 1. Facilities in Diphteria Surveillace System in East Java Provincial Helath Office

No.	Facilities	Total
1.	Computer devices	3 computers and 1 personal laptop
2.	Printer	2 Units
3.	Internet access	Available
4.	Communication devices	1 office phone dan 4 personal handphones
5.	Fax	1 Unit
6.	Report Form	1 Package
7.	Literature of Diphteria	2 Books
8.	Guidelines for surveillance	3 Books
9.	Car	1 Unit
10.	Motorcycle	1 Unit

Guidelines for diphtheria surveillance system in East Java Provincial Health Office refers to three regulations. The regulation were the Minister of Health Republic of Indonesia Decree No.1116/Menkes/SK/VIII/2003 about the guidelines for the implementation of epidemiology surveillance system and the Minister of Health Republic of Indonesia Decree No.1479/Menkes/SK/X/ 2003 about the Guidelines for the Implementation of communicable and Non-communicable Diseases Integration Surveillance System, Minister of Health Regulation No. 1501/2010 about the specific type of infectious diseases that can cause outbreak and the handling effort, Minister of Health Regulation No.949/2004 about Guidelines for the implementation of Outbreak Early Alert System. In addition to regulation and Policy implementation of surveillance systems, East Java Provincial Health Office refers to the guidelines for diphtheria outbreak prevention in East Java.

The fund for the diphtheria surveillance system implementation in East Java Provincial Health Office was derived from the Regional Government Budget (APBD) and the State Budget (APBN). The fund from Regional Government Budget in 2015 and 2014 were not specific to Diphtheria implementation, but it was included in the funding of outbreak prevention. In contrast to 2013, a specific fund for the prevention of diphtheria, especially the fund for the prevention of cases tracking and shipment of specimens. The funding from the state budget was for the cases tracking and meetings.

B. Process

East Java Provincial Health Office collected the data from the District Health Office/City, hospitals, laboratories and community. Provincial Health Office collected the W1 report, W2 or EWARS (Early Warning Alert and Respense System), Surveillance Integration Report (STP), Integration Report, Hospital Active Surveillance report and Dipt-1form. The Surveillance Integration Report which is collected by the East Java Provincial Health Office has the completeness and accuracy as many as 95% and 25%, while the EWARS in this Health Office has the completeness and accuracy as many as 69% and 56%.

The data compilation was done by looking at the completeness of answers, readable, and the validity of data. Incomplete forms were frequently encountered in the Dipht fom-1. The emptiness encountered on the close contact field. If officer discovered this void in the data entry process, then the officer will contact the relevant officers via telephone to confirm.

The data analysis has been carried out in the tables, graphs and spot map. The tables provides the diphtheria data of each district in East Java. The graph which is created by the officer were the monthly tendency of diphtheria cases, the annual tendency of diphtheria cases, the tendency of diphtheria cases by age, immunization status chart, and the spot map of diphtheria cases. The analysis is followed by the data interpretation which is found in the annual profile.

The information based on the processed data were provide in a epidemiology bulletin. Epidemiology bulletin published by the East Java Provincial Health Office as many as four times in a year.

C. Output

Dissemination of information was done through the publication of East Java Province Annual Profile and District Surveillance Integration Report to the Ministry of Health. The dissemination of information implementation was also made to the Governor. In addition, the dissemination of information was also made to the District/City Health Office (DHO) at the meetings which is held every three months. The examination of diphtheria situation at this meeting was a choice, so if there was a more important issue, the diphtheria situation would not displayed.

The feedback was provided form the request of data repair to the DHO. This request was made if there was something to be confirmed. But attendance reports were not given to DHO by East Java Provincial Health Office.

IV. DISCUSSION

Input component evaluation was done by comparing human resources, facilities (materials, methods and machines), and the funds in East Java Provincial Health Office with the indicator of system. The indicators used in this evaluation were the Minister of Health Republic of Indonesia Decree No.1116/Menkes/SK/VIII/2003 about the guidelines for the implementation of epidemiology surveillance system and the Minister of Health Republic of Indonesia Decree No.1479/Menkes/SK/X/ 2003 about the Guidelines for the Implementation of communicable and Non-communicable Diseases Integration Surveillance System.

The input components that appropriate with the indicator were the material such as the availability of facilities for recording and reporting, the machine by the avaibility of data processor (computers, laptops, and printers), communication devices, office phone, and internet acces, as well as means of transport facilities (car and motorcycle). The method was also appropriated with the indicator which known by the avaibility of diphtheria implementation guidelines and diphtheria literatures. The other components appropriated with the indicator was the fund, because the fund for diphtheria program was available from the regional government budget and the state budget.

Human resources was one of the input component that didn't appropriated with the indicator. Diphtheria surveillance system conducted by four officers who had their respective duties. The officers who had the master degree and received diphtheria training were 3 officers and the other had a bachelor degree and have not received the training. According to the Minister of Health Republic of Indonesia Decree No.1116/Menkes/SK/VIII/2003,

the indicators of human resources in Provincial Health Office were the availability of an epidemiologist with master degree, two epidemiologist wirh bachelor degree, two of trained epidemiologist, and general practitioner. So it can be seen that the human resources were not appropriated with the indicator for the absence of specialized staff and the lack of general practitioners for diphtheria surveillance system.

The process components that appropriated with the indicator were the data collection which is derived from the DHO, hospitals, laboratories and community. In addition, the data compilation, data analysis and data interpretation were also have to appropriated with the indicators.

According to and the Minister of Health Republic of Indonesia Decree No.1479/Menkes/SK/X/2003 about the Guidelines for the Implementation of communicable and Non-communicable Diseases Integration Surveillance System, Provincial Health Office was have the responsible to collecting data, process the data, analyze the data and provide the recommendations for further action. Surveillance unit in Provincial Health Office carry out the monthly tendency of diphtheria cases which is provided from table based on district and the monthly tendency chart of diphtheria cases, then inform the results to the associated program in the Provincial Health Office, DHO in their region, as well as inform the Provincial Health Office on adjacent areas, as the early warning system of potential disease outbreak implementation in the region[7].

Components that didn't appropriate with the process component indicators were the the accuracy and the completeness. Surveillance Integration Report which collected by East Java Provincial Health Office has the completeness and accuracy as many as 95% and 25%, while the EWARS has the completeness and accuracy as many as 69% and 56%. According to the Minister of Health Republic of Indonesia Decree No.1116/Menkes/SK/VIII/2003, the process indicators in the Provincial Health Office covering the completeness and accuracy of the reporting unit reports and preliminary data sources as many as 80% or more.
The low of accuracy and completeness in reporting by the reporting unit might decrease the sensitivity of surveillance. Sensitivity is meant by the system ability to be able to collect data accurately. Sensitivity can be considered through two levels. First, the level of data reporting, referring to the proportion of cases that can be detected by the surveillance system. Second, sensitivity refers to the ability to detect outbreaks, including the ability to monitor the changes in number of cases[9].

The timeliness on reporting, cases prevention, and dissemination on this system must be considered. The data reporting which is done in a timely manner enabling to utilize the data appropriately for the control of internal decisions. In addition, by using the data in a timely and high quality information, it would support in identifying and addressing the priority health problems in the population more effectively and efficiently[10].

The other of process components that didn't appropriate with the indicator was the epidemiological bulletin publishing. One of the performance indicator from the Surveillance Integration Report based on the Minister of Health Republic of Indonesia Decree No.1479/Menkes/SK/X/2003 was an epidemiology bulltein publishing at provincial and national level was 12 times in a year. However the epidemiologic bulletin which published by the East Java Provincial Health Office only 4 times in 1 year.

Dissemination of information such as the Annual Profile of East Java Province publication, the reporting of Surveillance Integration Report to the Ministry of Health, and dissemination of information to the Governor were the component that appropriated with the output indicators. In addition, the dissemination of information was also made to the DHO at the meetings held every three months.

The publication of annual profile in East Java Provincial Health Office was appropriate with the indicator. According to the Minister of Health Decree No.1479/ Menkes/SK/X/2003, Provincial Health Office should utilize the result of data processing as the material to make annual profile, material to make the planning in Provincial Health Office, related information programs, DHO, Directorate General of Disease Control and Environmental Health, research centers, research centers and universities as well as across relevant sectors in the region[11]. According Minister of Health Decree No.1116/SK/VIII/2003, output indicators in the Provincial Health Office is publication of annual profile of 1 times or more in a year.

According to the Minister of Health Decree No.1479/Menkes/SK/X/2003, the Provincial Health Office has a duty to provide the monthly feedback form of attendance reports and the request of data repair to the DHO in the region.

Based on the study results, known that the feedback that given by Provincial Health Office was data repair to the DHO if there was something to be confirmed. But the attendance reports were not given. It can be seen that the

output indicators which didn't appropriate with the indicator was the feedback form of attendance reports to the reporting unit.

V. CONCLUSION

Diphtheria surveillance system in the East Java Provincial Health Office has the input components in the form of material, machine, method, and the funds that have appropriated with the indicators, while in terms of human resources there are still shortcomings. In addition, the process components that appropriated with the indicator were the data collection, analysis and recommendations for further action, but components such as the accuracy and completeness of the reporting unit and the epidemiology bulletin publication were not appropriated with the indicator. Output components that meet the indicator was the annual profile publication and dissemination of information and feedback of data confirmation request, but the feedback form of attendance forms was not appropriated with the indicator.

VI. RECOMMENDATION

East Java Provincial Health Office required to strengthen the commitment on the diphteria surveillance procedures to reporting units, give an evaluation and feedback to the reporting units, and develop a simple electronic information system to improve the accuracy of reporting.

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