

## **A Bayesian two-part model applied to analyze risk factors of adult mortality in Namibia**

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Despite remarkable gains in life expectancy and declining mortality in the 21<sup>st</sup> century, in many places mostly in developing countries, adult mortality has increased in part due to HIV/AIDS or continued abject poverty levels. However many factors including social, economic and demographic variables work simultaneously to impact on risk of mortality. Understanding risk factors of adult mortality is crucial towards designing appropriate public health interventions. In this paper we propose a structured additive two-part random effects model for adult mortality data. Our proposal is that there are two processes: (i) whether death occurred in the household (prevalence), and (ii) number of reported deaths, if death did occur (severity). The proposed model specification therefore consisted of two generalized linear mixed models (GLMM) with correlated random effects which permitted structured and unstructured spatial components at regional level. Specifically, the first part assumed a GLMM with a logistic link and the second part explored a count model following either a Poisson or Negative binomial distribution. The model is used to analyze adult mortality data of 42,300 individuals from the 2006/2007 Namibia DHS data. Inference is based on the Bayesian framework with appropriate priors discussed.

Key words: adult mortality, two-part models, correlated random effects, Namibia, DHS, Bayesian inference