



# Methodological Evaluation of Public Health Surveillance Systems in Tanzania: A Comparative Study

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## Abstract

Public health surveillance systems are critical for monitoring infectious diseases in Tanzania, where rapid detection of outbreaks is essential to control disease spread efficiently. A meta-analysis was conducted using quantitative data from randomized field trials. The study employed a mixed-effects model to analyse the yield of surveillance systems, with robust standard errors accounting for heterogeneity between studies. The analysis revealed that the variability in system performance varied significantly across different regions ( $p < 0.05$ ), highlighting the need for tailored interventions. This meta-analysis underscores the importance of methodological rigor in public health surveillance systems and suggests a potential framework for enhancing their effectiveness. Investment should be prioritised in developing standardised methodologies and training programmes to ensure consistent performance across all sites. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^{-1} p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Sub-Saharan, Geographic, Spatial, Surveillance, Evaluation, Meta-analysis, Randomized

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