African Endocrine Surgery

Bayesian Hierarchical Model for Measuring Clinical Outcomes in Ghanaian District Hospitals Systems,

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Abstract

This study evaluates clinical outcomes in Ghanaian district hospitals using a Bayesian hierarchical model. A Bayesian hierarchical model was employed to analyse data from multiple districts, accounting for variability between hospitals and within each hospital over time. The model incorporates prior knowledge about clinical outcomes and utilizes robust standard errors to quantify uncertainty. The analysis revealed significant heterogeneity in clinical performance across different district hospitals, with some showing consistently higher success rates than others. Bayesian hierarchical modelling provided a nuanced understanding of hospital performance, highlighting areas needing improvement and best practices for better service delivery. District health authorities are recommended to focus on strengthening governance and quality control measures in lower-performing hospitals to enhance overall system efficiency. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Africa, Bayesian, Multilevel, Modelling, Hospital, Systems, Epidemiology*

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