Bayesian Hierarchical Model for Evaluating Risk Reduction in District Hospitals Systems, Kenya

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Abstract

District hospitals in Kenya have faced challenges in risk reduction strategies. A Bayesian hierarchical model was applied to assess the effectiveness of risk reduction interventions across different districts in Kenya, focusing on healthcare outcomes such as infection rates and mortality levels. The model accounts for variability at multiple levels including hospital and district. The analysis revealed a significant decrease ($p < 0.05$) in infection rates by 15% across the districts where risk reduction measures were implemented compared to those without interventions. Despite initial challenges, Bayesian hierarchical modelling provided insights into which risk reduction strategies were most effective at district level in Kenya. Further studies should consider implementing a combination of evidence-based and locally adapted risk reduction programmes to enhance overall system effectiveness. Bayesian Hierarchical Model, Risk Reduction, District Hospitals, Kenya Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow} p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Kenya, District Hospitals, Hierarchical Modelling, Bayesian Methods, Risk Assessment, Intervention Evaluation, Methodology*

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