

Monitoring and Evaluation of E-DHF Program Usage in Pasuruan City East Java Indonesia

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Submission date: 31-Jan-2023 05:13PM (UTC+0800)

Submission ID: 2003226685

File name: 27_monitoring_and_evaluation.pdf (218.9K)

Word count: 4984

Character count: 25249

3 Monitoring and Evaluation of E-DHF Program Usage in Pasuruan City East Java Indonesia

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Keywords: e-DHF, outbreaks, Dengue, Pasuruan

Abstract: Outbreaks of Dengue occur because of late in detecting cases. This research aims to create an online program that can speed up reporting of Dengue cases. It can be detected as early as possible. This research is an action research. Respondents are attendant health centers, clinics, hospitals and the Health Service as much as 14 people. Sampling was done by using purposive sampling technique. Evaluation method using questionnaire. In the first meeting, all of respondent discussed about E-Dengue Program in Focus Group Discussion. In second meeting, they were trained and tried to use the E-Dengue program. In the third meeting, they reported and evaluated the E-Dengue Program. The study was conducted during 11 months. The results of evaluation showed that e-DHF effective in identifying and analyzing and predicting Dengue outbreaks both in terms of input, process and output. To All of respondents said that E-Dengue program is easy to use and help them to report quickly. Provider hospital/ clinic, health center, and the Local Health District will do an active role in e-Dengue program. E-DHF can identify the accuracy of data collected and accelerate the analysis, presentation and reporting of Dengue cases. E-DHF is effective to detect outbreaks of dengue.

1 INTRODUCTION

For tropical countries, such as Indonesia, cases of Dengue fever (DHF) still becomes health problem that causes death. Deaths due to Dengue fever can be caused by several factors such as host, environment and agent. The variables of host factor are the nutritional status, knowledge, health services, and reporting Dengue cases from hospitals and clinics. The variables of environmental factors are the cleanliness, the free water reservoirs of mosquito larvae as well as free of clothes hanging. Environmental factors is to facilitate the agent multiply. For the sake of survival, the virus must compete with human cells as a host, especially in meet the need for protein. Competition is highly dependent on the durability of the host, if the durability is low then the course of the disease became more severe and can even cause death (Soegijanto, 2003).

Pasuruan in the category of outbreaks of Dengue Fever. Until April 2016 there are 11 patients who died because of Dengue. September 2016 there are 7 patients with Dengue and one of them died (Hartik, 2016). Even in the period August to November 2016 there will be 11 people died due to Dengue.

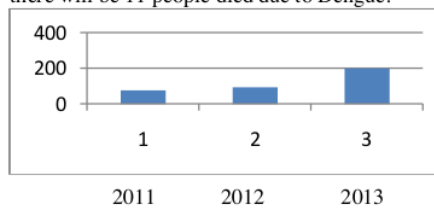


Figure 1: The distribution of dengue cases of Pasuruan.

Over a period of 3 years, the incidence of Dengue hemorrhagic fever (DHF) in the City of Pasuruan tends to increase as shown by figure 1. In 2010, as many as 85,3% village (29 out of 34 villages) in the City of Pasuruan into a village of

endemic Dengue. This figure is an increase of 8.8% compared to the previous year. However, in 2012 and 2013 decreased to 58.8% (DinasKesehatan Kota Pasuruan, 2014). There are 6 health centers in the City of Pasuruan, which still has a village endemic Dengue, the health center Karangketug, Singkil, Sekargadung, Kebonagung, BugulKidul and Kebonsari. As much as 75% of the territory of each puskesmas is considered endemic Dengue. Only the health center Trajeng and health Kandangsapi that does not have a village endemic Dengue. This condition is possible because of the still high density of mosquitoes in the City of Pasuruan. In 2013, Numbers Free Flick (ABJ) in all the village, Pasuruan still under the target (80%).

Risk factors is one of the main information in terms of surveillance, the information about the person, place and time (Departemen Kesehatan RI, 2008). One of the risk factors in the incidence of Dengue is a delay early detection. Early detection is also a major problem in the City of Pasuruan. The presence of a delay in early detection of Dengue dragging the city towards the case of extraordinary Events (outbreaks). One of the causes is the slow reporting from upstream to downstream. This occurs because the information system is still done manually. Reporting the incidence submitted in writing every month so there is a time lag between occurrence and reporting.

The information system is still done manually due to limited resources, unavailability of variable risk factors, as well as weak coordination across related sectors. The Information system can not provide the facilities the speed of reporting, the behavior of the treatment, the frequency of draining the water bath and the presence of trash that can hold water that cause the incidence of Dengue.

In this world there are a wide variety of information systems, ranging from the simplest to the most sophisticated. Today, documentation of the results of the analysis of the system can be in the form of a flowchart, chart and data flow diagram (data flow diagram). A data flow Diagram or data flow diagram (DFD) is a graphical representation of a system that uses a number of forms and symbols to depict the flow of data through a process of relating (McLeod, 2001) the Purpose of this study is to evaluate the effectiveness of the implementation of the e-DHF program in the City of Pasuruan.

2 METHOD

This study is the third stage of the circuit stages of the research within 3 years. This research is action research that is research that focuses on improving the quality of the organization in this case the Department of Health Pasuruan City as well as the performance of the surveillance system of Dengue fever. The system is developed with the involvement of other agencies as the efforts of the vigilance of early incidence of outbreaks of Dengue fever with partner hospitals/clinics and health centers. The research that has been done in the first year resulted in the identification of communities and institutions in the City of Pasuruan as the material to make the information system e-DHF. Research in the second year produces Software e-DHF, i.e. online information system that involves the provider and the department of health, and Software have been analyzed and operationalized. The flow of reporting is depicted in figure 2.

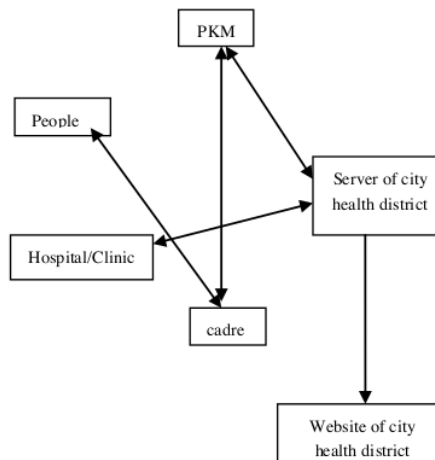


Figure 2: Path of reporting.

The activities of the third year is the monitoring and evaluation of the implementation of the software e-DHF and the rate of such a system includes input, process, and output. Study the third year is intended to evaluate the implementation of program e-DHF. Evaluation of the implementation using a questionnaire. Respondents are officers of health centers, clinics, hospitals and Health Department as many as 14 people. Sampling was done using purposive sampling technique. The study was conducted during 11 months from January 2016.

There are 3 stages in this phase. First, the respondents tried e-DBD and implementing it, both of them evaluate the implementation of e-DHF, second revised e-DHF based on the feedback from the respondents of the study. Once evaluated and revised then the information system of e-DBD is implemented. Evaluation and monitoring is done during implementation and the results of the evaluation presented in the research results. In third stage there were 3 meeting. In the first meeting, all of respondent discussed about E-Dengue Program in Focus Group Discussion. In second meeting, they were trained and tried to use the E-Dengue program. In the third meeting, they reported and evaluated the E-Dengue Program.

3 RESULT

This research was conducted in 3 stages. Stage 1 was conducted in the year 2014. Stage 1 is done by distributing questionnaires to a sample of 130 families obtained from the software CSurvey. The respondent is the family head (father or mother). Data is also collected by conducting FGD. The population of the FGD are all community leaders, religious leaders, and health workers, which is in the region of Pasuruan city. The sample for the FGD participants taken 1 people community leaders, 1 religious figures, and 1 health workers in the region work puskesmas and representing in each village. Participants of the FGD came from the Village Karangketuk, Petahunan, Randusari, Kranyakrejo, Kebonagung, Purutreja, Purworejo, BugulKidul, Kepel, Tapaan, Going, Krampyangan, Blandongan, Trajeng, Tambaan, contemporary styles, and Ngemplakrejo.

The conclusion of the research stage 1 indicates that the knowledge society in the City of Pasuruan on the prevention and control of Dengue has been good but community action is still lacking. The results of the research stage one also showed that the Department of Health Pasuruan City has developed a surveillance system by collecting data on the Office Plague and Disasters the Department of Health of the City of Pasuruan. But all pelaporan and the data is not yet be computerized so that the information produced is still yet to be delivered quickly and on time.

During this time, the data collected the Department of Health is the data the number of cases and place of the incident. Flow reporting starts from the patient Dengue, which is detected by the local medical center, hospitals/clinic are then reported to

the Office Plague and Disasters the department of health. The Data will be followed up with the command to do fogging in the area of the case. Because the reporting is still done manually, then often this reporting takes a lot of time as a result slow action is performed. The results of this study also identify the presence of problems of input of information system, namely the problem of the lack of the ability of officers in data processing and interpretation of data as well as making chart patterns minimum maximum as a tool in monitoring the early detection of outbreaks of dengue fever. At the stage of the process of reporting, accuracy, and completeness of the data collection can be considered still low. Acceptability for information is also still low.

Table 1: The frequency of distribution of the respondents E-DHF fever in the city of Pasuruan.

Institution	F	%
Health Distric	2	14,3
Hospital	1	7,1
Puskesmas	8	57,1
Clinic	3	21,4
Respondent opinion's about CPR Output	F	%
Need to increase	4	28,6
No need to increase	10	71,4
E-DHF Information about early detection of DHF	F	%
Not Good	1	7,1
Good	13	92,9
Easy to evaluate probabily to be DHF outbreaks	F	%
No	2	14,3
Yes	12	85,7
Easy to evaluate of E-DHF Coverage	F	%
No	1	7,1
Yes	13	92,9
Easy to evaluate relationship	F	%
No	2	14,3
Yes	12	85,7
Respondent's opinion about the simplicity of E-DHF	F	%
No	1	7,1
Yes	13	92,9
Easy to fill the form of E-DBD	F	%
No	1	7,1
Yes	13	92,9
Easy to send data in E-DHF	F	%
No	1	7,1
Yes	13	92,9
E-DHF could give Surveillance Indicator	F	%
No	2	14,3
Yes	12	85,7

Easy to Read Case Fertility Rate	F	%
No	3	21,4
Yes	11	78,6
Easy to Read Incidents Risk	F	%
No	3	21,4
Yes	11	78,6
Easy to Read Graphic	F	%
No	3	21,4
Yes	11	78,6
Easy for Data Analysis	F	%
No	1	7,1
Yes	13	92,9

System the right information, quickly, accurately expected to detect early incidence of

Dengue so that it can be done immediately to prevention of the spread of the cases. With early detection the incidence of Dengue can be suppressed and minimized its occurrence so that the mortality rate can also be decreased.

Research phase 2 was conducted in the year 2015. Research the second phase of this has resulted in software e-DBD, which can be operationalized by the health care system and public health authority. E-this DBD system is online with the approach of cloude compute. Such a system can function in collecting and storing data and presents the chart of the forecast minimum and maximum. Thus the stability of the stored data can be maintained. In addition, with the e-DBD, easy to report and more simple. Data processing can be done easily because the system has been complemented by the presentation of chart patterns minimum and maximum. The Output that is produced automatically generate indicators that can be used to establish the extraordinary events based on the criteria of outbreaks.

In stage 3, the study was conducted with the objective to monitor and evaluate whether the software e-DHF can be applied as information systems early warning is a remarkable occurrence of Dengue in the city of Pasuruan. With the special purpose to analyze the results of the application of e-DHF with a systems approach (input, process, output), identify the role as well as provider (hospital/clinic, health center, health), as well as identify the timeliness of the data collected (timelines).

Respondents in the study stage 3 from the district Health Office, health centers and Clinics in Pasuruan. They are the users of the service e-DHF. As shown table 1, the number of respondents most little derived from the hospital because there is only 1 hospital in the City of Pasuruan. Most respondents came from the health center because there are 17

health centers in the City of Pasuruan with the 6 health centers that endemic Dengue.

Most of the respondents consider there is no difficulty either in terms of time and technical program in terms of charging data of e-DHF. They can do because it is part of their duty to report the incidence of Dengue to the Health Department. However there are 2 respondents who are having difficulty in doing the data entry of e-DHF. This happens because the two respondents did not follow the training that was held. Because there are respondents who do not follow the initial training then these respondents felt that there was a slight difficulty in operating the e-DHF. As much as 100 percent of the respondents argued that the coverage area of the e-DHF less extensive because only in CityPasuruan. All respondents expect that e-DHF can be expanded enforced in the whole of East Java, even in Indonesia.

Table 1 shows that the respondents are of the opinion that e-DHF need to be added a variable so that it increase the limit of the Output of the CPR. The variable in question is of variable area and distance range. However, Table 1 also shows that the respondents think the information shown e-DHF can be a means to detect outbreaks of dengue fever early.

All respondents argue that by using e-DHF then the process of data collection becomes faster in addition to easier data collection. All respondents also argue that with the e-DHF then the presentation of the data to be precise and easy. In addition to more quickly, easily, and accurately, the respondents also argue that the e-DHF facilitate in performing the comparison, as shown in Table 1.

E-DHF also facilitate the respondents in view of the tendency of the occurrence of dengue fever and gives ease in seeing the coverage the incidence of dengue. According to the respondents e-DHF can also help the respondents in view of the relationship between the variable occurrence of DHF, as shown in Table 1.

Most of the respondents are of the opinion that the e-DHF simple and easy in filling the form. Respondents no difficulty in filling the form e-DHF and there is no question at all. In terms of data delivery e-DHF, the respondents also argue that the process is easy and not difficult. From Table 1 can also be aware that most of the respondents perceive e-DHF can produce indicators of the surveillance so through e-DBD can be detected the possibility of an outbreak of dengue. E-DHF also facilitate in assessing the Case Fertility Rate and Incident Rate.

E-DHF also provides a means of drawing a graph that shows the incidence in all regions in Pasuruan. From these Graphs, the reader can see and estimate where it will be going outbreaks of dengue fever. According to the respondents e-DHF this ease in reading the chart the incidence of Dengue fever so it is easy in predict the occurrence of outbreaks.

All respondents argue that the data is stored e-DHF is stable enough and e-DHF greatly help in the data analysis as shown in Table 1. Almost all respondents argued that the e-DHF is able to help them in analyzing the data related to Dengue fever and outbreaks of dengue fever. In general, e-DHF greatly assist officers in detecting an impending outbreak.

Although overall e-DHF greatly help health workers, but there are 3 respondents who have difficulty in terms of the availability of a computer in his office. The computer is needed for the purposes of data entry and to read the results. The effort that has been done is advocate for the institution to provide computer facilities for e-DHF. Other issues that appear in addition to availability of computers is the internet connection is substandard. For institutions that its internet connection is less smoothly, through this research has provided the modem for them.

All respondents argued that the e-DHF should be continued and developed. They are very supportive to e-DHF applied in all regions in Indonesia. All the respondents also argue that the e-DHF that has been made is the right method to help early detection of cases of outbreak of dengue.

4 DISCUSSION

The natural environment of the tropics, sanitation is poor and the number of population as well as low awareness of the community to be the main reason dengue is rampant. Indonesia even occupy the highest position in the case of Dengue disease in Southeast Asia with 10,000 cases in the year 2011 (Zakia, 2012). Speed in reporting will affect the speed in an effort to prevent the spread of dengue. Information system-based electronic will speed up the process of reporting information and analysis of the case. As expressed by Hill and Irwin (2005) that the information system is an orderly combination between people, hardware (machine and media), software (programs and procedures), data (basic data and knowledge), networks (communications media and network support) and data resources that

collects, transforms, and disseminates information in an organization.

The needs of information dissemination of dengue fever is required by various parties such as the Department of Health, health centers, Klinik and hospitals. The respondents in this study have met the prerequisites. Both in identification and implementation and evaluation has involved various parties from the Department of Health, health centers, Clinics and hospitals in Pasuruan. They are the users of the service e-DHF. Before e-DHF is created, they are identified and then analyzed. The results of the analysis became the basis for the creation of e-DHF.

Coordination between related sectors is very difficult to do when using the manual way which is traditional. The use of information technology or the computer can be applied to facilitate the coordination and communication data for the relevant institutions. The use of computers also facilitate the analysis of the data. Surplus computers is the speed and effectiveness of processing data and are able to produce various kinds of output expected. Computer technology also can be used

Program e-DHF recently completed on year 2015. Hence, since the 2013-2015 none provider better Hospital/clinic, health center or Health Department that plays a role as well. From 2013-2015 the data is still blank and not filled back by the provider. The number of tasks and workload other be the reason for the provider not enter the data of the last 3 years.

New at the beginning of the year 2016, there are 2 clinics to participate actively in the program e-DHF, i.e. the Clinic Al Aziz and Company. While other providers, such as health centers and Health Department, only utilize such data for the purposes of the database. Nevertheless the provider has active access e-DHF and use for several purposes such as reporting of DENGUE cases.

There is some information that is loaded by e-DHF include: patient name, address, date of identifiable Dengue fever, lab results Dengue fever and the diagnosis. Information is data that has been processed into a form that is more useful and more meaningful for the recipient, whereas data is a source of information that describes an event. According to Siregar (2006) information system is the order of the change data into information that can be used for decision making so it can be done variety action health development.

Most of the respondents consider there is no difficulty either in terms of time and in terms of technical data charging e-DHF. On the contrary,

almost all respondents consider e-DHF is easy and it help them in performing the task of reporting. For this is indeed the respondent was the one who always make a report of the incidence of DHF per month. They make reports manually and then sent manually to the office of the Department of Health. System annual this according to them is difficult because it requires a lot of time that travel and transportation from the location of heading to the office of the Department of Health. Information system e-DHF this is a system that meets the needs identification, processing and analysis of data that is managerial and could be the strategy of the Department of Health. System e-DHF is in compliance with the character of such a system which is said to Jogiyanto (2005) that the character of the system include system components, system boundary, the environment outside the system, liaison system, input system, output system and the target system. It is also in line with Siregar (1992) that a systems approach is the perspective of the object that is learnt as a system. A systems approach is used to study the function of the following system elements of the system in it. A systems approach is also useful to view the issues concerning cross-sectoral. This information system required by all parties and become an important part of the prevention of infectious diseases (Witten, 2004)

According to the respondents, processing the data through e-DHF is easily done. System e-DHF has been compiled based on needs in the field. Already customized to your needs so that data processing does not need to be done manually. Just click a button required in accordance the purposes of the data processed automatically. Mapping areas of threatened endemic dengue was immediately can be seen and read in the chart. In addition to processing data which is easy to do, e-DHF also facilitate in presenting the data according to person, place and time. Stay clicked the people or the place or the time then the presentation of the data have been arranged according to which is needed. No longer need to the presentation manually. Thus e-DHF has meet the system requirements as revealed by Siregar (1992) that the information system of the Science of health record data of a state of health in a place and at a specific time. System e-DHF have also been able to give feedback to planning and control. This is consistent with Witten (2004) that all system and subsystem is interdependent and related to each other. In the feedback system is a form of control system used for planning and control to manage resources.

According to Jogianto (2005), system analysis is the decomposition of the system into system components to identify and evaluate problems and needs, so that improvements can be proposed. From the results of the analysis of the system can be evaluated that although e-DBD is easy or not complicated but still needed training for officers before using it. This is shown by the existence of 2 respondents who experience difficulty in doing the data entry of e-DHF. Their difficulty because two respondents did not follow the training that was held earlier.

In this study, respondents argue that the coverage area of the e-DHF less extensive because only in CityPasuruan. Respondents recommend that the e-DHF can be expanded enforced in the whole of East Java. With regard to the coverage of the region actually e-DHF can be developed by using the method of PostGIS. PostGIS is a system to store geographic data in the relational database postgresSQL. PostGIS is developed by flattrchatr apps Research. PostGIS create a spatial object, in the form of points, lines and polygons. This can be stored in the database and then can be used to detect the occurrence and the possibility of its spread (Mitchell, 2005).

In the e-DHF need to be added variable area and distance range. The distance range can be developed by using GIS systems (Geographic Information System). This system can capture, store, analyse, query and display geographical data (Kang, 2002). Thus The accuracy of the region that is attacked can be identified with the right. This can be developed for further research.

Early detection through e-DHF allows to do because through e-DHF then the data collection process becomes faster and reporting is also faster. The analysis process also greatly assisted by the automated systems that add up the case and detect the incidence of cases per region. In addition it method the graphs presented to make the analysis easier and faster.

Various trends that will occur can also be analysed through the E-DHF. E-DHF has been designed to see the trend. The relationship between variables can be seen in this system. The addition of GIS and the GIS will facilitate the officers to analyze and decide the next action to be done. In addition, the simplicity and ease of an information system became an important part smooth running of the system. Program e-DHF is relatively simple and easy in filling the form. There is no difficulty that respondents perceived except in the case of procurement of computers and wifi network.

Procurement of computers and wifi network is a burden that must be borne by each institution. Budgeting should begin to be held next year. Efforts to advocate for the institution has been done. For institutions that its internet connection is less smoothly, they have assisted with the provision of the modem through research.

In terms of speed of data collection, e-DHF is very rapid. e-DHF is an online media that connect one institution with other institutions. The same as the characteristics of the other online media, reasonable if the e-DHF plays a role fast in terms of speed of data collection. Institutions do not need to meet offline to reporting. Does not require a lot of time and a certain place so the data is immediately reported well and to quickly and accurately.

Program e-DHF can also produce indicators of surveillance. This is because the e-DHF also allow and facilitate in assessing the Case Fertility Rate and Incident Rate. The case of the death and the incident can be accumulated, analyzed and used as a prediction of the incidence of the next. In addition, e-DHF is stable enough. The stability of a program is needed so that the collected data is complete and analysis can be done with the right.

Dignan (1992) says there are three basic concepts of evaluation. The first, evaluation is the investigation or analysis of a program that has been run. Second, the evaluation in principle focus on the identification of program performance. Third, Evaluation is done based on the standard of comparison, depending on the initial design adjust the objectives of the program. The results of the evaluation based on the theory of Dignan shows all the results of this study show that e-dengue should be continued and developed. Program e-DHF also possible to be applied in all regions in East Java, even Indonesia. From all these results it could be concluded that e-DHF is very useful for the community and health workers. E-DHF is seen to be able to help early detection of cases of outbreak of dengue fever in the City of Pasuruan.

5 CONCLUSIONS

E-DHF is effective in recognizing and analyzing as well as predict the occurrence of outbreaks of dengue fever both in terms of input, process and output. Provider Hospital/clinic, health center, and the Department of Health all want to play an active role in the program e-DHF. E-DHF can identify the accuracy of the data collected and quick in analysis, presentation and reporting of dengue cases.

Recommendations from this study is that the Department of Health Pasuruan City apply e-DHF as an effort to early detection of cases of outbreak of dengue fever. Thus the expected case of outbreaks of dengue fever decreased and the City of Pasuruan is eliminated from endemic Dengue.

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