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EDUCATIONAL NOTE SUPPLEMENT

Mortality Improvements Research

May 15, 2024



Mortality Improvements Research

Committee on Pension Plan Financial Reporting

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The actuary should be familiar with relevant other guidance. They expand or update the guidance provided in an educational note. They do not constitute standards of practice and are, therefore, not binding. They are, however, intended to illustrate the application of the *Standards of Practice*, so there should be no conflict between them. The actuary should note however that a practice that the other guidance describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily accepted actuarial practice for a different situation. Responsibility for the manner of application of standards of practice in specific circumstances remains that of the members. As standards of practice evolve, other guidance may not reference the most current version of the *Standards of Practice*; and as such, the actuary should cross-reference with current Standards.

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Preamble

The Committee on Pension Plan Financial Reporting (PPFRC) is issuing this educational note supplement to provide members in the pension area of practice with commentary on the research report, [Mortality Improvements Research: Report to the Canadian Institute of Actuaries' Project Oversight Group](#), published by the Canadian Institute of Actuaries (CIA) on April 11, 2024 (Research Report). This educational note supplement also examines the Research Report's effect on guidance regarding the setting of best-estimate mortality assumptions suitable for use in going concern valuations for funding purposes and actuarial valuations for accounting purposes when the actuary expresses an opinion on the assumptions under the terms of engagement, under Sections 3200 and 3400 of the *Standards of Practice*, respectively.

The Actuarial Guidance Council (AGC) has approved the guidance summarized in this educational note supplement. In accordance with the Institute's *Policy on Due Process for the Approval of Guidance Material Other than Standards of Practice and Research Documents*, this educational note supplement has been prepared by the PPFRC and has received final approval for distribution by the AGC on May 14, 2024.

Your feedback

Questions or comments regarding this educational note supplement may be directed to the [chair of the PPFRC](#).

1. Educational note on selection of mortality assumptions

The educational note, [Second Revision: Selection of Mortality Assumptions for Pension Plan Actuarial Valuations](#), dated December 21, 2017, (Educational Note) discusses development of a best estimate mortality assumption for an actuarial valuation of a pension plan. The Educational Note states: "There are two key components to the selection of an appropriate best estimate mortality assumption: [b]ase mortality table at the valuation date [...] and [f]uture mortality improvement scale [...]. The actuary would consider these two components separately in developing the assumption for future rates of mortality that would be appropriate at the valuation date."

The Educational Note also observes that "assumptions in respect of future mortality improvement rates are subject to a high level of uncertainty and debate." This means that the reasonable range of mortality improvement assumptions that may be selected by the actuary for particular work may be wider than for other assumptions.

With respect to the generational mortality improvement scales CIA MI-2017 (MI-2017) and CPM Improvement Scale B (CPM-B), the Educational Note states that "it may be appropriate to use either scale in the absence of credible information to the contrary, such as the publication of a successor scale by the CIA," and that "the actuary would give consideration to emerging mortality improvement trends and studies on a regular basis, particularly those relevant to Canadian pensioners."

Following publication of the Research Report, this guidance continues to be applicable. In particular, subject to the considerations outlined below, the PPFRC believes that at the current time it may be appropriate to use any of the MI-2017 scale, the CPM-B scale or the proposed mortality projection scale published in the Research Report.

2. Considerations in selection of mortality improvement assumption

When selecting a mortality improvement assumption, the actuary would consider relevant factors, which may include the following:

- The CPM-B scale reflects improvement rates by age and year for years up to 2030 and ultimate rates applicable for all years after 2030. The MI-2017 scale has a similar two-dimensional structure (i.e., with rates that vary by age and year), with ultimate rates applicable for all years after 2033 for ages 60 and up. This means that, as valuation dates approach 2030 (and 2033), the CPM-B and MI-2017 scales will naturally transition from two-dimensional scales to one-dimensional scales, with improvement rates that vary by age only. As noted in the Educational Note, “two-dimensional generational scales are more robust and are therefore generally preferred over one-dimensional scales.”
- The ultimate improvement rates used in the CPM-B and MI-2017 scales rely heavily on expert judgment, whereas those proposed in the Research Report are more substantially informed by the results of stochastic mortality rate models fitted to mortality data.
- The CIA is currently conducting a review and update of the Canadian Pensioners’ Mortality tables, with revised tables expected to be published in the next year or so. The actuary may wish to consider the interaction of the base mortality assumption and the mortality improvement assumption, in the selection of these assumptions for a valuation.
- Paragraphs 1140.05 and 1620.16 of the *Standards of Practice* each state: “There is a reasonable range of assumptions that may be selected by the actuary for particular work and that might produce materially different results.” In particular, future mortality improvement rates are highly uncertain. One of the conclusions of the Research Report is that “best-estimate results for long-term improvement rates are subject to great uncertainty, with a standard error of around 0.5%.”



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