Bayesian Hierarchical Model for Evaluating Public Health Surveillance Systems in South Africa,

Nandi Motshega[1]**, Sipho Khumalo**[1,2]

[1] Council for Scientific and Industrial Research (CSIR)

[2] Cape Peninsula University of Technology (CPUT)

Author notes

Nandi Motshega is affiliated with Council for Scientific and Industrial Research (CSIR) and focuses on Medicine research in Africa.

Sipho Khumalo is affiliated with Cape Peninsula University of Technology (CPUT) and focuses on Medicine research in Africa.

Abstract

Public health surveillance systems in South Africa have been evaluated sporadically over the years to assess their effectiveness and efficiency. A Bayesian hierarchical model will be used to analyse surveillance data from South Africa's public health systems. This approach allows for the incorporation of spatial and temporal variability in disease incidence. The analysis revealed a significant reduction ($p < 0.05$) in reported infectious diseases across monitored areas, indicating improved detection capabilities. The Bayesian hierarchical model successfully quantifies risk reduction within South Africa's public health surveillance systems. Future evaluations should consider expanding the model to include additional variables and regions for comprehensive assessment. 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 geography, Bayesian inference, hierarchical modelling, Markov chain Monte Carlo, surveillance systems, risk assessment, spatial analysis*

2001(1): 10-19 (2001) | *Nandi Motshega et al.*

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