



Forecasting System Reliability in Ghanaian Public Health Surveillance: A Time-Series Analysis

Emelia Aggrey¹, Abena Mensah^{1,2}, Kwesi Acheampong^{1,3}, Yaa Gyau^{1,4}

¹ University of Cape Coast

² Council for Scientific and Industrial Research (CSIR-Ghana)

³ Ghana Institute of Management and Public Administration (GIMPA)

⁴ Ashesi University

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Correspondence: eaggrey@gmail.com

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Author notes

Emelia Aggrey is affiliated with University of Cape Coast and focuses on Medicine research in Africa.

Abena Mensah is affiliated with Council for Scientific and Industrial Research (CSIR-Ghana) and focuses on Medicine research in Africa.

Kwesi Acheampong is affiliated with Ghana Institute of Management and Public Administration (GIMPA) and focuses on Medicine research in Africa.

Yaa Gyau is affiliated with University of Cape Coast and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in Ghana are crucial for monitoring disease trends and resource allocation. A time-series analysis was conducted using an ARIMA (AutoRegressive Integrated Moving Average) model with robust standard errors estimated at 95% confidence intervals. The forecasted reliability index showed a mean improvement of 20% in data accuracy over the previous year's system performance, indicating effective forecasting mechanisms. The ARIMA model successfully predicted future public health surveillance outcomes with reasonable uncertainty bounds. Implementing continuous monitoring and updating of the ARIMA model will ensure ongoing reliability in Ghanaian public health systems. Ghana, Public Health Surveillance, Time-Series Analysis, Forecasting System Reliability 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, ARIMA, forecasting, reliability, surveillance, time-series, econometrics

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