



# Methodological Evaluation of Public Health Surveillance Systems in Rwanda Using Panel Data for Risk Reduction Measurement

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## Abstract

Public health surveillance systems are critical for monitoring disease prevalence and implementing effective control measures in Rwanda. Panel data estimation techniques were employed to analyse temporal trends in health indicators across different regions of Rwanda. Robust standard errors were used for inference. A significant decrease ( $p < 0.05$ ) in the incidence rate of malaria was observed over a five-year period, indicating effective surveillance and control measures. The panel data analysis confirmed the efficacy of current public health surveillance systems in Rwanda, highlighting their role in reducing disease risk. Continuous monitoring and periodic review of public health policies are recommended to maintain these surveillance systems' effectiveness. Public Health Surveillance, Panel Data Analysis, Risk Reduction, Malaria Surveillance, Rwanda 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:** Rwanda, Public Health Surveillance, Panel Data, Econometrics, Epidemiology, Stochastic Frontier Analysis, Spatial Econometrics

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