



Bayesian Hierarchical Model Assessment for Yield Improvement in Ugandan District Hospitals Systems,

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Abstract

This study focuses on evaluating the performance of district hospitals in Uganda by applying a Bayesian hierarchical model to assess yield improvement over time. A Bayesian hierarchical model was employed to analyse data on hospital performance metrics. This approach allows for the estimation of parameters at multiple levels (e.g., individual hospital and district level) while accounting for within-district variability. The analysis revealed that there were significant variations in yield improvement across different districts, with some showing improvements exceeding 10% in certain areas. The Bayesian hierarchical model provided a nuanced understanding of the factors influencing hospital performance and identified key drivers of improvement within specific districts. District health authorities are recommended to focus on interventions that address the specific challenges identified, particularly those related to infrastructure and staff training. Treatment effect was estimated with $\text{text} \{ \logit \} (\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Hierarchical Models, Bayesian Methods, Quantile Regression, Spatial Analysis, Monte Carlo Simulations, Predictive Modelling*

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