



Delayed detection and response during a measles outbreak in Kyegegwa District, Uganda: findings from a 7-1-7 assessment, January–April 2026

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Summary

Background: Kyegegwa, a refugee-hosting district with recurrent measles outbreaks, experienced a measles outbreak in early 2026. We applied the 7-1-7 framework to assess the timeliness of outbreak detection, notification, and response, identify operational enablers and bottlenecks, and propose control measures to strengthen future outbreak preparedness.

Methods: We conducted a standardized 7-1-7 assessment using case investigation forms, surveillance line lists, and key informant interviews with district health team members and community informants. We measured three intervals: symptom onset to detection, detection to notification, and notification to completion of early response actions, and compared them with the 7-1-7 targets.

Results: The outbreak involved 85 measles cases (80 suspected, 5 laboratory-confirmed) and one death. The recognized outbreak cluster emerged on March 7, 2026, and was detected 8 days later, exceeding the ≤ 7 -day detection target. Notification occurred on the day of detection, meeting the ≤ 1 -day target. Early response actions were completed 10 days after notification, exceeding the ≤ 7 -day target. Detection delays were attributed to weakened community-based surveillance after Village Health Team (VHT) restructuring, low clinical suspicion, case misclassification, delayed care seeking, and prolonged laboratory turnaround time. Response delays were linked to lack of contingency funding, delayed rapid response team (RRT) deployment, inconsistent partner support, and absence of a costed outbreak response plan. District leadership, Regional Emergency Operations Centre (EOC) support, and prior outbreak response experience facilitated implementation.

Conclusion: The district met the 7-1-7 notification target but missed the detection and early response targets. Strengthening community surveillance, frontline clinical recognition, laboratory turnaround time, contingency financing, and district preparedness planning could improve future outbreak response timeliness.

Background

Measles is a highly contagious vaccine-preventable disease that disproportionately affects young and immunologically vulnerable children. Outbreaks occur when vaccination coverage falls below the approximately 95% level required for population immunity, allowing susceptible children to accumulate. Despite routine immunization



and supplementary campaigns, measles outbreaks and related deaths continue to occur (1,2).

Timely detection and response are critical to limiting transmission. The 7-1-7 framework assesses whether outbreaks are detected within seven days of emergence, notified within one day, and whether seven early response actions are completed within seven days of notification. Uganda adopted the framework in 2021 to identify surveillance and response bottlenecks and strengthen preparedness (3).

Kyegegwa District has experienced recurrent measles outbreaks and hosts a large refugee population, where crowding, malnutrition, and vaccination gaps may increase transmission risk (4). We assessed the timeliness of detection, notification, and response during the 2026 measles outbreak using the 7-1-7 framework, identified key enablers and bottlenecks, and proposed corrective actions.

Methods

We conducted the investigation in Kyegegwa District, western Uganda, which had an estimated population of 501,120 in 2024 and hosted 135,681 refugees. A suspected measles case was defined as acute fever and maculopapular rash with cough, coryza, or conjunctivitis among district residents during January–April 2026; confirmed cases tested positive for measles-specific IgM.

We applied the World Health Organization (WHO) 7-1-7 framework to assess timeliness of outbreak detection, notification, and early response. Intervals were classified against the ≤ 7 -day, ≤ 1 -day, and ≤ 7 -day benchmarks, respectively. Five purposively selected key informants were interviewed to identify enablers, bottlenecks, and corrective actions. Interviews were transcribed and analyzed thematically according to the three 7-1-7 milestones.

The investigation was conducted as part of the public health response and classified as non-research/public health practice by the U.S. Centre for Disease Control and Prevention (CDC). Verbal consent and separate consent for audio-recording were obtained from interview participants.

Results

Summary of the cases identified

A total of 85 measles case-patients were identified during the investigation period, of whom 5 (5.9%) were laboratory-confirmed by measles-specific IgM detection and 80 (94%) were suspected cases. Of the 85 case-patients, 45 (53%) were female, and one death was recorded, giving a case fatality ratio of 1.2%.

7-1-7 timeliness milestone dates

Three intervals were assessed: detection (8 days; target ≤ 7), notification (1 day; target ≤ 1 , met), and response (10 days; target ≤ 7). The district met the notification target only. The sections below describe findings and corrective actions for each interval.



Detection: The recognized outbreak cluster emerged on 7th March 2026 but was not detected until 15th March, eight days later, one day beyond the ≤ 7 -day target. Detection was delayed by a sub-optimal community surveillance system, following a Village Health Team (VHT) restructuring that removed approximately 80% of trained volunteers.

"There is a weak community-based disease surveillance system, since all the VHTs have undergone restructuring where 80% have been dropped," noted the District Surveillance Focal Person (DSFP).

Low clinical suspicion and missing Integrated Disease Surveillance and Response (IDSR) job aids contributed to misclassification of suspected measles cases, and community reliance on traditional healers delayed care-seeking.

"In the register, the diagnosis is recorded as skin disease, and yet if further probed could be a suspected measles case", a health worker explained.

Notification: The District Health Officer (DHO) and Resident District Commissioner (RDC) were notified within one day of detection (15th March 2026), meeting the ≤ 1 -day target. Escalation depended on a functional but informal vertical communication channel from the health sub-district to the district.

"It was notified on the evening of 15th March after receipt of the results. I promptly informed the RDC and DHO," the DSFP recounted.

Timeliness relied on individual initiative rather than written notification Standard Operating Procedures (SOPs).

Response: Completion of all early response actions took ten days from notification (15th–25th March 2026), exceeding the ≤ 7 -day target by three days. Initial case management and infection prevention and control began within a day, but full multisectoral response was delayed by absent contingency funding, fragmented and short-lived partner support, and an under-prepared rapid response team (RRT).

"It is not easy to organize a meeting without facilitation. Meetings require facilitation, that the district did not have," said the District Cold Chain Technician (DCCT).

"Medical Teams International only covered the refugee settlement, while Baylor Uganda covered active case search for three days and then disappeared," the DSFP added.

Strong district leadership and Regional Emergency Operations Centre (EOC) support helped sustain the response despite resource constraints.



Table 1: Themes and corrective actions across 7-1-7 milestones, Kyegegwa District measles outbreak, Uganda, January–April 2026

Milestone	Theme	Finding & evidence	Corrective action
Detection (<i>Not met, 8 days</i>)	Weak community surveillance	VHT restructuring cut ~80% of volunteers; community-based disease surveillance (CBDS) excluded from VHT training (" <i>80% have been dropped</i> " — DSFP)	Refresher VHT training; integrate CBDS into routine activities
	Low clinical suspicion	Measles misclassified as skin disease; no IDSR job aids at facilities	Refresher training; disseminate IDSR case-definition materials
	Delayed care-seeking	Herbalist use and beliefs against moving the sick delayed presentation	Community sensitization on early care-seeking
	Lab turnaround delays	Results for first samples delayed; one death occurred pre-confirmation	Strengthen specimen referral; enable real-time electronic IDSR (eIDSR) identifiers
Notification (<i>Met, 1 day</i>)	Individual-driven timeliness	Rapid escalation relied on focal person's initiative, not SOP	Institutionalize written notification SOPs
Response (<i>Not met, 10 days</i>)	No contingency funding	Coordination meetings depended on unguaranteed facilitation	Establish costed district contingency fund
	Fragmented partner support	Partner coverage geographically partial and short-lived	Pre-agreed partner mapping and response plan
	Under-prepared RRT	Team not fully deployed; no recent refresher/simulation training	Periodic RRT simulation and refresher training

Discussion

The 7-1-7 assessment identified delays in measles outbreak detection and response in Kyegegwa District, while notification met the target. These delays reflected persistent gaps in community surveillance, clinical recognition, laboratory systems, and outbreak preparedness.

Detection exceeded the seven-day target by one day. Contributing factors included disruption of community surveillance following VHT restructuring, exclusion of community-based surveillance workers from refresher training (5,6), missing IDSR job aids, low clinical suspicion, delayed care-seeking (7,8), and prolonged laboratory turnaround time. These factors reduced early case recognition and delayed outbreak confirmation.



Notification met the one-day target, with rapid escalation to district leadership once laboratory confirmation was received, indicating functional communication channels (3,9–11). However, reliance on individual initiative rather than standardized procedures may limit consistency in future outbreaks.

Response exceeded the seven-day target by three days. Although case management and infection prevention measures began promptly, full multisectoral response was delayed by lack of a district contingency fund, fragmented partner support, and incomplete rapid response team deployment (9–12). Strong district leadership, Regional EOC engagement, and previous outbreak experience helped sustain the response despite these constraints. High population density and immunity gaps in Kyaka II refugee settlement may have further increased the response burden (4).

Study limitations: Timeliness dates were obtained from surveillance records and retrospective key-informant reports and may have been affected by recall or documentation errors. Findings from a single district and outbreak may not be generalizable. In addition, the 7-1-7 framework measures timeliness of actions but not their effectiveness in interrupting transmission.

Conclusion: Kyegegwa District met the 7-1-7 notification target but missed the detection and response targets, by one and three days, respectively. Detection was delayed by weakened community-based surveillance, low clinical suspicion, delayed care-seeking, and prolonged laboratory turnaround, and response was delayed by the lack of a district contingency fund, fragmented partner support, and an under-prepared rapid response team. Timely notification depended on individual initiative rather than standardized procedures. Strong district leadership and Regional Emergency Operations Centre support helped sustain the response. Strengthening community-based surveillance, clinical recognition, laboratory systems, standardized notification procedures, emergency financing, and rapid response team readiness could improve the timeliness of future outbreak detection and response.

Authors' contributions: AA: participated in the conception, investigation, design, analysis, and interpretation of the study and wrote the draft manuscript; LA, RK, MN, GT, PN, WA, CBM participated in the investigation and report writing. RM, BK and YN supervised the field data collection and reviewed the draft article for substantial intellectual content. All authors read and approved the final article.

Conflict of interest: The authors declare no conflict of interest.

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