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

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Abstract

Public health surveillance systems in Kenya have been established to monitor disease outbreaks and public health events. These systems rely on data collection from various sources such as hospitals, clinics, and community health workers. A systematic literature review was conducted to identify relevant studies that used Bayesian hierarchical models for assessing the reliability of Kenya's public health surveillance systems. The methodology included data from multiple sources over a specific period. The findings suggest that there is significant variability in system performance across different regions, with some areas reporting higher detection rates than others, indicating potential regional disparities in healthcare infrastructure and resources. In conclusion, the Bayesian hierarchical model provided insights into the reliability of the Kenyan public health surveillance systems but highlighted inconsistencies in system performance which require further investigation to address disparities. Recommendations include a targeted intervention programme focused on improving surveillance capabilities in regions with lower detection rates and increasing awareness among healthcare workers about the importance of timely reporting of health events. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Kenya, Bayesian Hierarchical Model, Public Health Surveillance, Reliability Assessment, Methodology, Epidemiology, Geographic Information Systems*