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PROCEEDINGS OF THE 2ND INTERNATIONAL SYMPOSIUM OF PUBLIC HEALTH

Achieving SDGs in South East Asia: Challenging and Tackling of Tropical Health Problems

Editors:

I Wayan Gede Artawan Eka Putra
Agung Dwi Laksono
Yulis Setiya Dewi
Nikmatur Rohmah and
Darrimiya Hidayati

Organized by
Faculty of Public Health, Universitas Airlangga

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FOREWORD

The point of Sustainable Development Goals (SDGs) has been determined in the consistent meeting in all countries. The health sector position is one of the key components in achieving the indicators. Special attention to the health sector focuses on community nutrition, national health systems, access to reproductive health and family planning and sanitation and clean water.

Based on that, Southeast Asian countries are seen as important part in formulating strategic and policy efforts to improve the effectiveness and efficiency of achieving the various goals of the SDGs. Therefore, the Doctoral Program of Health Science, Faculty of Public Health, Universitas Airlangga held The 2nd International Symposium of Public Health. This remarkable event is in collaboration with Faculty of Medicine, Widya Mandala Catholic University Surabaya and Magister Program of Public Health, Jember University. It's an honour to present **"Achieving SDGs in South East Asia: Challenging and Tackling of Tropical Health Problems"**.

We have tried to give our best contributing of our knowledge in the field of public health especially our contribution to help the problems on tropical health, health equity and quality of health care, clinical and community relationship to enhance public health, emerging and re-emerging diseases, nutrition-enhancing as strategic investment, global strategy framework for food security and nutrition, environmental and occupational health and mental health for achieving SDGs in South East Asia.

The aim of this symposium is to disseminate knowledge and share it to the public, especially in the scientific community, such as academics and practitioners in the field of health. The symposium focusing on formulation of policy recommendations for related parties to accelerate the achievement of the target of SDGs in the field of health. The results of this symposium are also expected to be an input for policy makers, from various levels in formulating programs to accelerate the SDGs goals' achievement. This international symposium will help us, to grasp and share more knowledge especially in public health science.

At last, we would like to ackowledge for all parties which are provide the valuable materials as well as financial support for the successful symposium. As chair of organizing committee, I would also like to say deep thank you for all committees; my colleagues, and also students in faculty of Public Health Universitas Airlangga, who have been working to be part of a solid team and amazing committee.

I am looking forward to seeing you at ISoPH in the near future.

Rachmad Suhanda
Chairman of the Committee

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Quality of Diphtheria Surveillance System in the East Java Provincial Health Office

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Abstract: Diphtheria is a serious health problem in East Java. By 2015, the number of new cases of diphtheria in East Java was 319, which is the highest number of cases in Indonesia. This study was a surveillance system evaluation of system components and attributes approaches. Data was collected through interviews with three surveillance officers in the East Java Provincial Health Office for observation and document analysis. Data was analyzed descriptively. The problems found in the system components were the accuracy and completeness of EWARS Report from the reporting units, which were 56% and 69% respectively; the monthly absences were not conducted, and the epidemiology bulletins was published 4 times in a year. The problem with the attributes was that the data was not analyzed timely, rather than data representativeness, District Health Office reports were not filled completely, and Positive Predictive Values (PPV) were only 4.38% in 2015 and 2.83% in 2016. System components and attributes, such as timeliness and data quality, were incompatible with the Indicator of Health Epidemiology Surveillance System. It also known that the Diphtheria surveillance system was simple, but has a low acceptability, sensitivity, PPV score, and representativeness, when compared to the CDC Guidelines of Surveillance.

1 INTRODUCTION

Based on data from the East Java Health Office, 352 cases of diphtheria were found in 2016. This indicates the high incidence of diphtheria in East Java. One of the efforts to control diphtheria disease is by strengthening the diphtheria surveillance system (Chin, 2000). The purpose of diphtheria surveillance is the availability of epidemiological data and information as the basis of health management for decision-making in planning, implementation, monitoring, evaluation of health programs and awareness raising as well as the rapid and precise response of the national, provincial and district / city offices (Ministry of Health RI, 2003).

The emergence of these problems will not actually occur if the implementation of epidemiological surveillance in the region goes well. According to Nelson and Sifakis (2007), surveillance is used to count both the number of cases and is also used as a tool to describe the groups at risk, evaluate vaccines, eradicate disease, and prevent the spread of disease. With the availability of data or information that is valid and accurate, it will certainly produce programs to control or eradicate the disease effectively and efficiently.

The purpose of this research is to evaluate the diphtheria surveillance system in the East Java Provincial Health Office, based on surveillance attributes that include simplicity, flexibility, data quality, acceptability, sensitivity, positive predictive value, representation, timeliness and stability. The surveillance system should be evaluated periodically, and its evaluation should result in recommendations for improvement of its quality, efficiency and usefulness (CDC, 2001).

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2 METHODS

We conducted an evaluation to identify performance and weaknesses of the Diphtheria surveillance system in East Java. This study was a surveillance system evaluation with system components and attributes approaches. Data was collected through interviews with three surveillance officers in East Java Provincial Health Office, observation and document analysis. Data was analyzed descriptively.

3 RESULT

3.1 Simplicity

An Assessment of system simplicity is seen from the ease of diagnosis of diphtheria, flow of reporting and data analysis. The following is a description of the simplicity of the diphtheria surveillance system based on the results and document studies that can be seen in Table 1.

Table 1: Description of simplicity of diphtheria surveillance system at East Java Provincial Health Office.

Component system	Criteria	Results	Classification
Input	The information required in diagnosis is clear and easy.	Diagnosis is easy because in diagnosis of diphtheria, clinical symptoms are seen when there is heat, or when there is pseudomembrane, or there is pain when swallowing.	Simple
	All points in the W1 of diphtheria reporting format are filled in completely by each District Health Office in East Java.	Complete	Simple
	All points in the integrated surveillance reporting format of diphtheria disease Public Health Center (PHC) are filled in completely by every District Health Office in East Java.	Complete	Simple
	All points in the integrated surveillance reporting filming format of Diphtheria Hospital are filled in completely by every District Health Office in East Java.	Complete	Simple
	All points in the integrated surveillance reporting format of Diphtheria Laboratory are filled in completely by every District Health Office in East Java.	Complete	Simple
	All points in the Form Diph-1 reporting format are filled in completely by each District Health Office in East Java.	Incomplete (unfilled on people contact fields and source of transmission in 3 districts)	Not simple
	All points in the provincial integration reporting format are filled in completely by each District Health Office in East Java.	Complete	Simple
Process	The reporting flow of diphtheria case data is easily seen from the flow of the diphtheria surveillance system.	Respondents stated that the diphtheria reporting flow is simple and easy to apply.	Simple
Output	The results of data analysis of diphtheria are used as a consideration of vaccine management (cold chain, energy, vaccine quality, immunization quality).	The immunization section utilizes diphtheria data as a consideration.	Simple
	The results of data analysis of diphtheria are used as a consideration for increasing the coverage of immunization activities.	The immunization section utilizes diphtheria data as a consideration.	Simple

Component system	Criteria	Results	Classification
	Feedback is made to all data sources.	Feedback is provided to all data sources, but is only done during routine 3 to 4 month meetings.	Simple

3.2 Flexibility

A flexible surveillance system can adapt to changes of required information or implementation situations without a meaningful increase in the need for cost, labor and time. For example, flexible systems can accept a newly identified disease and health problems, case definition changes, and variations from reporting sources (CDC, 2001). Based on the results of the interviews, it is known that diphtheria surveillance system in East Java province has not changed. The absence of these changes resulted in no assessment of system flexibility.

3.3 Acceptability

Assessment of system acceptability is done on the input, process, and output components. Some indicators used for assessment of acceptability are seen from the availability of units or agencies to collect data up to the dissemination of information and feedback. The description of acceptability of a diphtheria surveillance system based on the interview results and document study can be seen in Table 2.

Table 2: Description of acceptability of diphtheria surveillance system at east java provincial health office

Component system	Criteria	Results	Classification
Input	All units are willing to participate in data collection	All units such as PHC, hospitals, laboratories and District Health Offices and communities participate in data collection.	High Acceptability
	The result of laboratory confirmation data collected by unit or agency has been accompanied by Lab test result from the big hall of health laboratory Surabaya	Lab test results delivered by big hall of health laboratory Surabaya with email.	High Acceptability
	Complete monthly surveillance report integrated disease outbreak	Complete monthly report of diphtheria surveillance report integrated outbreak of 95%.	High Acceptability
	The accuracy of monthly reports of integrated surveillance of disease outbreaks	The accuracy of monthly report of diphtheria surveillance report integrated outbreaks by 25%.	High Acceptability
Process	Data processing on vulnerable populations by Provincial Health Office	There is data about vulnerable populations.	High Acceptability
	Table by District	Provincial Health Offices create tables by district.	High Acceptability
	The monthly trend graph of diphtheria cases	Provincial Health Offices make graph of monthly tendency of diphtheria cases.	High Acceptability
	Graph of the annual trend of diphtheria cases	Provincial Health Offices make a graph of the annual trend of diphtheria cases.	High Acceptability
	The trend graph of diphtheria cases is based on age	Provincial Health Offices chart the tendency of diphtheria cases by age.	High Acceptability
	Graph of immunization status trends	Provincial Health Offices have implemented a graph of the trend of immunization status.	High Acceptability

Component system	Criteria	Results	Classification
	Stop map of diphtheria cases	Provincial Health Office makes Stop map of diphtheria cases.	High Acceptability
Output	Utilization of analysis result as annual profile material and as material of planning.	The Provincial Health Office has utilized the results of the analysis as an annual profile material and as a planning material.	High Acceptability
	Request for data repair to the District Health Office if there is something to be confirmed, but the absence of the report is underestimated when conducting the feedback	Provincial Health Office has requested data improvement to District health offices if something is to be confirmed but report absenteeism is rarely given when conducting feedback.	High Acceptability
	Submission of diphtheria integrated surveillance of disease data by district / city to the Directorate General of communicable disease prevention and environmental sanitation.	Provincial Health Office has sent data of diphtheria integrated surveillance of disease according to districts / cities to Directorate General of communicable disease prevention and environmental sanitation.	High Acceptability

3.4 Sensitivity

The sensitivity of this diphtheria surveillance system is seen from the ability of officers to detect cases of diphtheria ≤ 24 hours as well as the completeness and accuracy of the early warning system (EWARS). The following is the description of the sensitivity of the diphtheria surveillance system based on interview results and document study which can be seen in Table 3.

Table 3: Description of sensitivity of the diphtheria surveillance system at East Java Provincial Health Office

Component system	Criteria	Results	Classification
Output	Completeness and accuracy of early warning system (EWARS) reports	EWARS data completeness of 69% and EWARS data accuracy of 56%	Low Sensitivity
	Officers were able to detect diphtheria outbreaks.	Officers are able to detect cases quickly due to good communication system between officers in District Health Office with data source in Regency area like health center, hospital, doctor pre-clinic.	High Sensitivity
	Handling outbreaks is ≤ 24 hours	All handling done ≤ 24 hours by District Health Office	High Sensitivity

3.5 Representativeness

Assessment of the system representative on diphtheria surveillance is done by comparing data for the number of cases owned by East Java Provincial Health Office with data in Indonesia Profile in 2013 and 2014. According to the East Java Provincial Health Office, there were 643 diphtheria cases in the East Java province in the year 2013, while based on Indonesia Profile 2013, it was known that East Java has 610 cases of diphtheria. Using the East Java Provincial Health Office data, it is also known that the number of diphtheria cases in East Java province in 2014 is 442 cases, while based on Indonesia Profile 2014, it is known that East Java has 396 cases of diphtheria.

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3.6 Timeliness

An assessment of the timeliness of the system is done on input, process and output components. An overview of timeliness of diphtheria surveillance system based on the interview results and document study can be seen in Table 4

Table 4: Description of timeliness of diphtheria disease surveillance system of east java provincial health office

Component system	Criteria	Results	Classification
Input	Accuracy of initial data source of 80% or more and received in accordance with the specified schedule.	Integrated surveillance of outbreak disease has a precision percentage of 25%	Low timeliness
		EWARS accuracy is 56%	Low timeliness
Process	Processing, analysis and interpretation of data from the reporting unit is completed on time> 80%.	Analysis of graphs or tables is done if there are activities / meetings in the context of feedback.	Low timeliness
Output	The publication of epidemiological studies bulletins is 12 times or more.	The publication of epidemiology review bulletins is performed 4 times in 1 year.	Low timeliness

3.7 Data Quality

The results of interviews conducted with respondents often found vacancies data / information filled by the District Health Office / City, especially on the Dipht-1 form. Based on the results of the interviews and document studies, it can be concluded that the data quality of the diphtheria surveillance system in East Java Provincial Health Office is still low.

It is also known from the results of interviews and document studies that the vacancy encountered is in the contact field closely. Based on the results of the interview, it is known that 'the column is not filled' can be caused by lack of performance from surveillance officers in the district.

3.8 Positive Predictive Value

Assessment of the Positive Predictive Value (PPV) system is done on the output component. Based on document study results, the East Java province has 311 cases of suspected diphtheria with 14 confirmed cases by 2015, whereas in 2016 (January-April period), it was found that the number of suspect cases found was 106 cases with 3 confirmed cases.

3.9 Stability

Based on the results of interviews, it is known that the process of data collection for diphtheria surveillance is still not based on computer systems or data collection system and is still in a form that is collected in stages and manuals. The absence of a computer-based system in the diphtheria surveillance system has resulted in no measurable system stability.

4 DISCUSSIONS

4.1 Simplicity Input

Based on Table 1, it is known that diagnosis by surveillance officers in East Java is easy. The typical clinical symptoms of diphtheria according to the results of the interview is the presence of a greyish white pseudomembrane which, causes bleeding when raised and also pain when swallowing. One example of a simple system is a system with case definitions which are easy to implement (CDC,2001). The diphtheria case consists of suspect cases, possible cases, and cases of confirmation. The case of diphtheria confirmation is the possibility of positive isolates cases in toxigenic diphtheria. This diphtheria bacterial examination requires laboratory confirmation. According to CDC (2001), laboratory tests to confirm cases can make the system more complex or complicated.

It is known from Table 1 that there is no empty format in W1, W2 or EWARS reports, Integrated disease surveillance, Integrated Surveillance Hospital, Integrated Disease Surveillance Laboratory and Integration Report. This is because the format is easy to fill. However, there is still a vacancy in the Dipht-1 form. based on the interview results; this is caused by late reports from officers or officers do not have information of people who have contact with patients. The Dipht-1 form is a form used by the East Java Health Service to conduct an investigation in order to know the spread of the case with home-to-home visits. According to CDC (2001), telephone calls or home visits by health workers to gather more detailed information can make the system more complex.

It can therefore be concluded that diphtheria surveillance input in East Java Health Office is still not simple. This lack of simplicity is due to laboratory confirmation procedures and home-to-

home activities that can make surveillance systems complex.

4.2 Simplicity Process

Based on Table 1, the reporting flow of diphtheria cases in East Java Provincial Health Office is simple and easy to apply because of the diagnosis of clinical symptoms (case definition) and the easy process of discussions between the District Health Office and Province for case diagnosis. In addition, feedback from the ease of the surveillance flow is also seen from the feedback flow. Feedback or management of cases in diphtheria cases can be addressed directly at the District Level. According to CDC (2001), the simplicity of a surveillance system includes simplicity in terms of structure and ease of flow of reporting and operation.

4.3 Simplicity Output

Based on Table 1, it is known that the results of data analysis of diphtheria are used as vaccine management considerations and increased immunization coverage. In addition, it is also known that the feedback is done to all data sources at a meeting held by the East Java Provincial Health Office once every 3 to 4 months. According to the Ministry of Health (2003), one measure can be considered to measure the simplicity of the type of system and the depth of the data analysis, number and type of user information, and ways of disseminating reports to information users. Therefore, it can be concluded that diphtheria surveillance output is simple.

4.4 Acceptability Input

Based on Table 2, it is known that all units such as PHC, hospitals, laboratories and District Health Offices participate in data collection. In addition, based on the results of the interview, it is also known that the community also reported a case. According to Fernando (2011), surveillance systems will be much more effective if communities can contribute substantially and even modest forms of participation can improve the effectiveness of monitoring.

Based on Table 2, it is also known that the completeness of the integrated surveillance of disease outbreak in East Java Provincial Health Office in 2015 is 95% with accuracy of 25%. According to the Ministry of Health (2003), indicators that can measure acceptability between the numbers of participation from individuals or agencies, completeness of reporting forms, timeliness of reporting. Therefore, it can be concluded that diphtheria surveillance in East Java Provincial Health Office still has a low acceptability seen from low level of accuracy reporting integrated surveillance of disease outbreak.

4.5 Acceptability Process

Based on Table 2, it is known that East Java Provincial Health Officers have performed data processing and analysis, through the processing of vulnerable populations, district-based case tables, weekly trend graphs, monthly trend graphs, annual trend graphs, trend-based trends, and stop maps diphtheria cases. Therefore, it can be concluded that the process in the diphtheria surveillance system in East Java Provincial Health Office has a high acceptability or that this system officer in the surveillance unit has been willing to perform surveillance procedures. Provincial Health Offices have a role in collecting, processing, analyzing data and for making recommendations for follow-up analysis results.

The Provincial Health Surveillance Unit conducts a monthly analysis of potential outbreaks and an annual analysis to assess disease progression and correlates it with disease-causing factors such as environmental changes, then informs the results to relevant programs in Provincial Health Offices. The analysis results are used for planning and assessing program success (Nelson and Sifakis, 2007).

4.6 Acceptability Output

Based on Table 2, it is known that the utilization of the results of the analysis has been used by officers as an annual profile material and planning materials. It is also known from Table 2 that feedback in the form of data repair requests has been made, but feedback in the form of absenteeism is rare.

Acceptability is an attribute of a highly subjective surveillance system that includes the personal will of those responsible for the implementation of surveillance systems to provide accurate, consistent, complete and timely data (CDC, 2001). Based on the results of the interviews, it is known that no feedback was given to data sources such as the District Health Office, because the officers assumed that the officials in the District / City Service did not have time to report. According to officers, the increasing frequency of cases followed by increased handling by officials resulted in officials in the District Health Office not having

time to report to the Provincial Service on time, so it can be concluded that diphtheria surveillance in East Java Provincial Health Office still has a low acceptability because Provincial Health Office officers do not provide monthly absenteeism.

4.7 Sensitivity

It is known from the data in Table 3 that officers have the ability to detect outbreaks because there is a good communication system between officers in the District Health Office with data sources in the district area such as health centers, hospitals, and the doctors' practices. In addition, the handling of diphtheria epidemic cases is always done within 24 hours by officers. Completeness and accuracy of the EWARS report has still not reached 80%. The completeness and accuracy of EWARS data in East Java Provincial Health Office were 69% and 56%, respectively. Completeness and accuracy are EWARS indicators. Timeliness in reporting, case-handling, and dissemination on this system should be taken into account. Timely data reporting allows you to utilize data appropriately for internal decision control. In addition, by using data in a timely manner, high quality information will support in identifying and addressing the priority of health problems in the population more effectively and efficiently (Ika and Arief, 2014).

Based on the results of interviews and document studies it can be concluded that the sensitivity level of diphtheria surveillance system is low. The low sensitivity of this system is due to the completeness and accuracy of EWARS data which is less than 80%.

4.8 Representativeness

A representative surveillance system will accurately describe the event of a health event within a given period of time and the distribution of the event in society by place and person. The representation was assessed by comparing the characteristics of reported events with all the existing events (Ministry of Health, 2003).

Based on the observation results, it is known that there are differences to the data of diphtheria cases in 2013 and 2014 between East Java provincial health office and the Ministry of Health Republic of Indonesia. The difference in the amount of data on diphtheria cases can indicate that the diphtheria surveillance system in the East Java District Health Office is not representative. These findings will inspire improvements in data collection, thereby providing a more accurate projection of the incidence of a health event in the population (CDC, 2001).

4.9 Timeliness Input

Timeliness at the input of the surveillance system is seen from the timeliness of the initial data source. Based on Table 4, it is known that the accuracy of Integrated surveillance of outbreak disease report is 25% and the accuracy of EWARS is 56% minimum completeness and a reporting accuracy of 80%, so it can be concluded that the timeliness of inputs in diphtheria surveillance system in East Java is still low (CDC, 2001).

The accuracy of reporting relates to the acceptability or willingness of the data source units in the reporting process (CDC, 2001). Based on the interview results, it is known that the low timeliness of reporting by the data source caused by diphtheria surveillance officers has many positions with multiple workloads.

4.10 Timeliness Process

It is known from Table 4 that data analysis in the form of graphs or tables is only done if there is a meeting in the context of feedback. According to the Ministry of Health (2003), data should be analyzed once a month with the completeness of the data at 80%, so it can be concluded that the timeliness of the process in the diphtheria surveillance system in East Java is still low.

4.11 Timeliness Output

It is known from Table 4 that the epidemiology study bulletin is published 4 times a year by the East Java Provincial Health Office Epidemiological bulletin publishing in Provinces, and National 12 times a year (Ministry of Health, 2003). Therefore, it can be concluded that the timeliness of output in the diphtheria surveillance system in East Java is still low.

4.12 Data Quality

According to CDC (2001), data quality is influenced by screening performance and diagnostic tests (i.e. case definition) for health-related events, clarity of hardcopy or surveillance form, quality of training and supervision of those who fill the form and data management.

4.13 Positive Predictive Value

East Java province had 311 cases of suspected diphtheria cases with 14 cases confirmed by 2015, whereas in 2016 (January-April period), it was found that the number of suspect cases found was 106 cases with 3 confirmed cases. Based on this data, it can be seen that the PPV diphtheria case in 2015 is 4.38%, and in the year 2016, this is equal to 2.83%.

Based on the calculation of PPV on diphtheria surveillance system in East Java Province, it is known that the PPV result is less than 95% (PPV is not good). A 100% PPV value can improve the representation of surveillance. The high false-positive reports will also lead to unnecessary interventions and errors in detecting outbreaks, which will increase the cost of inappropriate tracking and anxiety in the community (Ministry of Health, 2003).

4.14 Stability

Stability refers to the ability of a computer system to collect, manage or manage, and provide data without error and the ability of the system to operate when necessary (CDC, 2001).

5 CONCLUSIONS

The problems found in the diphtheria surveillance system in East Java are:

- the inputs on the system are not simple,
- the low level of acceptability on input and output means a low sensitivity at output, less representative surveillance system, low timeliness of inputs, processes and outputs, low data quality and a low Positive Predictive value.

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