African Traditional Medicine (Pharmaceutical aspects)

Methodological Evaluation of Public Health Surveillance Systems in South Africa: A Randomized Field Trial for Cost-Effectiveness Assessment

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Abstract

Public health surveillance systems in South Africa are crucial for monitoring infectious diseases such as tuberculosis (TB). However, their effectiveness and cost-effectiveness need further evaluation. A randomized field trial design was employed to assess the cost-effectiveness of existing TB surveillance systems. Data collection included both quantitative and qualitative methods, with statistical analysis using mixed-effects logistic regression models. The trial revealed a significant improvement in detection rates for smear-positive pulmonary TB cases (75% vs. baseline 60%, $p < 0.01$) after implementing additional diagnostic tests. This study provides robust evidence on the efficacy and cost-effectiveness of current surveillance systems, with potential implications for public health policy reform in South Africa. Further research should be conducted to validate findings across different regions and diseases, and recommendations for system improvements based on this trial's outcomes should be considered by policymakers. 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, TB surveillance, Randomized controlled trial, Cost-benefit analysis, Outcome measurement, Public health metrics, Geographic information systems*

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