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Implementation of the Dengue Fever Surveillance System at the Klungkung District Health Office

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Abstract

This evaluation aims to find out how to implement and analyze problems in the dengue surveillance system. The evaluation was carried out in March-June 2023 using the concepts of input, process, output and surveillance attributes. Data collection was carried out on 1 health service officer, 4 community health center officers by interviewing and observing using a questionnaire. The health centers were selected based on the criteria for accuracy in collecting reports. Data is presented in the form of graphs, tables and narratives. According to interviews and observations, the findings relate to input, process, output and surveillance attributes. All health center and health service officers (100%) have never received training/orientation. There are (25%) community health center officers who are late in collecting reports, this is an obstacle to data collection by the Health Service. Health Service officers rarely carry out monitoring related to the collection of reports by the Puskesmas, but the reasons for delays are still communicated. 100% of community health centers have investigated risk factors, but the community health center network does not report suspect cases. As many as (100%) officers do not know how to analyze data based on person, place and time and all officers (100%) have not presented the results of data analysis as a form of information about dengue fever. This causes the type, components and attributes of surveillance, namely representative implementation, to not be optimal. The implementation of the surveillance system is not in accordance with the types, components and attributes of surveillance.

Introduction

Dengue is an acute disease caused by four serotypes of viruses belonging to the Flaviviridae family and transmitted mainly by the Aedes aegypti mosquito, is the arbovirus that affects the human population the most (Ahmad & Poh, 2019; Masika, 2022; Abu, 2022). Over the past 50 years, the dengue virus has emerged from an endemic focus in Southeast Asia to a pandemic in all tropical (Murugesan & Manoharan, 2020) and subtropical countries (Sharma et al., 2022). Dengue fever is expected to continue to increase and expand its distribution. This is because dengue vectors are widespread both in residential areas and in public places (Wowor, 2017; Wulandhani, 2019; Anastasia, 2018; Fakhriadi et al., 2015). Dengue Hemorrhagic Fever (DHF) is an acute viral infection caused by the dengue virus which is characterized by a fever of 2-7 days accompanied by manifestations of bleeding, decreased platelets (thrombocytopenia), the

presence of hemoconcentration characterized by plasma leakage Can be accompanied by atypical symptoms such as headache, muscle & bone pain, skin rash or pain behind the eyeball (Kementerian Kesehatan RI, 2017). Dengue fever was identified as one of the top 10 threats to global health in 2019 by the WHO. Dengue fever outbreaks occur almost every year in different places and the occurrence is difficult to predict. Dengue fever is expected to continue to increase and expand its distribution. This is because dengue vectors are widespread both in residential areas and in public places. In addition, population density, population mobility, urbanization are increasing, especially since the last three decades (Cheng & Duan, 2021; Xu et al., 2021; Tikoudis et al., 2022).

The strategy to improve disease control includes several activities such as: (1) prevention and control of disease risk factors including expanding the scope of early detection, strengthening real-time surveillance, vector control; (2) strengthening health security, especially increasing capacity for prevention, detection, and rapid response to disease threats, including strengthening the emergency event alert system and health quarantine; (3) increasing the scope of case discovery and treatment as well as strengthening the management of disease and injury handling; and (4) community empowerment in disease control and strengthening community-based total sanitation (Annashr et al., 2023; Pangestika, 2022; R Hapsara Habib Rachmat, 2018; Syafitri et al., 2024).

In Indonesia, dengue cases fluctuate every year and tend to increase the number of illnesses and the distribution of infected areas is getting wider. In 2020, dengue was transmitted in 13 provinces in Indonesia with a morbidity rate of 38.15 per 100,000 population, and a mortality rate of 0.70% only in 11 provinces where the dengue mortality rate was 1% - > 1%. Based on the health profile in Bali Province in 2020, the *Incident Rate* of dengue cases in Bali Province in 2020 is 278.6 per 100,000 population. Based on data from the Klungkung Regency Health Office, in 2023 until March there were 179 total cases from 9 health centers in Klungkung Regency. The implementation of the reporting system in Klungkung Regency is obtained from government and private hospitals and health centers. The health center is active surveillance while the health office is passive surveillance. Based on interviews conducted by P2DBD program holders of the Klungkung Regency Health Office, initial report information on dengue was obtained from hospital surveillance officers, both government and private. Then, the report is sent to the P2DBD program holder at the Klungkung Regency Office, after that, the report is sorted based on patient data to be submitted to the health center. The report is sent to the Puskesmas surveillance officer, after which the quick response in less than 24 hours the puskesmas surveillance officer will conduct an epidemiological investigation (PE) to the location listed in the SKDR data. After making a visit, then the PE result data will be returned to the agency in the form of ABJ data, the number of sick people and a follow-up plan. Surveillance reporting is going well in government and private hospitals, however, there are still obstacles in surveillance officers in 4 health centers when reporting data on dengue fever, this is due to weaknesses regarding human resources such as late in collecting reports, never getting orientation/refreshing regarding dengue hemorrhagic fever surveillance, there are differences in the application of case definitions between surveillance and doctors and the determination of work area boundaries less clear. This is still a problem in the implementation of the surveillance system in the work area of the Klungkung Regency Health Office.

Because of that, the implementation of the surveillance system that has been running in Klungkung Regency needs to be evaluated in depth. Because epidemiological surveillance is a very important activity in supporting the control and control of infectious diseases as an effort to detect the possibility of extraordinary events (KLB), obtain the necessary information for planning in terms of prevention, control and control at various administrative levels. So that the increase in the incidence and death rate due to dengue cases in the coming year can be prevented.

Literature Review

The Health Epidemiology Surveillance System (SSEK) is a sub-system of the National Health Information System (SIKNAS) and has a strategic function in disease intelligence and health problems for the provision of epidemiological data and information by conducting fast, precise and accurate fact-based data management. Based on the Minister of Health Regulation No. 45 of 2014 concerning the implementation of health surveillance, health surveillance is a systematic and continuous observation activity of data and information about the incidence of diseases or health problems and conditions that affect the increase and transmission of diseases or health problems to obtain and provide information to direct control and countermeasures effectively and efficiently.

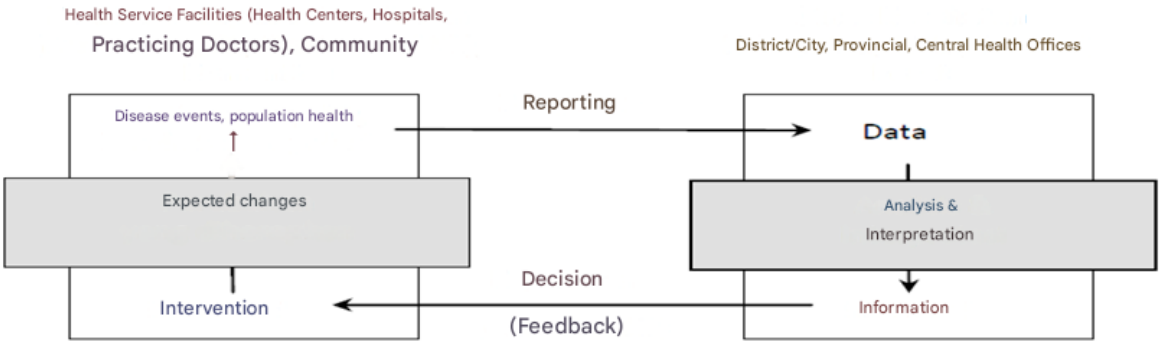

Figure 1. Surveillance system scheme

The purpose of event-based surveillance is to detect unusual public health events that have an impact on public health that are signals/alerts or have become Extraordinary Events (KLB), so that a quick response can be carried out to prevent wider problems and provide directions for further disease control measures

Several things that need to be considered in epidemiological surveillance according to (Rasmaniar et al., 2020; Mremi et al., 2021): 1) A series of epidemiological surveillance activities are not only carried out at a certain period/time but are carried out continuously and continuously; 2) The epidemiological surveillance process must be carried out systematically from the data collection process. Some important things that must be remembered that in eidemyological surveillance, data collection activities must be continued with the process of analysis, data interpretation, dissemination and evaluation so that it can be used appropriately in supporting policy/decision making; 3) The accuracy of policy-making/decision-making based on epidemiological surveillance must be supported by the availability of good quality data so as to produce effective and efficient policies/actions. Surveillance activities have indicators as a reference that must be done. In carrying out surveillance, it is expected to be in accordance with the indicators as a result of: 1) Report completeness; 2) Report determination ; 3) Distribution of local and national epidemiological news; 4) Improve the early warning system (SKD) of diseases; 5) Other surveillance performance indicators set by each program

Indicator-based surveillance is carried out to obtain an overview of diseases, risk factors and health problems or problems that have an impact on health using structured data. Indicators of surveillance activities must be monitored and evaluated. If in monitoring it is found that things are not according to plan, corrections and improvements will be made (Amiruddin, 2013). Indicators of a survelans are :

Simplicity

Simplicity is defined as being easy to understand and apply. If this simplicity can be made, it will have an impact on the time and operational costs needed but does not abandon the goal to be achieved (CDC, 2001 in (Rasmaniar et al., 2020))

Flexibility (Not Rigid)

The implementation of surveillance is expected to be able to adjust to changes in information and situations without causing significant additional time, costs and labor.

Acceptability

Implementers and organizations are expected to be actively involved in activities and achieve surveillance objectives to produce data that is accurate, consistent, complete and timely.

Sensitivity

Surveillance activities are expected to have sensitivity both in controlling and detecting extraordinary events (KLB) and monitoring the trend of a disease.

Positive Predictive Value

It is hoped that surveillance activities will have a good positive predictive value so that there is no waste of budget for case discovery and treatment.

Representativeness

Surveillance activities are expected to be able to describe events with an account based on time, place and person.

Timeliness

The information generated is expected to be timely with the aim of KLB an event, especially acute cases, can be controlled quickly.

Data Quality

The data recorded in the surveillance system must be complete, accurate and measurable. The system is also expected to represent health events under surveillance.

Stability

This is related to the reliability and availability of the surveillance.

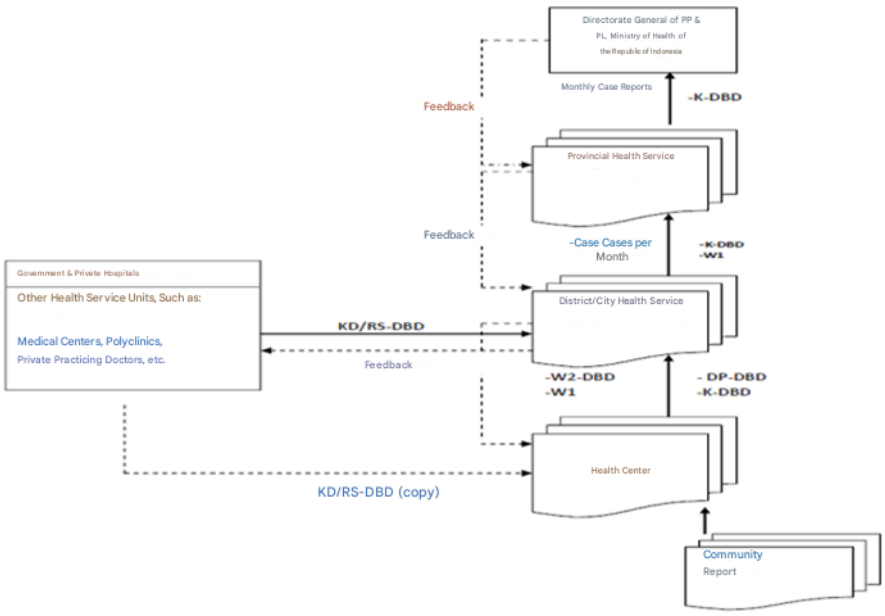

Figure 2. Flow of Reporting on Dengue Surveillance Activities

Methods

The evaluation of the dengue surveillance system is an evaluation of a descriptive study. The purpose of the surveillance system evaluation is to explore in-depth information related to the surveillance system that has been running and the extent to which the dengue surveillance program has an impact. After excavating the surveillance system, an evaluation was carried out by comparing the supposed surveillance system with the implementation that occurred in the field Selanjutnya diberikan masukan perbaikan dan upaya peningkatan sistem surveilans DBD di Dinas Kesehatan Kabupaten Klungkung. Data collection was carried out to 1 dengue surveillance officer at the Klungkung Regency Health Office, and 4 surveillance officers from the health center in Klungkung Regency.

Data collection was carried out on March 1-June 2023. The data collection tool uses questionnaires, observations of reports at the Klungkung Regency Health Office sourced from the Health Center, and direct interviews with surveillance officers. The data sources used are primary data and secondary data. Primary data was obtained through in-depth interviews, the results of filling out online questionnaires, and observation of report recording. Secondary data was obtained from the achievements of the annual program and monthly reports at the Klungkung Health Office and the Health Center.

The data that has been collected is analyzed descriptively and presented in the form of graphs and tables and then given a narrative. The types and components of data evaluated in the surveillance system start from inputs, processes to outputs and attributes of the surveillance system.

Result and Discussion

Table of Achievements of the Dengue Hemorrhagic Fever (DHF) Surveillance Program in Klungkung Regency in 2021 – 2023 in March.

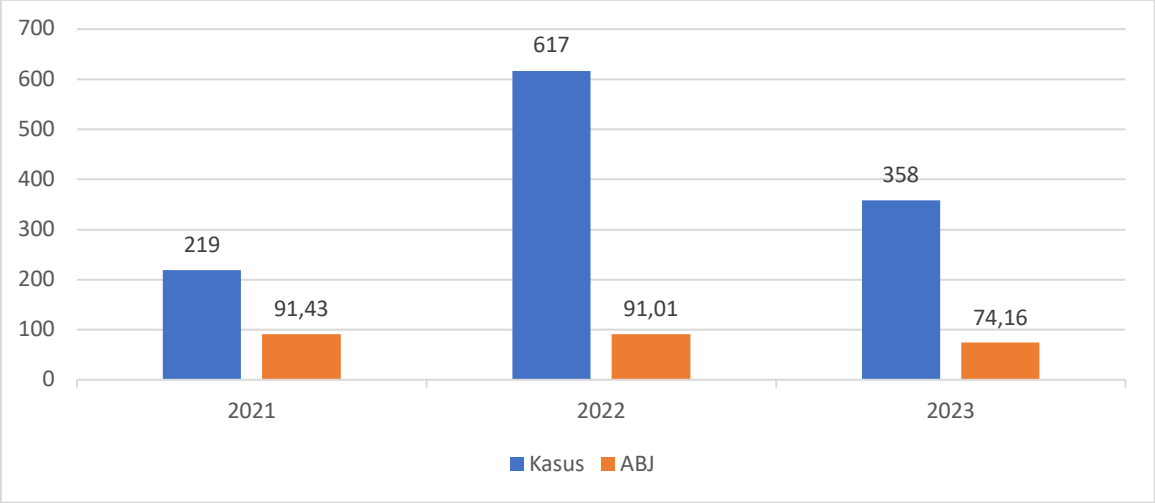

Figure 3. Analysis of the achievements of the surveillance system at the Klungkung Regency Health Office from 2021-2023 in March

Based on the results of the analysis of the achievements of the surveillance system at the Klungkung Regency Health Office from 2021-2023 in March, it was known that dengue cases in 2021 were 219 people, ABJ was 91.43%. In 2022, there was an increase in dengue cases, namely 617 people, ABD 91.01%. Meanwhile, in 2023 until March, dengue cases were 358 people and ABJ 74.16%. There was an increase in cases in the three months during 2023. When compared to the previous two years, the number of cases in 2023 has reached half of the total cases in 2022.

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Input Evaluation

Distribution of Human Resources (MAN) Frequency at Health Offices and Health Centers in Klungkung Regency in 2023 (N=5).

Table 1. Educational Background, Age Distribution, and Work Experience of Dengue Surveillance Officers

Variable	Category	Frequency	Person
Education	D3	3	60.00%
	D4/S1	1	20.00%
	Profession	1	20.00%
	S2	0	0
Total			**100%**
Age	25-35 year	1	20%
	36-45 year	1	20%
	>=46 year	3	60%
Total			100%
Gender	Man	4	80.00%
	woman	1	20.00%
Total			**100.00%**
Length of Working as a Dengue Surveillance Officer	0-5 year	2	40.00%
	6-10 year	2	40.00%
	11-15 year	1	20.00%
Total			**100.00%**
Training History	Available	0	0
	Not available	5	100.00%
Total			**100%**

Based on the frequency distribution of human resources (Man) in the Health Office and 4 health centers in the work area of the Klungkung Regency Office, most of the officers have D3 (60%), S1 (20%) and professional (20%) education backgrounds. When viewed from the age of surveillance officers, as many as 60% of officers are over or equal to 46 years old. Most of the dengue surveillance officers at the Health Center are men (80%) while at the Health Office are women (20%). A small part of the working time as dengue surveillance officers is > 10 years (20%), but there are officers with a working period of 0-5 years and 6-10 years (20%). Of the total officers encountered, they had never received training on dengue surveillance (100%).

Frequency Distribution Table of Facilities & Infrastructure (Money, Materials, Methods) at the Health Office and Health Center in Klungkung Regency in 2023 (N=5).

Table 2. Availability of Resources and Tools for Program Implementation

Variable	Category	Frequency	Percentage
Source of Funds	Available	5	100.00%
	Not Available	0	0
Total			**100.00%**
Surveillance Devices (Laptops/Computers)	Available	5	100.00%
	Not Available	0	0
Total			**100.00%**
Communication Tools (Mobile Phones & Internet Networks)	Available	5	100.00%
	Not Available	0	0

Total			**100.00%**
Juknis	Available	5	100.00%
	Not Available	0	0
Total			**100.00%**
Epidemiological Investigation Form (EIF)	Available	4	80.00%
	Not Available	1	20.00%
Total			**100.00%**
Report Collection Form	Available	5	100.00%
	Not Available	0	0
Total			**100.00%**

Based on the results of the frequency distribution of facilities & infrastructure, the Health Office and 4 Health Centers in the work area of the Klungkung Regency Health Office already have adequate facilities and infrastructure such as sources of funds, surveillance devices (Laptops/Computers), communication devices (mobile phones & internet networks), technical and report collection forms (100%), PE forms are only available at Puskesmas (80%) while at the Health Office there is no PE form because the Health Office does not conducting PE so that it is passive surveillance where data sources are obtained from Puskesmas and Hospitals.

Process Evaluation

Frequency Distribution Table Based on Early Detection Efforts of Officers at the Health Office and Health Centers in Klungkung Regency in 2023 (N=5)

Table 3. Distribution of Variables Related to Dengue Surveillance and Response Implementation

Variable	Category	Frequency	Percentage
Acquisition of dengue surveillance data	Active	4	80.00%
	Passive	5	100.00%
Total			**100.00%**
Clinical symptoms (fever, reddish rash, nausea & vomiting)	Yes	5	100.00%
	No	0	0
Total			**100.00%**
Implementation of PE 1x24 hours from the discovery of cases	Yes	4	80.00%
	No	1	20.00%
Total			**100.00%**
Laboratory inspection referrals	Yes	4	80.00%
	No	1	20.00%
Total			**100.00%**
Enforcement of dengue diagnosis with special workers	Yes	4	80.00%
	No	1	20.00%
Total			**100.00%**

The acquisition of dengue surveillance data carried out by the Health Center is actively finding cases directly during home visits. However, the Health Center is also included in passive surveillance because it obtains dengue surveillance data through cross-sector reports (Kades, Lurah / Klian Banjar) which reports to Village Midwives and then submits it to dengue surveillance for follow-up, in addition to that the Health Office also obtains passive dengue surveillance data through reports from hospitals (government/private). Confirmation of dengue diagnosis must be through a referral of laboratory examinations with clinical diagnoses in the

patients found, namely fever, reddish rash and nausea and vomiting. In establishing the diagnosis of dengue, it is carried out with doctors and assists LAB officers in conducting LAB examinations. Furthermore, surveillance officers will conduct PE within 1x24 hours from the time the dengue case is found/reported.

Based on interviews, the minimum clinical symptoms found in dengue cases have been known by all surveillance centers and health offices (100%). The data on dengue cases obtained by the Health Office sourced from hospitals will then be sorted and distributed to each Health Center which will then be PE within 1x24 hours (80%). All reports and coordination between the Health Office, Puskesmas and Hospitals are carried out through the *whatsapp group application.* If the spread of cases increases, dengue surveillance from the Health Office will go to the field to conduct an investigation.

Output Evaluation

Dissemination of the Report. The presentation of data in the form of mapping has never been done. The data that has been analyzed is not displayed on the information board in the surveillance room. This should be very important to do so that it becomes a source of appropriate and informative information for users both in the management of health problems, early detection and planning. Data analysis can be used for planning, early detection, advocacy, and decision-making for program improvement. The report is stated in the form of an annual report on the health profile of the province of Bali every year.

Based on the results of the interviews, the dengue surveillance system at the Health Office and Health Center is included in the simple criteria. The creation of reports that are easy to understand and can be done by officers. The reporting has been well structured. Communication for reporting is entirely carried out in the *whatsapp group application.* The reporting of the dengue surveillance system is flexible. Because, case reporting is made based on request, namely only dengue hemorrhagic fever cases are reported and the determination of diagnosis is based on clinical symptoms, namely fever, nausea and vomiting and red rash which is then carried out by LAB examination to determine the diagnosis of the disease in accordance with technical instructions and standardized reporting.

Based on the results of observations on the officer's report, the officer has been able to conduct an epidemiological investigation. The officer is able to fill out the PE form according to the instructions listed. Data filling is carried out uniformly, there are no prominent differences. The role of cross-sectors (kades, kadus, babinsa and babinkantibmas) also helps in epidemiological investigations. There is a difference in the renewal of the technology owned by dengue surveillance at the Health Center and the Health Office. However, technically it has followed its technical guidelines, starting from the reporting system, case investigation flow, case definition and clinical symptoms. This is because officers only get abundant authority on duty and have never received orientation regarding the dengue surveillance system. Overall, the health center has conducted a risk factor tracing, but it cannot be said to be representative, because the network of health centers such as doctors, midwives, and private practice nurses have not reported suspect cases or referred suspect patients to the health center for NS1 Lab examination. So that this is one of the triggers for ineffective data reporting and the prevention of KLB is hampered.

Based on the results of interviews and data searches, the implementation of the investigation was carried out 1x24 hours, this has been carried out by all health center officers. After that, the delivery of the report has been limited to the date of each month. However, there are still obstacles in sending monthly reports, there are delays in sending reports by health center officers for a reason. All data reports, both daily and monthly, are sent through *whatsapp groups.* According to interviews, surveillance officers of health centers and health offices have not received orientation or refreshment regarding the dengue surveillance system since the

beginning of the program. Officers only learn the surveillance system based on the technical and delegation of duties from previous officers. In addition, there are differences in the definition of dengue cases between surveillance officers and other health workers.

In the process of recording and reporting, it has been carried out by the health center and also the health office. Recording and reporting are in accordance with the conformity of the technical and report in the form of a table in excel format. However, the problem is that there are still health centers that exceed the time limit for collecting reports. Lack of monitoring carried out by the health office to health centers in reporting. And there are differences in the renewal of juknis between health center officers and health offices. So that this is an obstacle for health office officers in recapitulating data from health centers. The officer presented the data in the form of an excel format table.

The data analyzed were suspect data on dengue cases, data on new dengue cases, data on dengue in children, data related to environmental conditions, ABJ data. Officers have not been able to calculate the prevalence, incidence rate, mortality rate related to dengue, as well as make / present data in the form of graphs. The results of the recap have not been displayed by the officer to be used as the latest information about dengue.

Conclusion

Based on the problems that are an aspect of the analysis of the weaknesses of the surveillance system, the author can make an alternative recommendation to overcome these problems, namely: Conducting orientation / refreshing about the dengue surveillance system to dengue surveillance officers at the Health Center & Health Office. In order to equalize perceptions in accordance with the latest technical guidelines so that it is easier to carry out the surveillance system. Conduct periodic monitoring by the health office to the health center in collecting reports so that it can reduce the delay of officers in submitting reports. Providing feedback on information about DDB so that it can be accessed by cross-sectors.

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