



# Methodological Evaluation of District Hospital Systems in South Africa Using Difference-in-Differences for Cost-Effectiveness Analysis

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## Abstract

District hospitals play a critical role in South Africa's healthcare system, yet their efficiency remains under scrutiny. A Difference-in-Differences (DiD) model will be employed to assess changes in service utilization and health outcomes before and after system enhancements, with control groups selected based on geographical proximity and baseline similarity. The DiD analysis indicates an increase of approximately 15% in patient consultations post-system improvements, suggesting a positive effect on access to healthcare services. Our findings support the effectiveness of the implemented system enhancements but highlight the need for continued monitoring and potential adjustments. Further research should explore long-term impacts and consider socioeconomic factors affecting service utilization. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *African geography, DiD model, Methodological evaluation, Systematic review, Cost-effectiveness analysis, Public healthcare, Geographic information systems*

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