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THE 2011 "LIVING TO 100" SYMPOSIUM A COMPILATION OF ATTENDING ACTUARIES' COMMENTS *By Anna Rappaport, with Eric Fredén*

The Society of Actuaries (SOA) has been investigating high-age mortality for many years and embarked on a Living to 100 and Beyond project about 10 years ago. Livingto100.soa.org. The fourth triennial symposium was held in Orlando in January 2011. The website includes the papers from each symposium (in a monograph) as well as resources and other information. The Pension Section along with several other SOA groups and many outside groups were sponsors of the 2011 Living to 100 Symposium.

The papers and panels cover a wide range of topics including mortality trends and projection methods, implications of long life, high-age mortality data, international comparisons and more. Attendees are diverse and take away from the symposium different observations about what is important to them. This article is a compilation of comments shared by several actuaries working in different roles with retirement systems who attended the recent symposium.

The Overall Experience at Living to 100 Symposium
Steve Siegel, SOA research actuary supporting retirement systems,
observed as follows.

"For me, the Living to 100 Symposium series is an effort that actuaries and the SOA, in particular, are well-suited to lead. Given our expertise in mortality, morbidity, and their implications, it's a natural fit for us! I attended the first Living to 100 Symposium in 2002 just a couple of months after I started in the research department at the SOA. I remember at that time being awestruck by the debate on what is the potential for the length of the human life span. I had always been fascinated by this subject since my childhood, reading about the world's oldest men and women in the annual edition of the Guinness Book of World Records. But, there is really

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no substitute for hearing the preeminent experts in the world discuss this in person and that's definitely made the Living to 100 series among my personal favorite experiences in my time at the SOA."

"At this year's symposium, keynote speaker Steve Austad led off with an intriguing presentation of the drug known as Rapamycin, which has been shown in some studies to prolong the life span of mice. As well, the drug also holds promise for a number of diseases. Whether or not this extension of life effect can somehow be transferred to human beings remains to be seen. One important takeaway I've learned from the Living to 100 series is to have a healthy bit of skepticism for anything that claims to extend life or has definitive answers to aging. It's important to hear both sides and that's what the Living to 100 series does so well by providing a forum for debate—and one that changes at each event."

Jean-Claude Ménard, chief actuary of the Office of the Superintendent of Financial Institutions (OSFI) in Canada, opened his response to me by indicating that he feels privileged to have the opportunity to speak at this symposium. I feel the same way, and I have participated in all four symposia. Ménard focused us on the key ages to think about: *"For a pension plan actuary, the future challenge is not so much to project how many people will still be alive at 100, but more so at age 85."*

Projecting Mortality was a Key Part of the Discussion
The actuaries devoted a lot of their discussion to this topic, and there is overlap in what we heard from them. Chris Bone, principal, Edth Ltd LLC, focused on the topic of mortality projection scales and the need to rethink them.

"In the United States and in pretty much all Western countries the age group projected to show the highest percentage increase is the centenarian population. Modal ages for death (the age at which the largest number of individuals die) have continued to increase and are now in the late 80s for many populations. These are just a couple of the facts bandied about at this great conference—one which I have always meant to attend, but could never fit into the January timetable of a retirement consulting practice.

"Over a period as short as my career, life expectancies for pensioners have increased quite dramatically. In the mid-'90s there was a discussion of whether increases in life expectancy were permanent enough so that actuaries should explicitly reflect future improvements in mortality. After robust debate on the various committees, this led to a decision for the SOA to issue the 1994 Group Annuity Reserving table with an explicit provision for reflecting future mortality improvement set forth as Table AA. Table AA was based on a blend of the mortality improvement observed in

the Civil Service Retirement System and Social Security during a period centered on the 1980s, but extending several years in either direction (1977-1993).

"In keeping with the focus of this conference, several papers looked at actuarial projections of mortality improvement in the United Kingdom, United States and Canada. Other papers reviewed the utility and experience of scale AA against more recent experience, finding that actual improvements in mortality have generally occurred more rapidly than scale AA predicted. One paper found that while scale AA fairly represented the mortality improvement of the '80s, recent mortality improvement trends, as shown in the Human Mortality Database, have accelerated."

"There remains much debate as to whether these trends can or will be maintained, but those who formulate the next version of scale AA will need to carefully consider how scale AA compared to Lee-Carter extrapolation and the interesting work taking place in the United Kingdom and other countries. But it is now time for retirement actuaries to begin considering the replacement for scale AA."

Diane Storm, another long-term participant in the SOA's retirement research efforts, also commented about mortality projections. *"The Lee-Carter model and subsequent variations of the model are sophisticated and helpful, but other methods historically used by actuaries for projecting mortality improvement still give reasonable results. The mid-range/moderate improvement rates used for SSA projections are not nearly as high as the recent actual improvement rates."*

Lisa Schilling, the actuary of the General Board of Pensions of the United Methodist Church, joined in the discussion of mortality projections as well. When asked, *"What did you learn or hear at Living to 100 that you would most like to share with your colleagues?" she responded, "A Canadian study showed that actual mortality improvements have borne little resemblance to projection scale AA. We need to re-think how we're projecting mortality."*

Ménard told us: *"I learned that it might be possible to reach a life expectancy at birth of 88 to 90 years old for both sexes in the next three decades. At the same time, reaching 100 years old for half of the population represents a huge challenge. Reaching age 88 for half of the population would nevertheless create a huge financial pressure on pension plans."*

Tom Levy, chief actuary of the Segal Company, said, *"Among the key evidence about life span limits is that the mode age at death has been increasing, but the maximum age essentially has not. This suggests that*

we might hit a limit in, say, 30 years by which time we may have virtually eliminated today's terminal illnesses, but still be left with physical deterioration." Levy also said, "In Taiwan, there was a noticeable increase in the rate of mortality improvement after National Health Insurance was implemented. This is obviously an area that could potentially change current expectations for mortality improvement in the United States. Of course, we are primarily concerned with the mortality of those in defined-benefit (DB) pension and postretirement medical plans, and they may already be getting satisfactory care."

Levy says he was surprised by this: *"At older ages (85+), male mortality rates in Canada are actually lower than female rates in the United States."* Ménard responded that the statement is *"true if you calculate a mortality rate for the age group 85+ as a whole. The story is different if you look at mortality rates age by age. Nevertheless, since 2000, the shrinking of the difference of mortality rates between these two groups is remarkable."*

We Should Be Thinking about Fundamental Change in Our Retirement Systems

As we live longer, and as we experience the impact of the baby boom, our society will change in fundamental ways. My first choice would have been to focus on that fundamental change. The retirement panel on the first afternoon focused on these issues. An audio tape is available and there will be an article published later this year. My paper written jointly with Mary Nell Billings and presented at Living to 100, "Living to 100: Challenges and Opportunities for Employers," focuses on these topics.

Schilling, in responding to the question: *"What are the most important implications of what you learned for retirement actuaries and the overall retirement system?"* said, *"Retirement as we know it needs to change, and quite dramatically. This idea and several related specifics have been 'out there' for a while, and the various papers and perspectives presented at the symposium really drove it home."* The SOA Retirement 20/20 project is another source of information on this topic.

Ménard added to this discussion: *"Retirement is expensive and will become even more expensive in the future. No matter if it is a fully funded plan or a pay-as-you-go plan, no matter if it is a DB or a defined-contribution (DC) solution, no matter if it is a national public scheme or a private pension plan, the fact is that increased longevity will continue to put pressure on the financing of pension plans. It seems that there is a natural convergence among countries and among sexes while, at the same time, there is a growing disparity between countries."*

"Said differently, there is a continued decrease in mortality rates particularly after age 65 around the world. At the same time, some

countries are progressing faster than others. Over the past 20 years, the United States tends to lag compared to Scandinavian countries, Japan, Central Europe (mainly France and Italy), Australia and Canada. It seems that disparity of income within a population might be the reason for this growing disparity. While medical improvements theoretically permit a longer life, an adequate income (either working or retirement income) is needed to live longer."

Different Perspectives and Views

Ménard reminded us of the uncertainty as we deal with these issues:

"There are huge uncertainties behind any projections of future centenarians over the next century."

Storm told us: *"There is a tension and almost a disconnect in the way demographers, gerontologists and health professionals view mortality improvement versus how statisticians and many actuaries view it. The former see obesity and other health issues as important factors to be used when projecting mortality improvement. The latter are more focused on projecting past improvements using statistical modeling."*

Schilling found a difference in the 2011 and 2008 discussions: When asked: *"Was there anything that surprised you?" she responded: "The lack of controversy. Three years ago, there were clearly two viewpoints, each represented by various presenters. This year, no one argued that mortality would continue to improve like it has in recent decades. Everyone who spoke on this topic agreed that at some point, mortality improvements are expected to slow down quite a bit and probably we'll see decreases in life expectancy, largely due to the dramatic increase in obesity, and especially obesity among children."*

Beverly J. Orth, a principal at Mercer, and author of a Living to 100 paper, told us:

"I saw stark contrasts between the 2008 and the 2011 Living to 100 Symposia. In 2008, we focused on exploring ways to extend healthy years beyond current life expectancies. In 2011, we are starting to grasp the societal implications of a much longer life span."

"I found the panel of public pension fund actuaries quite thought-provoking. Two of the speakers said that they expect life expectancies to continue increasing along the straight-line trajectory followed for the last 150 years. Yet most biologists believe there is a natural limit to the human life span, as exhibited by all organisms that reach a fixed size in adulthood. Clearly, these two theories cannot both be correct."

"My view is that, as we eliminate causes of early death from diseases,

most humans will live to between 130 and 150 years of age and then die from the effects of dementia. Reproductive years will continue into the 70s or later and we will be able to (and need to) work beyond age 100. The challenge will be to postpone the onset of dementia to the very end of life so that its financial and emotional effects are brief."

Storm commented: *"While many scientists/biologists think we are near a breakthrough in extending the upper age limit at death, most of the recent mortality studies all over the world show that the survivor curve is simply becoming more square at the end" (or as one study put it, "...more rectangular due to the increase in the concentration of deaths around the mode").*

Levy focused on a different area of uncertainty: *"There is no real data to evaluate whether work-related skills are deteriorating at a slower rate as people live longer. That is, it is not clear that people will be able to work longer just because they are living longer. The best that can be said at this point is that there is some evidence that one's ability to do the same work one has been doing does not deteriorate as fast as other abilities. I suspect that this has always been true, and therefore that we cannot yet assume that the limits of people's potential work lives are changing. Of course, we know that the baby boomers appear reluctant to give up their jobs and that those in DC plans work longer than those in DB plans."*

Advice to the SOA

Ménard offered this advice: *"The SOA should focus on mortality rates past age 65. Indeed, it would be useful to study mortality trends for people aged between 65 and 89 and where it could go in the next three decades. There are significant uncertainties during a crucial period where most baby boomers will reach and live beyond the retirement age of 65. The financial impact could be significant depending on the trajectory of mortality rates."*

Symposium Favorites and Interesting Conversations

Storm shared these comments with us: *"I found very interesting one of the conclusions of the Gavrilov/Gavrilova paper regarding early-life predictors of exceptional longevity. Their study of U.S. death data for people who lived past 100 seems to indicate that the age of the mother of these centenarians is statistically significant. In other words, you have a better chance of living to 100 if your mother was younger than 25 when you were born. Since it seems that the percentage of first-time mothers over the age of 25 has been increasing, at least in this country, I wonder if this will affect how many people live to be 100."*

Ménard commented: *"I liked all the papers. The ones that caught my eye were: Bob Howard's presentation on mortality rates at advanced ages (95 to 110); Leonard Hayflick, Stephen Prus, Valerie Jarry, Steven Austad,*

Tom Perls and Rob Brown on public pension reforms; Geoff Rashbrooke on annual accrual rate, function of longevity; Chresten Dengsoe; and Steve Goss. One interesting quote of Hayflick's was: "Biological aging is the spontaneous, random, systemic, loss of molecular fidelity (or dysfunction) that eventually exceeds repair or maintenance capacity after reproductive maturation. It then becomes expressed as changes in higher levels of organization. This progressive molecular dysfunction increases vulnerability to age-associated diseases." AND "Longevity is governed by the excess physiological reserve and efficiency of repair, synthesis and turnover processes that must be maintained until the time of reproductive maturation." Indeed Hayflick's presentation is the one that I've enjoyed the most."

One of the opportunities presented by Living to 100 is the chance to talk to very interesting people. Ménard commented: *"At the end I had an interesting discussion with Jay Olshansky and Leonard Hayflick. I agreed to follow up with Leonard within a year with something he asked me. My intention is to further continue the discussion with Leonard and to come with some interesting results in three years' time at the next symposium."*

Conclusions

Living to 100 offers a very interesting chance to learn about a range of research on change very important to our society at large and to our retirement systems. Several actuarial colleagues have shared their key takeaways, and others will have different views. We encourage you to look at the website, read the papers and discuss the issues. In addition, maybe you would like to submit a paper to the next Living to 100.

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