



Forecasting Adoption Rates in Public Health Surveillance Systems: A Time-Series Model Assessment in Rwanda

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Abstract

Public health surveillance systems play a critical role in monitoring infectious diseases and other public health threats. Rwanda's system has been functioning for several years but its adoption rates have not been consistently tracked. We employed an autoregressive integrated moving average (ARIMA) model to forecast adoption rates over time. Data from the past five years were analysed and validated through cross-validation techniques. The ARIMA model predicted that without intervention, the adoption rate of Rwanda's public health surveillance systems would rise by approximately 15% within the next two years, with a confidence interval of ± 3 percentage points. Our findings suggest that proactive measures are needed to boost the adoption rates in line with national health goals. Public health officials should consider implementing educational programmes and incentives to improve system uptake among healthcare providers. public health surveillance, Rwanda, time-series forecasting, ARIMA model Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Africa, Geospatial, Quantitative, Epidemiology, Modelling, Public Health*

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