



Methodological Evaluation of Public Health Surveillance Systems in Tanzania: A Quasi-Experimental Design for Reliability Assessment

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in developing countries like Tanzania. However, their reliability and effectiveness can be improved through rigorous methodological evaluations. A mixed-method approach combining quantitative analysis with qualitative insights was employed. Data from existing surveillance systems were analysed for consistency and accuracy. Statistical models such as logistic regression and uncertainty intervals were used to assess reliability. The evaluation revealed a significant proportion (70%) of reported cases were consistent across different data sources, indicating high inter-source agreement in the surveillance system. However, there was variability in reporting times (mean \pm SD: 24h \pm 9h). While the Tanzanian public health surveillance system demonstrates robustness in some aspects, improvements are needed to ensure consistent and timely data collection. Enhancements should focus on standardising data entry protocols, reducing reporting times, and increasing staff training. This will contribute to a more reliable and efficient system. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, Sub-Saharan, Surveillance, Validity, Reliability, Quasi-experiment, Evaluation

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