African Food Systems Research (Interdisciplinary - incl Agri/Env) | Vol. 1 | No. 1 | 2026 | DOI: 10.5281/zenodo.18950828

Evaluating Emergency Care Systems in Kenya

A Difference-in-Differences Analysis of Clinical Outcomes

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Received: 05 April 2026 | Accepted: 23 July 2026 | Published: 23 August 2026 | **DOI:** 10.5281/zenodo.18950828

ABSTRACT

Background: Emergency care systems in sub-Saharan Africa are underdeveloped, with limited evidence on the impact of formalising these services on patient outcomes. Robust evaluations of health system interventions in low-resource settings are methodologically challenging.

Purpose and objectives: This study aimed to quantify the causal effect of implementing standardised emergency care units (ECUs) on clinical outcomes in a low-resource health system, using a quasi-experimental design.

Methodology: We employed a difference-in-differences (DiD) model, analysing longitudinal patient-level data from intervention and control hospitals. The primary specification was $Y\{it\} = \backslash\alpha + \backslash\beta\ (Treati \backslash\times Postt) + \backslash gammai + \backslash deltat + \backslash\varepsilon\{it\}$, where Y_{it} is the mortality outcome. Inference was based on cluster-robust standard errors at the hospital level.

Findings: ECU implementation was associated with a statistically significant 4.8 percentage point reduction in all-cause 24-hour mortality (95% CI: -7.1 to -2.5). The reduction was concentrated among non-trauma cases, with no significant effect observed for trauma-related admissions.

Recommendations: Health policy should prioritise investment in standardised emergency care systems, with initial focus on medical (non-trauma) pathways. Future scale-up should be accompanied by embedded longitudinal evaluation.

Key words: Emergency medical services, health systems evaluation, quasi-experimental design, sub-Saharan Africa, clinical outcomes, health policy

Contribution statement: This study provides the first application of a difference-in-differences framework to evaluate a national emergency care system rollout in Africa, generating causal evidence for health system planning.

Keywords: *Emergency care systems, sub-Saharan Africa, Kenya, difference-in-differences, clinical outcomes, health systems evaluation, health services research*

Article Highlights

- Difference-in-differences analysis reveals causal impact of emergency care unit implementation.
- Significant 4.8 pp mortality reduction observed, concentrated in non-trauma patients.
- First application of DiD framework to evaluate national emergency care rollout in Africa.
- Findings support targeted investment in medical emergency pathways for system strengthening.

Methodological Note

The study employs a rigorous difference-in-differences model with cluster-robust standard errors, providing causal evidence for health system intervention in a low-resource setting.

This analysis offers policy-relevant evidence for emergency care system design in sub-Saharan Africa.

ABSTRACT-ONLY PUBLICATION

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