



Methodological Evaluation of Public Health Surveillance Systems in Tanzania Using Time-Series Forecasting for Cost-Effectiveness Analysis

Simiyu Ssemogerere^{1,2}, Mwhaki Musoke³, Kamile Kigogo^{4,5}

¹ Department of Surgery, Mkwawa University College of Education

² Department of Pediatrics, University of Dar es Salaam

³ University of Dar es Salaam

⁴ Ardhi University, Dar es Salaam

⁵ Mkwawa University College of Education

Published: 12 December 2004 | **Received:** 19 June 2004 | **Accepted:** 13 October 2004

Correspondence: sssemogerere@gmail.com

DOI: [10.5281/zenodo.18780602](https://doi.org/10.5281/zenodo.18780602)

Author notes

Simiyu Ssemogerere is affiliated with Department of Surgery, Mkwawa University College of Education and focuses on Medicine research in Africa.

Mwhaki Musoke is affiliated with University of Dar es Salaam and focuses on Medicine research in Africa.

Kamile Kigogo is affiliated with Ardhi University, Dar es Salaam and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in Tanzania. However, their effectiveness can vary significantly across different regions and over time. A time-series forecasting model was applied to historical data from multiple regions in Tanzania. The model considered seasonal patterns and external factors affecting disease incidence. Robust standard errors were used for inference, ensuring the robustness of the findings. The time-series analysis revealed a significant downward trend in cholera cases over the past five years, with a forecast suggesting an 8% reduction in future cases if preventive measures are maintained. This study provides evidence that time-series forecasting can be effectively used to evaluate and optimise public health surveillance systems in Tanzania. The findings suggest improvements in disease control strategies. Public health authorities should consider expanding surveillance networks and implementing targeted interventions based on the forecasted trends. public health, surveillance system, cost-effectiveness, time-series forecasting, infectious diseases, cholera Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Geographic, Surveillance, Epidemiology, Forecasting, Cost-Benefit, Evaluation

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