

Methodological Evaluation and Multilevel Regression Analysis of Efficiency Gains in Kenyan District Hospital Systems

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Received: 29 July 2002 | Accepted: 11 October 2002 | Published: 28 November 2002 | DOI:

[10.5281/zenodo.18956853](https://doi.org/10.5281/zenodo.18956853)

ABSTRACT

Background: District hospitals in Kenya face persistent challenges in resource allocation and service delivery, yet robust methodologies for quantifying systemic efficiency are lacking. Existing analyses often fail to account for the hierarchical structure of health system data, leading to potentially biased estimates of performance drivers.

Purpose and objectives: This protocol details a methodological evaluation to measure efficiency gains within Kenyan district hospital systems. The primary objective is to develop and apply a multilevel regression model that accounts for patient-, facility-, and county-level variations to identify key determinants of technical efficiency.

Keywords: *Health Systems Research, District Hospitals, Sub-Saharan Africa, Multilevel Modelling, Efficiency Measurement, Kenya, Resource Allocation*

Article Highlights

- Proposes a three-level model (patient, facility, county) for efficiency analysis.
- Integrates Data Envelopment Analysis with multilevel regression.
- Aims to quantify variance attributable to each hierarchical level.
- Designed to move beyond facility-centric performance assessments.

Analytical Framework

Technical efficiency scores from DEA serve as the dependent variable in a three-level linear mixed model, accounting for nested data structures.

This article presents a methodological protocol; empirical results are anticipated in future research.

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