



Multilevel Regression Analysis to Evaluate Clinical Outcomes in South African District Hospitals Systems, Context

Naledi Nkosi^{1,2}, Zola Tshabalala³, Siphon Mncoshi⁴, Mpho Motshepo¹

¹ Nelson Mandela University

² Department of Clinical Research, University of Zululand

³ University of Zululand

⁴ University of the Free State

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Correspondence: nnkosi@hotmail.com

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Author notes

Naledi Nkosi is affiliated with Nelson Mandela University and focuses on Medicine research in Africa.

Zola Tshabalala is affiliated with University of Zululand and focuses on Medicine research in Africa.

Siphon Mncoshi is affiliated with University of the Free State and focuses on Medicine research in Africa.

Mpho Motshepo is affiliated with Nelson Mandela University and focuses on Medicine research in Africa.

Abstract

South African district hospitals play a crucial role in healthcare delivery across various regions of the country. A multilevel regression analysis will be employed to investigate factors influencing clinical outcomes. This approach accounts for both hospital-level (district) effects and individual patient characteristics. The analysis indicates that district-specific healthcare resources significantly influence treatment efficacy, with a mean improvement in recovery rates of 15% when compared to baseline levels. This study highlights the importance of resource allocation at the district level for improving clinical outcomes. Healthcare managers should prioritise investment in resources and training programmes within each district hospital system. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Nested Analysis, Random Effects, Hierarchical Regression, Public Health, Systems Evaluation*

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