



Time-Series Forecasting Model for Evaluating Public Health Surveillance Systems in Ghana,

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Abstract

Public health surveillance systems in Ghana have been established to monitor infectious diseases such as tuberculosis (TB). However, their effectiveness over time needs evaluation. A time-series forecasting model was developed and applied to historical data from to , with robust standard errors incorporated into the analysis. The model demonstrated an R^2 value of 0.85 indicating a strong fit between forecasted and actual TB incidence rates. The time-series forecasting model provided reliable estimates for system reliability in Ghana's public health surveillance systems, particularly for TB monitoring. Regular updates to the model should be conducted based on new data to ensure continued accuracy of TB surveillance predictions. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, spatial-temporal, epidemiology, intervention, evaluation, cohort, Bayesian*

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