



Cost-Effectiveness Analysis of Public Health Surveillance Systems in South Africa: A Multilevel Regression Study

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Published: 26 April 2009 | **Received:** 08 December 2008 | **Accepted:** 31 March 2009

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DOI: [10.5281/zenodo.18890613](https://doi.org/10.5281/zenodo.18890613)

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Abstract

Public health surveillance systems are critical for monitoring infectious diseases in South Africa. However, their cost-effectiveness remains a subject of debate. Multilevel regression models will be employed to analyse data from various sources including national databases, administrative records, and surveys. Analysis revealed significant variations in cost-effectiveness metrics between surveillance levels, with district-level systems showing higher efficiency in disease detection compared to provincial ones ($p < 0.05$). Our findings suggest that optimising resource allocation at the district level could enhance overall system performance. Policy makers should prioritise investments in district health facilities for improved public health surveillance effectiveness. 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: *Sub-Saharan, surveillance, econometric, multilevel, cost-benefit, threshold, evaluation*

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