Evaluating Water Treatment Systems in Kenya through Randomized Field Trials: A Methodological Assessment

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Abstract

Water treatment systems are critical for improving water quality in Kenya's public spaces. However, there is a need to evaluate their effectiveness and ensure they effectively reduce health risks. A randomized controlled trial design was employed to evaluate the water treatment systems in two different regions of Kenya. Participants were randomly assigned to either receive a standard water treatment system or no intervention control group. Data collection included microbiological analysis, user feedback surveys, and continuous monitoring of water quality parameters over six months. The randomized field trials revealed that the treated water had significantly lower levels of pathogenic bacteria compared to untreated sources ($p < 0.05$), suggesting an effective risk reduction strategy in reducing health risks associated with unsafe drinking water. This study provides evidence-based insights into the effectiveness of water treatment systems in mitigating public health risks, particularly in underserved communities where access to safe water is limited. Based on the findings, it is recommended that policymakers prioritise investment in sustainable and effective water treatment infrastructure as a key component for improving public health outcomes in Kenya. water treatment systems, randomized field trials, risk reduction, microbiological analysis, public health The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenyan, randomized controlled trial, waterborne diseases, filtration, disinfection, epidemiology, sanitation systems*

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