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Methodological Evaluation of Public Health Surveillance Systems in South Africa: A Randomized Field Trial for Measuring Clinical Outcomes

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Abstract

Public health surveillance systems are crucial for monitoring disease prevalence and guiding interventions in South Africa. However, their effectiveness can be improved with rigorous methodological evaluation. A randomized field trial was conducted to assess the performance of existing public health surveillance systems. Participants were randomly assigned to receive either standard or enhanced reporting protocols, with clinical outcomes measured over a six-month period using a logistic regression model for analysis. Enhanced reporting protocols showed a 15% improvement in the detection accuracy of diabetes prevalence compared to standard protocols (95% confidence interval: [8%, 23%]). The findings suggest that implementing more robust surveillance methods can lead to significant improvements in public health outcomes. Public health agencies should consider adopting enhanced surveillance systems to improve the detection of prevalent diseases and inform targeted interventions. public health, surveillance systems, clinical outcomes, randomized field trial, logistic regression Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, geospatial analysis, cluster-randomized trials, data quality, informatics, surveillance, validation studies*

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