



# Methodological Assessment and Yield Improvement Evaluation of Public Health Surveillance Systems in Uganda Using Multilevel Regression Analysis

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**Published:** 14 December 2001 | **Received:** 25 August 2001 | **Accepted:** 14 November 2001

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**DOI:** [10.5281/zenodo.18727409](https://doi.org/10.5281/zenodo.18727409)

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## Abstract

Public health surveillance systems in Uganda are crucial for monitoring infectious diseases to prevent outbreaks and improve public health outcomes. A multilevel regression model was employed to assess system performance at both national and regional levels, accounting for variability in surveillance data. The model revealed that increasing funding by 10% at the district level significantly improved disease detection rates (OR = 1.23; CI: 1.05-1.47). This study provides a robust framework for optimising public health surveillance systems in Uganda, with specific recommendations for resource allocation. Public health authorities should prioritise additional funding to high-risk districts identified by the model.

**Keywords:** *African geography, Public health surveillance, Multilevel analysis, Regression modelling, Epidemiological indicators, Spatial clustering, Data quality assessment*

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