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Evaluating the Impact of Community Health Centre Systems on Risk Reduction in Uganda

A Quasi-Experimental Methodological Assessment

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ABSTRACT

Community health centres are a cornerstone of primary care delivery in many African nations, yet robust methodological frameworks for evaluating their impact on population health risks are lacking. Existing assessments often rely on observational designs with limited causal inference. This study aimed to develop and apply a novel quasi-experimental design to rigorously assess the impact of integrated community health centre systems on health risk reduction in a sub-Saharan African context. We employed a difference-in-differences design with propensity score matching, analysing longitudinal data from intervention and matched control communities. The primary model was specified as $Y\{it\} = beta0 + beta1\,(Treati \times Postt) + beta2\,X\{it\} + mui + lambdat + \varepsilon\{it\}$, where Y_{it} is the composite risk score. Inference was based on cluster-robust standard errors. The intervention was associated with a statistically significant reduction in the composite health risk score (β = -0.18, 95% CI: -0.31 to -0.05). A key theme from supplementary analysis was the critical role of consistent drug supply chains in achieving this outcome. The applied quasi-experimental design provides a rigorous methodological framework for evaluating community health systems, demonstrating their measurable effect on mitigating population health risks. Programme funders and policymakers should adopt similar robust evaluation designs to guide investment. Strengthening logistical support for medical commodities is essential to maximise the impact of community health centres. health systems evaluation, quasi-experimental design, difference-in-differences, primary healthcare, causal inference, sub-Saharan Africa This paper provides a novel methodological framework for causal assessment of community health systems in low-resource settings, demonstrating a significant reduction in population health risk attributable to the intervention.

Keywords: *community health centres, sub-Saharan Africa, quasi-experimental design, risk reduction, primary healthcare, methodological evaluation, Uganda*

Article Highlights

- Intervention associated with a significant reduction in composite health risk score (β = -0.18).
- Study employs a novel difference-in-differences design with propensity score matching.
- Highlights the critical role of consistent drug supply chains in achieving outcomes.
- Provides a framework for causal assessment of health systems in low-resource settings.

Core Finding

The integrated community health centre system was associated with a statistically significant reduction in the composite health risk score (β = -0.18, 95% CI: -0.31 to -0.05).

This paper offers a replicable methodological framework for causal evaluation.