NEW INSIGHTS INTO PE
IN THE CONSTRUCTION

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NSIONER MORTALITY TRADES

A new study indicates that mortality among Canadian pensioners in the construction trades is higher on average than predicted by recently released mortality tables.

Age is just a number. This old adage may ring true for most people, but pension plans face a direct link between member demographics and the plan's financial health. People are living longer than previously estimated. This is good news for pensioners, and it's a testament to improvements in public health, medicine, nutrition and lifestyles.

But the harsh reality facing pension plans is this: With members living—and collecting pensions—for more years, the cost of funding their pensions is increasing. A mortality table that doesn't properly reflect the impact of increasing longevity on the pension plan can lead to calculations of plan liabilities and costs that miss the mark. So, it's vital for plan sponsors to have a clear understanding of their pensioners' life expectancy.

The *CPM* Report and MEPPs

The Canadian Institute of Actuaries' *2014 Final Report on Canadian Pensioners' Mortality (CPM)* confirmed mortality improvement trends for pensioners in a broad sampling of Canadian pension plans and took an important step in helping plans to better reflect this experience. The report presented the first-ever mortality tables and mortality improvement scales based solely on Canadian pensioner mortality experience, replacing outdated U.S. informa-

FIGURE 1

Life Expectancy of Male Aged 62

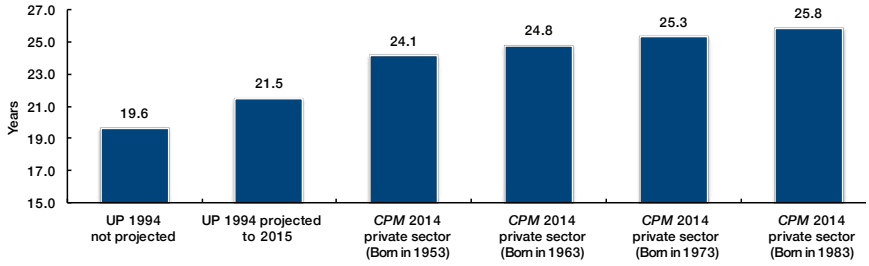

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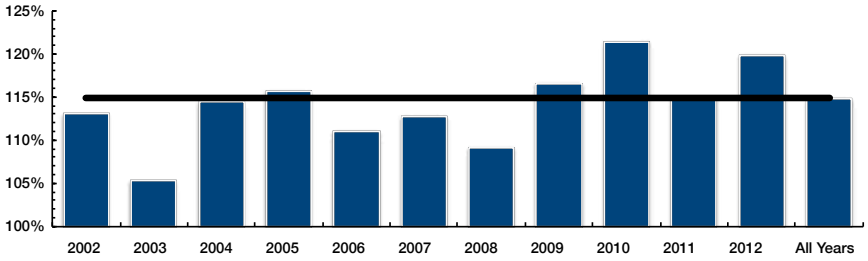
FIGURE 2

Ratio of Actual/Expected Deaths by Year (Expected Deaths Based on *CPM* 2014 Private Sector Table)



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tion previously used by Canadian actuaries.

More specifically, the *CPM* report included gender-specific mortality tables constructed from public and private sector data (the *CPM* 2014 public sector table and *CPM* 2014 private sector table, respectively) as well as a combined table (*CPM* 2014 table)reflecting all data. The report also presented a two-dimensional "generational" mortality improvement scale (by age and year), referred to as *CPM Scale B.* While the *CPM* mortality tables reflect improvements in mortality experienced to date, the improvement scale is intended to allow pension plans to reflect future expectations for mortality improvements.

Figure 1 shows the average number of years a 62-year-old male in 2015 is predicted to live, or his *average life expectancy*, according to some common mortality tables previously used (the 1994 Uninsured Pensioner [UP 1994] mortality table, with no mortality improvements and with mortality improvements projected to 2015) and the *CPM* 2014 private sector table. Figure 1 also shows the average life expectancy for a male who reaches the age of 62 in later years (2025, 2035 and 2045), according to the private sector table, with mortality improvements projected using *CPM Scale B.* This illustrates the significant improvements in pensioner mortality—and longevity—that are built into this new assumption compared with prior assumptions.

A significant proportion of multiemployer pension plans (MEPPs) cover union members in the construction trades. For many of these plans, adopting the unmodified *CPM* 2014 private sector table for their valuations could increase their pension liabilities by 10% or more (depending on the mortality assumption previously used) because of the longer expected payout periods.

In a construction trade MEPP, contributions are fixed, and members' benefits may be increased or decreased, depending on the plan's financial health. If a mortality table used in the valuation does not properly reflect members' expected life spans, the plan's cost of benefits and funding position may be calculated inaccurately. Driven by higher estimated costs and liabilities, benefit reductions implemented to fix a poor funded position could be greater than required. Likewise, using estimated costs and liabilities that are too low could lead to implementing overly generous benefit improvements. Determining a "best estimate" of future mortality is important to effectively managing a MEPP and to achieving equity

among groups—and generations—of the MEPP's members.

Prior mortality analysis from other sources generally indicates that mortality rates are higher—and therefore longevity is lower—amongst blue-collar pensioners than among white-collar pensioners. Similarly, the *CPM* report included mortality experience by industry, which showed the mortality rates of construction industry pensioners are, on average, 12.5% higher for males (and 17.5% for females) than predicted by the *CPM* 2014 private sector table. However, it cautioned that the analysis may not be fully reliable because of the limited industry-specific data in the report.

Actuarial professional standards call for a plan's actuary to use one of the *CPM* mortality tables in the plan's valuation unless there is more credible plan- or industry-specific data supporting the use of a different table or adjustments to the *CPM* table rates. So, while it seems likely that many construction industry plans are experiencing higher-than-average mortality rates in their pensioner groups, a construction industry plan's actuary would need more credible analysis than the industry-specific results in the *CPM* report to reflect this expectation in the plan's valuation.

New Research and Key Takeaways

Eckler Ltd. completed a *Construction Trades Mortality Study (CTMS)* in 2015 to address this key gap and explore construction trade-based longevity in much greater depth. The research was intended to help industry plans improve the mortality assumptions used in their valuations—leading to more effective and insightful plan management.

In any study, credibility of results is linked directly to the quantity and quality of the data. The *CTMS* gathered demographic data from 43 defined benefit MEPPs with members in the construction trades, covering the period 2002 to 2012. The data gathered was roughly four times the size of the construction industry pensioner data included in the *CPM* report. Participating plans represent 16 trades and pensioners from across Canada, although most are in Alberta, British Columbia and Ontario.

The research compared actual construction trades pensioner deaths from 2002 to 2012 with those predicted by the *CPM* 2014 private sector table. For instance, a ratio of actual to expected deaths of 110% for a particular plan indicates that the actual deaths over the period studied were 10% higher for that plan than the deaths predicted by the *CPM* 2014 private sector table. The intent of the research was to provide results from which an actuary could make a percentage adjustment factor to the private sector table rates that better reflects the actual experience of the plan or plans under consideration.

While the results varied year over year, the *CTMS* findings (Figure 2) reveal that, on average, actual construction industry pensioner deaths (as measured by amount of pension) were about 15% higher than expected deaths per the *CPM* 2014 private sector table.[1]

Both the *CTMS* analysis and the *CPM* report analysis are consistent in indicating that average mortality of construction industry pensioners is higher—and the longevity of those pensioners lower —than the *CPM* 2014 private sector table predicts. While the *CPM* report cautioned that the industry-specific results may not be relied upon fully because of limited data, the *CTMS* is based on approximately four times that amount of data and produced a substantially more credible

FIGURE 3

Life Expectancy for Male Aged 62 in 2015

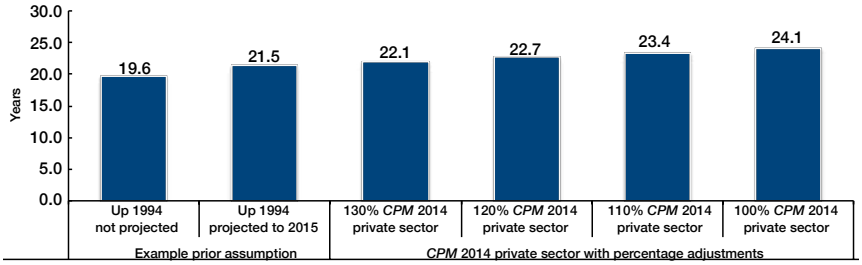

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TABLE

Mortality Rate Comparisons

		UP 1994 Mortality Table Projected to 2015	*CPM* 2014 Private Sector Mortality Table	110% of *CPM* 2014 Private Sector Table	120% of *CPM* 2014 Private Sector Table
Probability of Dying (Males)	**Aged 65**	1.2%	1.0%	1.1%	1.2%
	Aged 75	3.0%	2.0%	2.2%	2.4%
	Aged 85	9.0%	6.6%	7.2%	7.9%
	Aged 95	24.1%	23.0%	25.3%	27.6%
Average life expectancy calculated for male aged 62 in 2015		21.5 years	24.1 years	23.4 years	22.7 years
Sample plan's liability increase versus using UP 1994 mortality table projected to 2015		N/A	6%	4%	2%

Note: This table indicates, for several ages, the mortality rates taken from a table commonly used in the past (UP 1994 projected to 2015), the new *CPM* 2014 private sector table and the new *CPM* 2014 private sector table with rates adjusted by 110% and 120%. The *CPM* 2014 private sector table mortality rate of 2.0% at the age of 75 indicates that, out of 1,000 75 year-old males, 20 are expected to die before reaching the age of 76.

Adjusting the *CPM* 2014 private sector table by 110% means that the rates are 10% higher at each age than the rates taken from the original table. For example, the aged 75 mortality rate of 2.2% according to 110% of the *CPM* 2014 private sector table is equal to the corresponding mortality rate from the *CPM* 2014 private sector table (i.e., 2%) multiplied by 110%. Other percentage adjustments would be similarly applied.

Source: Eckler Ltd.

result for construction industry pensioners in aggregate. Given the overall results above, a construction industry MEPP that adopts the new *CPM* 2014 private sector table for its actuarial valuation, without any adjustment, may be overestimating its members' future life expectancies and, therefore, overestimating its plan liabilities and costs.

Similar to Figure 1, Figure 3 shows the average life expectancy for a 62-year-old male in 2015, according to some previously used mortality tables and the new *CPM* 2014 private sector table. Figure 3 also includes results based on the private sector table with various adjustments made to its mortality rates.

The differences in expected longevity due to a 10% change in expected mortality amount to only a fraction of a year, but the impact on a plan's liabilities can be significant. (See the table.) Pension trustees who are committed to effectively managing their plan and to achieving equity among groups—and generations—of plan members should consider how to reflect their plan's expected mortality experience going forward.

In addition to confirming somewhat higher mortality experienced by pensioners in the construction industry overall, the *CTMS* took the analysis a step further to explore mortality within the construction industry itself. Here, the study found considerable variance in results among trades and among plans.

Figure 4 shows actual-to-expected death ratios for 16 different trades represented in the *CTMS*—Actual deaths range from 60% higher to almost 20% lower than deaths predicted by the *CPM* 2014 private sector table, suggesting that it may not be appropriate to refer only to the mortality experience of construction trades in aggregate when setting the mortality assumption for the valuation of a particular construction trade MEPP.

Other Findings

While the main focus of the *CTMS* was to prepare analysis for use in determining a percentage adjustment factor to the *CPM* 2014 private sector table rates for the actuarial valuation of a particular construction trade MEPP, it also allowed for some interesting analysis and observations.

Provincial Data

As noted earlier, the *CTMS* data in-

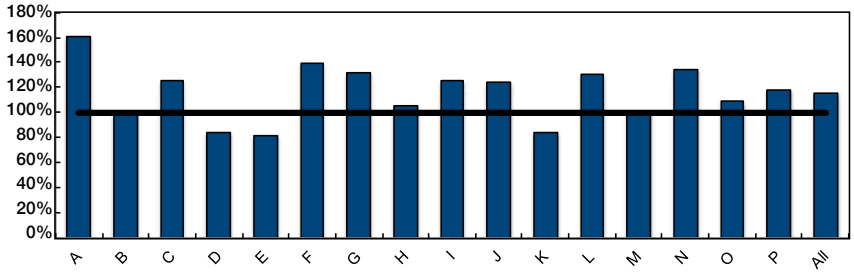
cluded pension plans with pensioners from across Canada, with the majority from Alberta, British Columbia and Ontario. Among the different provinces, the trades for which the study was able to collect pensioner data varied. Because there are differences in the data in the representation of the different plans and trades among provinces, credible analysis of mortality differences by province wasn't possible. For the three provinces with the greatest amount of data and thus the highest credibility (Alberta, British Columbia and Ontario), the actual-to-expected death ratios for construction trades pensioners are fairly tightly confined in the range of roughly 110% to slightly more than 120%.

Mortality Improvements

Preliminary analysis of the rate of mortality improvements from 2002 to 2012 confirmed an improvement in mortality experienced by construction trades pensioners over the entire study period. However, the average improvement over the study period appears to be about 80% of the improvement built into the *CPM Scale B* for that period. This is consistent with mortality research on U.S. plans by the Society of Actuaries, indicating a widening gap in life expectancy between white-collar and blue-collar workers. Meaningful analysis of mortality improvements requires much more data than Eckler could compile and was therefore beyond the scope of the study, but these preliminary results suggest additional research into construction trades mortality improvements is warranted. Plans should continue to review their mortality experience, and thus assumptions, periodically in the future.

FIGURE 4

Ratio of Actual/Expected Deaths by Trade (Expected Deaths Based on *CPM* 2014 Private Sector Table)



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Calculating Commuted Values

The actuarial professional standards set the mortality assumption that must be used when calculating commuted values (the lump-sum cash value) for terminating plan members. These calculations require the use of the *CPM* 2014 table, which provides mortality rates based on the combined private and public sector data and therefore has lower mortality rates—and generates longer expected longevity—than the *CPM's* private sector table. As illustrated in Figure

Takeaways

- The *Construction Trades Mortality Study (CTMS)* suggests that mortality among pensioners in the construction trades is higher on average than predicted by recent mortality tables developed by the Canadian Institute of Actuaries' *2014 Final Report on Canadian Pensioners' Mortality (CPM).*
- The *CTMS* showed considerable variance in mortality results among trades within the construction industry, with actual deaths ranging from 60% higher to 20% lower than deaths predicted by the *CPM* private sector table.
- Plan sponsors need a clear understanding of their pensioners' life expectancy to properly calculate pension plan liabilities and costs.
- If a plan uses a mortality table that is too conservative, leading to estimated costs and liabilities that are too high, benefit reductions implemented to fix a poor funded position could be greater than required. If the mortality table is not conservative enough, leading to estimated costs and liabilities that are too low, a plan might implement overly generous benefit improvements.
- Determining a "best estimate" of future mortality is important to effectively managing a multi-employer pension plan (MEPP) and to achieving equity among groups—and generations—of the MEPP's members.

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Construction Trades Mortality Study: Results and Impact

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From the Bookstore

Employee Benefits in Canada, Fourth Edition

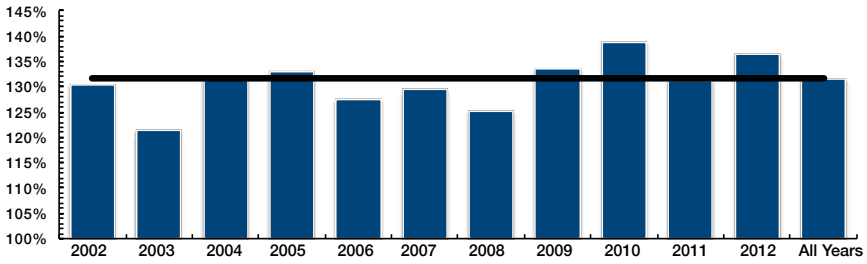
Mark Zigler, D. Cameron Hunter, Murray Gold, Michael Mazzuca and Roberto Tomassini.

International Foundation of Employee Benefit Plans. 2015.

Visit *www.ifebp.org/employeebenefitsincanada* for more information.

FIGURE 5

Ratio of Actual/Expected Deaths by Year (Expected Deaths Based on *CPM* 2014 (Combined) Table)



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4, the *CPM* private sector table appears to be too conservative for many of the construction trades analyzed. Since the *CPM* 2014 table predicts even lower mortality rates and, therefore, longer longevity, it's not surprising that the construction trades exhibit worse mortality)when compared with this table versus the *CPM* 2014 private sector table.

Figure 5 illustrates that, on average, actual construction industry pensioner deaths (as measured by amount of pension) were 32% higher than those expected per the *CPM* 2014 table and 15% higher than deaths expected per the *CPM* 2014 private sector table.

For most construction trades pension plans, the commuted values calculated using the *CPM* 2014 table, as is now required, will be higher than the amounts that would be calculated based on a mortality table reflecting the plan's actual experience. For instance, for a plan whose mortality experience indicates that a "best estimate" of mortality rates would be 130% of rates in the *CPM* 2014 private sector table, the commuted values calculated could be 7% to 9% higher, depending on the terminating member's age, than if they were calculated using a mortality table that reflects the plan's actual experience.

This can be a significant difference since commuted values are often in the hundreds of thousands of dollars. For many MEPPs, a going concern actuarial basis is used to determine the regulatory funding requirements, which is different than the basis used to determine the commuted value amount the member would receive if terminating and transferring funds out of the plan. Because of the current low-interest-rate environment, a terminating member's benefit value calculated on the going concern funding basis can be significantly lower than the commuted value. Imposing this new and more conservative mortality assumption for calculating commuted values favours terminating members even more, at the expense of the remaining members. The *CTMS* analysis supports the argument that the actuarial standards should allow for reasonable and supportable adjustments to the commuted value mortality assumptions.

Conclusions

Use of appropriate mortality table assumptions allows for pension liability and cost calculations that better represent the expected future mortality experience of plans, helping to better

achieve equity between different groups—and generations—of MEPP members.

Ultimately, the *CTMS* analysis indicates that pensioner mortality in many of the construction trades is higher than predicted by the mortality tables provided by the *CPM* report. The analysis also indicated considerable variance in results among trades and among plans indicated in the analysis. Participating plans in the *CTMS* could make use of this analysis in reviewing and setting mortality assumptions for their valuations.

More generally, the study indicates that there can be significant variances between the actual mortality experience of different pension plan membership groups and the mortality predicted by the *CPM* report tables. Larger plans, typically those with more than 1,000 pensioners, that want to more accurately reflect their mortality experience could conduct their own experience studies to develop an adjustment to one of the *CPM* tables or apply "size adjustment factors" (mortality rate adjustments based on size of pension, provided in the *CPM* report) to standard mortality rates. The options for smaller plans are more limited. Typically, they would use one of the *CPM* tables, possibly with size adjustment factors applied, unless there are relevant experience studies available from larger plans or groups of plans that have similar membership characteristics.

Endnote

1. The Canadian Institute of Actuaries' guidance on the selection of mortality assumptions for pension plan valuations advises that when using experience studies to establish tables for actuarial valuation purposes, using results weighted on benefit amounts, rather than on number of lives, generally yields more appropriate results.

BIO

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