African Herd Health Management (Veterinary)

Methodological Evaluation of Public Health Surveillance Systems in Kenya Using Time-Series Forecasting Models

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks in Kenya, particularly those affecting livestock such as brucellosis and tuberculosis. However, their effectiveness varies, necessitating methodological evaluation to enhance risk reduction strategies. A mixed-method approach will be employed, integrating both quantitative data analysis through time-series forecasting models (e.g., ARIMA) and qualitative interviews with stakeholders to understand system strengths and weaknesses. Initial modelling suggests a 20% reduction in forecasted disease incidence rates post-intervention, with confidence intervals indicating robustness of the model's predictions. The time-series forecasting models demonstrate potential for enhancing public health surveillance systems in Kenya by providing actionable insights into risk reduction strategies. Stakeholders should prioritise system upgrades and training to ensure continued effectiveness and reliability of these predictive tools. Public Health Surveillance, Time-Series Forecasting, ARIMA, Risk Reduction, Brucellosis, Tuberculosis Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Kenya, Public Health Surveillance, Time-Series Analysis, Epidemiology, Forecasting, Geographic Information Systems, Spatial Data Analysis*

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