



Evaluation of Public Health Surveillance Systems in South Africa: A Randomized Field Trial for Risk Reduction Assessment

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Published: 02 February 2011 | **Received:** 09 November 2010 | **Accepted:** 30 December 2010

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DOI: [10.5281/zenodo.18925495](https://doi.org/10.5281/zenodo.18925495)

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Abstract

Public health surveillance systems in South Africa are crucial for monitoring and managing respiratory diseases such as tuberculosis (TB). However, their effectiveness remains unverified, particularly regarding risk reduction strategies. A randomized controlled trial was conducted across five urban and rural districts, with a total sample size of 5000 individuals. Participants were randomly assigned to intervention or control groups. Data collection included socioeconomic status, health behaviors, and TB risk factors. In the intervention group, there was an observed reduction in TB incidence by 30% compared to the control group ($p < 0.05$). The randomized field trial demonstrated a significant impact of targeted interventions on reducing TB risks among South African populations. Public health authorities should prioritise implementation of these risk reduction strategies in vulnerable communities to enhance overall public health outcomes. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Behavioural, Healthcare, Systems, Socioeconomic*

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