

Determinants of the Utilization of Community Event-Based Surveillance System in Busia County, Western Kenya, from May 2022 to April 2025

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BACKGROUND

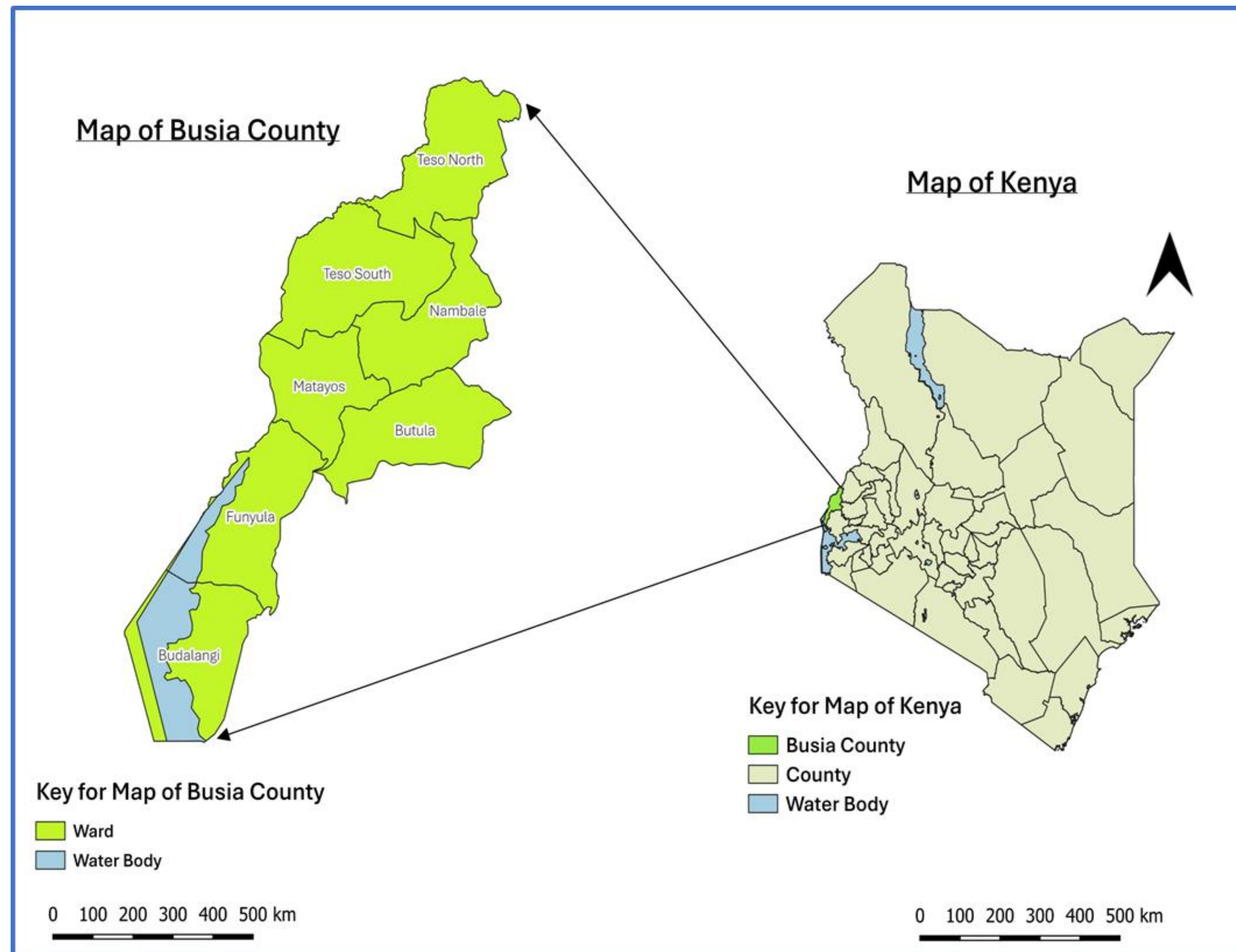
Globally, delayed outbreak detection poses a major health threat to communities. Community Event-Based Surveillance (CEBS) enables early detection through community reporting of unusual health events ("signals"). In Kenya, CEBS uses the *m-Dharura* mobile application, but Busia County has experienced declining signal reporting with limited evidence on causes.

OBJECTIVE: To investigate the determinants of the utilization of community event-based surveillance systems used for early detection of disease outbreaks in Busia County.

STATISTICAL ANALYSIS: Descriptive statistics summarized utilization and signal characteristics; logistic regression identified determinants of utilization using SPSS version 27.

METHODOLOGY: This cross-sectional mixed-method study assessed *m-Dharura* utilization and its determinants among Community Health Promoters (CHPs) in Busia County. Quantitative surveys were conducted alongside a retrospective review of *m-Dharura* signal data (January 2022-April 2025).

STUDY AREA: Busia County, Western Kenya



SAMPLING TECHNIQUE

	Sub County	No. of CHPs	Sample size
1.	Bunyala	244	36
2.	Butula	351	52
3.	Matayos	218	33
4.	Nambale	243	36
5.	Samia	345	51
6.	Teso Central	205	31
7.	Teso North	404	60
8.	Teso South	180	28
	Total	2190	327

RESULTS: Most CHPs were aged 48–60 (52.9%), with secondary education (66.7%) and >6 years' experience (78%). *m-Dharura* utilization was at 48.3%, and the primary purpose was disease surveillance (44.6%). System Accessibility was reported by 64.5%, with 78.9% confidence in event detection. Of 16,030 signals (May 2022–April 2025), Nambale contributed the most (35.2%) and Teso South the least (3.9%).

Multivariate Analysis

High utilization

- ✓ Higher utilization was independently associated with good/expert knowledge (AOR=7.28, 95% CI: 3.21–16.51)
- ✓ Weekly use (AOR=6.01, 95% CI: 3.15–11.48)
- ✓ Daily use (AOR=9.30, 95% CI: 4.26–20.27),
- ✓ Very high confidence in system use (AOR=22.89, 95% CI: 5.85–89.64).

Low utilization

- ✓ Poor accessibility (AOR=0.02, 95%CI: 0.003–0.15)
- ✓ Delayed/no technical support (AOR=0.06, 95%CI:0.02–0.17)
- ✓ Limited/no feedback (AOR=0.08, 95%CI:0.03–0.18)

Key Barriers

- ✓ Lack of reporting awareness (67.3%)
- ✓ Stigma (21.7%)

DISCUSSION

- ❖ Gaps in regular use, feature utilization, and data reliability highlight the urgent need for improved responsiveness, feedback, and targeted training to sustain CEBS performance.
- ❖ CEBS system faces geographic inequities, weak animal health surveillance, and low completion rates for priority conditions requiring urgent capacity building, One Health integration, and enhanced technical support.

CONCLUSIONS

- ❖ *m-Dharura* utilization in Busia County is moderately high, indicating effective community-level early warning capacity. However, utilization remains strongly dependent on CHP knowledge, platform accessibility, connectivity, and responsive health system support. Continuous capacity building, infrastructure improvements, and strengthened feedback loops can further optimize CEBS performance and strengthen public health surveillance.

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