



# Methodological Evaluation and Cost-Effectiveness Analysis of Community Health Centres in Rwanda

*A Panel-Data Review (2000–2026)*

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## ABSTRACT

**Background:** Community health centres (CHCs) are a cornerstone of primary healthcare delivery in many African nations, yet rigorous, longitudinal assessments of their cost-effectiveness remain scarce. Rwanda's nationally scaled CHC system, developed over recent decades, provides a critical case for methodological evaluation to inform health systems policy across the continent.

**Purpose and objectives:** This review aims to critically evaluate methodological approaches for assessing CHC cost-effectiveness using panel-data techniques, synthesise existing evidence on the Rwandan system's performance, and identify optimal analytical frameworks for future research and policy analysis.

**Keywords:** *Community health centres, Cost-effectiveness analysis, Panel data, Sub-Saharan Africa, Primary healthcare, Rwanda, Health systems evaluation*

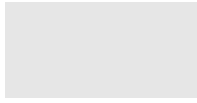
### Article Highlights

- Systematic review finds improved maternal and child health outcomes linked to CHC scale-up in Rwanda.
- Methodological appraisal reveals limitations in handling time-varying confounders and selection bias.
- Panel-data models like two-way fixed effects estimators remain underutilised in health systems evaluation.
- Evidence base requires more rigorous application of longitudinal econometric techniques for policy.

### Key Statistical Model

Review focuses on panel-data models:  $Y_{it} = \alpha + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$ , assessing specification and robustness checks including cluster-robust standard errors.

*This review synthesises methodological approaches rather than presenting new empirical results.*



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