The Human Mortality Trajectory Beyond the Age of 105

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Death rates at high ages level off for many species and humans are no exception. The fact that the human mortality trajectory increases slower than a Gompertz hazard for ages above age 85 is well established. Still it was not clear whether this deceleration in increase of mortality ultimately would lead to a plateau or even a decline in death rates at the most extreme ages because data on mortality at extreme ages inevitably are sparse. Therefore the project of the International Database on Longevity (IDL) was initiated. The IDL is a concerted international effort to gather age-ascertainment bias free and validated data on supercentenarians, that is people who attained an age of at least 110 years. Currently the database contains information on more than 800 individuals from 15 different countries for whom dates of birth and dates of death (or age when last seen, if individuals are still alive) have been thoroughly validated. More recently the range of ages covered by the IDL was extended to include people from the age 105 years and above.

This presentation first will describe the contents of the IDL and will give an overview on the basic characteristics of the data contained in the database, including period trends in the number of supercentenarians and the maximum age at death observed. Secondly, we will present methods and results of estimating the trajectory of human mortality from these data. Employing techniques of almost extinct cohorts and several statistical procedures we obtained the striking result that human force of mortality is flat after age 110, corresponding to an annual probability of death of about 50%, both for men and women. To further investigate when the actual leveling of the human mortality trajectory occurs, new incoming data on individuals at ages 105+ will be included in the analysis.