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Evaluation of the Perinatal Death Surveillance and Response System in Eastern Province, Rwanda

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Abstract

Background: Perinatal mortality remains a significant public health concern, particularly in low- and middle-income countries where the majority of deaths occur. The Maternal, Perinatal, and Child Death Surveillance and Response (MPCDSR) system was established to improve identification, reporting, review, and response to perinatal deaths. However, the performance of this system remains suboptimal in many settings. This study aimed to evaluate the performance of the perinatal death surveillance system using surveillance attributes and core functions in selected health facilities of Eastern province, Rwanda.

Methods: A descriptive cross-sectional surveillance system evaluation was conducted in selected health facilities in Eastern Province, Rwanda. Routinely collected surveillance data from 2021 to 2025, document reviews, and structured questionnaires administered to members of MPCDSR committees were used to assess surveillance system attributes and core functions based on the updated CDC guidelines. Performance was summarized using descriptive statistics and categorized as poor (≤50%), fair (51–79%), or good (≥80%).

Results: A total of 4,414 perinatal deaths were identified during the evaluation period. Of these, 3,050 (69%) were detected in HMIS and 1,440 (47%) were formally notified through the surveillance system. Data collection and management achieved excellent performance (100%), whereas notification (47%), analysis and interpretation (0%), and response and action based on the audited cases (58%) demonstrated weaknesses. Among surveillance attributes, usefulness (84.2%), data quality (90.5%), timeliness (92.0%), simplicity (80.1%), and flexibility (80.3%) were rated as good, while stability (59.8%), acceptability (77.5%), and representativeness (74.2%) showed fair performance.

Conclusion: The surveillance system demonstrated strong performance in data collection and documentation but important weaknesses in notification, analysis, and implementation of response actions. Strengthening timely notification, regular death reviews, feedback mechanisms, and the use of surveillance data for decision-making is essential to improve the effectiveness of the MPCDSR system and support the reduction of preventable perinatal deaths.

Keywords: Perinatal death; Surveillance system evaluation; Maternal, Perinatal and Child Death Surveillance and Response (MPCDSR); Perinatal mortality; Rwanda

Introduction

Perinatal death refers to either death prior to complete expulsion of the fetus or baby with a weight ≥ 1000g, at ≥ 28 weeks of gestation and ≥ 35 cm in body length or death within 7 days of birth(1). It reflects the quality received by the mother during antenatal, labor, and post-delivery and the care received by the newborn after birth(2). Accurate records of perinatal deaths can represent trends in causes and highlight opportunities for preventive actions of the deaths(2,3). It remains a critical global public health issue worldwide. In 2019, the global stillbirth rate was estimated at 13·9million of stillbirths per 1000 total births and it varied across the regions from 22·8 stillbirths per 1000 births in western and central Africa to 2·9 stillbirths per 1000 births in Europe(3).

A systematic review and meta-analysis conducted in Sub-Saharan Africa for assessing perinatal mortality and its determinants shows that there is a disproportionate burden, accounting for 58.35% of observed perinatal mortality(4). In addition, a study conducted in sub-Saharan Africa using secondary data from the Demographic health survey (DHS) aimed at assessing the factors associated with perinatal mortality showed that 37.31 per 1000 births were perinatal deaths(5). Socio-demographic factors, limited skilled birth attendance, and systemic health service inefficiencies contribute significantly to the high burden(5–7).

Evaluation of the perinatal mortality surveillance system conducted in Guanda district in Zimbabwe showed poor knowledge of participants and a low reporting rate was suggested as a reason for not being effective(2). Similarly, the maternal and perinatal mortality surveillance system conducted in the Meda Welabu District, Ethiopia, revealed prominent insufficiencies in the data timeliness, accuracy, completeness, and usage. They suggested that enhancing the overall quality and effectiveness of the surveillance system requires strong monitoring, feedback, weekly bulletins, a consistent coordination committee, and continuous system improvements to enhance surveillance effectiveness(8).

Rwanda introduced the maternal, neonatal, and stillbirth death audits in 2008, 2009, and 2013 respectively. In addition, in 2014, Maternal Death Audit (MDA) was extended to Maternal Death Surveillance and Response (MDSR) following the publication of the National Technical Guideline with the aim of identifying all births, maternal deaths, stillbirths, and neonatal deaths that occur either at health facility level, or at the community level and use WHO guidelines for its implementation(9). However, perinatal and child death was conducted without any guidelines.

In 2019, the combined guideline of maternal, perinatal, child death surveillance and response were developed with the objective of providing a systematic, standardized system of implementing death reviews in real time, identifying causes of deaths, determining which ones could have been avoided, and responding to those causes in terms of actionable recommendations aimed at preventing future avoidable deaths(1,10,11). Thus, this allows effective identification and appropriate notification of death including perinatal death.

For ensuring successful implementation of this surveillance system, maternal, perinatal, child death surveillance and response committee (MPCDSR) was established both at national level and at facility level(1,10). When a perinatal death occurs in the community, the Community Health Worker (CHW) fills out the notification form instantly after being informed and send it to the health center. The health center then notifies the hospital, which subsequently informs the central level. The notification timeline depends on the type of death: Perinatal deaths must be reported within 7 days. For ensuring the effectiveness of transmission, three ways of transmitting information were established; Submission of notification form from the community through the health center-hospital to the central level, Submission of information through RAPID SMS, and Submission of information through HMIS (SISCOM)(1). According to maternal, perinatal child death

surveillance and response (MPCDSR) guidelines, the perinatal deaths that occur in the first and third weeks of each month are only reviewed with committee with a minimum of six perinatal cases reviewed per hospital per month and the reviewed cases must be recorded in the individual reporting system on 5th of the following month (10).

In spite of Rwanda's significant improvement in reducing perinatal mortality through the application of the Perinatal Death Surveillance and Response (PDSR) system, perinatal mortality continues to be unacceptably high and largely preventable(12). Although there was establishment of PDSR at national level and health facility level together with national guidelines, their implementation has not been assessed yet and there is no similar study available from similar settings. Therefore, evaluating the performance of the PDSR system in Eastern Province is crucial to identify areas requiring improvement to improve maternal and perinatal health outcomes. This study aimed to evaluate the performance and implementation of the PDSR system in Eastern Province, Rwanda. Therefore, understanding the working of this system helps to improve interventions aiming at reducing maternal and perinatal death. Thus, evaluation of PDSR in Eastern Province, helps to identify the gaps that need immediate attention and address them to improve the program.

Methods

Study Design

A descriptive cross-sectional evaluation of the PDSR system was conducted using CDC guidelines for evaluating public health surveillance systems. The evaluation combined retrospective review of medical records from 2021 to 2025 and interviews of healthcare workers involved in PDSR activities.

Study Setting

The study was conducted in Eastern Province, Rwanda, which has a population of approximately 3,563,145 and is served by 10 hospitals that provide perinatal care and multiple health centers across 7 districts. Each hospital operates an MPCDSR Committee, which includes medical doctors, midwives, nurses, data managers, and quality improvement officers responsible for conducting perinatal death reviews(13).

The Perinatal Death Surveillance and Response system is implemented from the community level up to the central level. When a perinatal death occurs, immediate notification is made and reported through IDSR using immediate report. Members of the MPCDSR committee conduct an audit within seven (7) days to identify the avoidable causes of death and develop an action plan, which is then communicated to the concerned staff.

When perinatal deaths occur, notification is made immediately; however, reporting is done through the weekly report rather than through immediate report. Not all perinatal deaths are reviewed. Only cases that occur in the first week and those that occur in the third week are reviewed, with a minimum of six cases selected.

The reviewed cases of perinatal death are reported in the individual reporting system in 5th days of following month. Figure 1 summarize perinatal death surveillance and response system. Figure 2 shows current reporting and feedback mechanism of perinatal death surveillance and response (PDSR) in Rwanda.

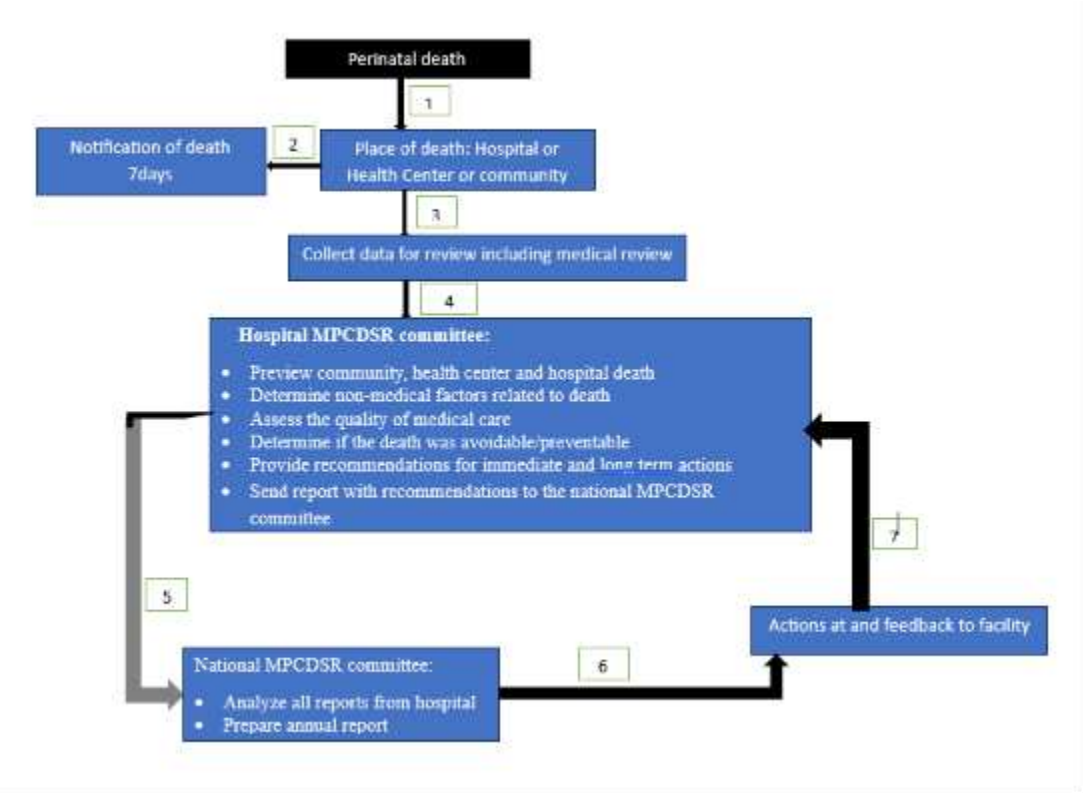

Figure 1: Current reporting and feedback mechanism of perinatal death surveillance and response (PDSR) in Rwanda(1)

Study population

This study involved all members of the maternal, perinatal surveillance, child surveillance and response system committee both at the hospital and health center level. The study population comprised a diverse group of professionals, including medical doctors, midwives, and nurses, with varying levels of experience and roles within the surveillance committee. Demographic profile of the participants provides essential context for understanding the perceptions and performance scores of the surveillance system. Data on gender, age, educational attainment, and years of professional experience were collected to ensure a representative assessment of the workforce currently implementing PDSR activities at both the hospital and health center levels.

Sample size

Six (6) hospitals were selected with two health centers attached to each hospital and all 12 members of maternal, perinatal, and child death surveillance and response committee from each selected hospital and 4 members of the committee from each health centers were included in sample size.

Sampling

Six hospitals were randomly selected from the ten hospitals in Eastern Province. Two health centers were purposively selected for each hospital one with a high perinatal mortality rate and one with a low rate was selected resulting in a total of 12 health centers. All MPCDSR committee members at the selected facilities were eligible to participate in the study.

Inclusion and exclusion criteria

This study included participants who were directly involved in the maternal and perinatal surveillance and response system and excluded those who were unable to consent.

Data Collection Instrument

Structured questionnaires were developed specifically for this study based on the updated Centers for Disease Control and Prevention (CDC) Guidelines for Evaluating Public Health Surveillance Systems and were administered electronically via KoBoToolbox(2). Questions assessed health worker demographic information, system attributes, and operational aspects of the perinatal surveillance system. The questionnaire was developed by the research team based on the CDC guidelines and was not adapted from any previously published instrument. The complete English-language questionnaire is provided as Additional file 1. Document reviews complemented questionnaire data for timeliness, data quality, part of usefulness, and core function assessments.

Pilot study

The questionnaire was tested through a pilot study that involved two hospitals and four health centers attached to them. The pilot study revealed that the study questionnaire was valid and reliable.

Surveillance Attributes and Core Functions Assessed

Eight system attributes were evaluated: usefulness, data quality, simplicity, acceptability, stability, timeliness, flexibility, and representativeness. Five core functions were also assessed: case detection, notification, data collection and management, analysis and interpretation, and feedback and action. Definitions followed CDC updated surveillance guidelines(2).

Scoring

Binary (Yes/No) and Likert scales were used to capture responses. Performance was classified into three categories based on percentage scores: poor (≤50%), fair (51–79%), and good (≥80%). For each attribute or core function, a composite performance score was computed by taking the mean of the percentage scores of all corresponding indicators within that domain(14).

$$\textbf{\% of attributes score} = \frac{Sum\ of\ all\ percentage\ obtained\ from\ all\ indicators\ of\ each\ attributes/\ \text{core function}}{Number\ of\ indicators\ of\ each\ attribute}$$

Data collecting procedure

Designated electronic kobo toolbox structured questionnaire revised from updated CDC guideline for evaluating public health surveillance system through documents review and participant interviews was used to collect data. Data were collected using structured questionnaires designed to evaluate knowledge of participants, flexibility, usefulness, and stability of the surveillance system among 19 health professionals. In addition, the other attributes and core function data such as timeliness, data quality, representativeness, also collected from MPCDSR committee record,

individual record system, delivery registers, notification form, and HMIS report to assess. The data collectors were trained to minimize the bias of responses from participants. Data from 2021 to 2025 was obtained from HMIS, SISCOM, and registered for further analysis.

Data Analysis

Data were entered into Microsoft Excel, cleaned, and exported for analysis. Descriptive statistics were used to summarize the data, including frequencies, percentages, and trends. Surveillance system attributes and core functions were scored according to CDC guidelines. Results were presented using tables, charts, and graphs to describe the distribution of perinatal deaths by person, place, and time. Missing data were assessed for completeness. Where the proportion of missing data was minimal (<5%), complete case analysis was applied. The dataset was checked for completeness before analysis. Missing data were minimal and did not materially affect the study variables; therefore, complete-case analysis was performed.

Results

Sociodemographic characteristics of the participants: A total of 136 healthcare workers involved in the Perinatal Death Surveillance and Response (PDSR) system across the Eastern Province participated in this evaluation. Table1 below shows sociodemographic characteristics of participants. It shows that 65.4% of them were male, 54.4% were aged between 30-39, 25.7% had an advanced diploma, 80.9% had more than 2 years of working experience, 61.7% were working at the hospital, and 12% were members of the MPCDSR committee. The detailed socio-demographic characteristics of the respondents are summarized in Table1 below.

Table 1: Socio-Demographic Characteristics of Study Participants (n=136)

Variable	Category	Frequency (n)	Percentage (%)
Gender of Healthcare workers	Female	47	34.6
	Male	89	65.4
Age (years)	20-29	24	17.6
	30-39	74	54.4
	40-49	28	20.6
	50 and above	10	7.4
Education Level	Advanced Diploma	35	25.7
	Bachelor Degree	87	64
	Post Graduate	14	10.3
Working Experience	<1 year	5	3.7
	1-2 year	21	15.4
	>2 years	110	80.9
Type of Health Facility	Hospital	84	61.7
	Health center	52	38.2
Role in MPCDSR	Chair Person	8	5.8
	Secretary	8	5.8

	Member	120	88.2

Epidemiology of Perinatal Deaths (2021–2025)

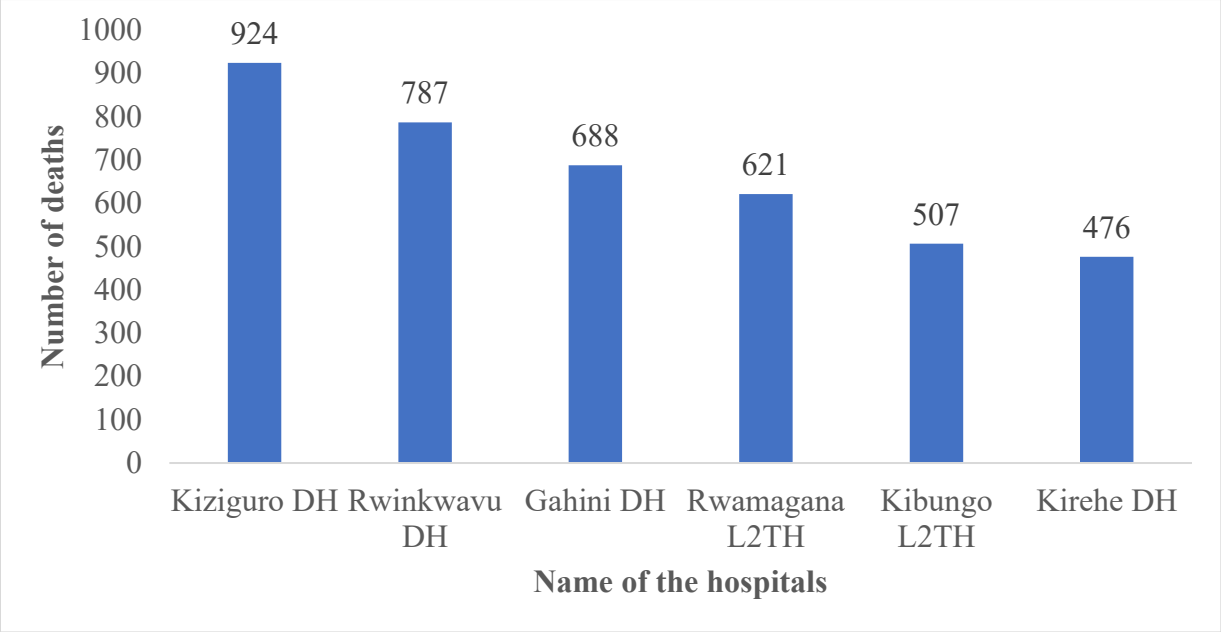

Figure 2: Distribution of perinatal death by Place in Eastern Province from 2021 to 2025 Fiscal Year

A total of 4,414 perinatal deaths were recorded across Eastern Province over the four-year period, highlighting the substantially greater burden of perinatal mortality. Figure 2 above reveals substantial variation in perinatal mortality across six (6) healthcare facilities, ranging from 924 deaths at Kiziguro DH to 476 at Kirehe DH.

Place of Perinatal Death in eastern Province

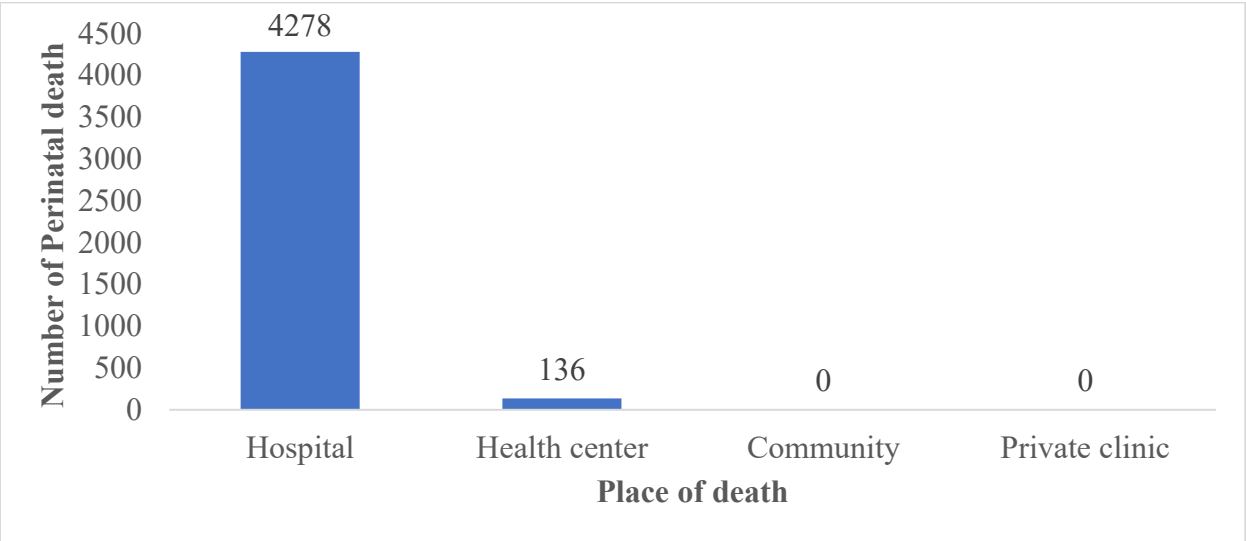

Figure 3: Place Perinatal Death in Eastern province from 2021 to 2025 fiscal year

The figure 3 above shows that the majority of perinatal deaths occurred in hospitals 4,278(97%) deaths, with minimal deaths at health centers 136 (3%) and no deaths were recorded in the community or private clinic. This distribution likely reflects hospitals' role as referral centers for high-risk pregnancies and complicated cases, though it may also indicate challenges in managing obstetric emergencies at the hospital level.

Trend of perinatal death in Eastern province

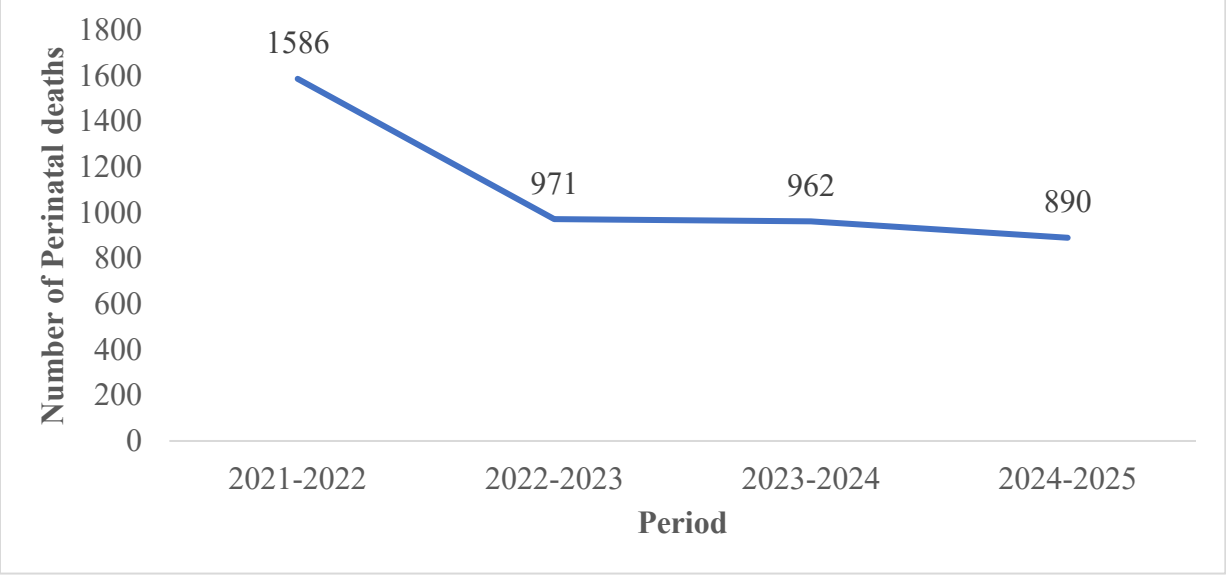

Figure 4: Trend of perinatal death in Eastern Province from 2021 to 2025 fiscal year

Figure 4 shows the trend in perinatal deaths in Eastern Province from 2021 to 2025. As illustrated, the number of perinatal deaths declined from 1,586 in 2021–2022 to 890 in 2024–2025, representing a 44% reduction. The progressive decrease across all periods demonstrates consistent improvement in perinatal care and outcomes. The table1 below shows surveillance system attributes that demonstrated strong overall performance, with good scores for usefulness (84.25%), simplicity (80.1%), and flexibility (80.3%), data quality (90.5%), and timeliness (92%). Fair performance was observed in acceptability (79.5%), representativeness (74.2%), and stability (59.8%).

Attributes of the perinatal surveillance system

The highest achieved attributes were data quality and timeliness that achieved 90.5%, and the least was stability that achieved 59.8% (Table 2).

Table 2: Attributes of the perinatal surveillance system in Eastern province from 2021 to 2025 fiscal year

No	Attributes	Evaluation Criteria	Results	Overall score (%)	Conclusion
		Proportion of respondents who agree or strongly agree that PDSR data is used for decision-making in their facility.			

01	Usefulness		109/136=81%	84.2%	Good
		Proportion of respondents who agree that PDSR data has led to interventions improving perinatal health outcomes	115/136=85%		
		Proportion of respondents who agree that PDSR data has led to interventions improving newborn health outcomes	115/136=85%		
		Proportion of respondents who agree that PDSR data is shared with relevant stakeholders to guide action	96/136=71%		
		Proportion of respondents who agree that the PDSR system has contributed to reducing preventable perinatal deaths in the catchment area	113/136=83 %		
		Proportion of facilities that have implemented PDSR recommendations	11/11=100%		
02	Data Quality	Number of perinatal records that were recorded in register compared to the total number of records that were reported in the system in HMIS.	4261/4414=97 %	90.5%	Good
03	Timeliness	Proportion of perinatal death cases reported in the individual reporting system within the required timeframe	759/904=84%		
		Proportion of Perinatal surveillance reports submitted on time (HMIS)	4414/4414=10 0%		
04	Simplicity	The system and its objectives are easy to understand.	94/101=93.1%	80.1%	Good
		Case definitions for deaths are clear.	121/136=89.2 %		
		Completing reporting forms is not time-consuming.	28/42=66.67%		
		Reporting mechanism is simple to implement.	25/35=71.4%		
05	Stability	Reporting system tools are consistently available.	113/136=83.4 %	59.8%	Fair
		Review meetings are conducted regularly.	79/136=58.9%		
		Technical problems rarely affect system functioning.	11/32=34.4%		
		Adequate technical support is available when needed.	20/32=62.5%		
06	Flexibility	System allows modifications from the central level.	30/33=90.9%	80.3%	Good
		retraining of change to the health workers usually require Either Minimum or none	23/33=69.7%		
07	Acceptability ty	Perinatal death Surveillance system is adequate and suitable for use.	103/136=72.3 %	77.5%	Fair
		Perinatal death reporting methods are standard/applicable.	112/136=82.7 %		
08	Representativene ss	Data reflect deaths in all geographic areas/populations.	44/54=81.5%	74.2%	Fair
		Deaths are reported consistently every month.	130/136=95.7 %		
		Deaths occurring in private facilities are adequately captured by the PDSR system	60/136=45.3%		

Core Functions of perinatal Surveillance system

Table 3 shows the performance of the perinatal death surveillance and response system core functions across different variables. Case detection was fair (69%), notification was poor (47%). This indicates significant underreporting of detected cases. Data collection and management were good (100%), showing all notified cases are found on data collection tool with complete data. However, no perinatal deaths were analyzed (0%), representing a critical gap in the system. Response and action were fair (58%), suggesting that 42% of reviewed cases missing feedback from committee to the concerned staff. Overall, weaknesses in notification, analysis, and response undermine the effectiveness of the system.

Table 3: Core Function of the Surveillance system in Eastern province from 2021 to 2025

Core Function	Evaluation Criteria	Results	Conclusion
Case Detection	Perinatal deaths detected / all perinatal deaths in registers	3050/4414=69%	Fair
Notification	Perinatal deaths notified/detected perinatal Cases	1440/3050=47%	Poor
Data Collection & Management	Perinatal deaths with complete data / total Notified	1440/1440=100%	Good
Analysis and Interpretation	Perinatal deaths analyzed / total perinatal deaths detected	0/3050=0%	Poor
Response and Action	Perinatal deaths with documented actions / total reviewed	436/750=58%	Fair

Discussion

The distribution of perinatal death, core functions, and attributes of the surveillance system were examined during evaluation of Perinatal Death Surveillance and Response (PDSR) system in Eastern Province, Rwanda. The evaluation revealed a functional system contributing to mortality reductions, though specific areas require strengthening for optimal performance. From 2021 to 2025 perinatal deaths decreased by 44% in Eastern Province. Although this reduction is encouraging, it should be interpreted cautiously because this descriptive evaluation cannot establish whether the decline was directly attributable to PDSR performance. The observed trend may also reflect concurrent improvements in maternal and newborn healthcare services and other health system interventions implemented during the study period. This demonstrates the strong performance of the PDSR system. This aligns with Rwanda's Health Sector Strategic Plan of reducing neonatal death in 2029 and reflects sustained system-level improvements(12). However, geographic variation persists, with perinatal deaths ranging from 924 at Kiziguro District Hospital to 476 at Kirehe District Hospital. These variations may reflect differences in catchment population, referral patterns, and case complexity, emphasizing the need for context-specific quality improvement interventions.

This study found that the system demonstrated high usefulness (84.2%) in relation to perinatal death surveillance system. This finding is consistent with evidence from other African settings. The study findings are consistent with the study conducted in Zimbabwe which reported perinatal surveillance system to be useful (88%). In contrast, an evaluation of the maternal and perinatal death surveillance system in Ethiopia reported lower perceived usefulness, with only 50% of healthcare professionals indicating that the system was useful(2,8). The high usefulness score suggests that healthcare workers perceive PDSR as valuable for identifying avoidable factors and guiding improvement actions; however, its impact depends on effective use of surveillance information for decision-making.

Our study found that simplicity of the surveillance system was good (80.1%) with participants reporting that case definitions were clear and reporting procedures were straightforward. A simple surveillance system facilitates routine implementation by reducing user burden and improving participation. This indicates using the easiest system facilitates the users to perform their activities in simple way. Nevertheless, some respondents expressed concerns regarding the complexity of reporting forms and the time required to complete them. This finding is in contrast, to the study conducted in Ethiopia that reported considerably lower simplicity, with only 41% of healthcare professionals indicating that the system was simple to use(8). The relatively higher simplicity observed in Rwanda may be related to familiarity with national surveillance procedures and integration of PDSR activities into routine maternal and newborn health services.

The system demonstrated good flexibility (80.3%), adapting to changes in case definitions and reporting tools. This level of adaptability is important for system evolution and is consistent with Surveillance and Response system evaluation conducted in Ghana, where flexibility scored 86.7%. In contrast, an evaluation conducted in Gambia that reported lower flexibility, with a score of 60%(14,15). Flexibility is important for sustainability because surveillance systems must adapt to changing health priorities and reporting requirements.

The system showed fair Acceptability (79.5%), with most healthcare workers recognizing system value but expressing workload concerns. The finding is much lower compared to the evaluation of perinatal mortality surveillance system conducted in Zimbabwe with acceptability scored 94.6% and 96% respectively(2,15). This might be due to high turnover which results in many activities performed by one person and limit him/her to accept performance of other activities. Addressing workload constraints through supportive supervision, feedback mechanisms, and better integration of surveillance activities into routine work may improve acceptability.

The stability of the surveillance system scored fair at 59.8%, indicating unreliable operations due to technical interruptions, and inadequate technical support when needed. In contrast, stronger stability was reported in evaluations of perinatal surveillance and response systems conducted in Zimbabwe (88%) and Ghana (94.6%)(2,15). Low stability may affect continuity of surveillance activities, data reliability, and timely implementation of response actions.

Representativeness of the surveillance system was fair (74.16%), this is slightly high compared to the evaluation of maternal and perinatal surveillance system conducted in Ethiopia with representativeness 55% and 55% (8,15). The fair representativeness was due to the design of the system where it does not have any variable of perinatal death in the community part, and above 55% of the respondent reported that the system did not capture deaths that occur in the private clinics. Enhancing private facility reporting mechanisms and adding variables in community-based system to capture perinatal death that occurred in a community is essential. Incomplete capture of community and private-sector deaths may underestimate the true burden of perinatal mortality and limit identification of priority interventions.

Timeliness of the surveillance system was good in this study (92%), This indicates that the participants understand the timeline of reporting both maternal and perinatal death(14). In contrast to the evaluation of perinatal surveillance system conducted in Zimbabwe which showed timeliness of 63%(2). High timeliness indicates that reported deaths were processed promptly; however, timely reporting cannot compensate for incomplete notification.

The surveillance system demonstrated strong performance in data collection and management (100%), moderate performance in case detection (69%) and response and action (58%), but poor performance in notification (47%) and analysis and interpretation (0%). The high level of data completeness indicates effective documentation and standardized reporting for notified cases. Poor notification may reflect inadequate knowledge of notification procedures, inconsistent adherence to notification requirements, or operational barriers, although these factors were not directly assessed. Additionally, the absence of analysis and interpretation of perinatal deaths reflects a critical gap in the system's capacity to utilize surveillance data for local decision-making.

The combination of high timeliness and poor notification suggests that the main challenge is incomplete entry of deaths into the surveillance system rather than delays after notification. This highlights the need to strengthen case identification and notification mechanisms.

The low notification rate suggests that a substantial proportion of detected perinatal deaths are not formally reported, which may limit the awareness of committee members regarding deaths occurring both within health facilities and in the community. According to the Maternal, Perinatal, and Child Death Surveillance and Response (MPCDSR) framework in Rwanda, all perinatal deaths should be detected, notified, and analyzed. However, only cases reviewed by the committee are assessed for avoidable factors, followed by the provision of feedback and the development of action plans(1). Improving notification completeness through clear accountability mechanisms, routine monitoring of reporting practices, and supportive supervision should therefore be prioritized to ensure that every perinatal death contributes to learning, prevention efforts, and quality improvement.

These findings demonstrate that effective surveillance requires more than data collection; it requires complete notification, analysis, interpretation, and response. Strengthening these components will improve the ability of PDSR to generate actionable information for preventing avoidable perinatal deaths.

This evaluation contributes to the limited evidence on perinatal death surveillance systems in sub-Saharan Africa by assessing both surveillance attributes and core functions within a decentralized health system. It identifies not only system strengths but also operational gaps affecting the translation of surveillance information into preventive actions.

In conclusion, the PDSR system in Eastern Province represents an important foundation for reducing preventable perinatal deaths in Rwanda. Strengthening notification completeness, data utilization, and system sustainability will be critical to ensuring that every perinatal death informs effective response actions and contributes to reducing preventable mortality.

Conclusion

This evaluation demonstrated that the Perinatal Death Surveillance and Response (PDSR) system in Eastern Province, Rwanda, performs well in data collection, documentation, timeliness, usefulness, flexibility, and simplicity. However, important weaknesses remain in notification, analysis and interpretation, system stability, and implementation of response actions. Addressing these gaps through strengthened reporting mechanisms, routine data analysis, improved feedback systems, and enhanced technical support will improve the effectiveness of the surveillance system and contribute to reducing preventable perinatal mortality in Rwanda.

Study Limitations

This evaluation excluded private facilities, limiting generalizability. Self-reported data may introduce social desirability bias. The cross-sectional design captured a single time point, missing temporal variations. Incomplete facility records affected some assessments. Assessing both the sensitivity and positive predictive value of the surveillance system was challenging because data on perinatal deaths during the study period were not accessible from the civil registration system, making it difficult to identify all true cases and verify whether reported deaths were accurate.

List of Abbreviation

CDC: Centers for Disease Control and Prevention

CHW: Community Health Worker

HMIS: Health Management Information System

IRB: Institutional Review Board

MPCDSR: Maternal, Perinatal and Child Death Surveillance and Response

PDSR: Perinatal Death Surveillance and Response

SISCOM: Système d'Information Sanitaire Communautaire

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Authors' contributions

BI conceived and designed the study, developed the study protocol, coordinated data collection, performed data analysis, interpreted the findings, and drafted the manuscript. KMJ contributed to study design, supervised the research process, reviewed the methodology, and critically revised the manuscript. IHE contributed to study design, supervised the research process, reviewed the methodology, and critically revised the manuscript. YMR, UV and NS contributed to data analysis, interpretation of findings, and critical revision of the manuscript for important intellectual content. NJC and NJ provided technical guidance throughout the study, supervised the research activities, contributed to the interpretation of findings, and critically reviewed the manuscript. All authors read and approved the final version of the manuscript.

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Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration

Ethics approval and consent to participate

This research was conducted in accordance with the ethical principles of the Declaration of Helsinki (1964) and applicable ethical guidelines for research involving human participants. Ethical approval was obtained from the University of Rwanda College of Medicine and Health Sciences Institutional Review Board (Ref: CMHS/IRB/755/2025). Permission to conduct the research was obtained from the hospital administration. Written informed consent was obtained from all participants before data collection. Participants were informed about the research objectives, voluntary nature of participation, confidentiality measures, and their right to withdraw at any time without consequences. Privacy and confidentiality were maintained throughout the research process. All collected information was anonymized and securely stored in a password-protected database accessible only to authorized members of the research team.

Consent for Publication

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

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