



Methodological Validation of Public Health Surveillance Systems in Rwanda: A Randomized Field Trial

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Abstract

Public health surveillance systems are crucial for monitoring infectious diseases and ensuring timely interventions in resource-limited settings such as Rwanda. A randomized field trial was conducted to assess the performance and cost-effectiveness of the surveillance system. Data collection included both quantitative and qualitative methods. The study found that the average response time for reported cases fell within $\pm 15\%$ of the expected mean, indicating a well-functioning system with acceptable variability. The randomized field trial confirmed the robustness of the surveillance system in Rwanda, offering insights into its cost-effectiveness and operational efficiency. Further research should focus on scalability and integration with existing health information systems to enhance overall public health outcomes. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Rwanda, Geographic Information Systems (GIS), Public Health Surveillance, Randomized Controlled Trials, Cost-Benefit Analysis, Data Quality Assessment, Evaluation Metrics

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