



Bayesian Hierarchical Model for Measuring Risk Reduction in District Hospitals Systems, Nigeria

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Abstract

District hospitals in Nigeria face significant challenges in managing patient care risks effectively. A Bayesian hierarchical model was employed to analyse data from multiple districts. This approach accounts for variability across hospitals while estimating the effectiveness of implemented interventions on reducing patient care risks. The analysis revealed that specific risk reduction measures in one district led to a 20% reduction in hospital-acquired infections, indicating the potential impact of targeted healthcare improvements. This study validates the utility of Bayesian hierarchical models for assessing and optimising risk management strategies in district hospitals. Further research is recommended to validate these findings across different regions. Healthcare policymakers should consider implementing the identified risk reduction measures based on this model, alongside continuous monitoring and adaptation of interventions. Bayesian Hierarchical Model, District Hospitals, Risk Reduction, Nigeria, Healthcare Delivery Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, Hierarchical modelling, Risk assessment, District health systems, Methodological evaluation, Quantitative research*

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