



Methodological Evaluation of Municipal Water Systems in Rwanda Using Difference-in-Differences for Clinical Outcome Assessment

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Published: 05 October 2009 | **Received:** 23 July 2009 | **Accepted:** 08 September 2009

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DOI: [10.5281/zenodo.18888141](https://doi.org/10.5281/zenodo.18888141)

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Abstract

Municipal water systems in Rwanda have been implemented to improve public health outcomes. A systematic review using the difference-in-differences (DiD) model was conducted, focusing on existing observational studies in Rwanda. The DiD analysis revealed a significant improvement in waterborne disease incidence post-implementation of municipal water systems. The DiD method provided robust evidence for the effectiveness of municipal water systems in reducing clinical outcomes related to water-borne diseases. Future studies should consider additional variables and longitudinal data to strengthen model validity. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Rwanda, Geographic Information Systems (GIS), spatial analysis, water quality monitoring, impact evaluation, econometrics, model validation

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