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

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Abstract

Public health surveillance systems in Kenya have been established to monitor clinical outcomes across various diseases. A Bayesian hierarchical model was employed to analyse data from multiple sources, incorporating uncertainty through robust standard errors. The model revealed that the proportion of positive cases in respiratory diseases was significantly higher than expected ($p < 0.05$). The application of a Bayesian hierarchical model enhanced the accuracy and reliability of surveillance data. Public health authorities should prioritise regular calibration of surveillance systems to ensure consistent performance. 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, Clinical Outcomes, Methodology, Epidemiology, Quantitative Methods*

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