

Analysing and quantifying the effect of predictors of stroke direct costs in South Africa using quantile regression

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ABSTRACT

Statement of the problem: In South Africa (SA), stroke is the second highest cause of mortality and disability. Apart from being the main killer and cause of disability, stroke is an expensive disease to live with. Stroke costs include death and medical costs. Little is known about the stroke burden, particularly the stroke direct costs in SA. Identification of stroke costs predictors using appropriate statistical methods can help formulate appropriate health programs and policies aimed at reducing the stroke burden. Analysis of stroke costs have in the main, concentrated on mean regression, yet modelling with quantile regression (QR) is more appropriate than using mean regression. This study aims to estimate stroke direct costs, identify and quantify its predictors through QR analysis.

Methodology: Hospital-based data from 35 730 stroke cases were retrieved from selected private and public hospitals between January 2014 and December 2018. QR model provides richer information about the predictors on costs. The prevalence-based approach was used to estimate the total stroke costs. Thus, stroke costs were estimated by taking into account the costs of all stroke patients admitted during the study period. Quantiles of stroke direct costs, with a focus on predictors, were modelled and the impact of predictors determined. QR plots of slopes were developed to visually examine the impact of the predictors across selected quantiles. Findings: Of the 35730 stroke cases, 22183 were diabetic. The estimated total direct costs over five years were R7.3 trillion, with R2.6 billion from inpatient care. The economic stroke burden was found to increase in people with hypertension, heart problems, and diabetes.

Conclusion & Significance: The identified predictors can be used to raise awareness on modifiable predictors and promote campaigns for healthy dietary choices. Modelling costs predictors using multivariate QR models could be beneficial for addressing the stroke burden in SA.

BIOGRAPHY

Mrs Lyness Matizirofa is a final year PhD student at the University of South Africa, South Africa. Her thesis is titled, Quantile regression analysis of incidence of stroke when predictors are measured with error. She holds an MSc in statistics and is an experienced statistics lecturer with solid experience in teaching and providing statistical consulting. Lyness enjoys collaborating with researchers/scientists from different disciplines to develop new skills and solve new challenges. Her research interests include Biostatistics, Public Health, Clinical Trials and Applied Statistics. She has worked as a biostatistician for different projects at the School of Public Health, South African Medical Research Council and South African Tuberculosis Vaccine Initiative. She is a professional member of the South African Statistical Association and Institute of Certificated Chartered Statistician of South Africa. She was Awarded 5 professional development certificates by the School of Public Health, UWC. Lyness has already published eight peer-reviewed publications from her PhD thesis.

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