Bayesian Hierarchical Model for Evaluating Maternal Care Facilities in Uganda: A Meta-Analysis of Clinical Outcomes

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Abstract

Maternal care facilities in Uganda face challenges in ensuring optimal clinical outcomes for mothers and newborns. A Bayesian hierarchical model was employed to synthesize clinical outcome data across different facilities, accounting for variation within and between facilities. The model revealed significant variability in clinical outcomes among facilities, with some showing substantial improvement over others. Bayesian hierarchical modelling provided a nuanced understanding of the factors influencing clinical outcomes in Ugandan maternal care systems. Facility managers should focus on improving areas where outcomes are notably poor to enhance overall system performance. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, Hierarchical models, Meta-analysis, Clinical outcomes, Maternal health systems, Quantitative synthesis*

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