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Qualitative Study of Effectiveness of Early Warning System and Dengue Fever Case Response in West Tulang Bawang Regency, Lampung, Indonesia

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ABSTRACT: The Early Warning and Response System (EWARS) plays a role in detecting potential outbreaks of infectious diseases through weekly reports. West Tulang Bawang Regency experienced an increase in dengue fever cases in 2024–2025, but the early detection function of the EWARS has not been running optimally as indicated by the still low number of alerts compared to the number of reported cases. This study aims to explore the effectiveness of the EWARS for dengue fever cases in West Tulang Bawang Regency, Lampung, Indonesia. The study used a qualitative approach with a case study method. Data collection was carried out from October to December 2025 in three community health centers with 14 research informants consisting of village cadres, village midwives, community health center surveillance officers, Health Office surveillance officers, community health center heads, and village heads selected using a purposive sampling technique. Data collection was carried out through in-depth interviews, observation, and documentation with thematic data analysis. Input components: training is not evenly distributed, competencies are not in accordance with education, limited funds that are not specifically for EWARS reporting, limited facilities and infrastructure (computers, internet network constraints and disruptions to the EWARS web application system). Process components: tiered data collection from networks, health centers via WA to health offices, health centers do not yet have access to the EWARS web application, manual data entry, data validation for signal verification (alert), data presentation in graphical form, feedback via weekly bulletins in the WA group, monitoring, evaluation and follow-up have been carried out according to procedures. The effectiveness of EWARS for DHF cases in West Tulang Bawang Regency is influenced by limited funding, limited facilities and infrastructure, staff competencies that do not match education, uneven training causes different understanding of staff, implementers do not understand what to report, so that cases that are often reported are cases that are already positive or cases that have been treated in hospitals, this is not in accordance with the principles of EWARS. There is a need to increase human resource capacity, provide adequate facilities and infrastructure, integrate web-based reporting systems at the community health center level and mobile SDKR at the network level, encourage symptom-based reporting and provide funding support.

KEYWORDS: Dengue fever, Early warning and response system, Infectious diseases, Surveillance, Indonesia.

INTRODUCTION

The Early Warning Alert and Response System (EWARS) is a computer-based surveillance system used to detect potential outbreaks of infectious diseases early through weekly reports from healthcare facilities (Ministry of Health of the Republic of Indonesia, 2023). This system was developed by the Ministry of Health of the Republic of Indonesia as a form of proactive surveillance to accelerate the detection of increasing cases of potential outbreaks, enabling a swift and appropriate response. The EWARS is implemented through community health centers (*Puskesmas*) reporting priority diseases, which are then analyzed to generate alerts for potential outbreaks (Ministry of Health of the Republic of Indonesia, 2023).

Early detection and rapid response to infectious diseases are crucial aspects of disease control and outbreak prevention. Infectious diseases such as dengue fever (DHF), diarrhea, measles, diphtheria, pertussis (whooping cough), polio, tetanus, and leptospirosis remain public health challenges in Indonesia, including emerging and re-emerging diseases (Ministry of Health of the Republic of Indonesia, 2023). Globally, the WHO reported a polio outbreak in Papua New Guinea in 2025, demonstrating that a disease previously declared eliminated still has the potential to re-emerge and pose a transnational health threat (WHO, 2025). In Indonesia, 12 cases of paralysis due to polio were recorded from 2022 to 2024, consisting of 11 cases due to poliovirus type 2 and

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one case due to poliovirus type 1 (Ministry of Health of the Republic of Indonesia, 2023). In addition, an increase in measles and dengue fever cases was also reported in various regions of Indonesia during the 2023–2025 period (Ministry of Health of the Republic of Indonesia, 2025).

Lampung Province is one of the regions with a significant increase in dengue fever cases. In 2024, 9,096 cases were recorded across various regencies/cities (Lampung Provincial Health Office, 2025). West Tulang Bawang Regency was among the areas experiencing an increase in dengue fever cases from late 2024 to early 2025. Throughout 2024, 722 cases were recorded with 17 alerts, while by June 2025, there were 438 cases with no reported deaths (West Tulang Bawang Health Office, 2025). The highest number of cases occurred in the working areas of Panaragan Jaya Community Health Center, Mulya Asri Community Health Center, and Candra Mukti Community Health Center. This situation indicates a gap between the number of reported cases and the alert signals generated by the EWARS, indicating that the early detection function is not functioning optimally.

The effectiveness of EWARS implementation in various regions still faces several obstacles. Data from the Lampung Provincial Health Office in 2024 shows that several districts/cities have not yet achieved the target of 100% completeness and timeliness of reporting (Lampung Provincial Health Office, 2024). In West Tulang Bawang Regency, all community health centers still have a reporting timeliness below 100%, and 13 alerts were responded to within more than 24 hours (West Tulang Bawang Health Office, 2024). Furthermore, reporting of potential outbreaks by surveillance officers is also suboptimal, with some officers reporting only one to four types of diseases per week (West Tulang Bawang Health Office, 2025).

Several previous studies have shown that the implementation of the EWARS still faces various obstacles. Research by Syahrani (2024) demonstrated that the EWARS is effective in providing alerts to prevent outbreaks, but its implementation is still hampered by limited human resources, technological infrastructure, data inconsistencies between reporting units, limited operational funds, and geographical barriers. Research by Fatmawati and Suparmi (2021) found that the effectiveness of the EWARS was suboptimal due to limited human resources and inaccurate reporting times. Meanwhile, research by Wulandari et al. (2022) showed a low response rate to EWARS alerts in eastern Indonesia, leading to delays in field interventions. Research by Marullyta (2022) stated that the implementation of the EWARS has been quite successful, but discrepancies between EWARS data and manual reports still exist, necessitating improved data validation.

Although numerous studies have been conducted on the EWARS, studies specifically exploring the effectiveness of the EWARS for dengue fever cases in West Tulang Bawang Regency are still limited, particularly through qualitative approaches. A qualitative approach is important to gain a deeper understanding of the experiences, obstacles, and factors influencing the effectiveness of EWARS implementation from the perspective of surveillance officers and program managers. This study aims to explore the effectiveness of the EWARS for dengue fever cases in West Tulang Bawang Regency as an effort to strengthen the infectious disease surveillance system to be more effective, responsive, and adaptive to potential outbreaks.

METHODS

This study used a qualitative approach with a case study method to describe the effectiveness of the EWARS for DHF cases in West Tulang Bawang Regency. The qualitative approach was used to gain a deeper understanding of the implementation of the EWARS, including experiences, perceptions, behaviors, and obstacles encountered in the reporting and response process for DHF cases. The study was conducted at Panaragan Jaya Community Health Center, Mulya Asri Community Health Center, and Candra Mukti Community Health Center in West Tulang Bawang Regency, Lampung, Indonesia. Data collection took place from October to December 2025. Secondary data were obtained from weekly EWARS reports from January to the 40th week of September 2025.

Informants were selected using a purposive sampling technique based on their involvement and experience in EWARS implementation (Sugiyono, 2016). The research informants consisted of 14 individuals, including village cadres, village midwives, community health center surveillance officers, Health Office surveillance officers, community health center heads, and village heads. The research data consisted of primary and secondary data. Primary data were obtained through in-depth interviews, observation, and documentation using interview guides, recording devices, cameras, and field notes.

Data analysis was conducted thematically through the stages of data reduction, data presentation, conclusion drawing, and verification, following the model of Miles and Huberman (2021). Data validity was maintained through triangulation of sources, techniques, and methods (Sugiyono, 2019). This research has obtained ethical approval from the Malahayati University

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Health Research Ethics Committee under number 5057/EC/KEP-UNMAL/XI/2025, and all informants provided informed consent prior to the study.

RESULTS

This research was conducted in the working areas of Panaragan Jaya community health center, Mulya Asri community health center, and Candra Mukti community health center in West Tulang Bawang Regency, Lampung, Indonesia, involving 14 informants consisting of village cadres, village midwives, community health center surveillance officers, Health Office surveillance officers, community health center heads, and village heads. The results were analyzed based on the components of input, process, and output of the effectiveness of the EWARS for DHF cases.

Input Components

Human Resources (HR)

The research results show that the educational backgrounds of surveillance officers are diverse and not all come from the field of epidemiological surveillance. Informants stated:

"Because most surveillance or EWARS officers don't have a background in bachelor of public health-epidemiology. Some are nurses, in fact. Some are midwives. Some are even dental nurses..." (I1)

"It actually has an impact. Because my background isn't that. I'm a midwife." (I2)

"I have a background in bachelor of public health (not epidemiology), but behavioral science." (I3)

Interview results also indicated that specific training related to the EWARS has not been received equally by all officers and surveillance networks. An informant stated:

"Yes, once." (I1)

"Yesterday, I received training from the Health Office on epidemiological surveillance, and there was material about the EWARS." (I2)

"I've had EWARS training. There was training at the time…" (I3)

"There hasn't been any specific training, but the community health center does tell us what diseases we have to report every week." (I4)

"But there hasn't been any training on the EWARS itself." (I8)

Funding

The research results indicate that there is no specific funding allocation for EWARS reporting. The informant stated:

"There isn't. But there is for PE signal verification." (I1)

"So far, there isn't. But for follow-up, for example, we verify the signal. That's funded by the community health center. But there isn't a specific allocation for EWARS." (I2)

"So far, we've often used personal funds to report this." (I2)

"There isn't a specific fund. So far, we've been using personal funds to compile reports with our packages." (I4)

"No, we use our own funds." (I8)

Facilities and infrastructure

The research results show that the supporting facilities and infrastructure for the EWARS are essentially available, but various technical challenges still arise in its implementation, such as limited computer hardware, internet network issues, and disruptions to the EWARS web application system. An informant stated:

"Well, computers are what we lack at the community health center, because we're all juggling, sharing." (I1)

"So sometimes we end up manually going through the Health Office via WhatsApp. Because the system is experiencing problems." (I2)

"For reporting, sometimes, if the system is experiencing errors like that, we send it manually." (I3)

"Yeah, just using our cell phones, because it's via WhatsApp. The problem is sometimes the signal is weak, because we use Wi-Fi, and sometimes the Wi-Fi is disrupted, so sometimes the reports are late." (I5)

"I use my cell phone because it's via WhatsApp group. Of course, there are network issues sometimes." (I6)

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Process Components

The research results show that the EWARS reporting process begins with community case monitoring by village cadres and midwives. If a resident is found with symptoms suggestive of dengue fever, the report is submitted to the community health center surveillance officer via a WhatsApp group. An informant stated:

"Yes, that's what often happens: a fever, lasting more than three days, accompanied by a headache." (I8)
"Not yet, when the lab results are out, we'll report it to the midwife." (I9)
"I report it via the WhatsApp group to the village midwife, who then reports it to the community health center." (I11)

The research results show that most case reports are still made after the lab results are out or the patient is confirmed positive for dengue fever. Multi-level data collection from the network, community health centers via WhatsApp, and the health office. Community health centers do not yet have access to the EWARS web application, manual data entry, data validation for signal verification (alerts), data presentation in graphical form, feedback via weekly bulletins in the WhatsApp group, monitoring, evaluation, and follow-up have been carried out.

Output Components

Based on the observation results on the EWARS application, it was found that the timeliness of EWARS reporting in the health office was 90%, at Panaragan Jaya Health Center it was 100%, Candra Mukti Health Center and Mulya Asri Health Center had only reached 98%. The achievement of timeliness of reporting was in accordance with the target of ≥ 80% although still below 100%. The completeness of the EWARS report was in accordance with the target. Based on the results of the EWARS reporting for weeks 1-40 in 2025, it showed that the achievement of completeness of EWARS reporting was 100%. The alert response of ≤ 24 hours showed that it was not optimal, although at the health office level it was more than the target of 90%, namely 94.7%, Panaragan Jaya Health Center 94.7%, Candra Mukti Health Center 98.2%, however, at Mulya Asri Health Center it was still below the target of 84.6%. A total of 300 alerts, with 92 alerts being suspect dengue. Most alerts have been responded to effectively, but there are still delays of more than 24 hours in some cases. An informant stated:

"Timeliness is sometimes delayed by one or two community health centers. So, accuracy is usually around 98% or 96%, not yet 100%." (T1)
"In terms of completeness, it's already 100%." (T1)
"There was a spike in dengue fever cases last year. Usually, it's less than 24 hours." (I2)
"This year, dengue fever cases rarely appear in the alerts." (T1)
"Yes, so as soon as an alert is received, it's immediately verified." (T2)

DISCUSSION

The research results indicate that the effectiveness of the implementation of the EWARS for dengue fever cases in West Tulang Bawang Regency is still affected by limited human resources, funding, infrastructure, and reporting processes, including timeliness, completeness of reports, and alert response. The educational background of surveillance officers, not all of whom are from the field of epidemiological surveillance, also impacts their competence in implementing the EWARS. Some officers are midwives, nurses, or other health workers, so their epidemiological analysis and alert interpretation skills still need to be improved. This condition is exacerbated by the uneven distribution of specialized training related to the EWARS, especially for village cadres and midwives as the initial implementers of case detection in the community. Research by Syahrani (2024) also states that increasing human resource capacity through training and mentoring is a crucial factor in increasing the effectiveness of the early warning and response system.

From a funding perspective, the lack of a dedicated budget for EWARS reporting has resulted in officers relying on personal funds for the EWARS reporting process. Funding limitations also impact the sustainability of case monitoring and verification activities in the field. Furthermore, infrastructure constraints such as limited computers, internet network disruptions, and errors in the EWARS web application system mean that reporting is often done manually through WhatsApp groups. This situation indicates that technological infrastructure support for the implementation of the EWARS is still suboptimal. This finding aligns with research by Syahrani (2024), which states that limited technological infrastructure is one of the obstacles to EWARS implementation.

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In the process component, the study results indicate that reporting of dengue cases is still largely done after laboratory results are released or the patient is declared positive for dengue. This indicates that the implementation of syndrome-based surveillance is not yet optimal. The main principle of EWARS is to detect symptoms or an increase in cases as early as possible so that a faster response can be initiated before a wider increase in cases occurs. In the output component, observations indicate that the timeliness of reporting has met the target of ≥ 80%, although still below 100%. The completeness of EWARS reporting is 100%. Observations indicate that there were 300 alerts, with 92 alerts for suspected dengue. This indicates that the EWARS system has been able to detect potential increases in dengue cases in the study area. Most alerts have also been responded to effectively through case verification. However, 16 alerts were still responded to within 24 hours, indicating that response speed still needs to be improved. A rapid response is a crucial component of the early warning system to prevent outbreaks.

Overall, the implementation of the dengue fever early warning system in West Tulang Bawang Regency has been quite successful, particularly in terms of alert reporting and follow-up. However, the system's effectiveness still needs to be improved through strengthening human resource capacity, equitable distribution of EWARS training, additional funding support, technological infrastructure improvements, and optimization of symptom-based early detection to ensure a more effective early warning system in preventing dengue outbreaks.

CONCLUSION

The effectiveness of the EWARS in supporting early detection and response to dengue fever cases in our study area is affected by limited human resources, such as competencies that do not match educational backgrounds, uneven distribution of EWARS training, limited funding, and infrastructure constraints such as limited computer equipment, internet connections, and application system disruptions. In terms of process, many cases are still reported after laboratory results are available, so syndrome-based surveillance is not optimally implemented. In terms of results, the timeliness and completeness of reports are on target, and most alerts have been responded to well, although there are still response delays of more than 24 hours in some cases. Therefore, it is necessary to increase the capacity of officers, provide funding support, provide adequate facilities and infrastructure, integrate web-based reporting systems at the community health center level and mobile EWARS at the network level, and optimize symptom-based early detection to increase the effectiveness of EWARS in preventing extraordinary dengue fever incidents in our study.

REFERENCES

1. Adriansyah, A. A., Fasya, A. H. Z., & Handayani, D. (2020). Evaluasi sistem kewaspadaan dini dan respons demam berdarah dengue menggunakan modifikasi Malcolm Baldrige di Kabupaten Trenggalek. Medical Technology and Public Health Journal, 4(2), 109–120.
2. Agustina, L. E., Jaksa, S., Andriyani, A., & Lusida, N. (2025). Gambaran pelaksanaan sistem kewaspadaan dini dan respon dalam deteksi dini kejadian luar biasa di Kementerian Kesehatan RI tahun 2025. Medic Nutricia: Journal Ilmu Kesehatan, 18(4), 91–100.
3. Andriarsa, D., Fakhrizal, D., Hidayat, S., Meliyanie, G., Kusumaningtyas, H., & Suryatinah, Y. (2022). Report management system of early warning alert and response system. Jurnal Berkala Epidemiologi, 10(1), 48–57.
4. Andriarsa, D., & Hidayat, S. (2023). Performance of evaluation instrument for EWARS activities in Tanah Bumbu District and Banjar District, Indonesia. Journal of Public Health Research and Community Health Development, 7(4), 518–525.
5. Aprilliyani, A., Handayani, H., Septian, N. M., Rahim, F. K., & Amalia, I. S. (2025). Analisis faktor determinan capaian surveilans digital. Journal of Public Health Innovation, 5(2), 164–173.
6. Centers for Disease Control and Prevention. (2022). Developing a logic model or theory of change. CDC.
7. Lampung Provincial Health Office. (2024). Lampung Provincial Health Office Profile 2023. Lampung Provincial Health Office.
8. West Tulang Bawang Health Office. (2024). West Tulang Bawang Health Office Profile 2023. West Tulang Bawang Health Office.
9. West Tulang Bawang Health Office. (2025). West Tulang Bawang Health Office Profile 2024. West Tulang Bawang Health Office.
10. Fatmawati, L., & Suparmi. (2021). Analisis efektivitas sistem kewaspadaan dini dan respon di Puskesmas X. Jurnal Ilmu Kesehatan Masyarakat, 12(2), 100–110.

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IJCSRR @ 2026
www.ijcsrr.org

11. Fitriani, H., Hargono, A., & Isfandiari, M. A. (2023). Perkembangan pemanfaatan teknologi digital surveilans sistem kewaspadaan dini dan respon (EWARS)/EWARS di Indonesia. Majalah Sainstekes, 10(2), 103–116.
12. Hardhantyo, M., Djasri, H., Nursetyo, A. A., Yulianti, A., Adipradipta, B. R., Hawley, W., Mika, J., Praptiningsih, C. Y., Mangiri, A., & Prasetyowati, E. B. (2022). Quality of national disease surveillance reporting before and during COVID-19: A mixed-method study in Indonesia. International Journal of Environmental Research and Public Health, 19(5), 2728. https://doi.org/10.3390/ijerph19052728
13. Ibrahim, L., & Kurniawan, E. (2021). Accuracy and timeliness of using syndromic surveillance for outbreak detection: A systematic review. Global Health Journal, 4(4), 78–91.
14. Ministry of Health of the Republic of Indonesia. (2022). Pedoman algoritma sistem kewaspadaan dini dan respon (EWARS). Direktorat Surveilans dan Kekarantinaan Kesehatan.
15. Ministry of Health of the Republic of Indonesia. (2023). Pedoman sistem kewaspadaan dini dan respon (EWARS) penyakit potensial KLB. Direktorat Surveilans dan Kekarantinaan Kesehatan.
16. Ministry of Health of the Republic of Indonesia. (2024). Profil kesehatan Indonesia tahun 2023. Pusat Data dan Teknologi Informasi Kesehatan.
17. Manurung, M., Reo, S., Pardosi, J., & Muscatello, D. (2020). Evaluation of the Indonesian early warning alert and response system (EWARS) in West Papua, Indonesia. WHO South-East Asia Journal of Public Health, 9(2), 111–117. https://doi.org/10.4103/2224-3151.294305
18. Marullyta, A., & Rohaningsih. (2022). Evaluasi sistem kewaspadaan dini dan respon penyakit (EWARS) Provinsi Daerah Istimewa Yogyakarta tahun 2022. Multidisciplinary Journal, 5(5).
19. Miles, M. B., Huberman, A. M., Rohidi, T. R., & Mulyarto. (2021). Analisis data kualitatif: Buku sumber tentang metode-metode baru. UI Press.
20. Notoatmodjo, S. (2018). Metodologi penelitian kesehatan. Rineka Cipta.
21. Nursetyo, A. A., & Hasri, E. T. (2021). Panduan penggunaan aplikasi sistem kewaspadaan dini dan respon (EWARS) untuk pelaporan penyakit berpotensi kejadian luar biasa (KLB). Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik Kementerian Kesehatan RI.
22. Salastianour, A. L., & Alnur, R. D. (2024). Evaluasi sistem kewaspadaan dini dan respon (EWARS) penyakit potensial KLB di Puskesmas Kota Tangerang Selatan tahun 2023. Jurnal Pendidikan Kesehatan, 4(2), 57–64.
23. Sugiyono. (2019). Metode penelitian kuantitatif, kualitatif, dan R&D. Alfabeta.
24. Susilawati, S., Pratiwi, A., Megarani, S., Siregar, J. S., Jasmine, S. T., Panjaitan, M. F., Ramadiah, P. S., & Shandy, B. (2025). Analisis kerangka COM-B dalam pelaksanaan sistem kewaspadaan dini dan respon (EWARS): Studi kualitatif. JUKEJ: Jurnal Kesehatan Jompa, 4(4), 1605–1614.
25. Syahrani, Z. (2024). Analisis pengimplementasian sistem kewaspadaan dini dan respon (EWARS) untuk penyakit potensial KLB di Indonesia: Literature review.
26. WHO. (2014). Early detection, assessment and response to acute public health events: Implementation of early warning and response with a focus on event-based surveillance. WHO Press.
27. WHO. (2018). Early warning alert and response in humanitarian emergencies (EWARS): Technical guidance document. WHO.
28. WHO. (2025). Circulating vaccine-derived poliovirus type 2 – Papua New Guinea. WHO Disease Outbreak News. https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON571
29. Wikansari, N. W., Santoso, D. B., Pramono, D., & Widarsih, D. W. (2019). Evaluasi program early warning alert and response system (EWARS) dalam pelaksanaan surveilans KLB Kota Salatiga Provinsi Jawa Tengah. Jurnal Manajemen Informasi dan Administrasi Kesehatan, 2(1), 9–17.
30. Wulandari, S., Rahmawati, A., & Hadi, S. (2022). Evaluasi pelaksanaan EWARS berbasis puskesmas di wilayah timur Indonesia. Jurnal Sistem Informasi Kesehatan Indonesia, 8(1), 45–55.

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