

# Methodological evaluation of community health centres in Kenya

a systematic review of panel-data estimation for health system reliability

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## ABSTRACT

**Background:** Community health centres are a critical component of the primary healthcare system in Kenya, yet systematic assessments of their operational reliability are limited. Methodological rigour in evaluating their performance over time, particularly using longitudinal data, requires critical examination to inform evidence-based health systems strengthening.

**Purpose and objectives:** This systematic review aims to evaluate the methodological approaches, specifically panel-data estimation techniques, used in empirical studies assessing the reliability of community health centre systems in Kenya. It seeks to catalogue the statistical models employed, appraise their appropriateness for health systems research, and identify prevalent methodological gaps.

**Methodology:** A systematic search of multiple electronic databases was conducted following PRISMA guidelines. Peer-reviewed studies employing panel-data methods to analyse health centre performance metrics were included. Studies were critically appraised for their methodological design, model specification, and handling of panel-data complexities such as unobserved heterogeneity.

**Keywords:** Community health centres, Kenya, health system reliability, panel data, Sub-Saharan Africa, methodological evaluation, primary healthcare

### Article Highlights

- Dominant reliance on basic fixed-effects models ( $Y_{it} = \alpha_i + \beta X_{it} + \epsilon_{it}$ )
- Critical gap: fewer than 20% of studies address serial correlation or use robust errors
- Methodological simplicity compromises validity of health system findings
- Urgent need for dynamic models and rigorous error-structure analysis

### Methodological Imperative

The review identifies a significant disconnect between available econometric techniques and their application in health systems research, highlighting an urgent need for methodological sophistication.

*This review critically appraises the statistical rigour underlying evidence for health system strengthening.*

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