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LIVING TO 100: INSIGHT ON THE CHALLENGES AND OPPORTUNITIES OF LONGEVITY

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THE NEED FOR INSIGHT INTO INCREASING LONGEVITY

The thought leadership presented at the Living to 100 symposia by our academic and professional communities has highlighted the critical role actuaries have to play in identifying, quantifying, and helping to address the individual, economic and societal impacts of our longer lifespans

Our increasing longevity has far-reaching economic and medical implications for individuals and families, business and industry, and governmental organizations. Individuals will be challenged to achieve and maintain financial security over a longer time horizon, while pension plans, social programs and health care systems will face unprecedented stress. Long-held assumptions about how long human beings work, when they retire and the quality of life they can expect may undergo dramatic changes if longevity trends continue as seen in recent decades. Major re-allocations of individual, family and societal resources may be required to support growing lifespans.

As society comes to terms with the full range of changes and challenges associated with increasing longevity, actuaries are uniquely positioned to provide critical insights and analysis. The opportunities extend across the financial services, retirement planning and health care industries as well as into multiple areas of government and regulatory functions, as actuaries can help guide the design of profitable products to serve society's needs. In fact, many of us believe it is incumbent on us as professionals to actively engage with other stakeholders, promote understanding and provide leadership—both in the technical and societal realms.

The recent Society of Actuaries (SOA) research paper, "[Living to 100: Insights on the Challenges and Opportunities of Longevity Literature Review: 2002 through 2011](#)" highlights some of the core issues associated with increasing longevity, including some significant knowledge gaps that exist today. The SOA commissioned Ernst & Young to prepare this literature review based on The Living to 100 symposia, an international research program focused on understanding human longevity and aging. Sponsored by the SOA and others, Living to 100 brings together scientists, academics, policymakers and others to share knowledge and promote understanding of advanced-age longevity and its potential societal and individual consequences. There are many opportunities for the actuarial community to contribute their experience and ideas: in fact, the [2014 Living to 100 symposium](#) is just around the corner.

This article outlines the key findings of the full paper, most notably the societal impact of increased longevity, the pressing need for more and better data on various longevity-related issues, the potential of advanced analytics and sophisticated modeling to enhance our ability to project future mortality, and the opportunity for actuaries to engage stakeholders and provide leadership on these important topics.



THE SOCIETAL IMPACT OF LONGER LIFE SPANS

While there is some variation in the longevity gains between men and women and among people of different races, geographies and socioeconomic status, overall trends are clear—people are living longer. In many societies, the leaps forward have been dramatic. This has put strain on the traditional “three-legged stool” model of retirement planning—wherein governments, employers and individual citizens each play a role.

As longevity expectations change, personal and social safety nets will be forced to adapt, as will medical support systems. Pay-as-you-go social insurance programs are becoming harder to maintain as more beneficiaries live longer; the age at which benefits from entitlement programs become available is a key issue. It is likely that workers and companies will need to innovate ways—for example, through the use of phased retirement strategies, or flexible work arrangements—to keep older workers in the workforce to a more advanced age. The terms on which workers exit the workforce will be refined, with significant inputs to come from governments and industry. These are important issues across many societies, and merit broader and more formal discussion, not just in the actuarial and academic communities, but also in political and commercial circles.

This is especially true given that the decline in defined-benefit plans, low savings rates in the United States, increased longevity, and the failure of many people to effectively plan for retirement means that many people now find themselves without adequate resources for retirement. Research on what the public knows about retirement and retirement planning shows significant gaps in knowledge and many misperceptions. Many employees would benefit from education, as well as improved access to financial security products to meet their needs

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Looking at health care, major breakthroughs in the diagnosis and treatment of disease are a driving force behind increased longevity. However, both the increase in the share of disabled older adults receiving paid help and the intensity of the services they require present access, delivery and financing challenges. Important decisions will need to be made on both the individual and social levels as to who gets what and how it is paid for.

IMPROVING DATA COLLECTION AND ACCESS

While there is objective evidence and emerging consensus regarding increasing lifespans and broad agreement that the impacts might be profound, there is considerably less clarity about the key factors that materially affect life expectancy. Researchers have generated some important insights, but there are critical gaps in the data, especially at older ages. Specifically, significant questions remain about the rate of improvement and the ultimate age at which it is appropriate to assume a mortality table should end. A focused effort to collect credible data is necessary to develop our understanding of future mortality.

In many regions, there is no broad consensus on the appropriate base mortality rates and improvement factors that should be used to value life-contingent liabilities, let alone the models that should be used to forecast those rates into the future. Both of these issues—the gaps in data, particularly at older ages and the lack of consensus with respect to the techniques that should be used to forecast mortality—create challenges for practitioners. The use of different data, as-

assumptions and models lead to inconsistencies in these forecasts across disciplines and stakeholders (e.g., pension and insurance) as each develops its own independent view of future mortality.

One solution may lie with social insurance and census programs: through these programs governments have ample mortality and longevity data which may be used to develop base mortality rates and improvement factors. However, actuaries must consider how underlying populations map to the planned application of this data. Life insurance, annuity and pension practitioners will require additional sources of data that go beyond government programs.

The full paper highlights the data needs and associated challenges. Many of these issues relate to the need to understand potential variances within the data. Consider that:

- Researchers must segment data in various ways to understand correlations and establish appropriate subgroupings; this process is complex as the relevance of a subgrouping may be driven, in part, by the type of information that is included in a given database.
- Calibrating extrapolations to different time periods will lead to significantly different results.
- Companies should be explicitly or implicitly incorporating the effects of current and recent medical advancements, but major future developments (such as a cure for cancer) are difficult to predict and model.

In the near term, actuaries must be actively involved in determining the best estimate of current and future mortality rates. More broadly, actuaries must work together as a community to address these issues by educating stakeholders through common benchmarks, tools and materials and appropriate projection models.

There are a number of specific steps we can take:

- Consistency in techniques—such as stress testing, scenario testing, risk heat maps, screening systems—can be used to address the wide variances produced by projection models and better define base mortality rates and improvement factors. These techniques should be adopted and refined to research and modeling purposes.
- Because insured and annuitant populations are significantly different from the general population, insurers should be actively encouraged to participate in the voluntary data submissions for research being conducted by the SOA and American Academy of Actuaries (AAA). Additionally, we must find a way to collect high-quality and “clean” data on pensioner mortality to assist in setting assumptions for corporate plans.
- We need to look beyond our industries and global regions to find new insights and lessons learned. Potential sources include the United Kingdom’s Continuous Mortality Investigation and similar efforts in Germany. Populations around the world will face different challenges given the variations among current practices and conventions in both private and pension plans. These differences may represent a rich source of comparative information.

A substantial amount of academic research is being conducted on a variety of longevity-related issues across a range of disciplines. New findings shift perspectives and continue to shape the conversation and understanding of longevity issues. It is important that we as actuarial practitioners continue to stay abreast of important research findings and the current literature. The full paper identifies a number of milestone studies and high-profile papers that merit the attention of actuaries.

ADVANCED ANALYTICS AND MODELING

As with many challenges, it is not just a matter of problem solvers and stakeholders having access to data; what they do with the data is just as important. That is where advanced analytics and modeling capabilities can be brought to bear.

While access to more and better data will empower all stakeholders interested in longevity issues, stronger capabilities in analytics and modeling will help clarify our understanding of issues and risks and, ultimately, help determine appropriate actions. Actuaries are likely to play a role in a number of specific areas: We can use our expertise to employ techniques—stress testing, scenario testing, risk heat maps, screening systems—that can be used to give us insight into what base mortality rates and improvement factors could be. We can help identify mechanisms for assessing the utility of finer subgroupings of the population which may give us insight into the drivers of mortality improvement at a more granular level. In addition, we can explore the use of more detailed techniques focused on correlations—for example, seasonal effects or birth characteristics—which may help develop our understanding of patterns in future mortality improvement. Here again, actuaries are in a good position to share lessons learned and provide guidance. Specifically, we can apply learnings from other industry sectors—like reinsurance, property and casualty carriers, and capital markets—that have more experience in using predictive modeling tools and techniques.

Actuaries are likely to contribute data to the modeling process and use the results and outputs. We will also partner with our colleagues in academia to answer some of the critical questions that are raised during the analytical and modeling phases. Those questions include:

- Which graduation methods are most appropriate for the oldest of ages?
- Can a wealth/longevity effect at the oldest ages, especially for disability income and long-term care business, be validated?
- How can companies model and mitigate risks associated with major technological advances in medicine?
- What are some mechanisms for assessing the utility and validity of more sophisticated, multivariate projections?

BOTTOM LINE

The significant increase in human longevity raises critical issues for governments, social institutions, pension plans, insurers, companies and individuals around the world. The impacts will be felt at every level of society and across many industries. For actuaries, there is real opportunity to shape the discussion, share insights and guide both product development and public policy. As demonstrated by the latest Living to 100 symposia—and certain to be confirmed by future events—there are significant knowledge gaps that the actuarial community is uniquely positioned to address. ■

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