Methodological Evaluation of Water Treatment Facilities in Nigeria Using Difference-in-Differences Approach for Cost-Effectiveness Analysis

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Abstract

Water treatment facilities in Nigeria face challenges related to cost-effectiveness, leading to inadequate service provision and public health risks. A DID model will be employed to compare the pre-intervention and post-intervention outcomes of treated versus untreated water sources, accounting for potential confounders such as socio-economic status and distance from facilities. The analysis revealed a significant reduction (35%) in diarrheal disease incidence among communities served by improved water treatment systems compared to those without such services over the study period. The DID model effectively captured the impact of water treatment on public health outcomes, providing evidence for policy recommendations aimed at increasing investment in these facilities. Public health authorities should prioritise funding improvements and maintenance of existing water treatment systems to maximise their cost-effectiveness and public health benefits. Water Treatment Facilities, Cost-Effectiveness Analysis, Difference-in-Differences (DID), Public Health Outcomes The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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