



A Quasi-Experimental Protocol for Evaluating Emergency Care System Performance and Clinical Outcomes in Ethiopia

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Author notes

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ABSTRACT

{ "background": "Emergency care systems in low-resource settings are underdeveloped, with a critical lack of evidence on how structural enhancements impact patient outcomes. In Ethiopia, the recent establishment of dedicated emergency units presents a unique opportunity to evaluate system performance in a real-world context.", "purpose and objectives": "This protocol details a quasi-experimental study to assess the causal effect of a standardised emergency care unit model on clinical outcomes. The primary objective is to compare mortality and complication rates before and after implementation. Secondary objectives include evaluating system process metrics such as time-to-treatment and adherence to clinical protocols.", "methodology": "A controlled interrupted time series design will be implemented across multiple hospitals. The intervention is the introduction of a standardised emergency unit with trained staff, defined workflows, and essential equipment. Routinely collected clinical data from hospital records for a pre-defined period before and after implementation will be analysed. The primary analysis will use a segmented regression model: $Y_t = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 T_t X_t + \epsilon_t$, where Y_t is the monthly mortality rate, T_t is time, and X_t is the intervention phase. Inference will be based on 95% confidence intervals for the change in level and trend (β_2 and β_3).", "findings": "As a protocol, no empirical findings are presented. The anticipated primary outcome is a reduction in the all-cause, 24-hour mortality rate among emergency unit patients. We hypothesise an absolute risk reduction of at least 3 percentage points following system implementation. Process analysis is expected to show a reduction in median time to clinician assessment.", "conclusion": "This protocol provides a robust methodological framework for evaluating emergency care

system performance. The findings will generate crucial evidence on the effectiveness of a scalable model for emergency care in resource-constrained settings.", "recommendations": "Future research should incorporate detailed cost-effectiveness

Keywords: *Emergency care systems, Low-resource settings, Sub-Saharan Africa, Quasi-experimental design, Clinical outcomes, Health systems evaluation, Ethiopia*

Article Highlights

- A quasi-experimental design to assess a standardised emergency unit model in Ethiopia.
- Primary analysis uses segmented regression to measure changes in mortality rates.
- Anticipates an absolute risk reduction of at least 3 percentage points in 24-hour mortality.
- Seeks to evaluate both clinical outcomes and critical system process metrics.

Methodological Approach

Controlled interrupted time series analysis across multiple hospitals, using a segmented regression model to isolate the intervention's effect on monthly mortality rates.

This article details a study protocol; empirical results are forthcoming.

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