African Animal Health Research

Methodological Evaluation of Public Health Surveillance Systems in Kenya Using Multilevel Regression Analysis for Clinical Outcomes Assessment

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Abstract

Public health surveillance systems in Kenya are essential for monitoring infectious diseases such as malaria and tuberculosis (TB). However, their effectiveness varies across different regions and levels of administration. A multilevel regression model will be employed to analyse data collected from various healthcare facilities in Kenya. The model will account for both fixed effects (e.g., facility-level characteristics) and random effects (e.g., regional variations). The analysis revealed that facility-level infrastructure significantly influenced clinical outcomes, with a moderate effect size. Our multilevel regression approach provides valuable insights into the performance of surveillance systems in Kenya, offering a refined method for future evaluations. Future studies should consider incorporating additional variables to enhance model accuracy and address potential biases. 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, Public Health Surveillance, Multilevel Analysis, Regression Modelling, Epidemiology, Geographic Information Systems, Spatial Statistics*