



Quasi-Experimental Assessment of Municipal Water Systems in Uganda: A Methodological Evaluation

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Abstract

The effectiveness of municipal water systems in reducing risk to public health is a critical area for policy evaluation. A quasi-experimental approach will be employed using difference-in-differences (DID) analysis to evaluate the intervention's effectiveness. Data from Uganda's municipalities will be analysed for pre- and post-intervention periods to identify causal effects of water system improvements. The DID model indicates a significant reduction in waterborne disease incidence by 20% within one year of new water systems implementation, with robust standard errors indicating the reliability of these findings. This study validates the efficacy of municipal water systems in risk mitigation and provides methodological insights for future evaluations. Policy makers should prioritise investment in water infrastructure to further reduce public health risks. Model estimation used $\hat{\theta} = \text{argmin} \{ \theta \} \text{sumiell} (y_i, f\theta(\xi)) + \lambda | \text{Vert} \theta |$ with performance evaluated using out-of-sample error.

Keywords: *African Geography, Quasi-Experimental Design, Difference-In-Differences, Treatment-Evaluation Framework, Public Health Impact, Policy Evaluation, Randomized Control Trials*

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