Inference for Logistic-type Models for the Force of Mortality
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Abstract

Logistic-type models for the force of mortality like those introduced by Perks or Kannisto provide better fit to mortality data of people aged over 85 than Makeham's model where the force of mortality increases exponentially with age. However, the difficulty in estimating their parameters by the maximum likelihood method makes their use less popular among actuaries.

For Kannisto's model, we propose a weighted least-squares estimator which can easily be calculated with any regression software; the estimator is shown to be consistent, asymptotically unbiased and normally distributed. For Perks' model, using a Taylor's series expansion, the estimation problem is again reduced to a least-squares problem. The various estimators proposed in the paper are compared numerically using Canadian mortality data.