

# A Methodological Protocol for Evaluating District Hospital System Reliability in Tanzania

*A Difference-in-Differences Modelling Approach*

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## ABSTRACT

**Background:** District hospitals are critical nodes in African food systems, influencing nutrition and health security. System reliability, defined as the consistent delivery of intended clinical services, is poorly quantified, hindering evidence-based policy. Current evaluations often lack robust counterfactuals to attribute changes to specific interventions.

**Purpose and objectives:** This protocol details a methodological approach to rigorously evaluate the impact of a hospital systems strengthening intervention on service reliability. The primary objective is to estimate the causal effect on a composite reliability index. Secondary objectives include analysing heterogeneity in effects by hospital characteristics.

**Keywords:** *District hospitals, Health systems evaluation, Sub-Saharan Africa, Difference-in-differences, System reliability, Tanzania, Methodological protocol*

### Article Highlights

- Employs a quasi-experimental, longitudinal difference-in-differences design.
- Aims to estimate the causal effect of an intervention on a composite reliability index.
- Uses routine health data and structured assessments for analysis.
- Designed to yield credible evidence for health and food system decision-makers.

### Core Analytical Model

The primary model is  $Y_{it} = \beta_0 + \beta_1(\text{Treat}_i \times \text{Post}_t) + \gamma_i + \delta_t + \varepsilon_{it}$ , estimating the intervention's effect on hospital reliability score  $Y$ .

*This article presents a study protocol; empirical findings are anticipated.*

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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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