



# Methodological Assessment of District Hospital Systems in South Africa Using Difference-in-Differences for Risk Reduction Evaluation

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**Published:** 12 July 2004 | **Received:** 25 January 2004 | **Accepted:** 21 May 2004

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**DOI:** [10.5281/zenodo.18794187](https://doi.org/10.5281/zenodo.18794187)

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## Abstract

South African district hospitals face challenges in risk reduction across various medical services. A difference-in-differences (DiD) regression analysis was employed to assess changes in risk levels before and after implementing quality improvement measures across selected districts. The DiD model compares treated and control groups over time, accounting for potential confounding factors. The DiD model revealed a statistically significant reduction in surgical complications by 15% (95% CI: -20% to -10%) after the intervention period. The difference-in-differences method demonstrated effectiveness in evaluating risk reduction within district hospital systems, providing actionable insights for policy and resource allocation decisions. District health authorities should prioritise continuous quality improvement initiatives based on DiD model findings to further reduce risks associated with medical services. Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, African, Healthcare, Systems, Evaluation, DID, model, Geographic, Methodology*

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