

ISOPH 2017

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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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- Agustina Abuk Seran**, Politeknik Kesehatan Kemenkes Kupang, Indonesia
- Rahayu Listianingsih**, Universitas Airlangga, Indonesia

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 acknowledge 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 Suhandu
Chairman of the Committee

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Evaluation of Dengue Hemorrhagic Fever Surveillance System

Kusuma Cutwardani¹, Atik Choirul Hidajah¹ and Sigunawan²

¹Department of Magister Epidemiology, Universitas Airlangga, Mulyorejo Street, Surabaya City, Indonesia

²Lamongan District Health Office, Dr. Wahidin Sudirohusodo Street, Lamongan District, Indonesia
kusuma.cutwardani-2015, atik-c-h¹@fkm.unair.ac.id, sigunawan20@yahoo.com

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Abstract: The incidence of the dengue report estimate indicates that there are 390 million dengue infections per year. One of the Dengue Hemorrhagic Fever (DHF) prevention programs is epidemiological surveillance. Evaluation is required to assess the implementation progress of the DHF surveillance system. This evaluation was conducted in May and June 2016 at Lamongan District. Primary and Secondary Data were collected. There are 10 health centers that were selected as a sample by purposive sampling in Lamongan District. Data was analyzed descriptively. The results of this evaluation show that the DHF surveillance system in Lamongan has good acceptability. Meanwhile simplicity, representativeness, data quality and the stability of the data are considered low. As for the sensitivity, positive predictive value (PPV) and timeliness cannot be assessed. Information dissemination is done through DHF reports, by telephone, or in a meeting held with the health office. Surveillance data is used for decision making in solving health problems such as the occurrence of DHF outbreaks. Some of the problems found in this evaluation, are that attendance is needed to be assessed along with the timeliness and data external to the system to assess the Sensitivity and PPV attributes.

1 INTRODUCTION

Dengue is a mosquito-borne viral disease that has rapidly spread in all regions of the World Health Organization (WHO) in recent years. The dengue virus is transmitted by female mosquitoes, mainly of the species *Aedes aegypti* and to a lesser extent *Aedes albopictus*. Dengue is widespread throughout the tropics, with local variations of risk, influenced by rainfall, temperature, and unplanned rapid urbanization (WHO, 2016). The incidence of dengue has grown dramatically around the world in recent decades. The actual numbers of dengue cases are underreported and many cases are misclassified. One recent estimate indicates 390 million dengue infections per year (95% credible interval 284–528 million) (Bhatt et al., 2013).

Dengue hemorrhagic fever (DHF) is one of the public health problems in Indonesia in which the number of sufferers tends to increase as it spreads more broadly.

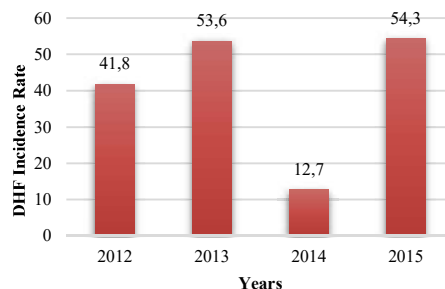


Figure 1: DHF incidence rate at Lamongan district, 2012-2015

Source: Lamongan DHO, 2015

In Indonesia, dengue disease continues to be a health problem because there are still many endemic areas (Widoyono, 2011). DHF data in East Java Province showed that the incidence of DHF increased in 2015 (IR 52.72 per 100,000 population) when compared to 2014 (IR 25.16 per 100,000 population). Data from East Java Provincial Health Profile in 2012 showed that Lamongan District ranks ninth for the number of dengue cases as many as 312 cases (East Java Province Health Office, 2013). The

morbidity rate of dengue in Lamongan Districts from 2012 to 2015 had fluctuated, the difference of case increased between 2014 (IR 12.70 per 100,000 population) and 2015 (IR 53.13 per 100,000 population) far enough (Lamongan District, 2015). If dengue cannot be handled, then an outbreak can happen and also impact on the economic burden. In order to solve the dengue problems in Indonesia since 2004, the Ministry of Health had been working with the Provincial Health Office and the District Health Office (DHO) to implement the DHF prevention method, that is epidemiological surveillance (Ministry of Health of the Republic of Indonesia, 2005).

The correct information related to DHF is needed to solve health problems. Therefore, in general, the dengue surveillance purpose is the availability of dengue epidemiology data and the information as a basis of health management for decision making in planning, implementation, monitoring, evaluation of health programs and awareness improvement as well as a quick and appropriate outbreak response (Ministry of Health of the Republic of Indonesia, 2015). Lamongan DHO had conducted epidemiological surveillance of the DHF disease and to see the implementation development of a DHF surveillance system, it was necessary to do evaluation of the implementation of the DHF surveillance system in Lamongan DHO.

2 METHODS

This research is a descriptive research. Based on its objectives, this study is an evaluation study. This research evaluated the implementation of a DHF epidemiology surveillance system at Lamongan DHO in 2016. An assessment of the implementation of a surveillance system is based on the attributes of a surveillance system consisting of simplicity, acceptability, sensitivity, positive predictive value, representativeness, timeliness, quality data, stability. Primary and Secondary Data are collected. Secondary data is collected from the DHF surveillance report by Lamongan DHO. Meanwhile, primary data is collected through interviews and document study. The respondents of this study are the DHF Program Officer from the Health Center and Lamongan DHO.

The instruments used for collecting data is a questionnaire. There are 10 samples from a total of 33 health centers that are selected by purposive sampling in the Lamongan District. The Health Centers' sample selection was based on the number

of DHF Incidence Rate that have been reported. The Ministry of Health Republic of Indonesia target in 2015-2019 is that the IR DHF at District/City is less than 49 per 100,000 population. Hence, samples selected are Health Centers that report IR DHF numbers of ≥ 49 per 100,000 populations and IR DHF numbers of <49 per 100,000 populations, and each selected 5 Health Centers.

3 RESULTS

Based on Table 1 below, it appears that most of the respondents are male (80%), aged > 40 years old (70%), had a working period as a DHF program officer for 1-5 years (40%), and had last education as Bachelor of nursing (50%).

Table 1: Description of respondent's characteristics.

Respondent's Characteristics	N (%)
Sex	
Female	2 (20)
Male	8 (80)
Age (Years)	
21-25	0 (0)
26-30	0 (0)
31-35	1 (10)
36-40	2 (20)
> 40	7 (70)
Working Period (Years)	
<1	0 (0)
1-5	4 (40)
6-10	2 (20)
11-15	2 (20)
16-20	2 (20)
Education	
Senior High School	1 (10)
Diploma of Midwifery	1 (10)
Diploma of Nursing	3 (30)
Bachelor of Nursing	5 (50)

3.1 Simplicity

The interviewed respondents mostly stated that the DHF surveillance system in DHO Lamongan District is currently quite easy to implement such as data collection (80%), form filling (100%), case reporting (100%), availability of human resources (90%), availability of facilities and infrastructure (90%), as well as information dissemination (100%). Information dissemination is done through DHF

reports, by telephone, or from a meeting held by the health office. However, some program holders at the Health Centers stated that they are still having difficulties in terms of data processing (50%).

3.2 Acceptability

The results of the interviews show that all stakeholders are willing to participate in the implementation of existing activities within the surveillance system. Data on dengue fever cases obtained from health centers came from nearby community reports (cadres) and health workers. In addition, the hospital in the Lamongan work area also participated in providing information about the existence of dengue cases.

Data on the number of cases from the health centers is also used by Lamongan DHO to monitor the occurrence of DHF especially in endemic areas and also as a consideration for decision making appropriately. Thus, it could be said that the surveillance system in Lamongan District had good suitability.

3.3 Representativeness

The results of the interviews have shown that all respondents recorded the case based on the person, place and time. However, 10% of the respondents stated that sometimes there are cases of DHF that are not recorded because patients are treated in health services that are outside of the working area of the Health Center concerned. Therefore, the surveillance system is not considered to be able to describe the occurrences of DHF accurately all the time so its representation is low.

3.4 Sensitivity

Determination of DHF diagnosis is always done by laboratory examination of looking at patient platelet value. If the assessment is only based on results of symptoms and anamneses and not accompanied by laboratory results, then it is not included in the case report. Based on that, it could be concluded that there is a sensitivity value of 100%, so it could also be concluded that the sensitivity value of dengue cases in Lamongan is considered good. However, since the laboratory results are examined only in the form of hematocrit and hemoglobin values, the sensitivity value cannot be calculated. This is because the hematocrit and hemoglobin values are considered as clinical diagnostic criteria.

3.5 Positive Predictive Value

The positive predictive value of the DHF surveillance system in Lamongan DHO could not be measured as the probability of DHF signals could not be calculated because, in their own Lamongan, no other comparative surveys could be used to confirm the occurrence of cases or epidemic events that occur. Data on DHF incidence for the entire Lamongan district are still only sourced from Health Centers and Hospitals data collected by DHO.

3.6 Timeliness

Overall, DHF program officers who were interviewed at the health centers stated that it is never too late to report data to Lamongan DHO. However, to support the statement, the Lamongan DHO did not make an attendance to assess the timeliness of data reporting. Unavailability of attendance in Lamongan DHO made the respondent's statement difficult to be confirmed, so the timeliness attribute could not be measured yet.

3.7 Data Quality

From the results of the interviews, it is known that the Lamongan DHO did not conduct an assessment of the report format reported by the health centers. During the interviews, there is a different understanding of the types of case reports collected by the health centers for the DHO. 90% of the respondents stated that the reports collected are S0 reports, weekly reports that could be reported via the Short Message Service (SMS), and monthly reports. However, 10% of respondents stated that the case reports collected are only S0 reports. Thus, it is assumed that the data quality of DHF reports in Lamongan District is low.

3.8 Stability

The result of the interview showed that 30% of respondents stated that there is data loss and 50% of respondents stated that there had been damage to computer data storage. The damage takes a long time to repair (i.e. 2 to 3 days). This indicates that the surveillance system has a low stability.

4 DISCUSSION

4.1 Dengue Case / Disease Reporting System

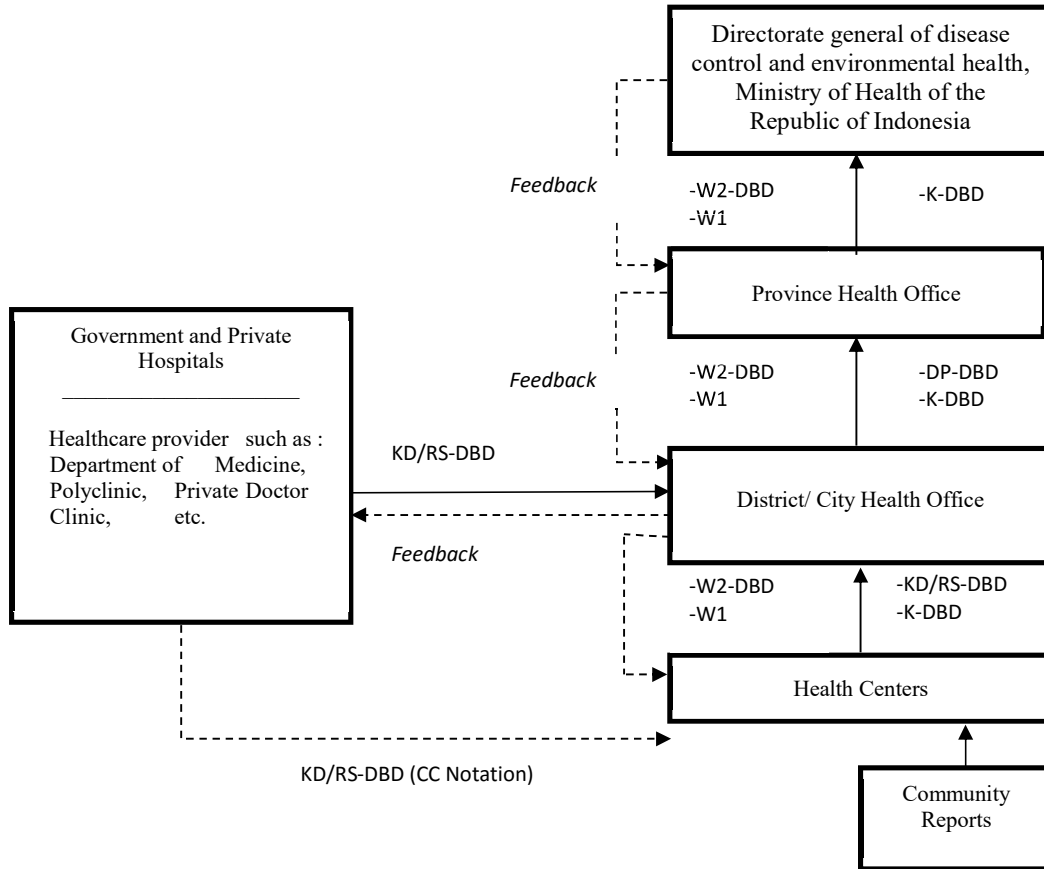


Figure 2: Dengue case / disease reporting system.

Source: Ministry of Health Republic of Indonesia. 2005.

4.2 Attribute of Surveillance System

Simplicity in a surveillance system can be seen in the structure, reporting flow, and ease of operation (Center for Disease Control and Prevention, 2001). Implementation of surveillance in the working area of Lamongan DHO is not considered to be simple because there are still DHF program officers at Health Centers who find difficulties in terms of processing and analyzing data. According to research by Natalia (2012), dengue surveillance can be influenced by officer factors. Factor officers are working period, education, knowledge, positive

attitude, skills in processing and presenting data and attention from superiors. The working period of a DHF program officer at Health Centers located in the work area of Lamongan District is mostly 1 to 5 years (40%), and they mostly have a Bachelor of Nursing degree standard of education (50%), and all have double workload.

Employees who are given dual tasks have to work in multiple positions and tasks, so the results achieved become less than the maximum because of the many tasks and responsibilities given to employees, while the time provided only allows them to complete these tasks only partially

(Mudayana, 2012). Essentially, the biggest obstacle to employee performance lies in the individual and the ability of the employee itself (Pakpahan et al, 2014).

Some of the problems faced related to the quality of employees are as follows:

- The lack of discipline in employees and unskilled employees hamper the performance of employees, and this is related to the fewer human resources in the mastery of technology.
- Some employees do not master the field of work due to educational background that is not in accordance with what he or she did.
- Employees who are less effective while working because they are not placed in accordance with their individual expertise (Prasetia, 2012).

Therefore, it is necessary to develop the capacity and ability of employees to be constantly in line with the development of the main tasks and functions in completing the work they have (Pakpahan, 2014).

A representative surveillance system will accurately describe the occurrence of a health event within a given period of time and the distribution of the event in society according to the person, place and time (Center for Disease Control and Prevention, 2001). The results showed that 10% of respondents stated that there are still obstacles in case tracking, if patients are treated outside the work area of the health center concerned. This condition indicates that the available data is less reliable. Representative data means that the data is unbiased and reliable (Australian Minerals & Energy Environment Foundation, 1996). Although there is no comparable data to assess the reliability of DHF incidence data, there is the possibility of a change in the number of cases because of unrecorded data from outpatient treatment in the working area of the Health Centers concerned, which shows that the available data is less representative.

This is also related to the quality of surveillance data. There are 38 attributes to determine whether a set of data is of good quality. Data completeness and timeliness or updating of data are some of the attributes (Chen et al, 2014). However, to assess the completeness and timeliness of reporting required the attendance. Meanwhile, Lamongan DHO did not provide this so that the completeness and accuracy of the report cannot be assessed. There is also attribute reliability (Chen et al, 2014). If, conclusions are drawn based on unreliable data then the quality of DHF data in the Lamongan District is still not representative of the actual condition as

there is still data that is Under-Reporting because not traced. Under-Reporting is one of the 11 attributes that determine if a dataset has a low quality (Chen et al, 2014).

Acceptability of the surveillance system in Lamongan DHO can be concluded acceptable. This is similar to the research conducted by Zumaroh (2015) at Putat Jaya Health Center, and the surveillance system is said to be acceptable because of several parties participating in the implementation of surveillance case such as cadres as representatives of the community and local government. Example of these are the Villages, while the results of the surveillance of cases have been utilized by the heads of Health Centers, Villages and the Health Office to monitor the situation of dengue.

The definition of a surveillance case determines events to be taken into account and is a fundamental requirement of any surveillance system. Components of the definition of a surveillance case include clinical signs and symptoms, laboratory data, and also include other defining features such as epidemiological characteristics (person, place, and time) (Stein et al, 2011). There are no rules about how sensitive or specific the case definition should be. In the early stages of outbreaks investigation, the goal is to detect as many cases as possible. This requires a sensitive case definition (e.g. in the case of outbreaks of foodborne disease or food poisoning, the definition of clinical cases are people who have loose stools three or more times within 24 hours). At a later stage, the clinical picture is often more pronounced and the diagnosis is confirmed in a laboratory. This allows a more specific case definition (e.g. laboratory-confirmed Salmonella infection), which can then be used for further analytical work (Morgan & Pinner, 2009).

The sensitivity of case surveillance in health centers in the working area of Lamongan District Health Office cannot be assessed because the overall case is determined only based on clinical diagnostic criteria. Based on DHF Control Guidelines in Indonesia, operational definitions of dengue infection cases include dengue hemorrhagic fever (DD), dengue hemorrhagic fever (DHF), and expanded dengue syndrome (EDS). The DHF case definition are fever for 2 to 7 days with bleeding manifestation, platelet count $\leq 100,000 / \text{mm}^3$, presence of signs of plasma leakage (increased hematocrit $\geq 20\%$ of baseline value, and or pleural effusion, and or ascites, and or hypoproteinemia/hypoalbuminemia). If the DHF laboratory results are based solely on platelet and or hematocrit values, the sensitivity of DHF

surveillance cannot be assessed, as it is based on the DBD control guide that this platelet value is considered to be part of the clinical diagnostic criteria. Meanwhile, to determine the confirmation of DHF cases based on laboratory diagnostic criteria that is through:

- Dengue virus isolation from serum or autopsy sample;
- HI Test to assess the increase of antibody titer or increase of IgM antibody specific to dengue virus;
- Dengue virus antigen examination through tissue autopsy;
- Examination of dengue antigen with Polymerase Chain (Ministry of Health Republic of RI, 2015).

It is also associated with a positive predictive value that cannot be measured because the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) are terms commonly associated with diagnostic testing (Kelly et al, 2008). The capacity of the public health surveillance system to detect outbreaks (or changes in incidence and other prevalence) can be increased substantially if detailed diagnostic tests are included in the system (Bender et al., 1997). The sensitivity and PPV measurement of the surveillance system requires:

- the collection or access to data that is usually outside the system to determine the actual frequency of the supervised population conditions, and
- the validation of data collected by the system, examples of data sources used to assess the sensitivity of health information or public health surveillance systems including medical and registry records (CDC, 2001).

The unusual timeliness with a median time of only 2 days may reflect some inaccuracy of recording the date of onset, as dengue would generally be diagnosed about 3 to 5 days from the onset of fever (WHO, 2011). The delay in detection and declaration of the outbreak suggests the advisability of setting alert levels and incorporating an automated alert in the system. If this is not possible, then staff should continue to check dengue trends on a weekly basis at least. Since the epidemic, central-level staff now continue to check on dengue trends on a weekly basis (Abdulla et al, 2014).

Data stability in a surveillance case is related to the methods and supporting facilities used in data recording and processing (recap) the number of cases and not lost or damaged data (Zumaroh, 2015). It is concluded that the data stability in Lamongan

District is low. Data is stored in softcopy and hardcopy. The results of the interview show that 30% of respondents have experienced data loss. To support data stability, it is better to use an electronic reporting system to enable easier and more effective reporting, as well as having a great potential to improve monitoring of not only timeliness, but also data quality, and must also be supported by accurate and quality data input (WHO, 2010).

5 CONCLUSIONS

It can be concluded from the results of evaluation activities of the DHF surveillance system in Lamongan District, that most respondents are males, aged > 40 years, who had a working period as DHF program officers for 1 to 5 years, had a recent education gaining a Bachelor of Nursing qualification, and all of them had multiple workloads. The problems of the DHF surveillance system in the Lamongan District are attributed to the simplicity, representativeness, quality of data and data stability. The sensitivity, positive predictive value, and timeliness could not be assessed due to time constraints.

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