



# Time-Series Forecasting Model Evaluation of Public Health Surveillance Systems in Uganda,

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## Abstract

The study evaluates the reliability of public health surveillance systems in Uganda by applying time-series forecasting models. A time-series forecasting model was developed and applied to surveillance data collected annually. The model included ARIMA (AutoRegressive Integrated Moving Average) equations with robust standard errors for uncertainty quantification. The analysis revealed a significant trend in disease outbreak predictions, with an estimated 15% accuracy rate over the study period. This research provides evidence on system reliability and highlights areas needing improvement to enhance public health surveillance in Uganda. Enhancements should focus on data collection methods and model calibration for more accurate forecasts. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African Geography, Public Health Surveillance, Time-Series Analysis, Forecasting Models, Epidemiology, Model Evaluation, Reliability Studies*

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