African Health Psychology

Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Emergency Care Units across Rwanda

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Abstract

Emergency care units in Rwanda have been established to improve patient outcomes, but there is a need for methodological evaluation of their effectiveness. A Bayesian hierarchical model was employed to analyse data from multiple emergency care units. The model accounts for variability between units while estimating overall clinical outcomes. The analysis revealed significant variation in patient recovery rates among different units, with some showing improvement and others no change compared to baseline levels. The Bayesian hierarchical model effectively captured the heterogeneity of emergency care units, providing insights into areas needing further attention for system optimization. Policy makers should focus on improving care in units where recovery rates are lower than expected based on our findings. Bayesian Hierarchical Model, Emergency Care Units, Rwanda, Clinical Outcomes Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Bayesian statistics, hierarchical modelling, clinical outcomes, emergency care, Rwanda, geographic analysis, randomized controlled trials*

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