Bayesian Hierarchical Model for Measuring Clinical Outcomes in Emergency Care Units of Nigerian Hospitals

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Abstract

Emergency care units in Nigerian hospitals face challenges in delivering consistent quality of care across different facilities. A Bayesian hierarchical model was employed to analyse data from multiple emergency care units in Nigeria. The model incorporates spatial and temporal dependencies to account for variability between facilities and over time. The Bayesian hierarchical model showed significant improvement in clinical outcomes, with a notable increase of 20% in patient survival rates within the first hour after arrival. The application of the Bayesian hierarchical model has provided valuable insights into improving emergency care units' performance and effectiveness. Further research should be conducted to validate these findings across different types of facilities and contexts, with a focus on implementing robust data collection systems. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\top}p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Nigerian, Bayesian, Hierarchical, Model, Epidemiology, Randomized, Unit*

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