



Methodological Evaluation of Public Health Surveillance Systems in Senegal Using Difference-in-Differences Models

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks in Senegal's livestock sector. These systems aim to detect and respond to emerging diseases promptly. We employed difference-in-differences modelling to compare pre- and post-intervention outcomes in terms of RVF detection. This approach allows us to isolate the effect of surveillance enhancements from other potential changes over time, providing a robust assessment of system performance. A notable finding is that the implementation of enhanced surveillance led to an increase in early disease detection by approximately 25% compared to pre-intervention levels, indicating improved yield and reduced economic losses due to RVF outbreaks. Our findings suggest that public health surveillance systems significantly improve their effectiveness through targeted enhancements. These improvements are critical for maintaining the health of livestock populations and ensuring sustainable agricultural productivity in Senegal. Based on these results, we recommend continued investment in surveillance infrastructure and training programmes to further enhance detection capabilities and support disease prevention efforts. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, livestock, surveillance, econometrics, epidemiology, intervention, impact assessment*

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