



SOCIETY OF ACTUARIES

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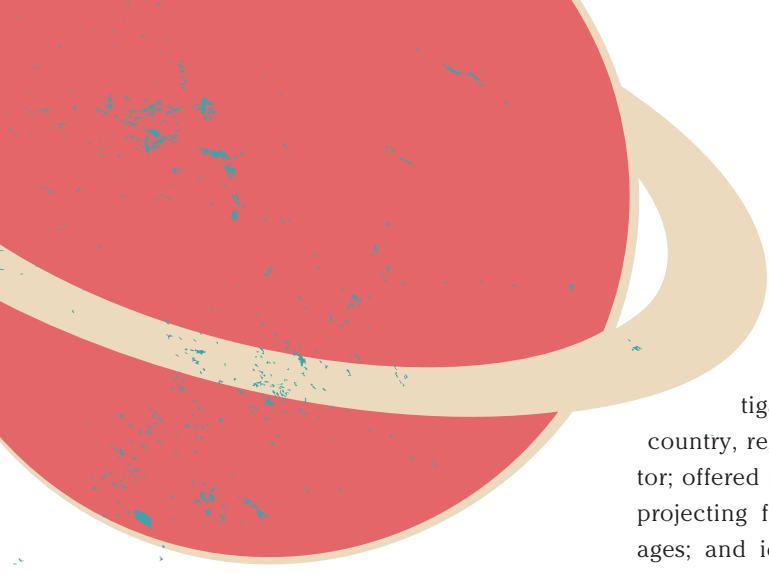




*THE TOMORROWLAND OF*  
**LONGEVITY**

BY RONORA STRYKER WITH CONTRIBUTIONS FROM STEVEN SIEGEL

**THE 2011 LIVING TO 100 SYMPOSIUM** explored the latest scientific theories on how and why we age, examined possible predictors of long life and offered new models and methods for projecting future mortality at the older ages.



**E**ARLY THIS YEAR I traveled to Orlando to attend the Society of Actuaries SOA Living to 100 Symposium. But before the symposium began I visited the Magic Kingdom at Walt Disney World. This was my first sojourn to the theme park since childhood. Unlike my earlier trip, one of the highlights for me was the sense of community I felt when I walked into the park. People from all over the world had a similar interest and purpose to mine. While the park was very crowded and the lines were long for the attractions, time went by quickly as I and my new international friends whom I met waiting in lines shared our thoughts and experiences with each other.

Several days later when Tim Harris, co-chairperson of the symposium organizing committee, welcomed attendees in some of their native languages, I had a similar feeling to my Walt Disney World experience. Although there were not tens of thousands of people in attendance, conference participants were from 17 different countries and varied professional backgrounds. Yet we had a common goal. We wanted to know about future human life expectancy and if it will continue to increase like in the past.

Of course, no one knows what the future will bring, but a range of ideas and observations about aging and the societal implications was presented. The 2011 Symposium, the fourth in the Living to 100 series: explored the latest scientific

theories on how and why we age; examined possible predictors of long life; investigated mortality differences by country, region and socioeconomic factor; offered new models and methods for projecting future mortality at the older ages; and identified and addressed the challenges individuals and societies face in managing post-retirement risks.

### ... the *SCIENCE OF AGING* is on the brink of being able to treat aging as a disease.

This article summarizes our interpretations of just a few of the intriguing questions addressed and hopefully will whet your appetite for a series of articles scheduled for future issues of *The Actuary*. This series will explore a number of topics from the symposium and provide an in-depth perspective on each of them. Look for a discussion on the implications of increasing longevity on financial and other systems in the next issue.

#### IS IT POSSIBLE TO SLOW AGING THROUGH THE USE OF PHARMACEUTICALS?

Stephen Austad, professor of cellular and structural biology at the Barshop Institute for Longevity & Aging at the University of Texas Health Science Center, San Antonio, led off the symposium with an explanation of this question. In his captivating presentation, he illustrated why aging research is at the beginning of what he calls the “Pharmaceutical Era.” Although there currently is not a drug that has proven to slow the aging process in humans, the science of aging is on the brink of being able to treat aging as a disease. Therefore, it is a realistic expectation for the future that such a drug will be found.

He explained there were three reasons for his belief. Unlike earlier days, “bad science” is quickly revealed because people read the studies and when they see something “bad,” they call attention to it. Second, there are rigorous testing protocols to confirm study results. Third, the understanding of the basic biology of aging is advancing rapidly. For example, scientists have identified more than 200 genes that,

when altered in animals, have been shown to extend their lives. Each of the genes is a potential target for a drug that could possibly make humans live longer.

One drug showing promise in slowing the human aging process is rapamycin. This is an immunosuppressant drug already used in human medicine to suppress organ rejection. Austad is currently testing the drug in mice and preliminary results have shown that the drug delays the onset and slows the progression of: Alzheimer’s Disease; cardiovascular disease; cancer; and helps protect immune function in late life. He warned not to run out and ask doctors for a prescription quite yet as more testing is needed using animals more closely related to humans such as monkeys.

Not all speakers shared Austad’s views. Leonard Hayflick, professor of anatomy at the University of California, San Francisco, School of Medicine, does not believe the aging process can be treated like a disease because it does not exhibit the same characteristics as a disease. Unlike any disease, age changes occur in every animal that reaches a fixed size in adulthood; occur in all spe-

cies after the age of reproductive maturation; occur in wild animals protected by humans even after that species probably has not experienced aging for thousands or millions of years; increase vulnerability to disease and death in all animals; and occur in the molecules of both animate and inanimate objects as molecules lose structural integrity and functional capacity over time. Instead, he believes that biological aging is the spontaneous, random, systemic loss of molecular function that eventually exceeds repair or maintenance capacity after reproductive maturation.

While he indicated delaying, slowing or eliminating the causes of death attributable to disease or pathology will increase human life expectancy, age changes will still continue. Even when all age-associated diseases are resolved, the increase to life expectancy would only be 15 to 20 more years. In fact, if a cure was found for Alzheimer's Disease, it would only add about 19 days to life expectancy.

Hayflick feels that the chances of slowing the aging process in humans are small as there needs to be more research about the fundamental biology of aging. He pointed out that, in the United States, the focus of aging research is not on understanding the biology of aging but on disease prevention, diagnosis, cure and care.

### **WILL THERE BE ENOUGH DOCTORS, NURSES AND HOSPITALS FOR AN AGING POPULATION?**

In addition to the scientific and technical sessions, there were sessions at Living to 100 on the practical implications of aging. Given the changing demographics in many of the developed countries around the world, one session focused on the increasing health

care needs as populations age and whether the needs will be met by increasing numbers of health care providers. Several country perspectives were presented on the future supply and demand for physicians and nurses.

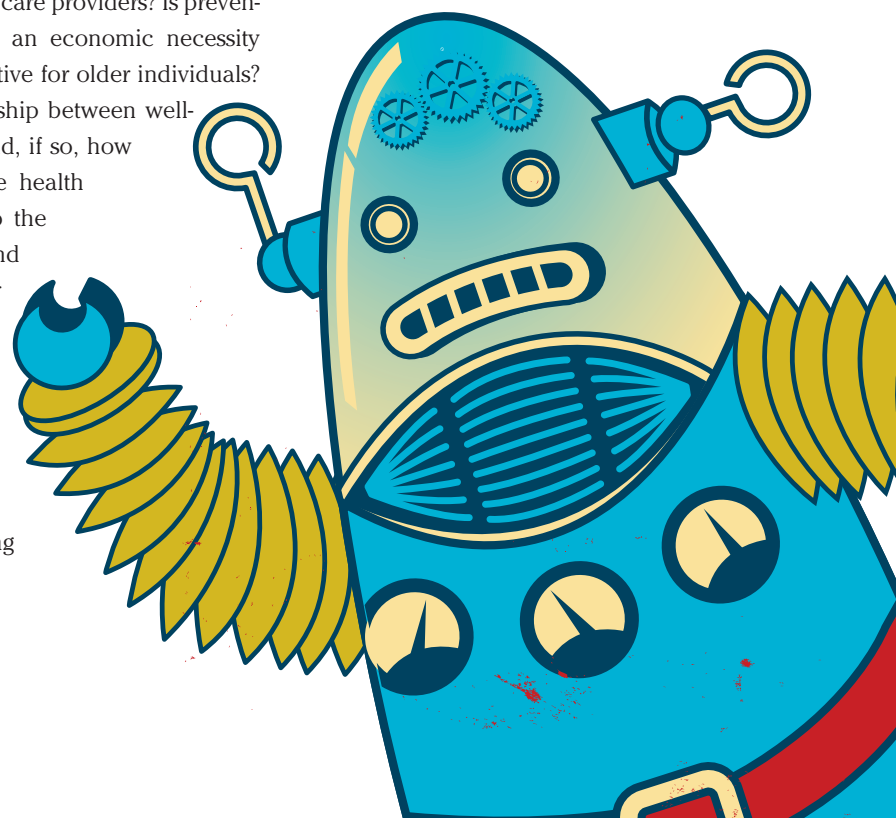
In the United Kingdom, Noreen Siba, managing director of the International Longevity Centre—U.K., mentioned while there has been a gradual increase in the number of doctors per 1,000, the United Kingdom's National Health Service (NHS) is believed to be understaffed compared to other international health systems. Given rising health care costs and NHS wanting to save funds, Siba opined that it is likely there will never be enough doctors and nurses to cope with the demographic change.

Siba raised interesting considerations that societies must face in trying to meet the future demand for health care services. How important are the changes in provider quality and quantity to obtaining improvements in the health and well-being of older individuals? As populations age, do increasing health needs have to be met by increasing numbers of health care providers? Is preventative health care an economic necessity and is it cost-effective for older individuals? Is there a relationship between wellness and work, and, if so, how might preventative health care contribute to the employment and well-being of older individuals? How will best practices and efficiencies that emerge from developed countries cascade down to developing countries?

Doug Andrews, a member of the Canadian Institute of Actuaries Health Committee, provided a Canadian viewpoint to the future demand and supply of health care providers. While Siba thought the United Kingdom will likely not have enough providers to handle demand, Andrews didn't know if Canada would be in the same predicament as there are a number of factors affecting this situation. While it is impossible to include all of Andrews' observations in this overview, a few of the factors he mentioned follow.

The size of the waiting list for health care services impacts provider supply. Since provincial governments do not want residents to go elsewhere for services, governments will likely be involved in managing the waiting lines and determining appropriate lengths. This suggests there might always be a sufficient provider supply for demand.

Among the Organisation for Economic Co-operation and Development (OECD) countries, Canada has the highest index



of geographic concentration of the population in small regions. This makes it difficult in delivering health care on a uniform basis among the population. An issue in determining whether provider supply is sufficient is how health care services get distributed across the population.

Another factor affecting the number of providers is that the education and licensing of doctors and nurses is dependent on governmental support. As of 2008 there were 1.95 physicians per 1,000. This might be considered a shortage as typically two physicians per 1,000 is considered adequate. The number of registered nurses (RNs) appears adequate at about 10 RNs per 1,000. If government provides more funding, there could be an increase in the number of providers.

Dr. William Peck, a physician and director of the Center for Health Policy at Washington University, discussed the U.S. landscape. Similar to Andrews, Dr. Peck is not sure that there will be a shortage of health care professionals for the increasing demand. Peck did note, though, many reasons to believe that there will be a shortage in the United States including the following:

- Demand for health care services continues to increase with the emergence of chronic illness.
- There is also evidence that there currently is a shortage of primary care physicians and this is where the shortage is believed to be most significant in the future.
- It will be difficult to expand the primary care physician workforce as there are fewer medical school graduates in America going into primary care.
- Expansion of the primary care physician workforce is dependent upon the federal government as they provide the funding for the number of residencies.

However, he also pointed out that while the demand for services is increasing, the practice of medicine will likely change significantly over the next 20 to 30 years and no one knows what the impact of this will be on physician supply. Panelists offered insight into what the future practice of medicine might look like, indicating RNs might play a larger role than today in an individual's health care management.

### HOW WILL INDIVIDUALS ADAPT TO LONGER LIVES IN TERMS OF WORK AND RETIREMENT?

A panel of distinguished experts tackled this and other questions in one of the highlights of the symposium. Moderated by Robert Powell of MarketWatch, the panel discussed the concept of phased retirement and phases of retirement as well as potential paradigm shifts for retirement. The panel included:

**Donald Segal, FSA, FCA, MAAA, EA**—president of the SOA and a vice president with Aon Hewitt,

**Paul Laporte, ASA**—consultant, formerly with LIMRA International,

**Anna Rappaport, FSA, MAAA, EA**—owner of Anna Rappaport Consulting, and

**Andrew Peterson, FSA, FCA, MAAA, EA**—retirement staff fellow at the SOA.

The common denominator for all panelists except Peterson is that they are examples of phased retirees. In simple terms, phased retirement is a process of leaving the workforce in a gradual manner, rather than all at once. Segal led off by explaining that he retired from his full-time job about five-and-a-half years ago to take a part-time job where he essentially works three days a week. As Segal noted, he wanted to cut back from full-time work, but was not ready to stop completely. For Laporte, an opportunity to retire from LIMRA International sparked a second career that he phased into by partnering with his son in a financial planning business. Wanting to have time to pursue artistic interests and spend more time with family prompted Rappaport to open her own consulting firm and retire from full-time consulting. In this way, she has phased into a lifestyle where she is not on-call full-time and can take on assignments that she finds meaningful.

Clearly, the panelists implied living longer will make instances of phased retirement more common and desirable as individuals find more opportunities to balance work and free time. However, this trend may be somewhat moderated as retirees experience diminishing physical and mental capabilities as they progress through what is commonly referred to as the phases of retirement. Phases of retirement refer to distinct stages where retiree limitations can become progressively more inhibiting and make the possibility of working completely impractical.

## LEARN MORE

Learn more about the **LIVING TO 100** initiative and symposium at <http://livingto100.soa.org>.





The panelists noted that the interaction between phased retirement, living longer, and the experience of different stages of retirement will impact stakeholders in different ways. For instance, employers will need to determine how they can best retain the talent they need, while balancing an appropriate mixture of younger and older workers. Businesses will need to find different ways to use people, employ them, reward them, and provide benefits. Panelists looked at this as both a huge challenge and an opportunity.

The panelists were also asked about the retirement issues that presented the biggest challenges based on what they heard at the symposium or in the news. Laporte noted the issue of Social Security and primarily the potential for raising the retirement age. He further commented that the actuarial

profession had proposed this as an actuarial solution to what was deemed as an actuarial problem. Whether or not this proposal is embraced remains to be seen. Rappaport said that society needs to create its own game-changers by developing new job options as one way to address the challenges that lay ahead. Finally, Segal commented that a great challenge is posed by the quality of the additional years of life that may be experienced. He quoted a passage from *Metamorphoses*, by Ovid, "I grabbed a pile of dust and holding it up foolishly asked for as many birthdays as the grains of dust. I forgot to ask that they be years of youth." An apt description for the issues discussed by the panel and the entire symposium.

The three questions explored in this article only touch the surface of the multitude of

global topics covered at the 2011 symposium. A good way to learn more is to visit the online monograph of papers presented at the conference expected to be available later this year.

The Living to 100 Symposium strives to bring longevity science predictions of tomorrow to audiences of today. Perhaps, on my next visit to Walt Disney World, the symposium will have inspired a new exhibit—the Tomorrowland of Longevity. **A**

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# SOA '11 ELECTIONS!

Mark your calendar and let your voice be heard!



## CALLING ALL ELIGIBLE VOTERS

This year, elections open **August 8** and will close **September 2 at noon Central time**. Complete election information can be found at [www.soa.org/elections](http://www.soa.org/elections). Any election questions can be sent to [elections@soa.org](mailto:elections@soa.org).

