

ORIGINAL ARTICLE

Evaluation of Measles Surveillance System in Provincial Health Office, East Java, Indonesia

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ABSTRACT

Introduction: Measles is one of the infectious diseases which is very easy to spread and can even cause death. There are frequent outbreaks of measles in East Java province, Indonesia. Therefore, this study was conducted to evaluate case-based measles surveillance system (CBMS) in Provincial Health Office, East Java, Indonesia. **Methods:** This study was conducted on October 21, 2018 to November 17, 2018. To obtain data and information systems related to the implementation of measles surveillance system at East Java Provincial Health Office, an interview was undertaken to surveillance officers and study documents originating from the 2014-2017 of Provincial Health Service Annual Report, and CBMS performance reports and Regency/City Laboratory Results in 2018 (per 1st May 2018) were used. The goal of this research was to evaluate the measles surveillance system at Provincial Health office, East Java, Indonesia by comparing the indicators and attributes of surveillance to Technical Guide for Measles Surveillance 2012. **Results:** The study showed that there were still several weaknesses related to Human Resources (HR) in terms of quantity. There was a low flexibility attribute especially the implementation of CBMS was constrained due to limited stock of reagents and inadequate specimens. Simplicity, data quality, acceptability, Positive Predictive Value (PPV), and timelines were relatively low. **Conclusion:** The current issues were on HR due to low quantity and understanding about good measles surveillance among officers. Poor allocation of funds for training and supporting infrastructure especially for the reagents and procurement of bulletins might possessed additional effect.

Keywords: Attribute surveillance, Surveillance System, Measles, Provincial health office, East java

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INTRODUCTION

Measles is one of the infectious diseases which is included in the priority of health problems in Indonesia (2). Groups that are vulnerable toward measles are child aged more than 1 year old, infants who are not vaccinated and immunized, adolescents and young adults who have not received second immunizations (7).

Indonesia is a developing country in the Southeast Asia region with a high incidence of measles cases for the <1 year age group which reached 48.9 per 100,000 people a year, 1-4 years old was 36.6 per 100,000 people a year (4). Whereas the mortality rate from measles in children aged <5 years in 2013 also shows that the proportion is still high at 5% (7-8).

Based on the measles surveillance report since 2010 to 2015, 12-30% of the 11,000 suspected cases of measles were laboratory confirmed. Based on the data above, it was estimated that there are 23,164 cases

of measles confirmed in Indonesia (3, 7). However, it reflected a small proportion of the true number of cases occurring in the community (3). They do not seek health care or, if diagnosed, are not reported especially from private health services and lag time in reporting of the surveillance reports (3, 8).

Based on Indonesia's Health Profile 2017, it was reported that East Java ranked first out of 5 provinces with the highest number of measles cases in Indonesia, which reached 3,547 cases (10). There were 38 districts found for measles cases in East Java Province. Measles cases in East Java had increased from 2009 to 2011. In 2011 a "Measles Campaign" was conducted to reduce this case, so that in 2012 measles cases decreased to 1085 cases. In 2013, measles cases increased to 2,529 and in 2014 it fell by 762 cases, while in 2015 it increased to 2,268 cases and in 2016 it increased to 3,765 cases with a Case Fatality Rate (CFR) of 0.1% (9).

Integrated prevention and mitigation efforts to provide an early response to epidemics that occur continuously is done to reduce the number of outbreaks in East Java Province. Universal Child Immunization (UCI) in 2016 did not meet the target, which only reached 82.93% of the national target of 95% (8). There are 17.07% or

1449 villages that still have not reached UCI.

Various efforts have attempted to be carried out by the government to tackle measles cases that still appear in the community. Since 2000, the second chance of measles immunization was given gradually to 1st - 4th grade of school students (catch up measles vaccine) which is then followed by routine measles immunization program to first grade elementary school students (*Bulan Imunisasi Anak Sekolah/BIAS*). To speed up the achievement of measles protection in children, in August-September 2016 measles program crashes were carried out in children aged 9-59 months (10).

One important factor influencing the high number of measles cases in various regions is measles surveillance performance (1). Surveillance is not only used to count the number of cases, but also used as a tool to describe risk groups, evaluate vaccines, eradicate disease and prevent the spread of disease (11). With the availability of valid and accurate data or information, it will certainly produce effective and efficient control or eradication programs.

The surveillance system must be evaluated periodically and must produce recommendations for improving quality, efficiency and usefulness (12). Therefore, the goal of this research is to describe the measles surveillance system at Provincial Health office, East Java, Indonesia by assessing the indicators and attributes of surveillance.

MATERIALS AND METHODS

This study was an evaluation research (13) which aimed to assess the program of a project that is being or has been carried out. This study was conducted at the East Java Provincial Health Office on October 21, 2018 to November 17, 2018. This study adapted the 2001 updated CDC guideline on surveillance evaluation (12). The results obtained were compared with the Technical Guidelines for Measles Surveillance 2012 (14), Decree of Health Ministry Republic Indonesia Number 1116/MENKES/SK/VIII/2003 (*Kepmenkes RI No. 1116/MENKES/SK/VIII/2003*) concerning the Health Epidemiology Surveillance System Guidelines and employed both qualitative and quantitative methods to describe and evaluate the system (1). Stakeholders were the head of the disease eradication section, EWARS Surveillance officer and the field of epidemiology surveillance officers (SO) from East Java Provincial Health Office were interviewed to assess their views on the usefulness and acceptability of the system. The working area of East Java Provincial Health Office consisted of 38 Regencies/cities. A retrospective record review of the measles case-based surveillance data originating from the 2014-2017 Provincial Health Service Annual Report, CBMS performance reports and Regency/City Laboratory Results in East Java in 2018 (per 1st May 2018) were

used. It was included data analysis of achievement of indicators in Measles Surveillance Performance in the East Java Health Office in 2018. The output component that must be done by the provincial health office was to cover all measles surveillance performance indicators based on the measles surveillance technical guide (15). This research was a document study that had received approval from the East Java Provincial Health Office, before the commencement of this study, all participants were informed about the purpose of the study and obtained written informed consent from each of them. Primary data collection was obtained through interviews to respondents using questionnaires and observations. While secondary data collection was obtained through the study of documents or records of measles epidemiological surveillance data available at the East Java Provincial Health Office.

Analysis Data

The indicator of surveillance system assessed with three types of indicators; input, process, and output (16). Input indicators were assessed based on resources needed and existed during the implementation of measles surveillance activities. Process indicators were assessed based on the plan and implementation of surveillance, while the output indicators were assessed based on the results of the surveillance activities that are running at the East Java Provincial Health Office. Assessment of the three indicators were based on the results of interviews with respondents and study documents.

The attributes of surveillance were assessed based on parameters including: simplicity, flexibility, acceptability, sensitivity, PPV, representativeness, dan timeliness. Assessment of these attributes based on primary data through interviews with respondents using questionnaires and secondary data observation.

RESULTS

Finding on the indicators of the measles surveillance system

An assessment of the input component of the surveillance system was carried out on the quantity and quality of Human Resources (HR), funds, as well as the means to implement the system. The results are summarized in table I. Human resources at the East Java Provincial Health office have met the criteria consisting of Early Warning Alert and Response System (EWARS) surveillance officers (Epidemiology S1 expert), measles surveillance program holder (Epidemiology S2 expert) and field surveillance officer (Epidemiology S2 expert). However, in terms of quantity, the number of surveillance officers is considered to be lacking, as they also perform double tasks which is as a manager of Congenital Rubella Syndrome (CRS) Surveillance. Funding at the provincial level was available for surveillance activities, but it was not enough to conduct meeting on coordination of information dissemination, training of district and

Table I: Overview of the Measles Surveillance System in the East Java Provincial Health Office 2017 in the Input Component

Items	Criteria Provincial Health Office	Level
Human Resource (HR) Quantity	Qualified	Not Qualified
	Not Qualified	
Human Resource (HR) Quality	Qualified	Qualified
	Not Qualified	
Computer	Available	Available
	Not Available	
Implementing Guidelines	Available	Available
	Not Available	
Application Program	Available	Not Available
	Not Available	
Surveillance Facilities	Transportation	Available
	Literature	Not Available
Form	Literature	Available
	Form	Not Available
Stock reagents	Qualified	Not Qualified
	Not Qualified	

Public Health Center measles surveillance officers, and purchasing reagents and procuring bulletins.

The type of staff in the implementation of measles surveillance at the East Java Provincial Health Office has met the standards contained in the 2012 Measles Surveillance Technical Guidelines (15) which consists of Immunization-preventable disease (PD3I) surveillance data management officer (Measles and Rubella) and two people as surveillance officers (SO).

Data collection on the measles surveillance system at the provincial level was done passively (the data were collected by regional health service through e-mail to provincial health service). District/City frequency to carry out monthly data reports to the Provincial Health Service is on the 10th (15). However, the timeliness of District/City to report monthly data (C-KLB-K/ C1-CBMS integration data) to the East Java Provincial Health Office is only 25%.

Assessment for processing and analysis was carried out by the Health Office at the District/City and Provincial level (1). According to the 2012 Measles Surveillance Guidelines, surveillance activities aim to study the epidemiological picture of measles cases, so that they can answer "Who, Where, When, Why and How" questions (15). However, data analysis activities at the Provincial Health Office level were only carried out by displaying data in the form of tables and images, and have not been analyzed in accordance with people, place and time. Therefore, it was hard to identify the problems of measles and the cure could not be done effectively.

The description of the measles surveillance system at the East Java Provincial Health Office in 2017 on process components can be seen in Table II.

Table II: Overview of the Measles Surveillance System in East Java Provincial Health Office 2017 on Process Components

Items	Criteria	Level	
		District/City Health Office	Provincial Health Office
Data collection frequency	appropriate	Not appropriate	appropriate
	Not appropriate		
Data processing	appropriate	Not appropriate	Not appropriate
	Not appropriate		
Data analysis	appropriate	Not appropriate	Not appropriate
	Not appropriate		

Fig. 1 shows the process that every case of measles treated at a health facility in the work area of the District/City Health Service must be reported and the Public Health Center (*Puskesmas*) Officer tracing the case area and collecting serum specimens. Data on the results of tracking or investigating cases of measles and blood specimens (serum) are brought and reported to the District / City Health Office, using form C1. Then the District / City Health Office Surveillance Officer brings the blood specimen (serum) to Surabaya BBLK using form C1 and the laboratory examination request form and reports to the East Java Provincial Health Office with the same form.

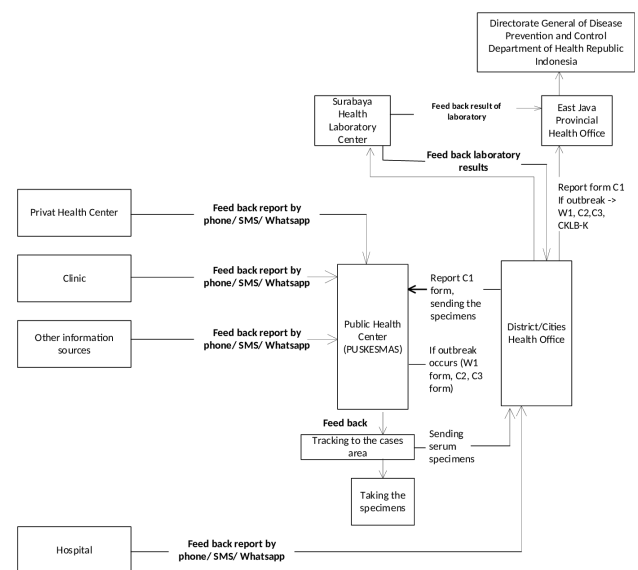


Figure 1: Measles Case-based Surveillance Reporting Flow Chart (13)

The East Java Provincial Health Office disseminates information to the District/City Health Office written or verbally through periodic reported to the Ministry of Health of the Republic of Indonesia every month and annual reports. Annual reports have been made in narrative form. Epidemiological information was provided at the time of the meeting forums at the district, provincial and central levels. Quarterly written feedback was addressed to the Head of District/City Health Office

in East Java in the form of tables and graphs. However, reports of measles have not been made in the form of bulletins, circulars, scientific publications or uploaded on the website of the East Java Provincial Health Office.

Finding on the attributes of the measles surveillance system

Simplicity: Fig. 1 shows the flowchart of measles cases reporting was done by SMS (Short Messages Service), Whatsapp and telephone access, making it easier for surveillance officers to exchange information or field conditions with limited human resources, time, and costs. The EWARS application also make it easier for officers to calculate the number of cases, but the data generated was aggregate data rather than individual data. This was supported by the complete reporting of C1 form (only 20.30%) below the target minimum of $\geq 90\%$. Other than that in Table III showed that based on October, 2017 there were only 41.49% of the specimens had been examined due to limitation of reagents. So, it can be conclude that the results of the simplicity assessment in the implementation of measles surveillance at the East Java Provincial Health Office were not simple.

Flexibility: In 2015, the measles surveillance system that has been implemented has changed related to the changing reporting system in which the implementation of CBMS from clinical cases must be through laboratory confirmation. The implementation of CBMS is constrained due to limited stock of reagents and inadequate specimens. This change is considered to cause additional costs and training for field staff in carrying out specimen collection. Based on Table III competency is needed in the implementation of measles surveillance, but the program holder at East Java Provincial Health Office has never received training and guidance on case-based measles surveillance.

Acceptability: reflects the ability of individuals and organization to participate in the implementation of surveillance. This acceptability was reflected in the reporting of suspected cases. Table IV illustrates the results of the evaluation of the surveillance system with the acceptability attribute approach which was assessed from three aspects of evaluation results which are the percentage of districts/cities reported a case rate of negative measles below the standard (0.43%), suspected measles were examined by IgM above the standard (84.00%), and inadequate specimens (22.00%). It can be concluded that the measles surveillance system is considered inaccurate because the overall average percentage is 31.87% or $< 80\%$.

Data Quality: The quality of the data could be indicated by the completeness of the *Puskesmas* or outbreak report form(C-1), the accuracy of the Public Health Center report and the completeness of the recapitulation outbreak

Table IV: Description of Measles Surveillance System 2017 according to Achievement of Indicators of Measles Surveillance Performance in East Java Provincial Health Office (15)

Aspect	Standard	Evaluation Result
Data Resource : Routine Report		
The percentage of districts/ cities reported a case rate of negative measles $\geq 2/100,000$ population	$\geq 80\%$	0.43%
Suspected measles were examined by IgM	$\geq 80\%$	84.00%
Completion of Health Center Reported by Form (C-1)	$\geq 90\%$	20.30%
Accuracy of <i>Puskesmas</i> reported form C-1	$\geq 80\%$	1.10%
Adequate specimens	$\geq 80\%$	22.00%
Outbreak report		
Completion of outbreak report form (C-KLB)	$\geq 90\%$	63.40%

data (CKLB-K) report. Filling out the incomplete and inaccurate reporting format was not possible to identify the high-risk populations of measles transmission in the East Java Province.

Timeliness: The ability of the surveillance system to control time for the entire process of conducting surveillance was important. Timeliness assessment was carried out by analyzing the accuracy of reports originating from reporting sources so that stakeholders could consider them to make the right decisions. Data collection had to be reported at the East Java Provincial Health Office every month, the 10th, and EWARS reports were weekly (Zero reports). Based on reporting attendance, the reporting unit's accuracy was 25%. So, it can be concluded that timeliness in data collection was low.

Stability: System stability refers to the stability or capability of the facilities or equipment used to support the surveillance system. System stability could be seen from the equipment used in collecting and storing data. Based on the results of interviews, it was known that data processing begins with data entry and complete the attendance of data completeness manually using Microsoft excel. Based on Table V showed that there was redundancy in the reporting forms (C-1, C-2, C-3 and CKLB-K) thus, affecting the completeness and accuracy in reporting measles surveillance data. *Puskesmas* officers experienced difficulties in filling out the reporting format as in coloumns 15-21; unsimilar dating types, errors in writing epidemiological numbers, and unfillled important variables such as in measles immunization status in coloumn 14.

In implementing surveillance program, there was an EWARS application to facilitate the reporting of the number of cases of all health surveillance programs and become an early warning of outbreaks. However, the EWARS component only showed the number of cases. While the implementation of measles outbreak surveillance must be in accordance with the case of individuals from fully investigated if the case of measles

Table V: Data that must be Filled in Forms C-1, C-2, C-3, and CKLB-K (15)

No.	Type of Data	No.	Type of Data
1.	Province*	18.	Sex
2.	Date of data recapitulation	19.	The measles vaccination dose was received before illness
3.	Month of incident	20.	Last measles vaccination
4.	Year of Incident	21.	Date of onset illness
5.	Outbreak period (if outbreak occurs)	22.	Date of onset rash appear
6.	Number of case	23.	Date of report was received
7.	Number of epidemiology	24.	Date of investigation
8.	Number of outbreak	25.	Date of taking serum samples
9.	Case's name	26.	Date of taking regular samples
10.	Parent's name	27.	Measles IgM laboratory results
11.	Address	28.	Rubella IgM laboratory results
12.	Puskesmas	29.	Laboratory results of virus isolation
13.	Sub-district	30.	Vitamin A
14.	Districts/ city	31.	The last condition
15.	Province*	32.	Final classification
16.	Age (years old)	33.	Nutrition status
17.	Age (months)	34.	Complications that arise

redundancy data

outbreaks occur. Therefore, it is concluded that the measles surveillance system is unstable.

Positive Predictive Value (PPV): Refers to the suspected proportion identified by the system and was positive according to the laboratory examination compared to the total number of suspected measles cases as follows:

$$PPV = \frac{\text{number of true positives}}{\text{number of true positives} + \text{number of false positives}} \times 100\%$$

$$PPV = \frac{703}{703+248} \times 100\%$$

$$PPV = 73.92 \%$$

Based on the results of these calculations, it can be concluded that the value of PPV was low. Some factors that influence the volume of specimen collection is <1 cc, storage of specimens was not appropriate at 2-80°C, and the time of sending specimens to the laboratory is >48 hours.

DISCUSSION

In 2013, in several countries in the world were implemented measles surveillance with laboratory confirmation of suspected cases including 3 countries in South-East Asia region (Bangladesh, Nepal, and Myanmar) (8). It reported case-based measles surveillance data monthly to the WHO-South-East Asia Regional Office through their national disease surveillance systems, while other countries in the region reported aggregate measles surveillance data monthly

(8). In 2015, Indonesia held a program leading to measles eradication, with case based measles surveillance (CBMS) effort that ran along with rubella control.

The case-based measles surveillance system (CBMS) aimed to detect cases of measles as early as possible. So, that actions could be performed to take serum specimens to prevent transmission to surrounding people (15). Every case of measles must be carried out by laboratory investigation and confirmation. This is an effort to get fast and appropriate handling. So, the transmission can be prevented as early as possible.

The measles surveillance system is the availability of data and information about measles cases that can be used to make policies, so that the morbidity and mortality rates from measles can be reduced (1). An individual measles surveillance system will provide information on the prevalence of measles and patterns of risk.

Finding on the indicators of the measles surveillance system

Input : According to Ministry of Health Regulation of Republic Indonesia No. 45, 2014 (*Permenkes RI No. 45, 2014*) concerning the implementation of Health Surveillance, it is explained that the implementation of health surveillance must be supported by availability of human resources who have competencies in the field of epidemiology, adequate funding, and facilities and infrastructure needed use appropriate technology (17). Qualitatively, the HR at the East Java Provincial Health officethat handles measles surveillance has fulfilled the requirements according to the provisions contained in the Measles Surveillance Technical Guidelines 2012 (18). The quality of HR at East Java Provincial Health Office was compliance with EWARS surveillance staff, surveillance officers measles and field surveillance officers. However, quantitatively the number of surveillance officers was lacking, because the measles surveillance officer also served as a CRS surveillance. So, there were supposed to be 3 surveillance officers at East Java Provincial Health Office.

Measles surveillance activities are under the coordination of the Head of Disease Eradication Section. However, the activities carried out are more likely to achieve the objectives of the control program so that measles surveillance activities have not been maximally achieved. Periodic evaluation of surveillance system is important in assessing its efficiency and effectiveness and to ascertain if the system is meeting the objective for which it was established, even though according to *Permenkes RI No. 45, 2014* concerning the implementation of surveillance (17), these activities should be carried out.

In terms of funding, the measles program already has allocations in accordance with *Kepmenkes RI No. 1116/SK/MENKES/VIII/2003* which comes from the

Regional Budget (APBD I) as well as external assistance. Surveillance facilities at the health office level has also corresponded with *Kepmenkes RI No. 1116/SK/MENKES/VIII/2003*.

The types of data collected (Fig. 1) were: patient identity using C-1 report form, integration report (Acute Flaccid Paralysis/ AFP, Measles, tetanus neonatorum, and diphtheria), measles outbreak recapitulation report (C-KLB recap form), SARS completeness report (Severe Acute Respiratory Syndrome), and C-1 Health Center (attendance form/ Regency). In Kaduna State, Nigeria, at health facility level, data collection is done using three data collection instruments: Case Investigation Form (CIF) (001A), laboratory information inputted into form 001B and sent the measles reference laboratory at Yusuf Danso memorial hospital for laboratory confirmation (ELISA and IgM antibody) (19).

Process: Health surveillance activities included data collection, data process, and data analysis (17). Data collection at the Health Office was done passively; data was obtained from routine health facility reports and other reporting sources. The obstacles encountered during data collection were about the accuracy and completeness of the report. *Puskesmas* officers experienced difficulties in filling out the reporting format as in columns 15-21; unsimilar dating types, errors in writing epidemiological numbers, and unfulfilled important variables such as in measles immunization status in column 14.

Poor Completeness and accuracy of data indicated that there were still under reporting of measles cases. If the completeness and accuracy of the data were low, the generalization of the data does not describe the actual situation which affects the implementation of the measles surveillance program.

Data collection of measles aims to find out the epidemiological description comprising time, place of occurrence, age and immunization status in each health center and hospital. Data processing activities at the *Puskesmas* level, accordance to *Permenkes RI No. 45, 2014*, states that before being processed there should be clearance, correction, and rechecking. Further at the Health Office level, the data will be processed to answer surveillance purposes.

At the provincial health office level, there was no analysis of the collected data has been carried out. After doing data processing, it was only presented in the form of graphs and tables. Then, it was made as presentation material during a meeting with the Head of the District/ City Health office, the manager, or during monitoring and evaluation. So, it cannot answer the "Who, Where, When, How" of problems occurred. Likewise, the conclusions taken were often not based on theory or scientific studies.

Output: The information that has been generated from the surveillance process were in accordance with the 2012 Measles Surveillance Technical Guidelines. The purpose of measles surveillance is to identify areas and high-risk populations that are likely to occur measles transmission, monitor the process of measles eradication programs, carry out measles data collection to determine epidemiological features comprising time, the location, age, and immunization status of each *Puskesmas* and hospital, the epidemiological investigation of every measles outbreak and laboratory confirmation, the analysis of measles and risk factors at each level of health administration, and the realization of decision making using surveillance data.

Based on the objectives of measles surveillance, the results of the evaluation at the East Java Provincial Health Office in 2017 were in accordance with the objective of measles surveillance, which was to identify areas and high-risk populations of measles transmission. While the written dissemination of the information has been done by the East Java Provincial Health Office by making regular reports in the form of narratives every year. However, reports of measles have not been made in the form of bulletins, circulars and scientific publications and uploaded on the website of East Java provincial health office. In Kaduna State, there are 188 (10.9%) health facilities report case based information on epidemic prone disease on a weekly basis to the Local Government Area (LGAs) level, then forwards all aggregated reports to the national level on before close work on Wednesday of the same week (19).

Finding on the attributes of the measles surveillance system

In the years under review, the surveillance system was associated with a progressive decline in timeliness and completeness of reporting. This similar finding had been shown to be consistent in most part of provinces in Indonesia especially where paper based reporting is used (6, 18). The major challenge with the decline in timeliness is that most outbreak go undetected and when finally detected would have caused a lot of harm (21).

The surveillance system was also shown to have a low PPV. This was reflected in the low annualized detection rate of measles and non-measles febrile rash. Since measles is endemic in East Java with a high prevalence (10, 9). It was also occurred in Nigeria in 2010-2012, the measles surveillance system having low PPV (19). It implies that the measles surveillance system would not be able to detect cases adequately (19). The reduced low PPV could be due to low reporting representativeness, as a relatively large number of public health facilities and most private health facilities do not report. Furthermore, the under-reporting associated with this system simply means that the surveillance system cannot predict outbreaks and most outbreaks that occur are undetected

(12).

The decline in timeliness implies the low simplicity of the measles surveillance system at East Java Provincial Health Office, because in terms of the case definition the individual measles-based surveillance system requires laboratory examinations. This results also affected on the poor attribute of surveillance that is flexibility. This was due to the needs of stock of reagents to confirm the suspected measles cases were not fulfilled and inadequate of specimen resulted by the poor performance of the officers in taking the specimens. The only way that can be done is to provide sufficient funds to meet the needs, for example, available funds are allocated for training.

The measles surveillance system in Health Office of east java Province according to table IV showed that on the surveillance attribute, acceptability was considered unacceptable. This was due to the poor completeness and accuracy of reporting from health facility units. The accuracy of the report accelerates response alerts to early detection of outbreaks (1). This was also related to the data stability and quality of the ongoing surveillance system. Stability in evaluating the measles surveillance system at the East Java Provincial Health Office was assessed based on the devices used, namely the EWARS application program and case reporting form. The method used in recording and reporting measles surveillance data employed a form which was input into Microsoft Excel. In conducting surveillance, there was an EWARS application that made it easy to report the number of cases of all health surveillance activities. However, the components in the EWARS system only showed the number of cases and were not in accordance with the individual cases needed for follow-up investigation of measles outbreaks.

Information technology continues to grow, so that the presentation of accuracy, speed, and efficiency of information is needed. This development should also be used to support surveillance so that integrated recording and reporting can automatically save costs, time and flexibility. The information produced was also getting better quality (23).

CONCLUSION

To conclude, the evaluation of measles surveillance system implemented at the East Java Provincial Health Office showed that there were still several weaknesses related to HR in terms of quantity. The assessment of surveillance attributes showed that it was not simple, unstable, with low data quality; low PPV value and the timeliness of data collection were also low.

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