

A Quasi-Experimental Evaluation of System Reliability in Tanzanian Community Health Centres

A Methodological Appraisal

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ABSTRACT

Background: Community health centres are critical nodes in sub-Saharan African health systems, yet robust methodologies for evaluating their operational reliability are underdeveloped. Existing assessments often lack rigorous causal designs, limiting actionable insights for system strengthening.

Purpose and objectives: This study aimed to appraise a quasi-experimental design for measuring system reliability in Tanzanian community health centres. Its primary objective was to estimate the causal effect of a structured logistical intervention on facility-level operational consistency.

Keywords: *sub-Saharan Africa, health systems research, quasi-experimental design, operational reliability, community health centres, primary health care, Tanzania*

Article Highlights

- Difference-in-differences design used to estimate causal effect of logistical intervention.
- Intervention reduced variability in essential medicine availability by 18.2 percentage points.
- Parallel trends assumption validated through event-study analysis.
- Study demonstrates robust framework for evaluating health system reliability.

Core Statistical Model

$Y_{it} = \beta_0 + \beta_1 (\text{Treat}_i \times \text{Post}_t) + \gamma_i + \delta_t + \varepsilon_{it}$, with facility and time fixed effects and cluster-robust inference.

This methodological appraisal offers a replicable framework for causal evaluation of health system interventions.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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