Bayesian Hierarchical Model for Assessing Risk Reduction in Rwanda's District Hospitals Systems

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Abstract

Rwanda's district hospitals face challenges in risk reduction strategies due to varying healthcare quality across different regions. A Bayesian hierarchical model was employed to analyse data from multiple districts, accounting for heterogeneity in hospital performance. The model revealed a significant reduction ($p < 0.05$) in infection rates across all evaluated districts when implementing standardised protocols. Bayesian hierarchical modelling provided insights into risk reduction strategies and identified specific areas needing improvement. District hospitals should prioritise the implementation of standardised healthcare practices to further reduce infection rates. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, District Hospitals, Bayesian Hierarchical Model, Healthcare Quality, Risk Assessment, Methodology, Epidemiology*

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