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Bayesian Hierarchical Model for Evaluating Clinical Outcomes in South African Rural Clinics Systems

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Abstract

Clinical outcomes in South African rural clinics have been a subject of interest due to their unique challenges and resource constraints. A Bayesian hierarchical model was developed to analyse data from multiple rural clinics in South Africa. The model incorporates both fixed effects (clinic-specific factors) and random effects (clinic variation). The analysis revealed significant clinic variations in clinical outcomes, with some clinics outperforming others by over 20%. The Bayesian hierarchical model provided a nuanced understanding of clinic performance, highlighting the importance of contextual factors and variability. Further research should focus on implementing targeted interventions to improve underperforming clinics based on identified patterns. Bayesian Hierarchical Model, Rural Clinics, Clinical Outcomes, South Africa 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, African, Bayesian, Hierarchical, Modelling, Spatial, Epidemiology*

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