



Methodological Evaluation of Public Health Surveillance Systems in Senegal Using Difference-in-Differences Models for Cost-Efficiency Assessment

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Abstract

Public health surveillance systems are crucial for monitoring diseases in Senegal, a country with endemic infectious diseases. However, the effectiveness and cost-effectiveness of these systems vary, necessitating methodological evaluation. The review encompasses a comprehensive search strategy including electronic databases and grey literature. Studies are screened, data extracted, and assessed for methodological quality. A meta-analysis with robust standard errors is conducted on studies employing difference-in-differences models. Studies suggest that the implementation of surveillance systems in Senegal has led to a reduction in disease prevalence by approximately 20% over five years, although variability exists among regions and diseases. The use of difference-in-differences models provides valuable insights into the cost-effectiveness of public health surveillance systems in Senegal. Future research should consider additional factors such as resource allocation and system scalability. Investment decisions regarding public health surveillance systems should be informed by this evidence, with a focus on areas where impact is most pronounced and sustainable solutions are required. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, surveillance, econometrics, regression analysis, evaluation methodology, analytical frameworks, geographic information systems*

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