



Methodological Validation of Public Health Surveillance Systems in Nigeria: A Randomized Field Trial on Cost-Efficiency Assessment

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Abstract

Public health surveillance systems in Nigeria are crucial for monitoring disease prevalence and guiding interventions. However, their effectiveness and cost-efficiency vary widely among different regions. A randomized field trial was conducted to assess the performance of four publicly funded surveillance systems across three states. Data collection included direct observation and questionnaire surveys among healthcare workers and community members. Among the four surveillance systems evaluated, System X demonstrated a significantly higher detection rate of malaria cases ($p < 0.05$) compared to Systems Y and Z, with an estimated cost per case detected of 120 ± 30 . System X is recommended for further implementation in Nigeria due to its superior performance and cost-efficiency. Implement System X across all states in Nigeria and conduct regular audits to ensure continued high-quality surveillance. Public Health Surveillance, Cost-Efficiency, Randomized Field Trial, System X

Keywords: *Sub-Saharan, Geographic Information Systems, Health Informatics, Sampling Theory, Cost-Benefit Analysis, Randomized Controlled Trials, Surveillance Epidemiology*

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