Bayesian Hierarchical Model for Evaluating Efficiency Gains in Uganda's District Hospital Systems,

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Abstract

This study aims to evaluate the efficiency gains in Uganda's district hospital systems through a Bayesian hierarchical model. A Bayesian hierarchical model was employed to analyse the efficiency of district hospitals. This approach accounts for both hospital-specific variability and regional trends, providing nuanced insights into performance improvements. The analysis revealed that across four districts, there were significant gains in operational efficiency, with an average improvement rate of 15% in resource utilization. This study highlights the potential of Bayesian hierarchical models for evaluating healthcare system effectiveness and suggests practical implications for policy makers aiming to enhance hospital performance. The findings underscore the importance of continued monitoring and strategic interventions aimed at maintaining and further improving district hospitals' efficiency levels. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Bayesian Hierarchical Model, District Hospitals, Methodology, Efficiency Measurement, Quantitative Methods, Econometrics*

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