

Performance evaluation of EWARS (early warning and response system) for leptospirosis cases in Kebumen district health office in 2023

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Abstract. This study aimed to evaluate the performance of the early warning and response system (EWARS) in the Kebumen District Health Office in 2023, with a focus on the early detection of leptospirosis cases. This descriptive evaluation study used secondary data from the EWARS platform. The data was retrieved from the website web.skdr.surveilans.org. The timeliness of EWARS reporting at community health centers and hospitals in 2023 was 95.42% and 96.23%, respectively. The completeness of EWARS reports at community health centers and hospitals in 2023 was 100%, respectively. Community health centers reported 314 alerts, while 413 were reported from hospitals during 2023. The most frequently reported alert from hospitals was leptospirosis. In the EWARS, 66 cases of leptospirosis were reported at week 11. Alerts from hospital reports from week 1 to week 11 were increasing. An alert from the health center report appeared in the 9th week. The response that has been made is improving health awareness of leptospirosis around the affected community health centers and hospitals in the Kebumen area. The verification of cases from hospitals was 93.46% and verified within 24 hours. The timeliness and completeness of EWARS reporting in Kebumen District have surpassed the national targets of 80% and 90%, respectively. In the case of leptospirosis, community health centers need to increase early detection of symptoms and risk factors for leptospirosis.

1 Introduction

Surveillance is the activity of collecting, analyzing, and interpreting specific data results systematically and continuously, which is used for planning, implementing, and evaluating public health policies and implementation [1]. Surveillance data serves as an early warning system for impending disease outbreaks that could pose a public health emergency, monitoring and evaluating the impact of health interventions that help monitor progress towards set goals as well as monitoring and explaining the epidemiology of health problems, guiding priority

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setting, planning, evaluation of public health policies and strategies [2]. The surveillance system has two main functions: an early warning system for potential threats to public health and a program monitoring function for specific or multi-diseases [1].

Early Warning Alert Response and System (EWARS) is a system that has functions to detect the potential epidemic of infectious diseases, which are reported weekly using a web-based platform and can present alerts or early warning signals when disease cases exceed the threshold in an area. The alerts on the system did not directly indicate an epidemic had occurred. Still, it helped health officers detect any diseases that have the potential to be epidemic and prevent them from occurring.[3]

EWARS has been implemented from the lowest level health service unit (public health centers) to the Ministry of Health office. The aim of implementing EWARS is to carry out early detection of infectious diseases with epidemic potential, provide input to related programs and sectors to carry out responses to control infectious diseases with epidemic potential, minimize morbidity and mortality, and assess the impact of infectious disease prevention and control programs. [3] In the Kebumen district, EWARS is implemented by all public health centers and hospitals, totaling 35 public health centers and 11 hospitals.

Leptospirosis is an acute zoonotic disease caused by *Leptospira* bacteria, which can cause death. Leptospirosis cases are divided into three criteria: suspect, probable, and confirmed. Due to its potential to cause an epidemic, leptospirosis case reporting is included in the EWARS, which data processing, analysis, and interpretation of data based on socio demographics, including risk factors and case mapping as well as preparation of recommendations and follow-up routinely performed [4]. This study aims to evaluate the performance of the EWARS for Leptospirosis in Kebumen District. In 2023, there was a significant increase in leptospirosis cases compared to the previous year. In 2022, there were 42 suspected leptospirosis reports. While in 2023, there were 116 suspected leptospirosis reports.

2 Materials and Methods

This descriptive study used secondary data from <https://skdr.surveilans.org/> and focused on Kebumen district data in 2023. The aggregated data came from public health centers and hospitals. In addition to using secondary data, interviews were also conducted to determine strategies and respond to alerts regarding the increase in suspected cases of leptospirosis. The inclusion criteria for the EWARS evaluation report are reports from health centers and hospitals from week 1 to week 52 of 2023.

2.1 Participants

This study involved all 35 public health centers and 11 hospitals in the Kebumen district area. Surveillance officers from public health centers and hospitals were enrolled in this study for interviews.

2.2 Data collection tools

The flow of the EWARS reporting system in the Kebumen district starts with the disease report from the public health centers and hospitals. EWARS reports at this phase are performed using WhatsApp/Short Message Service (SMS) by registered phone number. The reports are then received and processed in the EWARS data server. The district health office, provincial health office, and Ministry of Health Surveillance Directorate then monitor EWARS reports on the web-based platform. The district health office will follow up on any alert that appears in the

system by conducting a verification process with the public health center. A follow-up (epidemiological investigation and specimen collection by a public health center) will be performed based on the verification results. For more details, see Figure 1.

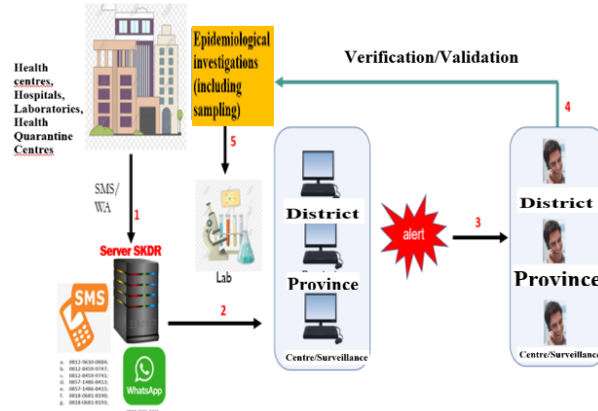


Fig. 1. EWARS workflow [3]

3 Results and Discussion

The performance of the Early Warning and Response System (EWARS), especially the accuracy of reports in Kebumen District, has reached the target of more than 80%. However, one public health center, the Kuwarasan Public Health Center, has not reached the minimum target of 80%. Include reference sentences and explanations for each figure (ex: Figure 2 showed the numbers of cases in 2023.) This is also comparable to the results of the EWARS accuracy report achievement in the Regency/City in the Special Region of Yogyakarta Province. In 2022, the accuracy report was more than 80% [6]

The use of EWARS technology is as an effort for early detection/outbreak disease alert, because with the existence of supporting alert data in the system, it can prevent outbreak disease from occurring or prevent outbreak disease from spreading and prevent it from recurring in the future period.[7]

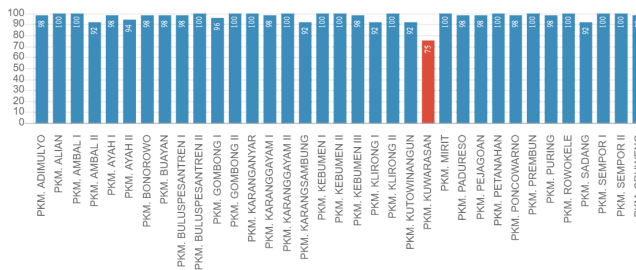


Fig. 2. Accuracy of the EWARS report from public health centers in 2023 [5].

Meanwhile, regarding the accuracy of EWARS reports from hospital reporting units, all 11 hospitals in Kebumen District have achieved the accuracy target of 80%. Include reference sentences and explanations for each figure (ex: Figure 3 showed the numbers of cases in.....)

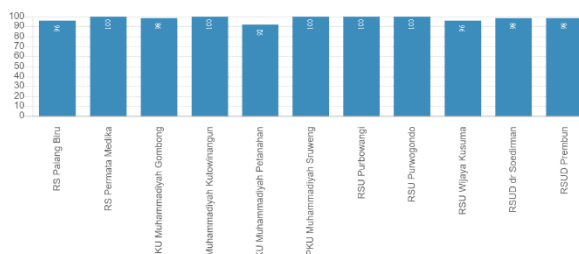


Fig. 3. Accuracy of EWARS report from hospitals in 2023 [5].

In terms of completeness, the EWARS report from the reporting public health centers and hospitals surpassed the target of at least 90%. Both public health centers and hospitals reached 100% completeness. Include reference sentences and explanations for each figure (ex: Figure 4 showed the numbers of cases in 2023).

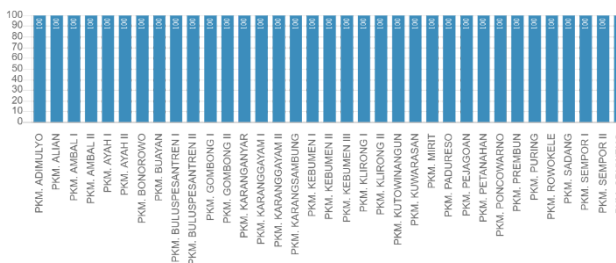


Fig. 4. Completeness of the EWARS report from public health centers in 2023 [5]

Include reference sentences and explanations for each figure (ex: Figure 5 showed the completeness of EWARS report in hospital)

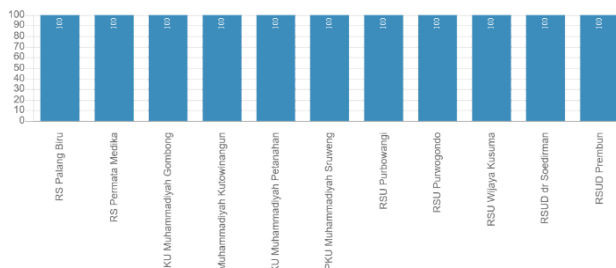


Fig. 5. Completeness of the EWARS report from hospitals in 2023 [5]

Based on the public health center EWARS report, the first suspected leptospirosis was reported in the week 9th. The highest number of suspected leptospirosis cases was detected in week 11th, then sharply declined, followed by a small number of cases reported until week 47

(Figure 6). The first hospital report of suspected leptospirosis cases appeared in the first week of 2023 and showed the highest number of cases in week 11th, with 66 suspected cases. A comparison between public health centers and hospitals in reporting suspected leptospirosis cases showed that hospitals reported more cases (see Figures 6 and 7). This finding was possibly due to the symptomatic patient not seeking healthcare services until it got worse and needed hospital care. Another possible reason was the misdiagnosis of patients at public health centers.

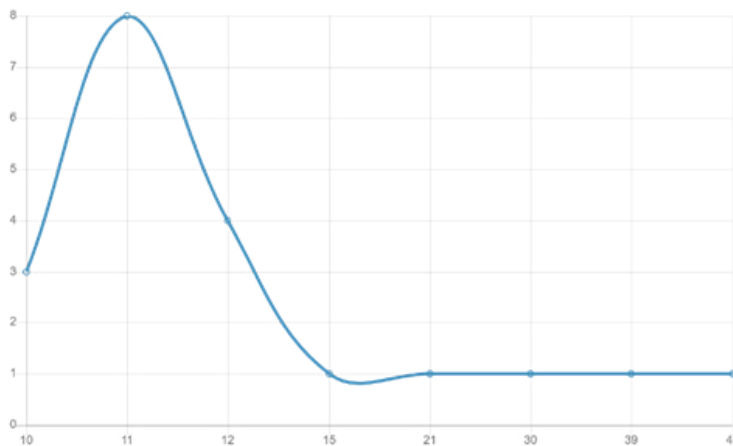


Fig. 6. The report of suspected leptospirosis cases in 2023 from public health centers.[5]

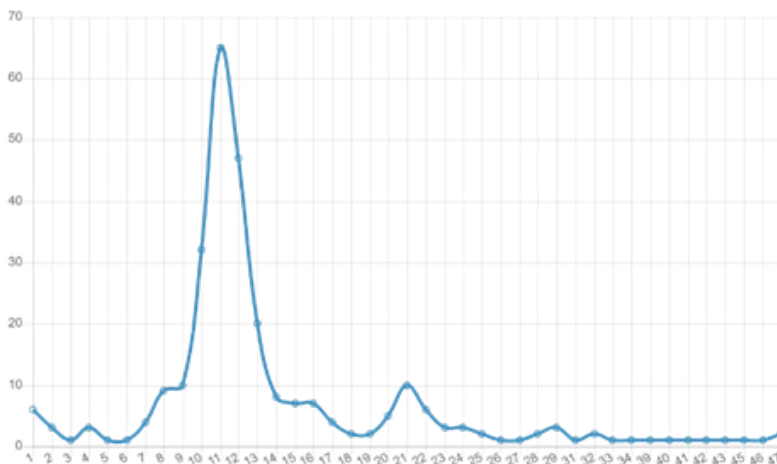


Fig. 7. The report of suspected leptospirosis in 2023 from hospitals [5].

The response that the Kebumen District Health Office has carried out to control the increase in leptospirosis cases is to make an official announcement to all health facilities in Kebumen District to increase awareness of leptospirosis, conduct early detection, improve case management and referral of suspected leptospirosis patients, provide rapid diagnostic tests

(RDT leptospira), intersectoral meetings related to the analysis of the situation of leptospirosis in Kebumen District and conduct risk factor surveillance with BBTCLPP Yogyakarta.

4 Conclusion

The accuracy and completeness of the Early Warning and Response System (EWARS) in Kebumen District has exceeded the national target for both parameters. Despite its good performance in EWARS, improvement in suspecting and detecting leptospirosis cases at public health centers is needed. Early case detection at public health centers could prevent leptospirosis transmission in the population and lower disease mortality and morbidity. The official announcement by the district health office should be followed up by conducting case management training and ensuring RDT logistics in each public health center.

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