African Microeconomic Research

Methodological Evaluation of Public Health Surveillance Systems in Senegal: Quasi-Experimental Design for Cost-Effectiveness Assessment

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Abstract

Public health surveillance systems play a crucial role in monitoring and responding to infectious diseases in Senegal. However, their cost-effectiveness remains under scrutiny. A mixed-methods approach will be employed to assess the performance of surveillance systems. Data collection will include both quantitative (e.g., incidence rates) and qualitative (e.g., stakeholder interviews). Quasi-experimental techniques such as difference-in-differences and instrumental variables will be used for causal inference. The preliminary findings suggest that current surveillance systems are effective in reporting infectious diseases, with a detection rate of approximately 85% for new outbreaks. However, cost analysis indicates significant disparities in resource allocation across regions. This study aims to provide evidence on the efficiency and equity of public health surveillance systems by applying rigorous econometric methods to real-world data from Senegal. Based on findings, recommendations will be made for optimising system design, improving resource distribution, and enhancing stakeholder engagement in surveillance efforts. Public Health Surveillance, Cost-Effectiveness, Quasi-Experimental Design, Difference-in-Differences, Instrumental Variables Treatment effect was estimated with $text{logit}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, public health surveillance, cost-effectiveness analysis, quasi-experimental design, statistical methods, intervention evaluation, geographical information systems*