



Bayesian Hierarchical Model Evaluation of Emergency Care Systems in Ghana, 2008

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Abstract

Emergency care systems in Ghana have faced challenges in delivering timely and effective treatment to patients. Understanding these systems through a Bayesian hierarchical model can provide insights into clinical outcomes. A Bayesian hierarchical regression model was applied to data from multiple hospitals across Ghana. The model accounts for variability between different healthcare facilities while estimating the impact of various factors on clinical outcomes. The analysis revealed significant differences in survival rates (58% vs 64%) and readmission rates (32% vs 27%) between two major cities, suggesting regional disparities that need attention. Bayesian hierarchical modelling offers a robust framework for assessing emergency care systems. The identified variations highlight the importance of tailored interventions to improve patient outcomes in Ghanaian hospitals. Health authorities should prioritise improving resources and training in lower-performing regions, with a focus on enhancing communication between pre-hospital and hospital settings. Bayesian hierarchical model, emergency care, clinical outcome, Ghana 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: *Geographic, Sub-Saharan, Hierarchical, Bayesian, Markov, Random, Process, Network*

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