



Methodological Evaluation of Public Health Surveillance Systems in Ethiopia: A Randomized Field Trial for Cost-Effectiveness Assessment

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Abstract

Public health surveillance systems are critical for monitoring disease outbreaks in Ethiopia, but their cost-effectiveness remains uncertain. A randomized controlled trial was conducted to assess the performance of two different public health surveillance systems. Data collection included disease incidence rates, system operational costs, and user feedback. The analysis revealed that System A had a lower operational cost per unit of detected diseases compared to System B (System A: 100 ± 20 per case detected; System B: 150 ± 30 per case), indicating potential cost savings with System A. While both systems performed well, System A demonstrated superior cost-effectiveness in terms of operational costs and disease detection efficiency. Further implementation should prioritise the adoption of System A based on its cost-effectiveness metrics. Continuous monitoring is recommended to ensure sustainability and adaptability.

Keywords: *Ethiopia, Geographic Information Systems, Cluster Sampling, Surveillance Networks, Randomization, Outcome Evaluation, Cost-Benefit Analysis*

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