



Reliability Assessment of District Hospital Systems in Kenya Using Panel Data Analysis: A Methodological Evaluation

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Abstract

The reliability of district hospital systems in Kenya is a critical concern for healthcare delivery. A mixed-methods approach combining quantitative panel-data estimation with qualitative insights was employed. The study utilised a robust statistical model with uncertainty quantification for robustness assessment. The analysis indicated an average reliability score of 75% across the sampled district hospitals, suggesting room for improvement in system efficiency and resource allocation. The results highlight the need for targeted interventions to enhance hospital systems' reliability and patient care outcomes. Specific recommendations include optimising resource distribution and enhancing training programmes for healthcare staff. district hospitals, panel data analysis, reliability assessment, Kenya, medical system Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *District Hospitals, Panel Data, Reliability Assessment, Quantitative Methods, Qualitative Research, Health Systems Strengthening, Evaluation Methodology*

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