African Journal of Surgery

Bayesian Hierarchical Model Assessment of Public Health Surveillance System Reliability in South Africa

Mpho Khumalo[1], **Sipho Mkhize**[1,2], **Nomsa Xulu**[1,2]

[1] Durban University of Technology (DUT)

[2] SA Astronomical Observatory (SAAO)

Published: 04 November 2010 | **Received:** 04 August 2010 | **Accepted:** 20 September 2010

Correspondence: mkhumalo@yahoo.com

DOI: 10.5281/zenodo.18901504

Author notes

Mpho Khumalo is affiliated with Durban University of Technology (DUT) and focuses on Medicine research in Africa.
Sipho Mkhize is affiliated with SA Astronomical Observatory (SAAO) and focuses on Medicine research in Africa.
Nomsa Xulu is affiliated with SA Astronomical Observatory (SAAO) and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems are essential for monitoring disease prevalence and guiding public policy in South Africa. However, their reliability often varies, necessitating a methodological evaluation. A Bayesian hierarchical model was applied to assess system performance across different regions and time periods. The model accounts for spatial and temporal dependencies, providing robust estimates of system reliability. The analysis revealed significant variability in system reliability across provinces, indicating that some surveillance systems may not be consistently reliable over time or by region. This study highlights the importance of regular evaluation to ensure public health surveillance systems provide accurate and consistent data for policy-making. Public health officials should consider revising surveillance strategies in regions with unreliable performance, aiming to improve overall system reliability. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African epidemiology, Bayesian inference, hierarchical modelling, public health surveillance, reliability assessment, spatial analysis, stochastic processes*

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