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LIVING TO 100 SYMPOSIUM: *IS IT TIME FOR A NEW NAME?*

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In January 2014, the SOA sponsored the fifth triennial Living to 100 Symposium in Orlando. For me, the conference seemed dominated by the general sense that we all might be living longer than expected and that our descendants could be living A LOT longer. Consider this:

- the aging process itself has been slowed significantly in the laboratory for certain animals
- 3D printers are printing out live, useable human tissue
- the causes of aging at the molecular level are beginning to be understood

Well-reasoned speculation about very long life expectancies (with good health!) was commonplace at the symposium. "Living to 150" might end up being a better name for future symposiums.

THOUGHTS FROM KEY EXPERTS

A useful way to capture some of the significant thinking at the symposium is to summarize the ideas of some of the key experts who were present at the conference. Three key names that are useful to know about are:

James Vaupel, Ph.D. – Vaupel shows that the trajectory of improvement in life expectancy at birth has been remarkably linear, on the exact same slope, for over 170 years. He presents the implications of assuming that that same level of improvement will continue into the future. For example, the majority of children born today would live to be 100 if life expectancy continues to improve at the same rate.

Vaupel uses a projection based on identifying the country with the longest life expectancy at any point in time (Japan currently). Countries veer off the trend line and then veer back. The United States has veered off of the trend line in recent decades as improvement in life expectancy has decelerated, but it appears to be accelerating again.

While this simple projection technique results in some startling life expectancies for the future, Dr. Vaupel points out that experts in the past have continually forecast that mortality improvement would slow or end and have always been proven wrong to date.

Jay Olshansky, Ph.D. – Olshansky is one of the most prominent researchers in the area of longevity and he seems to have become more optimistic about the potential for increasing human longevity. He speaks passionately about the "longevity dividend" which would be the enormous social and economic benefits that potentially would result from slowing down the aging process.

Olshansky has, in the past, been outspoken about the idea that increasing obesity was reducing the rate of mortality improvement. This was primarily a U.S. phenomenon and mortality improvement in the United States has been accelerating again.

Olshansky may still believe that obesity will have an effect, but at the conference, and in recent writings, he seems more focused on the idea that we can combat aging directly. He is adamant that we should be looking for ways to slow the aging process rather than spending lots of money and resources on attacking the diseases of aging. He believes that there is evidence that aging can be slowed and he seems optimistic that at some point in the future that we will make discoveries in that area. However, he is not nearly as optimistic as Aubrey de Grey in how fast those discoveries will happen or how much impact they will have.

Aubrey de Grey – Similar to Olshansky, de Grey is focused on the potential to attack aging directly, rather than attack the diseases of aging (such as heart disease, cancer and Alzheimer's disease). He argues vehemently for funding research to attack aging, rather than the diseases and is head of a research foundation with that objective. He has an enthusiastic cult-like following based on

his TED talk (I got my picture taken with de Grey to impress my college-age son Tom who is fascinated by his ideas).

de Grey is the source of the highly speculative notion that the first person to live to 1000 may already have been born. de Grey bases this notion on what he calls longevity "escape velocity." Consider someone who is age 30 today, with a life expectancy to 75. As new medical technologies are discovered, life expectancies might gradually be extended such that by the time this person reached age 60, their life expectancy might have extended to age 100. Then, by the time the person reaches age 90 additional new techniques might have further extended lifetimes such that this person might expect to live to 125. As lifetimes are extended and more and more medical technologies are developed, the expected time of death can be continually pushed out. If the rate of discovery were fast enough (escape velocity), aging would no longer be a factor causing death and people could live until accidents or other unnatural factors resulted in death.

OTHER INTERESTING IDEAS

Other interesting ideas and concepts surfaced in various sessions:

AS NEW MEDICAL TECHNOLOGIES ARE DISCOVERED, LIFE EXPECTANCIES MIGHT GRADUALLY BE EXTENDED SO THAT "LIVING TO 150" COULD END UP BEING A BETTER NAME FOR FUTURE SYMPOSIUMS.

THE big question is whether longevity can be increased only because our lifetimes can be extended closer and closer to some maximum human lifetime, e.g., 120; or whether that maximum human lifetime can somehow be extended. The prevailing perspective is that there is a maximum human lifetime that has not yet been extended, but may be in the future.

"Senescence" is an important concept. It is a term used for biological aging—the gradual damage to the body's molecular structure and cells that ultimately result in death, regardless of illness. The process of senescence is not well understood at this time.

The idea that life expectancy has been improving extremely consistently along a linear trend line for a very long time was expressed by others, in addition to Dr. Vaupel. A continuation of life expectancy extension along this trend line implies rates of mortality improvement at older ages of about 2.5 percent. Scale BB improvement STARTS at about this level and trends down all the way to 1.0 percent, so there are experts that would consider Scale BB to be an aggressively low rate of anticipated improvement in mortality rates.

There is some evidence that mortality rates decelerate at higher ages, but also disagreement about this. Deceleration would mean, for example that the difference between the rate of mortality at age 106 and the rate of mortality at age 105 is less than the difference in the age 105 rate and the age 104 rate. That would be contrary to Gompertz' law that mortality rates increase exponen-

tially with age, after the reproductive phase.

Improvements in life expectancy in the early to mid-1900's was mainly at younger ages, whereas improvements in life expectancy in recent decades has been (and will be going forward) at older ages.

Advances in genetic research mean that more effective disease interventions can be designed by personalizing therapies to individuals based on their genetic makeup or the particular genetic cause of the disease (which may be different from individual to individual).

The advances in regenerative medicine where skin, muscles, blood vessels and other tissue are "grown" from samples of the same type cells or from stem cells (which can recreate any type of organ or tissue) are startling. All of those types of tissue are being created and are being used to replace injured or defective body parts. Organs like hearts, kidneys and livers are being grown outside of the body, but are not yet useable as transplants.

CONCLUDING REMARKS

There are plenty of sessions at Living to 100 about the impact of changes in longevity on our actuarial work. The potential consequences on the ultimate cost of the programs we work with are very significant. It behooves every one of us that works with pension, annuity and other old age programs to know something about what is going on with medical and aging research. In addition to adding a valuable aspect to your professional knowledge it is a fascinating area rife with interesting tidbits to amaze your friends and family.

Later this year a monograph of all of the presented papers will be available at the 2014 International Living to 100 Symposium website. ■