African Advertising Research

Bayesian Hierarchical Model Evaluation of Public Health Surveillance Systems in Kenya,

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Abstract

Public health surveillance systems in Kenya have been established to monitor infectious diseases and provide timely interventions. However, their effectiveness varies across different regions. A Bayesian hierarchical model was applied to analyse surveillance data from multiple districts, accounting for spatial and temporal variability. Uncertainty in estimates was assessed through credible intervals. The analysis revealed significant differences in system efficiency across regions, with some systems showing substantial gains (e.g., a 20% reduction in outbreak response times). Bayesian hierarchical models offer a robust framework for evaluating public health surveillance systems, providing insights into their performance and areas needing enhancement. Enhancements to surveillance systems should focus on improving infrastructure and training of local health workers, particularly in regions with lower efficiency scores. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta \rightarrow p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian hierarchical models, Methodological evaluation, Public health surveillance, Spatial analysis*

ABSTRACT-ONLY PUBLICATION

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