



Methodological Evaluation of Public Health Surveillance Systems in Rwanda: A Randomized Field Trial on System Reliability

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Abstract

Public health surveillance systems are crucial for monitoring disease prevalence and guiding policy in Rwanda. However, their reliability and effectiveness have not been extensively evaluated. A randomized field trial was conducted across three regions in Rwanda. Participants included healthcare workers and community volunteers who monitored disease incidence using standard protocols. Data were collected over one year, with randomization to test system reliability under varying conditions. In the evaluated region, a 20% increase in reported cases accuracy (95% CI: [14%, 26%]) was observed compared to baseline periods without intervention. The randomized field trial demonstrated improved reliability of public health surveillance systems in Rwanda, with significant increases in case reporting accuracy under controlled conditions. Public health officials should consider implementing similar validation trials to enhance system performance and ensure data integrity for evidence-based decision-making. public health surveillance, reliability, randomized field trial, disease monitoring, 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: *Sub-Saharan, Geospatial, Validity, Reliability, Sampling, Data, Analytics*

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