



Methodological Evaluation of Public Health Surveillance Systems in South Africa: A Randomized Field Trial for Yield Improvement Assessment

Nkosana Mqondo¹, Mpho Nkonyane²

¹ SA Astronomical Observatory (SAAO)

² Department of Public Health, SA Astronomical Observatory (SAAO)

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Correspondence: nmqondo@aol.com

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Author notes

Nkosana Mqondo is affiliated with SA Astronomical Observatory (SAAO) and focuses on Medicine research in Africa.

Mpho Nkonyane is affiliated with Department of Public Health, SA Astronomical Observatory (SAAO) and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in South Africa. However, their effectiveness can vary significantly due to methodological shortcomings. A randomized controlled trial was conducted in three provinces of South Africa. The system performance was assessed using a mixed-method approach combining quantitative data from surveillance reports and qualitative feedback from healthcare workers. The proportion of accurate outbreak notifications increased by 25% after implementing the intervention, with no significant adverse effects observed. This study demonstrates the potential benefits of methodological improvements in public health surveillance systems, particularly for enhancing yield improvement assessment. Future research should consider scaling up these interventions and exploring additional methods to further improve system performance. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, infectious disease surveillance, randomized trials, methodological assessment, public health metrics, yield improvement measures, geographical epidemiology*

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