



A Quasi-Experimental Protocol for Evaluating Health Systems Optimisation and Yield in Ethiopian District Hospitals

A Methodological Framework

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ABSTRACT

Background: District hospitals in Ethiopia face systemic inefficiencies that constrain service delivery and health outcomes. Existing evaluations often lack robust counterfactuals, limiting causal inference on health systems optimisation interventions.

Purpose and objectives: This protocol details a quasi-experimental design to evaluate a multi-component health systems optimisation package aimed at improving operational yield, defined as the volume of key clinical services delivered per unit of resource input. The primary objective is to estimate the causal effect on yield across four clinical domains.

Keywords: *Health systems research, Quasi-experimental design, District hospitals, Sub-Saharan Africa, Process evaluation, Capacity building, Clinical governance*

Article Highlights

- Employs a controlled before-and-after study with propensity score-matched controls across 24 hospitals.
- Primary outcome is a composite yield index measuring clinical services per unit of resource input.
- Analysis uses difference-in-differences modelling with cluster-robust standard errors for causal inference.
- Disaggregates effects across four clinical domains, with

Core Analytical Model

Difference-in-differences estimation: $Y_{it} = \beta_0 + \beta_1(\text{Treat}_i \times \text{Post}_t) + \gamma X_{it} + \alpha_i + \delta_t + \varepsilon_{it}$, where Y_{it} is the yield index for hospital i at time t .

This article presents a study protocol; empirical findings from the evaluation are forthcoming.

surgical yield hypothesized for greatest improvement.	
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