African Plant Breeding and Genetics (Agri/Plant Science)

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

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Abstract

Public health surveillance systems in Senegal are crucial for monitoring infectious diseases. However, their effectiveness in predicting and mitigating yield improvements is not well understood. A mixed-methods approach combining quantitative data analysis from surveillance systems and qualitative interviews to assess system performance. The study employs statistical models for predictive accuracy assessment. The surveillance systems showed moderate predictive power, with a coefficient of determination (R^2) of approximately 0.35 in forecasting yield improvements over the past five years. While promising, the current public health surveillance system in Senegal has room for improvement, particularly in data integration and predictive accuracy. Enhanced collaboration between health and agricultural sectors is recommended to improve yield prediction models and streamline data collection processes. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Geographic Information Systems, Quasi-Experimental Design, Public Health Surveillance, Impact Assessment, Spatial Analysis, Epidemiology*