Bayesian Hierarchical Model for Evaluating Cost-Effectiveness of Public Health Surveillance Systems in Nigeria,

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Abstract

Public health surveillance systems in Nigeria have been established to monitor disease outbreaks and implement control measures efficiently. A Bayesian hierarchical linear regression model was employed to analyse data from Nigeria's public health surveillance system. The model accounts for varying levels of effectiveness across different regions and integrates cost data with surveillance outcomes. The model revealed that the surveillance systems in northern Nigeria were more effective than those in southern regions, with a likelihood ratio test indicating significant differences ($p < 0.05$). This study provides insights into the effectiveness of public health surveillance systems in Nigeria and highlights the need for targeted interventions to improve system performance. Future research should focus on developing cost-effective strategies that can be implemented across different regions of Nigeria, based on this model's findings. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Public Health Surveillance, Bayesian Hierarchical Model, Cost-Effectiveness Analysis, Regression Modelling, Geographic Medicine, Epidemiology*

ABSTRACT-ONLY PUBLICATION

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