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An application of MCMC simulation in mortality projection for populations with limited data

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Abstract

Objective: IIn this paper, we investigate the use of Bayesian modeling and Markov chain Monte Carlo (MCMC) simulation, via the software WinBUGS, to project future mortality for populations with limited data. In particular, we adapt some extensions of the Lee-Carter method under the Bayesian framework to allow for situations in which mortality data are scarce. Our approach would be useful for certain developing nations that have not been regularly collecting death counts and population statistics. Inferences of the model estimates and forecasts can readily be drawn from the simulated samples. Information on another population resembling the population under study can be exploited and incorporated into the prior distributions in order to facilitate the construction of probability intervals. The two sets of data can also be modeled in a joint manner. We demonstrate an application of this approach to some data from China and Taiwan.

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