



Bayesian Hierarchical Model for Efficiency Gains in Ghanaian District Hospitals Systems,

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Abstract

The healthcare system in Ghana, particularly its district hospitals, faces challenges in resource utilization and efficiency. A Bayesian hierarchical model was applied to analyse data from district hospitals in Ghana between and , accounting for variations across different regions and sub-centers. The model revealed that the efficiency of district hospital systems improved by an average of 15% over the study period, with significant gains observed in resource allocation and patient care processes. This study provides evidence on how a Bayesian hierarchical model can be effectively used to assess and enhance the operational efficiency of Ghanaian district hospitals. Future research should consider extending the model to include more regions and years, as well as exploring additional factors that could impact hospital performance. Bayesian Hierarchical Model, District Hospitals, Efficiency Gains, Healthcare System, Ghana Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Hierarchical, Mixed-Methods, Modelling, Quantitative, Ethiopia*

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