

A Multilevel Regression Analysis Protocol for Evaluating Urban Primary Care Network Performance and Clinical Outcomes in Kenya

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ABSTRACT

Background: Urban primary care networks (PCNs) are a critical component of health system strengthening in sub-Saharan Africa, yet robust methodologies for evaluating their performance and impact on clinical outcomes are lacking. Existing evaluations often fail to account for the hierarchical structure of data inherent in networked care delivery.

Purpose and objectives: This protocol details a methodological approach for evaluating the performance of urban PCNs in Kenya. The primary objective is to quantify the association between PCN-level structural and process factors and individual-level clinical outcomes for hypertension and type 2 diabetes, while controlling for patient and facility characteristics.

Keywords: *Primary care networks, Multilevel regression analysis, Sub-Saharan Africa, Health systems evaluation, Clinical outcomes, Kenya, Urban health systems*

Article Highlights

- Proposes a two-level hierarchical model for patient outcomes within networks
- Quantifies association between network factors and hypertension/diabetes control
- Uses routine health data and facility assessments in urban Kenya
- Aims to generate evidence for primary care network performance evaluation

Core Statistical Model

$y_{ij} = \beta_{0j} + \beta_{1X_{ij}} + \varepsilon_{ij}$, where $\beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + u_{0j}$. Patient outcomes (level-1) are nested within PCNs (level-2).

This article presents a methodological protocol, not empirical results.

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