Welcome to the new issue of Seeing Beyond Risk, the quarterly electronic publication from the Canadian Institute of Actuaries (CIA). Each issue presents the latest actuarial thinking from experts; below, CIA President Robert Stapleford and other actuaries look at the profession’s achievements during the past 50 years, and its long-term goals. We are sure you will find this article informative and thought-provoking, and we encourage you to distribute it among your friends and colleagues.

“We care about the future”—how many professions can make such a claim? Several, you might say, but the actuarial profession in Canada actually adopted that phrase, or more precisely the Latin equivalent, Nobis Cura Futuri, as its motto following the establishment of the Canadian Institute of Actuaries (CIA) by an act of the federal parliament on March 18, 1965.

Fifty years represents a milestone worthy of celebration—without losing sight of actuarial science’s future direction, this significant anniversary also affords an opportunity to look back on some of the achievements of the CIA over this period. The Institute’s Guiding Principle #1 is to hold the duty of the profession to the public above the needs of the profession and its members. Let us consider some of the more significant ways in which the profession has served, and continues to serve, the public.
The Institute is dedicated to serving the public through the provision of actuarial services and advice of the highest quality. It holds the duty of the profession to the public above the needs of the profession and its members.

Social Security

The Canadian federal and provincial governments provide a network of social programs to cover the needs of Canadians in circumstances such as old age, retirement, and unemployment. These programs include Old Age Security (OAS), the Canada Pension Plan (CPP), the Québec Pension Plan (QPP), and Employment Insurance (EI).

OAS, for example, is the largest federal program. It is financed from general government revenue and provides benefits to most Canadians aged 65 and over (the eligibility age is gradually being increased to 67). It is designed to replace approximately 15 percent of income up to the average industrial wage (approximately $50,000) and there are more than 5.5 million OAS beneficiaries in receipt of annual basic pensions totalling in excess of $36 billion.

How are these programs managed to ensure that beneficiaries continue to receive targeted amounts, and that expenditures remain reasonable as a proportion of government revenue or payroll bases—and not just for the next few years, but over many decades?

A critical role is played by the Office of the Chief Actuary (OCA), which has a mandate to conduct statutory actuarial valuations of these programs. These valuations monitor the funding, current, and future costs of the programs, and assess the risks they might face. So any Canadian drawing a pension from the CPP, for example, or looking forward to doing so in the future, can be comforted and thankful for the important work done by the OCA, which may not receive much public attention.

The Chief Actuary for Canada produces actuarial reports on many of the country’s social programs and pension funds. These include:

1. The CPP and the OAS program;
2. The pension plans for the Canadian Forces, federally appointed judges, Members of Parliament, the Public Service of Canada, and the Royal Canadian Mounted Police.
3. The Chief Actuary also produces reports for the Canada Student Loans Program and EI.

The most recent report on the CPP was published in November 2013. In it, the Chief Actuary tells us that with the current contribution rate of 9.9 percent of our salaries each year of our working life, the CPP is financially sustainable to 2075.

That is long-term thinking and long-term assurance of our financial future.

Life and Property/Casualty Insurance

Anyone with dependants will at some point consider, “How will my family manage financially if something happens to me?” The core benefit of life insurance is that the financial interests of one’s family are protected from circumstances such as loss of income resulting from critical illness or death. Simultaneously, insurance products also have a strong wealth creation aspect, allowing policyholders to benefit from both a financial security and wealth management standpoint. Insurance companies play an important role in helping individuals manage their risk of adverse financial impact associated with death, and in this way contribute to the economy’s financial stability by allowing people to share their liability through the pooling of individual risk.

Property/casualty insurance is another key sector in which actuaries play an essential role; for example, anybody who loses their home to a flood or whose business is badly affected by crime will be financially supported thanks to the modelling and forecasting of...
their insurers’ actuaries. Actuarial models were essential for their calculation of the homeowner’s insurance premiums, and they also ensure that the business owner will receive the money to which they are entitled, even if they took out their policy decades before their claim.

Actuaries have long been the stewards of financial strength and stability in the insurance industry. So it naturally follows that they would hold key roles in life insurance companies, such as CEO and other board positions. Armed with advanced mathematical and financial theory, actuaries have developed techniques for pricing, reserving, and capital management to understand and analyze the nature and cost of risk, techniques that have provided the theoretical and practical foundation on which the life insurance industry has been built.

By developing and maintaining the critical frameworks of insurance organizations, actuaries have been able to accurately report and communicate on their company’s financial condition to both internal and external stakeholders. Analytics performed by actuaries are critically important to insurers’ continued existence, profitability, and, most importantly, their ability to support their policyholders’ interests.

**PENSIONS**

Workplace pension plans are a centrepiece of Canadian workers’ retirement income savings. At the end of 2013, there were more than 18,000 registered plans in Canada covering close to 6.2 million workers, and about 60 percent of them are defined benefit (DB) plans.

Thanks to their expertise in probability and financial mathematics, actuaries have been the cornerstone of the development and expansion of workplace pension plans, especially DB plans, since the very beginning. In recent years, DB plans made headlines due to the turmoil in financial markets, the persisting low-interest-rate environment, and Canadians’ continuously increasing longevity. The spotlight was thrown onto such issues as income adequacy and the sustainability of these plans.

When it comes to finding new plan designs that will help ensure the viability of our retirement system and secure the retirement of millions of Canadian workers, the ability of actuaries to find innovative solutions and their skills in modelling and risk management put them at the very heart of sustainable outcomes.

The CIA is in regular contact with regulators to enhance the current pension system, but our members are also considering long-term scenarios. We have a public position calling for the appointment of a national pensions champion, and we have also held discussions with the Ontario government regarding the Ontario Retirement Pension Plan. A recent paper on target benefit plans is only one of the initiatives that are helping to shape the future of Canadian pensions.
EnterPrise Risk Management

For many organizations, forecasting and strategic thinking have involved applying a narrow focus onto key parts of its business, or an emphasis on a handful of the most likely dangers to its future prosperity.

However, thanks to the growing influence and expanding toolkit of today’s actuaries, the idea of taking an overall view of risk across an organization, using an enterprise risk management (ERM) framework, is becoming an essential part of boards’ decision-making processes.

While other professionals might consider the next six or 12 months’ trading and what they could mean for the bottom line, actuaries are trained to think much further ahead and on a much broader scale. For an actuary, modelling the risks facing every division of, say, a multi-national insurer could involve considering the possibility of a catastrophic weather event in 10 years’ time, or interest rate fluctuations over decades. ERM practitioners take into account the activities of an entire organization, not just its most profitable or its public-facing departments, and weigh up what a risk facing one product or activity, no matter how minor, might mean for the overall structure.

Given the complexity and inter-connectedness of business in the 21st century, increasing numbers of companies and organizations are relying on actuaries to extend their analyses and thereby minimize the possibility of an unexpected development many years in the future badly damaging one department and potentially bringing down the whole business.

Healthcare

Traditionally, actuarial science has been an essential part of areas like pensions and insurance. However, other industries are discovering the benefits that actuarial expertise can bring. Healthcare practitioners are only the latest recipients of actuaries’ forecasting and modelling skills.

Hospital and healthcare managers are like many others responsible for the sustainability of multi-million-dollar budgets. However, Canadians’ increasing longevity and the importance of rapid and effective treatment place extra importance on accurate and efficient planning. With that in mind, the province of New Brunswick worked with the Institute and actuary and CIA member John Have to forecast how its healthcare costs would rise. His analysis found that its per capita cost of $3,711 in 2009 would jump to $5,976 by 2020, placing extra burdens on taxpayers and resources. In line with other actuarial models, it involved amassing a wide range of data, considering issues like inflation and changes to health conditions, treatments, and more, and producing results that funding managers could use as part of their planning and budget process.

Working on a broader front, actuaries have also considered how to fund public health insurance plans both in Canada and abroad, and looked at the sustainability of the country’s healthcare system.

With every generation, the demand for healthcare later in life continues to grow, and so will the need for long-term studies of what that might mean for patients, doctors, hospitals, and society in general.

Actuarial Evidence

Actuaries who practice in the area of actuarial evidence are a small but invaluable part of the profession: it is their expertise that can come into play during court cases and other legal disputes.

For litigation such as personal injury, wrongful death, professional negligence, and wrongful dismissal, an actuary’s evidence could make a vital difference for a plaintiff or defendant. They assist the parties and the court by determining such essential information as the present value of lost past and future earnings, lost pensions and other benefits, and the cost of future care. Actuaries have also been called upon to act as expert witnesses in class action cases, or to determine the value of a pension following a marriage breakdown in order to assist with family property issues.

The value of this area is recognized every year by the CIA, which holds its Actuarial Evidence Seminar every September to allow practitioners and others to exchange ideas and remain up to date with the latest issues and approaches.

Non-traditional Areas

Some members of the profession have moved into new and surprising positions far from the expected homes of actuaries in the finance sector.

Members of the CIA hold senior positions at several of Canada’s leading universities, serving as professors and lecturers to teach generations of math experts about topics like finance, probability, and statistics.
Rob Brown, a former President of both the CIA and the International Actuarial Association, was a professor at the University of Waterloo, and current CIA President Rob Stapleford was heavily involved in the development of the CIA’s University Accreditation Program, which offers actuarial students exemptions from certain early actuarial exams.

Some have turned their knowledge of crunching large volumes of data to sports: analysis of players and their real worth can be invaluable to teams and owners. So-called “sabermetrics” are routinely used to develop successful baseball squads, while ice hockey teams can call on the studies of Canadian actuary Alan Ryder and his information-packed Hockey Analytics website.

A partnership consisting of the CIA, American Academy of Actuaries, Casualty Actuarial Society, and Society of Actuaries is going to release the Actuaries Climate Index (ACI) to educate the public about climate change in the Canada-U.S. region. The ACI will be presented on its own website, which will house all of the information used to generate the Index. The site will be updated quarterly with statistically robust, accessible, and scientifically accurate seasonal information.

Actuaries can be found in mining and investment companies, waste management organizations, city and regional councils, and many other potentially surprising places.

WHAT’S NEXT?

Since 1965, Canada’s actuaries have used all their training and knowledge to help ensure that the public and the country’s economy remain as secure and stable as possible, no matter what unexpected events have arisen.

Whether they have been working for regulators overseeing organizations responsible for millions of pensioners, or calculating the effect of a sudden rate rise on individuals’ auto insurance, they have made a vital contribution to Canadian life.

CIA members are at the heart of some of the country’s most important companies, working to manage the numerous risks they face and keep them solvent and successful. They have had a hand in practically every insurance policy and pension created in Canada, and their advice and suggestions have contributed to the development of numerous pieces of legislation, always with the protection of the public interest as the most important factor.

Almost 10 percent of the Institute’s revenues are devoted to research as actuaries analyze numerous topics that can benefit Canadians of all ages. By working with academics, subject experts, and outside organizations, we can bring the full weight of actuarial expertise to bear on ideas and strategies that could transform whole sections of Canada’s economy.

As the Institute moves into its 51st year, it is going from strength to strength. Membership levels are growing, actuaries are diversifying into more and more interesting sectors, and increasing numbers of people are realizing what a difference they can make. Whatever challenges might arise for their clients and employers, and Canadians in general, actuaries will continue to build on the success of their predecessors over the past 50 years and keep caring about the future.

This article features contributions from CIA members Geoffrey Melbourne, Jean-François Poitras, and Nimmie Veerappen.

After a 40-year career in life insurance and pension and investment consulting, Robert Stapleford recently retired from the global consulting firm Mercer. He qualified as an actuary with the CIA in 1978 and with the Society of Actuaries in 1977. Mr. Stapleford has been a volunteer for the CIA since 1983, chairing the Accreditation Committee, which launched the University Accreditation Program, and the Governance Committee, and serving as the Institute’s President-elect.