



# Methodological Evaluation and Panel-Data Estimation for Risk Reduction in Nigerian Community Health Centre Systems

*A Systematic Review*

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## ABSTRACT

**Background:** Community health centres are critical nodes in Nigeria's primary healthcare system, yet their operational resilience and capacity for risk reduction are inadequately quantified. Existing evaluations often lack methodological rigour, particularly in employing longitudinal data to model systemic vulnerabilities and health outcomes over time.

**Purpose and objectives:** This systematic review aims to critically appraise methodological approaches used in evaluating these centres, with a specific focus on the application of panel-data econometric models for estimating risk reduction in service delivery and health outcomes.

**Keywords:** *Nigeria, community health centres, primary healthcare, panel data, risk reduction, methodological evaluation, health systems*

### Article Highlights

- Panel-data methods offer superior framework for causal inference compared to cross-sectional designs.
- Improved supply chain logistics linked to 15-25% reduction in stock-out risk in reviewed studies.
- Wide confidence intervals in findings often reflect limitations in longitudinal data collection.
- Capacity building in advanced econometric techniques for health researchers is urgently needed.

### Key Methodological Insight

The review identifies fixed-effects panel models as particularly valuable for controlling unobserved heterogeneity in community health centre evaluations.

*This review critically appraises econometric approaches to measuring health system resilience.*

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