



Bayesian Hierarchical Model for Measuring Adoption Rates in Tanzanian District Hospitals Systems,

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Abstract

The study aims to evaluate the adoption rates of new medical technologies in Tanzanian district hospitals over a five-year period. A longitudinal study employing a Bayesian hierarchical model to analyse hospital-level data from multiple districts. The model incorporates spatial dependencies and temporal dynamics to estimate adoption trends over time. Bayesian hierarchical models revealed significant variation in adoption rates across different hospitals, with some showing rapid uptake while others lagged behind. The Bayesian approach effectively captured the heterogeneity of adoption processes and provided robust estimates for policy recommendations. Policy makers should prioritise targeted interventions to accelerate technology adoption in lagging districts. 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: *Geography, Africa, Hospital, Systems, Socioeconomic, factor, Analysis*

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