



Forecasting Yield Improvement in Public Health Surveillance Systems: A Time-Series Analysis in Uganda

Orika Nkwishi^{1,2}, Kabwita Musoke³, Mutebi Nabinya⁴

¹ Kampala International University (KIU)

² Department of Clinical Research, National Agricultural Research Organisation (NARO)

³ National Agricultural Research Organisation (NARO)

⁴ Department of Clinical Research, Kampala International University (KIU)

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Correspondence: onkwishi@aol.com

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Author notes

Orika Nkwishi is affiliated with Kampala International University (KIU) and focuses on Medicine research in Africa.

Kabwita Musoke is affiliated with National Agricultural Research Organisation (NARO) and focuses on Medicine research in Africa.

Mutebi Nabinya is affiliated with Department of Clinical Research, Kampala International University (KIU) and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems are essential for monitoring disease prevalence and guiding public health interventions in Uganda. We employed an ARIMA (AutoRegressive Integrated Moving Average) model for our time series forecasting. The uncertainty around the forecast was estimated using robust standard errors. The ARIMA model predicted a significant increase in disease surveillance coverage by 15% over the next five years, with a confidence interval of ± 3 percentage points. Our findings suggest that timely interventions can enhance public health surveillance effectiveness, thereby improving yield outcomes. Public health authorities should prioritise resource allocation to strengthen surveillance infrastructure and ensure data quality for accurate forecasting. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^* p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, ARIMA, surveillance, forecasting, public health, econometrics, intervention effectiveness*

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