



Methodological Evaluation of Public Health Surveillance Systems in Senegal: Panel Data Estimation for Risk Reduction Measurement

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Abstract

Public health surveillance systems play a crucial role in monitoring disease prevalence and implementing timely interventions to reduce risk factors. Panel-data analysis was employed to assess the impact of surveillance systems on reducing health risks. The study utilised a mixed-effects model with robust standard errors to account for within-subject correlations and potential omitted variable bias. The mixed-effects model revealed significant reductions in risk factors by 15% (95% confidence interval: -20, -10) when surveillance systems were operational. Enhanced public health surveillance systems significantly contribute to reducing health risks in Senegal. Continued investment and improvement of surveillance systems are recommended for further risk reduction. 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: *African, Geographic, Epidemiology, Panel, Regression, Surveillance, Validation*

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