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Methodological evaluation of community health centres in Uganda

a panel-data analysis of yield optimisation in health systems

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ABSTRACT

Background: Community health centres are critical nodes in Uganda's healthcare system, yet persistent inefficiencies in resource allocation and service delivery constrain their operational yield. A robust methodological framework for quantifying and analysing longitudinal performance improvements in these settings is lacking.

Purpose and objectives: This study aims to develop and apply a panel-data econometric model to evaluate systemic yield optimisation within a network of community health centres. The primary objective is to estimate the marginal effects of key operational inputs on a composite yield metric, controlling for unobserved heterogeneity.

Keywords: *health systems strengthening, sub-Saharan Africa, panel-data analysis, resource allocation, primary healthcare, operational efficiency, Uganda*

Article Highlights

- Targeted staff training showed the strongest positive association with operational yield.
- Panel-data techniques are essential for isolating drivers of health system performance.
- Baseline staffing levels were not a significant predictor after accounting for centre-specific factors.
- The model accounts for unobserved heterogeneity through two-way fixed effects.

Core Econometric Model

Two-way fixed effects specification: $Y_{it} = \alpha + \beta_1 Staff_{it} + \beta_2 Supply_{it} + \beta_3 Training_{it} + \mu_i + \lambda_t + \varepsilon_{it}$, with cluster-robust inference.

This analysis provides a methodological framework for evaluating longitudinal health system performance.