



Methodological Evaluation of District Hospitals Systems in Kenya Using Multilevel Regression Analysis for System Reliability Assessment

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Abstract

District hospitals in Kenya face challenges in maintaining system reliability due to resource constraints and operational inefficiencies. A multilevel regression model was employed to analyse data from multiple hospitals across different districts. The model accounts for both within-hospital and district variations. The multilevel regression analysis revealed that financial support per patient visit had a significant positive effect on system reliability, with an odds ratio of 1.05 (95% CI: 1.02-1.08), indicating a moderate improvement in reliability for each additional unit of financial investment. The study underscores the importance of targeted financial support as a critical factor in enhancing system reliability within district hospitals in Kenya. District health authorities should prioritise allocating funds to financially supportive programmes, alongside other interventions aimed at improving hospital operations and patient care. district hospitals, multilevel regression, system reliability, Kenyan healthcare, financial support Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, district hospitals, multilevel regression, data analysis, system reliability, resource constraints, operational inefficiencies*

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