



Bayesian Hierarchical Model for Risk Reduction in Senegal's District Hospitals Systems,

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Abstract

This study centers on evaluating the performance of district hospitals in Senegal's health system during a specific period. A novel Bayesian hierarchical model was utilised to analyse data from Senegalese district hospitals, aiming to quantify the effectiveness of risk reduction measures over time. The analysis revealed a significant decrease in patient readmission rates by approximately 15% across participating districts following implementation of the risk management protocols. This study underscores the efficacy of the Bayesian hierarchical model in evaluating healthcare system interventions, particularly in reducing hospital readmissions. Further research should explore scalability and potential for broader application within Senegalese health systems. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Bayesian, Hierarchical, Epidemiology, Quantitative, Random-effects, Logistic*

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