

Cost-Effectiveness of District Hospital Systems in Kenya

A Multilevel Regression Analysis from 2000–2026

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ABSTRACT

Background: District hospitals are critical nodes in Kenya's healthcare system, yet systematic evaluations of their cost-effectiveness are scarce. Existing analyses often fail to account for the hierarchical structure of health system data and long-term trends.

Purpose and objectives: This study aimed to develop and apply a novel multilevel modelling framework to assess the cost-effectiveness of district hospital systems, quantifying the influence of facility-level and regional-level determinants on performance metrics over an extended period.

Keywords: *Cost-effectiveness analysis, District hospitals, Kenya, Multilevel modelling, Sub-Saharan Africa, Health systems evaluation, Resource allocation*

Article Highlights

- Multilevel modelling explains 68% of variance in hospital cost-effectiveness.
- Outpatient throughput is a key operational lever for improving efficiency.
- 22% of residual variance attributed to significant provincial-level disparities.
- Projections indicate a widening regional efficiency gap without intervention.

Methodological Note

The analysis employs a three-level linear mixed model (hospitals, districts, provinces) to correctly attribute performance variation to the appropriate administrative tier, avoiding biased inference common in non-hierarchical evaluations.

This analysis provides a framework for equitable resource allocation in sub-Saharan African health systems.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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