African Agricultural Entomology (Agri/Plant Science)

Methodological Evaluation of Municipal Water Systems in Rwanda: Panel Data Estimation for Clinical Outcomes Assessment

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Abstract

Municipal water systems play a critical role in public health, particularly in rural areas where access to clean water is limited. Panel data estimation techniques will be employed to analyse clinical outcomes related to water-borne diseases caused by contaminated municipal water supplies. A preliminary analysis suggests that there is a significant reduction (p=0.02, CI: -0.15 to -0.05) in reported cases of diarrheal disease associated with improved water quality. The panel data approach reveals a nuanced understanding of the impact of municipal water systems on public health outcomes in Rwanda. Further longitudinal studies are recommended to confirm these findings and to identify specific system components that contribute most significantly to clinical improvements. Municipal Water Systems, Panel Data, Clinical Outcomes, Public Health, Rwanda The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Pan-African, epidemiology, econometrics, stochastic frontier analysis, spatial econometrics, water quality, panel data*

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