African Sport Studies (Interdisciplinary - Social/Management/Health)

Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Rwanda's District Hospitals Systems

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Abstract

Clinical outcomes in Rwanda's district hospitals have been monitored through traditional statistical methods with varying degrees of success. A Bayesian hierarchical model was developed to estimate the effectiveness of treatments across Rwanda's district hospitals. This approach considers both fixed effects (e.g., treatment efficacy) and random effects (e.g., hospital-specific variations). The model revealed a significant improvement in patient recovery rates, with an estimated increase of over 20% compared to previous estimates. Bayesian hierarchical modelling provided a more nuanced understanding of clinical performance across Rwanda's district hospitals systems. District health managers should use this Bayesian approach for continuous quality improvement and resource allocation decisions. Bayesian Hierarchical Model, Clinical Outcomes, District Hospitals, Rwanda Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwandan, Hierarchical, Bayesian, Quantitative, Evaluation, Methodology, Epidemiology*

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