Methodological Assessment and Time-Series Forecasting in District Hospital Systems of South Africa: A Review

Sankwazi Mxolisi[1], Bongani Sikhethlwa[2], Thabo Dlamini[3], Selukwe Khumalo[1,4]

[1] Durban University of Technology (DUT)

[2] University of the Free State

[3] Department of Pediatrics, Durban University of Technology (DUT)

[4] University of KwaZulu-Natal

Author notes

Sankwazi Mxolisi is affiliated with Durban University of Technology (DUT) and focuses on Medicine research in Africa.
Bongani Sikhethlwa is affiliated with University of the Free State and focuses on Medicine research in Africa.
Thabo Dlamini is affiliated with Department of Pediatrics, Durban University of Technology (DUT) and focuses on Medicine research in Africa.
Selukwe Khumalo is affiliated with Durban University of Technology (DUT) and focuses on Medicine research in Africa.

Abstract

District hospitals in South Africa play a crucial role in healthcare delivery, particularly in underserved areas. Despite their importance, there is limited research on methodological assessments and forecasting models for evaluating their performance. The study employs a systematic literature review approach, focusing on empirical studies that utilised methodological tools such as statistical models and time-series analysis. Specifically, ARIMA (AutoRegressive Integrated Moving Average) model will be used to forecast future trends in service adoption. A key finding is the significant variation in patient utilisation rates across different district hospitals, with some showing a 30% higher adoption rate for antenatal care services compared to others. The review highlights gaps in methodological consistency and recommends adopting standardised forecasting models to improve the reliability of service adoption predictions. Health policymakers should prioritise methodological standardization and encourage the use of robust time-series analysis tools like ARIMA for evaluating healthcare system performance. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\neg} p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, spatial analysis, econometrics, regression analysis, predictive modelling, healthcare delivery, geographical information systems*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge