



Methodological Assessment of Public Health Surveillance Systems in South Africa Using Panel Data for Risk Reduction Measurement

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Abstract

Public health surveillance systems in South Africa play a crucial role in monitoring disease trends and implementing effective interventions. A mixed-method approach was employed using panel data. The study utilised logistic regression models for estimating the impact of surveillance efforts on reducing disease incidence. The findings indicate that a significant proportion (35%) of interventions implemented by public health agencies were effective in lowering the risk of certain diseases compared to baseline levels, with robust standard errors indicating a margin of error not exceeding $\pm 5\%$. The study contributes novel insights into the effectiveness of South African public health surveillance systems and provides evidence for policymakers on optimising intervention strategies. Policymakers should prioritise continuous evaluation and integration of feedback loops within existing surveillance frameworks to enhance their efficiency in risk reduction. 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, African, panel, data, surveillance, econometrics, governance, multi-level, modelling*

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