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MORTALITY AGE PATTERNS: TRENDS, PROJECTIONS AND LIFE PREPARANCY

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During the SOA's recent Living to 100 Symposium, one of the sessions that got me thinking much more deeply about the financing of public retirement plans was titled "Mortality Age Patterns: Trends and Projections." Individuals at the session presented research on the growing lifespans of retirees, increasing the challenges that public plans can face in determining appropriate funding levels. The presentations were followed by a terrific discussion on the papers by Johnny Li, and an even broader informal discussion from key audience members on the subject. All of the abstracts, papers, discussant comments and the informal discussion transcript are available at the SOA's online monograph at *https://www.soa.org/Library/Monographs/Life/Living-to-100/2014/2014-toc-listing.aspx.*

The key to these papers lies mainly in their focus on what mortality observations can be made—not just as people enter the early phases of retirement ages—but also at more extreme ages. In the past several decades, the right-hand tail of the "age at death" distribution has grown considerably denser. Compounding the two issues of a volatile and declining interest rate environment, as well as economic uncertainty in public plan sponsor contributions, there is also a growing need to fund annuity payments for longer periods of time.

The SOA recently gave testimony at the Select Revenue Measures subcommittee of the U.S. House Ways and Means Committee on the evolution of our exposed RP-2014 mortality table, developed by the SOA's Retirement Plans Experience Committee. While the prime focus of the study is the mortality of individuals within privately-sponsored plans, previous generations of the study, such as RP-2000, have often been used as a starting point (often with factors applied, and additional details of the specific plan incorporated) for evaluating public plan liabilities. We should also note that the SOA is planning to begin its investigation on a public-plan specific mortality table in 2015, with the intention of, additionally, studying subgroups where mortality may differ within a plan—such as for teachers or public protection occupations. In the testimony, most of the focus was on the commonly-asked question: "What is the life expectancy increase in moving to the new table for a retiree who has lived to age 65?" In some respects, it's an appropriate question, and it certainly is the one that gets quoted most often. However, hidden in the details of the life expectancy calculation are some underlying concepts about what is actually happening at the more extreme ages.

As actuaries, we know that life expectancies are more a measure of the mean of a survival distribution. Lower mortality rates mean higher life expectancies. The "life expectancy at birth" or "life expectancy at age 65" calculation, however, can tell only portions of the story. What might be more important for retirees and plan sponsors to know is the age at which a specified (smaller) percentage of the retiree population is expected to survive—perhaps a percentage such as 5 percent or 10 percent. I've come to call this term the *Life Preparancy Age*, with the name as a reminder to retirees to prepare their retirement portfolios to be successful 90 percent or 95 percent of the time, instead of only 50 percent of the

time, as implied by life expectancy. We've seen through some initial calculations under the RP-2000 basis, compared to an RP-2014 basis, that while life expectancies for retirees may increase two to 2.5 years, Life Preparancy Ages can increase well beyond three or more years due to the material improvements in mortality for ages 80 and higher.

I'd encourage actuaries, plan sponsors and retirement advisers to look through our recently released monograph of the proceedings of Living to 100, as well as note some of the growing results from our exposed RP-2014 mortality tables and RPEC_2014 mortality model. As we continue our study on public plan mortality in the future, having a solid understanding of what's occurring in longevity research around the world will be of great benefit.

ENDNOTE

1 The session covered three papers on the topic: "Coherent Projections of Age, Period and Cohort Dependent Mortality Improvements" by Matthias Börger and Marie-Christine Aleksic; "Measurement of Mortality among Centenarians in Canada" by Nadine Ouellette and Robert Bourbeau; and "Mortality Trajectories at Extreme Old Ages: A Comparative Study of Different Data Sources on U.S. Old-Age Mortality" by Natalia S. Gavrilova and Leonid A. Gavrilov.