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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 in South Africa are essential for monitoring disease prevalence and guiding public health interventions. However, their effectiveness is often under scrutiny due to potential biases and inefficiencies. The research employs a mixed-method approach, including quantitative data collection through structured questionnaires and qualitative insights from focus group discussions. A randomization technique is utilised to ensure unbiased sample allocation across the study groups. A preliminary analysis indicates that there is a significant variance in reporting rates between different surveillance systems ($p < 0.05$), suggesting systematic errors need addressing for more reliable data collection. The randomized field trial successfully demonstrates the importance of rigorous methodology in public health surveillance, revealing discrepancies that require immediate attention to improve system performance and clinical outcomes. Immediate steps should include revising reporting protocols and enhancing training programmes for healthcare workers. Future research could explore more complex models to further refine these findings. 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, African, epidemiology, surveillance, knowledge-dissemination, risk, bias*

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