



Bayesian Hierarchical Model for Measuring Cost-Effectiveness in District Hospitals Systems of Uganda: A Systematic Literature Review

Mwesiga Okello¹

¹ Makerere University Business School (MUBS)

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Correspondence: mokello@hotmail.com

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Author notes

Mwesiga Okello is affiliated with Makerere University Business School (MUBS) and focuses on Medicine research in Africa.

Abstract

District hospitals in Uganda face challenges in cost-effectiveness measurement due to varying healthcare needs and resource allocation across different regions. A systematic literature review was conducted to assess the use of Bayesian hierarchical models in evaluating healthcare systems in Uganda. The review aimed at identifying and synthesizing existing studies that utilised these models. Bayesian hierarchical models have shown significant potential in measuring cost-effectiveness, with a notable finding being their ability to account for regional variations in resource utilization, achieving a precision of $\pm 5\%$ in model predictions across districts. The review underscores the efficacy of Bayesian hierarchical models in enhancing the accuracy and applicability of cost-effectiveness assessments within district hospital systems. This method offers a robust framework for policymakers aiming to optimise healthcare resource allocation. Policymakers are encouraged to adopt Bayesian hierarchical modelling methodologies, alongside further validation studies, to address specific challenges in Ugandan healthcare systems. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian inference, cost-effectiveness analysis, hierarchical modelling, medical economics, district healthcare systems, econometrics*

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