



# Bayesian Hierarchical Model Evaluation of District Hospitals in Ghana: Assessing Efficiency Gains

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## Abstract

District hospitals in Ghana face challenges in meeting healthcare demands efficiently. A Bayesian hierarchical linear regression model was applied to analyse data from district hospitals, accounting for variability across different districts. The analysis revealed an average efficiency gain of 15% in resource utilization among the evaluated hospitals. Bayesian hierarchical models provided a robust framework for assessing hospital performance and identifying areas for improvement. District health authorities should prioritise training programmes to enhance staff skills, particularly in data management and analysis. district hospitals, Ghana, Bayesian hierarchical model, efficiency gains Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, Ghanaian, Hierarchical, Bayesian, Evaluation, Efficiency, Regression

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