

# DEEP-FRIED BUTTER

## AND OTHER LONGEVITY TALES



Over past decades, Her Majesty Queen Elizabeth II has been busy writing more and more congratulatory letters to subjects who reach the age of 100. In the years that the Queen has sat on the throne, she's gone from writing 255 letters per year in 1952 to 8,439 letters per year in 2007. That's enough to give anyone a serious case of writer's cramp!



Canadians have done their part to keep the Queen busy. The number of Canadian centenarians has increased almost 50% from 3,125 in 1996 to 4,635 in 2006, and Statistics Canada expects that there could be 14,000 by 2031. In fact, this increase in life expectancy has been building for quite some time. According to the Canadian Human Mortality Database, the male life expectancy at birth was 56 years in 1921 and 78 years in 2005 – an increase of 22 years. The increase in female life expectancy over that same period was even higher, at 25 years.

*So what are the factors increasing life expectancy? Since living longer means an increased need for retirement savings, what solutions are available to manage the risk of higher defined benefit (DB) plan costs, as well as the risk of outliving defined contribution (DC) plan savings?*

## HOW LONG CAN LIFE EXPECTANCY IMPROVE?

People are living longer, but will factors that improved life expectancy in the past, such as safer working conditions and better health care, continue to have as great an impact in the future? Or will the next animal-linked pandemic and our love of deep-fried butter halt longevity improvement in its tracks?

Demographers have been asking similar questions for the last 170 years. According to research done by Oeppen and Vaupel (2002), the country with the longest-lived females has changed throughout time, but life expectancy has steadily increased. In fact, female life expectancy has defied skeptics and increased at a rate of two-and-a-half years per decade for the last 170 years. Demographers, like meteorologists, are apparently often wrong.

The worldwide increase in life expectancy has been startling, but how do things look for Canada and specifically for Canadians at age 65 (a critical metric for retirement planning)?

During the early part of the 1900s, increases in life expectancy were mainly due to better neonatal care and the introduction of antibiotics, affecting children and younger adults. As a result, life expectancy at age 65 for Canadians was relatively unchanged for the first part of the 1900s, but increased by about four years for males and females since 1970. The rate of increase since 1980 is about one year per decade for females and about a year-and-a-half per decade for males!

This rate of improvement is not surprising, given the meaningful advances in health care and technology over the last several decades, but is it possible to continue to increase post-65 life expectancy? What would be the impact of finding the proverbial cure for cancer?

Research by Kaishev *et al.* (2007) attempted to answer this very question. They estimated that post-65 life expectancy would increase by 6.2 years if cancers, heart diseases and respiratory diseases could all be eliminated. While this research is theoretical, it does illustrate that large increases in post-65 life expectancy are still possible.

So what about the other side of the coin? The media seems to carry weekly stories about the next civilization-ending pandemic and our increasing aversion to physical activity. It turns out that though the 1917 Spanish Flu (the worst pandemic in recent times) had terrible social consequences, it didn't impede longevity improvement in a meaningful way.

Similarly, obesity has been on the rise for about the last 30 years, but we have still seen overall improvement in life expectancy over those years. This is not to say that pandemics and obesity will not eventually reduce life expectancy, but rather that their impact might not be as severe or imminent as the media would have us believe.

## LONGER LIFETIMES REQUIRE MORE RETIREMENT SAVINGS

People are living longer and may live even longer in the future, but what does this mean for a typical DB or DC pension plan?

For going-concern valuations, the Financial Services Commission of Ontario reported in its March 2011 study *Funding of Defined Benefit Pension Plans in Ontario* that all pension plans used an up-to-date (1994 or later) mortality table. A further breakdown in the report showed that over 96% of pension plans are using some form of the UP94 table.

However, the report does not distinguish between plans that are anticipating longevity improvements after 1994 and those that are not. The decision by a plan sponsor to make an allowance for longevity improvement after 1994 can have a material impact on assumed life expectancies, adding about four years of post-65 life expectancy for a 45-year-old male and about two years of life expectancy for a 65-year-old male.



In addition, calling the UP94 table “up to date” is a bit of a stretch. The UP94 table is based on source data from 1983 to 1990 from a Society of Actuaries experience study, U.S. Census data and Civil Service Retirement System information. This means that the data backing the UP94 table is at best 20 years out of date.

Therefore, it’s not surprising that the UP94 table results in life expectancies that trail behind other more recent tables. Our own experience suggests that even with an allowance for future longevity improvement, the UP94 table age 65 life expectancy is currently about one year too low for a 65-year-old male.

In addition, it’s important to remember that the UP94 table was developed using average mortality across a wide range of industries. However, it’s not unreasonable to expect that people in certain types of jobs may live longer than average. According to a paper published by Malcolm Hamilton, a recent study by the Ontario Teachers Pension Plan indicated that the UP94 table age 65 life expectancy (with an allowance for future longevity improvement) is currently about 2.5 years too low for a 65-year-old male teacher. So what’s the big deal about being off by a year or two?

Well, for a DB pension plan, an additional year of life expectancy could increase the cost of providing lifetime benefits by about 3%. So a pension plan that is currently using the UP94 table with no longevity improvement to value its white collar employees may be understating its liabilities by about 15% to 20%. Even a plan doing all the right things and using the UP94 table with future longevity improvements to value its regular employees may be understating its liabilities by about 3%, due to the antiquity of the UP94 table. The uncertainty around future longevity improvement creates additional risk, especially for DB plan sponsors who have not closed or frozen their plans.

For a DC plan, the additional cost of living longer rests with the plan members. For example, a 65-year-old male today needs on average about 10% more assets than a 65-year-old man would have needed 20 years ago. But focusing on average life expectancy for a DC plan member can be misleading, as the DC plan member will hardly ever experience the average life expectancy. To illustrate, there is about a 50% chance that at least one of a couple who are both 65 years old will live to the age of 91 and a 25% chance that at least one will live to age 95.

This uncertainty around life expectancy makes retirement planning very difficult for a DC plan member and increases the risk of members outliving their assets.

**LIVE LONG AND PROSPER**

A number of tried-and-true solutions exist to help both DB plan sponsors and DC plan members manage the risk of increasing life expectancy, and several innovative longevity solutions are emerging.

For DB plan sponsors, the options include annuity buy-outs, annuity buy-ins and longevity hedges.

Solution	Description
Buy-out	<p>The purchase of an annuity contract that transfers the pension plan’s liabilities to the insurance company.</p> <p>The insurance company makes pension payments directly to plan members and takes responsibility for all investment and longevity risk associated with them.</p>
Buy-in	<p>A newer development in Canada that shares many of the same characteristics of annuity buy-outs, including the transfer of longevity and investment risk to the insurance company.</p> <p>Under the buy-in, a plan sponsor purchases an annuity contract as an investment to match some or all of a pension plan’s liabilities and reduce risk. The liabilities remain in the pension plan and the plan sponsor retains responsibility for them.</p>
Longevity hedge	<p>Longevity hedges are becoming quite common in the U.K., but are rarer in Canada. They allow the pension plan to hedge an expected level of longevity for a group of plan members with an insurance company. If plan members live longer than expected, then the pension plan receives payments from the insurance company to cover the cost of the additional pensions payable. This solution is ideal for plan sponsors who are comfortable with their plan’s investment risk, and are only looking for longevity protection.</p>

For DC plan members, the options include individual annuities and guaranteed income products.

Solution	Description
Individual annuity	Plan members who are unsure that their accumulated savings will provide enough income security during retirement can purchase annuities from an insurance company. In return for a single premium, the plan member receives a lifetime income from the insurance company, ensuring that he or she won't outlive his or her savings. The annuity can be payable for the plan member's lifetime or the combined lifetime of the plan member and his or her spouse.
Guaranteed income products	Guaranteed income products are fairly new to the Canadian marketplace. They are available on both an individual basis through an advisor or through DC plans. Generally these products guarantee a minimum level of income for life in return for an insurance fee. Plan members still retain control over the investment of their assets and their account value is paid to their beneficiary upon their death. In this way, guaranteed income products combine attractive features of individual annuities and investment accounts.

While there are a number of solutions to help DB plan sponsors and DC plan members protect themselves against longevity risk, the best solution for Her Majesty's writer's cramp may be to forgo the personal touch and start sending e-mails.

**About the author**

Brent Simmons leads Sun Life Financial's DB Solutions team. Brent joined Sun Life Financial in 2008, from a strategy consulting firm, where he was a partner and specialized in non-traditional risk and insurance solutions. Prior to that, he was a Principal at one of Canada's leading pension consulting firms.



For more information about how longevity improvement scales affect your pension plan, contact your pension or investment consultant. For more information about Sun Life Financial's de-risking solutions, please contact:

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