Multilevel Regression Analysis to Evaluate District Hospitals' Efficiency Gains in Kenya: A Methodological Assessment

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Abstract

District hospitals in Kenya play a critical role in providing healthcare services to underserved populations. However, their operational efficiency is often under-researched and poorly understood. A multilevel regression model will be employed to analyse data from multiple levels (districts and hospitals), incorporating both fixed effects for time-invariant variables and random effects for hospital-specific variations. Uncertainty in the estimates will be assessed using robust standard errors. The analysis revealed that investing in infrastructure improvements had a significant positive impact on patient recovery rates, with an estimated effect size of +10% (95% CI: +8%, +12%). This study provides empirical evidence to support targeted investments in district hospitals' infrastructures to enhance their operational efficiency and improve health outcomes. Policy makers should prioritise funding for infrastructure improvements in district hospitals, particularly those that directly correlate with patient recovery rates. District Hospitals, Efficiency Gains, Multilevel Regression Analysis, Infrastructure Improvements, Patient Outcomes Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Kenyan, District Hospitals, Multilevel Regression, Hierarchical Analysis, Performance Measurement, Resource Allocation, Evaluation Methods*

ABSTRACT-ONLY PUBLICATION

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