



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

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Abstract

Public health surveillance systems in South Africa are crucial for monitoring and managing disease outbreaks efficiently. However, their effectiveness varies significantly across different regions. A randomized field trial was conducted to assess the accuracy and efficiency of current surveillance systems. Participants were randomly assigned to receive standard care or additional interventions based on system recommendations. The analysis revealed that incorporating real-time data from community health workers significantly improved the detection rate of clinical outcomes by 25% compared to traditional methods. This study provides empirical evidence supporting the use of enhanced surveillance systems for better clinical outcome measurement in South Africa's public health settings. Public health authorities should prioritise integrating real-time data collection mechanisms into existing surveillance frameworks to enhance their overall effectiveness. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, randomized controlled trial, clinical outcomes measurement, data quality assessment, geographic information systems, outcome evaluation*

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