e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers

International Journal of Health Sciences (IJHS)

Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index

Volume 3 | Number 4 | December 2025 |

Evaluation of the Epidemiological Surveillance Program at Community Health Centers in Preventing Extraordinary Events (KLB)

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ABSTRACT

Surveillance plays a crucial role in the early warning system for infectious diseases and outbreaks. Community health centers, as the spearhead of primary health care, have the primary responsibility for implementing continuous surveillance activities. This study aims to evaluate the implementation of epidemiological surveillance programs at community health centers in preventing outbreaks and to identify supporting and inhibiting factors.

The research method used a descriptive evaluative approach with the CIPP (Context, Input, Process, Product) model. Data were collected through in-depth interviews with surveillance officers, direct observation of reporting activities, and review of weekly infectious disease report documents.

The research results show that from a contextual perspective, policies and implementation guidelines are available but have not been consistently implemented. From an input perspective, limited human resources and reporting facilities are the main obstacles. From a process perspective, routine data collection and reporting activities are ongoing, but timeliness and analysis of disease trends are still suboptimal. Meanwhile, from a product perspective, the surveillance system has assisted in the early detection of several potential outbreaks, although it has not been optimal in comprehensive prevention.

In conclusion, the epidemiological surveillance program at the Community Health Center has been running according to guidelines but requires strengthening the capacity of surveillance personnel, increasing the use of information technology, and more effective cross-sector coordination.

Keywords: Epidemiological Surveillance, Community Health Centers, Extraordinary Events, Program Evaluation, Disease Prevention

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e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

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1. Introduction

Surveillance is a key component of the early warning and response system for infectious diseases in Indonesia. Through systematic surveillance activities, data on disease incidence can be collected, analyzed, and used to detect increases in cases that could potentially lead to an Extraordinary Event (KLB). Based on Regulation of the Minister of Health of the Republic of Indonesia Number 45 of 2014 concerning the Implementation of Health Surveillance, epidemiological surveillance at the Community Health Center (Puskesmas) level serves as the basis for decision-making in the prevention and management of public health problems.

Centers (Puskesmas) play a strategic role in implementing epidemiological surveillance because they are the first-level health care facilities closest to the community. Surveillance officers at Puskesmas are responsible for collecting infectious disease data, analyzing case trends, and reporting the results to the District/City Health Office periodically through the Early Warning reporting system. Alert and Response System (EWARS) or other electronic surveillance systems.

Surveillance activities in the field still faces various challenges. Several previous studies have shown that limited human resources, lack of technical training, delays in reporting, and minimal use of data for decision-making remain major problems in implementing surveillance programs at community health centers (Puskesmas). This impacts the delay in early detection and response to potential outbreaks, such as Dengue Hemorrhagic Fever (DHF), Acute Diarrhea, and Measles, which remain common in various regions.

Evaluation of epidemiological surveillance programs is crucial for determining the effectiveness of their implementation at the community health center (Puskesmas) level. This evaluation aims not only to assess the program's success but also to identify factors that support and hinder surveillance implementation in preventing outbreaks.

Based on this background, this study aims to evaluate the implementation of the epidemiological surveillance program at the Community Health Center (Puskesmas) in an effort to prevent Extraordinary Events (KLB) using the CIPP (Context, Input, Process, Product) evaluation model. The results of the study are expected to provide input for policy makers in strengthening the epidemiological surveillance system at the primary health care level.

2. Research Methods

This study used a descriptive evaluative approach to assess the implementation of the epidemiological surveillance program at community health centers (Puskesmas) in an effort to prevent extraordinary events (KLB). This approach was chosen because it can comprehensively describe the program's implementation and identify supporting and inhibiting factors based on actual conditions in the field.

a. Research Design

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The research design uses the CIPP (Context, Input, Process, Product) evaluation model developed by Stufflebeam. This model is used to comprehensively evaluate the program through four main aspects:

1) Context: Assess the background, objectives, and policies underlying the implementation of the surveillance program at the Community Health Center.
2) Input: Evaluate human resources, infrastructure, funds, and implementation guidelines used.
3) Process: Reviewing the implementation of surveillance activities, including the collection, processing, and reporting of disease data.
4) Product (Results): Assess the results and impact of surveillance activities on outbreak prevention efforts in the Community Health Center work area.

b. Location and Time of Research

The study was conducted at several Community Health Centers (Puskesmas) representing work areas with different characteristics (urban, suburban, and rural) within one district/city. The study period was May to August 2025.

c. Population and Sample

The population of this study was all community health centers (Puskesmas) in the district/city where the study took place. The sample was determined using purposive sampling, which is based on certain criteria, such as:

- Health centers that have active epidemiological surveillance officers,
- Have used the EWARS reporting system, and
- Have experienced or handled potential outbreaks in the last two years.

Key informants in this study include:

- Head of the Health Center,
- Surveillance officers, and
- Infectious disease program officer.

d. Data Types and Sources

The data used consists of:

- Primary data: Obtained through in-depth interviews and direct observation of surveillance activities at the Community Health Center.
- Secondary data: Includes weekly surveillance reporting documents (W2), KLB reports, minutes of coordination meetings, and technical guidelines from the Ministry of Health.

e. Data collection technique

Several techniques are used in data collection, namely:

1) In-depth interviews using a semi-structured interview guide were conducted to explore program implementation and the challenges faced.

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2) Direct observation of the process of recording, processing, and reporting surveillance data.
3) Review documents to assess the completeness and timeliness of reporting infectious disease data.

f. Data Analysis Techniques

Data were analyzed qualitatively and descriptively by comparing field implementation results to epidemiological surveillance standards and guidelines established by the Ministry of Health. The analysis was conducted through data reduction, data presentation, and conclusion drawing. Data validity was strengthened by triangulation of sources and methods, namely comparing interview results, observations, and supporting documents to ensure the accuracy of the information.

3. Results And Discussion

a. Results

1) Context Aspect

Community health centers (Puskesmas) have a clear legal basis and guidelines for implementing epidemiological surveillance. However, regional policy support for strengthening early warning systems remains limited.

2) Input Aspect

Human resource availability remains a challenge. Surveillance officers often overlap with other duties, thus suboptimal focus on surveillance activities. Electronic reporting facilities (ESR, EWARS) are available, but their use is not optimal due to limited training.

3) Process Aspect

Infectious disease data collection is conducted routinely, but delays in weekly reporting are still common. In-depth analysis of case trends has not been conducted, and coordination across programs and sectors is suboptimal.

4) Product Aspect

Despite the ongoing surveillance system, early detection of outbreaks is not always effective. Some outbreaks (such as dengue fever and diarrhea) are detected after a significant increase in cases. However, outbreak reports compiled by community health centers (Puskesmas) have assisted the Health Office in its rapid response.

5) Overview of Research Location

The study was conducted in three community health centers (Puskesmas) representing different regions: an urban, a suburban, and a rural area. These three centers cover a wide area with a population of between 25,000 and 40,000. All of the centers had epidemiological surveillance personnel and implemented an *Early*

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Warning reporting system. Alert and Response System (EWARS) according to the Ministry of Health guidelines.

Surveillance activities are still found, particularly related to the availability of personnel, facilities, and cross-sectoral coordination. This indicates that regional characteristics also influence the effectiveness of epidemiological surveillance programs at the primary care level.

6) Evaluation Results Based on the CIPP Model

a) Context Aspect

Community Health Centers (Puskesmas) understand the importance of epidemiological surveillance activities as part of an early warning system for infectious diseases and outbreaks. Each Puskesmas has policy documents, technical guidelines, and an annual work program that outlines surveillance activities. However, policy support from local governments for strengthening surveillance programs remains limited. Not all regions have a dedicated budget allocated for surveillance activities or officer training. Furthermore, dissemination of national policies and the latest guidelines from the Ministry of Health has been uneven, resulting in inconsistent implementation in the field.

b) Input Aspect

The research results indicate that human resources are a major constraint. Of the three community health centers studied, only one had a full-time surveillance officer. The other two assigned infectious disease program officers to double as surveillance officers. This situation resulted in suboptimal data collection and analysis.

Supporting resources such as computers, internet access, and reporting forms are available, but their quality varies. In some rural locations, unstable internet connections often hinder online reporting through the EWARS system. In terms of funding, operational funds largely depend on allocations from the Health Office, and there is no dedicated budget for surveillance development at community health centers.

c) Process Aspect

Surveillance activities are conducted weekly through the recording and reporting of infectious disease data. However, the timeliness of reporting remains a challenge. Observations show that the average weekly reporting accuracy is only 75%.

Disease trend analysis and spot mapping of case areas have been conducted, but have not yet become the primary basis for planning prevention programs or activities. Coordination across programs (e.g., with P2P, nutrition,

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and health promotion) and across sectors (sub-districts, schools, and communities) remains suboptimal.

Response activities to potential outbreaks have not fully followed standard operating procedures (SOPs) due to limited personnel and a lack of technical training in epidemiological investigations.

d) Product Aspect

Surveillance program has contributed to increased early warning of outbreaks in the Community Health Center (Puskesmas) work areas. Based on data from the past two years, the three Community Health Centers were able to detect increases in Dengue Hemorrhagic Fever (DHF) and Acute Diarrhea cases more quickly than in the previous period.

The effectiveness of outbreak prevention still needs to be improved. Preventive measures such as community education, focused fogging, and cross-sector coordination are often implemented after cases have increased, rather than based on early detection from surveillance data. This indicates that surveillance data has not been fully utilized as a basis for public health program decision-making.

b. Discussion

Surveillance program at community health centers (Puskesmas) is ongoing, but has not been optimal in supporting outbreak prevention. The main obstacles identified are limited surveillance personnel, minimal technical training, and inadequate use of surveillance data in program planning.

This finding is in line with research conducted by Sari (2022) and the Ministry of Health (2021) which stated that human resource factors and reporting systems are the main challenges in the success of epidemiological surveillance at the primary care level.

These results underscore the importance of strengthening cross-sectoral coordination. The involvement of village officials, health workers, and the community is crucial for early detection of infectious disease symptoms in the field. Without cross-sectoral support, the resulting surveillance data cannot be used effectively to prevent outbreaks.

From a technological perspective, the implementation of electronic reporting systems like *EWARS* has been a significant advancement. However, the success of these systems depends heavily on the training and mentoring of community health center staff to enable them to optimally utilize the disease trend analysis and risk mapping features.

The evaluation results show that although the surveillance program has been implemented according to guidelines, it is necessary to improve the quality of

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implementation through ongoing coaching, training, and strengthening of digital-based health information systems.

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