



# Evaluating the Cost-Effectiveness of Public Health Surveillance Systems in Rwanda Using Panel Data Analysis

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## Abstract

Public health surveillance systems play a crucial role in monitoring infectious diseases to prevent outbreaks. Rwanda has established such systems but lacks comprehensive evaluations of their cost-effectiveness. A mixed-method approach was employed, integrating quantitative panel data analyses with qualitative insights from stakeholder interviews. The study utilised a fixed effects model to estimate the impact of surveillance system investments on health outcomes over time. The analysis revealed that an investment ratio of 150 *per capita* in public health surveillance systems led to a reduction in infectious disease incidence by approximately  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Pan-African, Geographic Information Systems, Panel Data Analysis, Cost-Benefit Analysis, Health Economics, Infectious Disease Surveillance, Epidemiology*

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