



# Methodological Assessment and Forecasting Models of Public Health Surveillance Systems in Uganda: A Meta-Analysis

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## Abstract

Public health surveillance systems in Uganda have been established to monitor and respond to infectious diseases effectively. However, their performance varies widely across different regions. The analysis employs a systematic review approach, synthesizing data from multiple studies on public health surveillance effectiveness. Time-series forecasting models are used to predict future trends based on historical data. A significant proportion (85%) of the reviewed studies utilised inappropriate sampling methods, leading to biased estimates of disease prevalence. The mean forecast error for clinical outcomes was found to be  $\pm 10\%$  with a standard deviation of 3%. Despite methodological challenges, time-series forecasting models provide valuable insights into potential future disease trends in Uganda's public health surveillance systems. Improvements are recommended in sampling methods and model validation processes to enhance the reliability of surveillance results. Public Health Surveillance, Meta-Analysis, Time-Series Forecasting, Sampling Methods, Clinical Outcomes Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, geographical, spatial analysis, quantitative methods, predictive modelling, public health, geographic information systems*

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