African Plant Nutrition (Agri/Plant Science)

Methodological Evaluation of Public Health Surveillance Systems in Tanzania: A Randomized Field Trial Evaluating Clinical Outcomes

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Abstract

Public health surveillance systems in Tanzania are essential for monitoring disease outbreaks and guiding interventions. However, their effectiveness varies, necessitating a methodological evaluation to improve public health response strategies. A randomized field trial was conducted across four regions in Tanzania. A total of 100 healthcare facilities were randomly selected, and their surveillance data for one year were analysed using mixed-effects logistic regression models to assess the accuracy of reported cases and timely interventions. The analysis revealed a 25% higher detection rate of malaria cases compared to reported numbers, indicating an underreporting bias in current systems. This suggests that improving reporting protocols could enhance surveillance efficiency. This randomized field trial provides insights into the strengths and weaknesses of public health surveillance systems in Tanzania, highlighting the need for targeted improvements to ensure timely and accurate disease response. Healthcare facilities should be encouraged to adopt standardised reporting procedures and invest in training staff on best practices for disease surveillance. Policy makers can use these findings to develop evidence-based guidelines for system enhancement. Treatment effect was estimated with $text{logit}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Tanzania, Geographic Public Health Surveillance, Randomized Controlled Trials, Clinical Outcomes Assessment, Data Quality Improvement, Sentinel Site Monitoring, Epidemiological Methods*

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