Extreme Value Analysis of Mortality at the Oldest Ages: A Case Study Based on Individual Ages at Death

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Abstract

In this paper, the force of mortality at the oldest ages is studied using the statistical tools from extreme value theory. A unique database recording all individual ages at death above 95 for extinct cohorts born in Belgium between 1886 and 1904 is used to illustrate the relevance of the proposed approach. No leveling off in the force of mortality at the oldest ages is found, and the analysis supports the existence of an upper limit to human lifetime for these cohorts. Therefore, assuming that the force of mortality becomes ultimately constant—i.e., that the remaining lifetime tends to the negative exponential distribution as the attained age grows—is a conservative strategy for managing life annuities.

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