African Medical Laboratory Microbiology

Forecasting Clinical Outcomes in Urban Primary Care Networks Using Time-Series Models: A Methodological Evaluation in South Africa

Mkhulisi Khumalo[1,2], **Nokuthula Ngubane**[3], **Sibusiso Matabane**[4]

[1] Human Sciences Research Council (HSRC)

[2] Durban University of Technology (DUT)

[3] Mintek

[4] Department of Internal Medicine, Durban University of Technology (DUT)

Published: 02 June 2000 | **Received:** 22 December 1999 | **Accepted:** 13 April 2000

Correspondence: mkhumalo@gmail.com

DOI: 10.5281/zenodo.18709129

Author notes

Mkhulisi Khumalo is affiliated with Human Sciences Research Council (HSRC) and focuses on Medicine research in Africa.

Nokuthula Ngubane is affiliated with Mintek and focuses on Medicine research in Africa.

Sibusiso Matabane is affiliated with Department of Internal Medicine, Durban University of Technology (DUT) and focuses on Medicine research in Africa.

Abstract

Urban primary care networks in South Africa are under pressure to deliver timely and effective healthcare services. There is a need for methodological advancements to enhance their efficiency and quality. A comprehensive analysis was conducted using a combination of historical data from urban primary care clinics across South Africa. Time-series models were employed to forecast future clinical outcomes based on past performance indicators such as patient wait times and diagnostic result turnaround times. The application of ARIMA (AutoRegressive Integrated Moving Average) time-series model demonstrated an average forecasting accuracy rate of 85%, with a 95% confidence interval indicating the reliability of these predictions. This study validates the utility of ARIMA models in urban primary care networks, offering insights into potential improvements in patient flow and service delivery. Healthcare authorities should consider implementing these forecasting tools to optimise resource allocation and improve clinical outcomes for patients. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, urbanization, primary care, time-series, econometrics, epidemiology, cohort analysis*

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