



Multilevel Regression Analysis of Community Health Centre Systems in South Africa: A Methodological Evaluation over Two Years

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Abstract

Community health centres in South Africa are crucial for addressing healthcare needs across diverse populations. However, their effectiveness and efficiency have not been thoroughly evaluated over time. This study employs multilevel regression models to analyse data collected from two years of operation across various communities. The analyses account for both within-centre variability and centre differences. Multilevel regression analysis revealed significant improvements in service delivery, with a 15% reduction in patient wait times at participating health centres. The multilevel regression models provide robust insights into the operational efficiency of community health centres in South Africa. Further research should explore potential interventions to enhance these gains and improve overall service quality. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, South African, Multilevel, Regression, Evaluation, Health, Systems*

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