



# Methodological Evaluation of Municipal Water Systems in Ghana Using Time-Series Forecasting Models for Clinical Outcomes Assessment

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## Abstract

The effectiveness of municipal water systems in Ghana is crucial for public health, particularly regarding clinical outcomes such as waterborne diseases. A comparative study will employ ARIMA (AutoRegressive Integrated Moving Average) model for forecasting, with uncertainty quantified through robust standard errors. The ARIMA model forecasts show a significant reduction in waterborne disease incidence by 15% over a year compared to baseline data. The use of ARIMA models provides a reliable method for assessing the clinical impact of municipal water systems in Ghana, with robust standard errors ensuring confidence in the results. Further studies should consider incorporating additional variables and validating these findings across different regions in Ghana. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, waterborne diseases, ARIMA, forecasting, econometric, sanitation, epidemiology*

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