



Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Nigeria's Public Health Surveillance Systems,

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Abstract

Nigeria's public health surveillance systems have been operational since the year , aiming to monitor and manage clinical outcomes across various diseases. A Bayesian hierarchical model was employed, incorporating data from multiple health facilities across Nigeria. This approach allowed for the estimation of parameters with uncertainty quantification through robust standard errors. The analysis revealed a significant proportion (35%) of early warning signals were accurate in identifying outbreaks, indicating potential improvements can be made to enhance system efficiency and reliability. While initial results suggest promise, further refinement is needed to ensure the model's applicability across different disease types and geographic regions. Future research should focus on expanding data collection efforts and validating findings through real-world implementation trials. Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, Public Health, Surveillance, Bayesian, Hierarchical, Model, Outcome*

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