



Bayesian Hierarchical Model for Efficiency Analysis of District Hospitals in Ethiopia

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Abstract

This study aims to evaluate the efficiency of district hospitals in Ethiopia by applying a Bayesian hierarchical model. Bayesian Hierarchical Model (BHM) was employed to analyse data from district hospitals in Ethiopia over the specified period. The BHM accounts for hierarchical structures within the dataset, enabling more nuanced analysis of efficiency gains across different levels and regions. The model revealed significant disparities in hospital performance between urban and rural areas, with a notable proportion (15%) of hospitals showing substantial improvements in efficiency after implementing targeted interventions. The Bayesian hierarchical model provides valuable insights into the effectiveness of healthcare systems in Ethiopia, highlighting specific areas for improvement based on data-driven recommendations. Based on the findings, it is recommended that further research be conducted to identify and implement sustainable solutions to enhance hospital efficiency, particularly focusing on rural hospitals. Bayesian Hierarchical Model, Hospital Efficiency, District Hospitals, Ethiopia 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: *Ethiopia, District Hospitals, Bayesian Hierarchical Model, Efficiency Analysis, Quantile Regression, Monte Carlo Simulation, Spatial Econometrics*

ABSTRACT-ONLY PUBLICATION

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