



Bayesian Hierarchical Model for Assessing Adoption Rates in District Hospitals Systems of Senegal: A Methodological Evaluation

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Abstract

Bayesian hierarchical models are increasingly used in health research to analyse complex data structures, particularly when studying adoption rates across multiple districts or hospitals. A Bayesian hierarchical model was employed, incorporating spatial and temporal dependencies among districts. Data on medical technology adoption were collected from district hospitals across Senegal, with a focus on recent implementation rates. The analysis revealed substantial variation in adoption rates across different geographical regions of Senegal, with some areas showing adoption rates up to three times higher than others. This study provides empirical evidence that spatial and temporal factors significantly influence medical technology adoption in district hospitals. The Bayesian hierarchical model offers a robust framework for understanding these variations. Future research should consider using the identified geographical clusters for targeted interventions aimed at increasing adoption rates in underperforming districts. Bayesian Hierarchical Model, Medical Technology Adoption, District Hospitals, Senegal Treatment effect was estimated with $text\{logit\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

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African,

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Terms:

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Terms:

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