

Methodological Evaluation of District Hospital Systems in Kenya

A Multilevel Regression Analysis of Clinical Outcomes

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ABSTRACT

Background: District hospitals are critical nodes in healthcare delivery, yet systematic evaluations of their system-level performance and its impact on clinical outcomes in sub-Saharan Africa are methodologically limited. Existing assessments often rely on aggregate data, failing to account for the hierarchical structure of patient care within hospital systems.

Purpose and objectives: This study aims to methodologically evaluate the performance of district hospital systems in Kenya by developing and applying a multilevel regression framework to analyse variations in clinical outcomes attributable to hospital-level system factors.

Keywords: *District hospitals, Sub-Saharan Africa, Multilevel modelling, Health systems evaluation, Clinical outcomes, Kenya*

Article Highlights

- Multilevel modelling isolates system-level effects from patient-level data in hospital evaluations.
- Specialist clinician density linked to 15% reduction in odds of inpatient mortality.
- Pharmacy stock-out rates identified as critical modifiable system factor.
- Framework enables targeted policy for human resources and supply chains.

Methodological Contribution

Introduces a three-level hierarchical logistic regression model to partition variance in clinical outcomes between patient, department, and hospital system levels within a sub-Saharan African context.

This analysis provides a replicable framework for evaluating health system performance.

ABSTRACT-ONLY PUBLICATION

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