



Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Rural Ghanaian Clinics Systems

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Abstract

Clinical outcomes in rural Ghanaian clinics are often underreported due to limited data collection and analysis methods. A Bayesian hierarchical model was applied to analyse clinical outcome data from multiple rural clinics, accounting for variability between clinics and within clinic settings. The model revealed significant differences in infection rates across different clinics (e.g., a 15% higher rate in Clinic X compared to Clinic Y). The Bayesian hierarchical model provided nuanced insights into clinical performance that traditional methods could not achieve, offering a more precise assessment of rural healthcare delivery. Clinics should use the identified data for targeted interventions and training based on their specific outcomes. Bayesian hierarchical models, clinical outcomes, Ghanaian clinics, rural health systems Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, hierarchical modelling, clinical outcomes, data analysis, resource-limited settings, randomized trials*

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