



Methodological Evaluation of Public Health Surveillance Systems in South Africa: Randomized Field Trial for Adoption Rates Assessment

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases in South Africa, where various pathogens pose significant threats to herd health and human populations. A randomized field trial design was employed where two treatment arms (intervention and control) were established in selected regions. A logistic regression model was used to predict the probability of adoption based on socio-economic factors, healthcare infrastructure, and previous surveillance system experiences. The proportion of regions adopting the public health surveillance systems varied significantly across treatment groups, with an estimated probability of adoption of 65% for those receiving direct support compared to 40% in control areas. Uncertainty around these estimates is $\pm 10\%$. Despite initial challenges, substantial progress towards system implementation was observed through targeted interventions and supportive policies. Further investments should be directed towards strengthening healthcare infrastructure and improving access to surveillance technologies in underserved regions. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Surveillance, Systems, Epidemiology, Qualitative-Methods, Randomization, Data-Collection*

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