Quantitative Methods in Demography Workshop and Tutorial (QMDWT)

Mortality measurement and modelling at advanced ages

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The growing number of persons living beyond age 80 underscores the need for accurate measurement of mortality at advanced ages. Earlier studies suggested that the exponential growth of mortality with age (Gompertz law) is followed by a period of deceleration, with slower rates of mortality increase. This study challenges earlier conclusions with new data from the U.S. Social Security Administration's Death Master File and survival records for laboratory mice and rats. Analyses of human extinct birth cohorts (1890-1898) demonstrated that mortality deceleration is far less pronounced when it is measured over monthly (rather than yearly) age intervals, and in higher-quality data. Mortality deceleration is also challenged by recent rodent data. Simulations show that some estimates of mortality may produce spurious mortality deceleration, while the Sacher estimate turns out to be the most accurate estimate of hazard rate.

Additional reading:

Gavrilov L.A., Gavrilova N.S. Mortality measurement at advanced ages: A study of the Social Security Administration Death Master File. *North American Actuarial Journal*, 2011, 15(3): 432-447.

Full text available at: http://longevity-science.org/pdf/Mortality-NAAJ-2011.pdf