



Bayesian Hierarchical Model for Cost-Effectiveness Assessment of Ethiopian District Hospitals Systems,

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Abstract

The Ethiopian healthcare system faces challenges in ensuring equitable access to quality services across its diverse regions. District hospitals play a crucial role in providing essential health care, but their performance and efficiency vary significantly. A Bayesian hierarchical model was employed to assess the cost-effectiveness of Ethiopian district hospitals. This approach allows for the incorporation of local data while accounting for regional variations. The analysis revealed that some hospitals were operating at an efficiency level below expected, with a proportion of 35% showing suboptimal performance in critical service delivery areas. The Bayesian hierarchical model provided insights into the cost-effectiveness of district hospital systems, highlighting disparities and inefficiencies. Targeted interventions should be prioritised for hospitals identified as having suboptimal performance to improve their efficiency and effectiveness. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Hierarchical, Bayesian, Cost-effectiveness, Ethiopia, Medicine, Evaluation*

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