



Methodological Evaluation of District Hospitals Systems in Uganda: Multilevel Regression Analysis for Measuring System Reliability

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Abstract

This study examines the reliability of district hospitals in Uganda's healthcare system through a multilevel regression analysis. A multilevel regression model was employed to analyse data from district hospitals across Uganda, accounting for both individual hospital-level variables (e.g., staff availability) and contextual factors at the district level (e.g., socioeconomic status). The analysis revealed that district-level factors significantly influence system reliability, with a moderate effect size measured by standardised coefficients. This study provides robust evidence for the importance of integrating both hospital-specific and contextual data in assessing healthcare systems' reliability. Policy makers should prioritise interventions targeting district socioeconomic conditions to enhance overall system performance. 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: Uganda, District Hospitals, Multilevel Analysis, Regression Modelling, Health Systems, Geographic Information Systems, Spatial Statistics

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