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Methodological Evaluation of Public Health Surveillance Systems in Tanzania Using Time-Series Forecasting Models for Reliability Assessment

Mwaka Soganda[1], **Kabwe Mufindi**[2,3], **Tumaini Kazungu**[4,5]

[1] Mkwawa University College of Education

[2] Department of Internal Medicine, Tanzania Wildlife Research Institute (TAWIRI)

[3] Sokoine University of Agriculture (SUA), Morogoro

[4] Department of Pediatrics, Mkwawa University College of Education

[5] Tanzania Wildlife Research Institute (TAWIRI)

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Correspondence: msoganda@yahoo.com

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Author notes

Mwaka Soganda is affiliated with Mkwawa University College of Education and focuses on Medicine research in Africa.

Kabwe Mufindi is affiliated with Department of Internal Medicine, Tanzania Wildlife Research Institute (TAWIRI) and focuses on Medicine research in Africa.

Tumaini Kazungu is affiliated with Department of Pediatrics, Mkwawa University College of Education and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in Tanzania are critical for monitoring diseases and implementing effective interventions. However, their reliability and efficiency require rigorous evaluation. The study will employ a time-series forecasting model to analyse historical data from existing surveillance systems. The forecast accuracy will be evaluated using mean absolute error (MAE) with robust standard errors, providing a measure of reliability. A preliminary analysis suggests that the MAE for one system is within ±5% of its actual values in recent years, indicating consistent and reliable forecasting performance. The time-series forecasting model demonstrates the potential to assess the reliability of public health surveillance systems in Tanzania, with specific applications in disease outbreak prediction and intervention planning. Future studies should expand the evaluation to include more systems and incorporate real-time data integration for enhanced accuracy and timeliness. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, geospatial, forecasting, model, econometrics, public, safety, health*