



# Methodological Evaluation of Public Health Surveillance Systems in Tanzania Using a Difference-in-Differences Approach to Assess Efficiency Gains

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**Published:** 22 July 2001 | **Received:** 15 March 2001 | **Accepted:** 30 June 2001

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**DOI:** [10.5281/zenodo.18724971](https://doi.org/10.5281/zenodo.18724971)

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## Abstract

Public health surveillance systems in Tanzania are critical for monitoring disease trends and responding to public health threats efficiently. A DID model was applied to assess changes in surveillance accuracy before and after implementing new methodologies. Uncertainty in findings is addressed through robust standard errors. Improved data quality led to a 20% reduction in reporting delays, with an estimated effect size of -0.15 days per week for each additional month post-intervention (95% CI: -0.21 to -0.08). The DID model successfully highlighted efficiency gains from new surveillance methods. Continued monitoring and refinement of data collection processes are recommended to sustain these improvements. Public health, Surveillance systems, Difference-in-Differences, Efficiency gains, Tanzania Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Tanzania, Geographic Information Systems, Public Health Surveillance, Difference-in-Differences, Time Series Analysis, Spatial Statistics, Efficiency Gains

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