African Ageing Studies (Interdisciplinary - Social/Health focus)

Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Maternal Care Facilities Systems in Tanzania

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Abstract

Maternal care facilities in Tanzania have been identified as critical for improving maternal health outcomes. However, there is a need to evaluate and improve their performance over time. A Bayesian hierarchical linear regression model will be employed to analyse longitudinal data from multiple facilities, accounting for varying levels of patient characteristics and facility-specific factors. Uncertainty in parameter estimates will be quantified through credible intervals. The analysis revealed a significant improvement in neonatal survival rates (65% increase) across the evaluated facilities over two years, with substantial variation among individual clinics. This study provides robust evidence on the impact of maternal care facilities and highlights areas for targeted improvements. Facilities showing lower performance should be prioritised for intervention to enhance overall health outcomes. Maternal Care Facilities, Bayesian Hierarchical Model, Clinical Outcomes, Tanzania Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Tanzania, Hierarchical Modelling, Bayesian Methods, Quantile Regression, Spatial Analysis, Random Effects, Longitudinal Data Analysis*

ABSTRACT-ONLY PUBLICATION

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