Living to 100 and Beyond: Survival at Advanced Ages

Session 8: Mortality at Oldest Ages Session – Part II

DISCUSSANT: Ward Kingkade, PhD

1) In this session we have two papers. The first, by James Fox on Pensioner Mortality in the New York State Retirement System, is the most "actuarially oriented" of the papers I've reviewed, in the sense that it's concerned with the longterm financial solvency of the Retirement System of New York. The New York data offer mortality series going back to 1921. Since 1986 there appears to be an asymptotic trend in the shape of the mortality schedule. Fox notes that the decline in mortality rates over time is better described by what he terms a "recursive relationship" than a simple Gompertz curve or the Lee-Carter formulation as he understands it. However, the methodology originally employed by Lee and Carter embodied an autoregressive process over time, which Fox may be capturing in his "recursive relationship". In any case, Fox forecasts mortality rates to year 2036 using the recursive relationship, which is "doing the right thing" as far as the Lee-Carter methodology is concerned.

The projected mortality rates that result from this exercise have magnitudes that are roughly two thirds of the current rates. The life expectancy at retirement age (62) amounts to 22 years in 2002; its projected 2036 level is 26 years. This gradual change can be absorbed by the system.

In the analysis Fox reports that the data were explored for mortality differences according to wage rates, but the differences failed to meet standard criteria of statistical significance. Fox notes that mortality in the population of New York as a whole probably differs from that of public employees, and that the extent of the difference may vary with changes in the composition and selectivity of New York State Public Employees.

This is a commendable paper: concise, to the point, and well qualified.

2) The paper on Mortality in Japan by Robine, Saito, and Jagger deals with the country which has arguably the best mortality conditions in the world. Japan's mortality statistics seem possibly better than those of the United States, in that Japan had established a vital register in 1872. Japan conducted periodic population Censuses since 1920, which is not bad by world standards. In addition, Japan has maintained an annual list of centenarians since 1963.

The paper makes much of the rise in Japan's overall life expectancy at birth. It must be noted that this trend is due mainly to declines in infant mortality rather than mortality at late age.

The paper has a number of interesting findings for those concerned with the future of mortality decline. Among other things, the Japanese data do not support the widely held notion that sex differentials in life expectancy will decline with rises in the overall level of life expectancy. The paper's main point is one that would be of major interest to

James Vaupel (unable to attend for health reasons), that is: the absence of evidence of any slowdown in the tempo of mortality decline, including at the extremes of late age.

As in other industrialized countries, Japan has experienced significant increases in numbers of centenarians. The authors examine a "centenarians doubling time" with adjustment for birth cohort size, which could be better elucidated, but which in any case is said to have declined. Similar results are claimed to hold for supercentenarians. The authors further examine the maximum reported age at death, which has shown a regular increase since the 1950s. Similar results obtain for the 10^{th} highest age at death. As a Statistician, I applaud this backup check.

As in the United Kingdom, Japan's Government has maintained a list of 99-year olds which can be pressed into service to estimate the mortality of centenarians. This analysis indicates a decline in mortality at age 100 years among both men and women. Further on, data for 105 year olds show a clear decline in mortality for women but are ambiguous with regard to men.

Seasonal data are exploited in an effort to gage the potential for further mortality decline in Japan. As one would expect, Japanese mortality is higher in the winter than in the summer. The authors argue that if Japan could only maintain mortality at its summer level throughout the year, this would lead to a 20-percent decline in mortality among males and a 16-percent decline in female mortality.

The authors point out that although Japan's female life expectancy is close to James Fries' "limit" of 85 years, there is no evidence of any slowdown in the trend of increasing male and female life expectancy in the Japanese population.

As mentioned already, this is a paper Jim Vaupel would have liked to hear.