

Individual Life Insurance Mortality Improvement Scale Recommendation for Use with AG38/VM20

American Academy of Actuaries' Life Work
Group and the Society of Actuaries
Research Institute's Mortality and
Longevity Oversight Advisory Council

September 2024

Purpose

This document describes the 2024 individual life insurance historical mortality improvement (HMI) and future mortality improvement (FMI) recommendations approved by the National Association of Insurance Commissioners (NAIC) Life Actuarial Task Force (LATF) on the September 12, 2024 call.

For US statutory reserves under VM20 or AG38 using the 2008 Valuation Basic Table (2008 VBT) or the 2015 Valuation Basic Table (2015 VBT), the HMI and FMI scales discussed herein are applicable.

For statutory reserves using the 2008 Limited Underwriting tables, the HMI and FMI mortality improvement assumptions are zero for all years.

Background

As part of the work conducted by the American Academy of Actuaries' Life Work Group and the Society of Actuaries Research Institute's Mortality and Longevity Oversight Advisory Council (MLOAC) to develop the 2015 Valuation Basic Table, the Mortality Improvements Life Working Group (MILWG) (a subgroup of MLOAC) was tasked with reviewing recent mortality improvement levels based on available data for the individual life insurance policyholder population.

Since yearend 2014, the MILWG has been tasked with studying and annually recommending updates to the mortality improvement scales for use with AG38 and VM20 (specific to the individual life insurance product lines). Each year, the MILWG presents a recommendation for a set of HMI factors, and starting in 2022, a set of FMI factors to be used

in conjunction with the 2015 Valuation Basic table. Both the HMI and FMI scales vary by attained age and sex. The FMI scale also varies by calendar year.

The HMI & FMI scales presented in this document were accepted for use for the 2024 valuation year in conjunction with AG38 and VM20. See Appendix A of this document for background on the development of the current methodology for producing these scales.

The SOA Research Institute's Mortality and Longevity Steering Committee is simultaneously working on a general framework for developing product-neutral mortality improvement scales, which will subsequently be used as a guide by the MILWG to revisit the current approach for creating these scales each year.

Recommendation

HMI AND FMI SCALES

The MILWG, as well as other industry groups working on valuation mortality and mortality improvement rates, considered appropriate methods to reflect the impact of a shock mortality event like COVID-19. In order to ensure consistency in thinking about how to reflect the impact of a shock mortality event, an industry group was formed in January 2022 to discuss and develop a set of principles to reflect the impacts of COVID-19 on life insurance and annuity valuation mortality. This group included representatives from the life insurance industry, the American Academy of Actuaries, the Society of Actuaries Research Institute, and the NAIC. A key principle agreed upon by the group was that the initial shock impact of the COVID-19 event should be reflected in valuation mortality only to the extent it is expected to continue in the future.

In practice, this principle was reflected in the current recommendation by implementing a revised methodology for HMI and FMI for years 2022, 2023, and 2024. The revised methodology is outlined below.

Revised Methodology

For HMI, for 2022 and 2023 scale years, under the principle of not including the initial shock impact of COVID-19 to develop the HMI or FMI scales, the historical average component was calculated as the 10-year average from 2010-2020 and from 2011-2021, respectively. However, for purposes of this calculation, it was assumed that 2020 and 2021 mortality remained at the same level as 2019. For 2024, the 10-year average calculation has returned to the standard methodology, using a geometric average over the period 2012-2022.

For FMI, for the first reserve projection year (2025), for all ages where 2024 HMI rates are negative, the FMI rates will show continued deterioration in mortality, followed by a zero MI level from 2026 to 2029, in order to reflect a reasonable estimate of potential ongoing impacts of COVID-19 as well as the opioid epidemic on the life insured population. This will result in an increase in mortality over pre-pandemic levels at these ages. See below for a more detailed description of the methodologies applied to develop the 2024 HMI and FMI scales.

It is recommended that the HMI and FMI rates provided in the accompanying spreadsheet be used for 2024.

2023 Historical Mortality Improvement (HMI) Scale Methodology

The raw, unsmoothed HMI rates are equal to the average of a historical component and a future-looking component as described below:

- Historical component

The historical component is represented by the 10-year (ending in 2022) geometric average annual mortality improvement level implied from general population mortality data published by the Social Security Administration (SSA).

- Future-looking component

The future component is represented by the 20-year geometric average annual mortality improvement level (for 2024, this covers the period from 2022 to 2042), based on the most recent SSA Trustees report (2024) intermediate assumption.

For AG38/VM20 purposes, the “future/unknown” period is relatively short (for 2024, final historical data only exists through 2022, so that the “unknown” future component is 2 years). However, applying the 20-year period for averaging generally results in smoother patterns by age and calendar year, as well as allowing for greater weight being given to the long-term average.

The average annual rates calculated as above are then manually smoothed to produce final scales by sex and age (as well as calendar year for FMI).

2023 Future Mortality Improvement (FMI) Scale Methodology

The FMI rates are calculated as follows.

- The starting point for FMI is the 2024 HMI scale.
 - The FMI rates grade from the 2024 HMI level to a long-term MI assumption that is based on the average of years 10-15 of the SSA 2024 Trustee’s Report intermediate projected mortality assumption. The FMI rates grade to the long-term level over the first 10 years of the projection.
 - The FMI rates then remain level at the long-term rate from 2033 to 2038 (5 years).
 - The FMI rates then grade to zero at year 20 (2043).
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A reasonable estimate of the deterioration in mortality for calendar year 2025 was determined by calculating an “alternative” HMI scale that reflects the full impact of COVID-19 in determining the initial FMI starting point. This initial deterioration is reflected in 2025, and results in deterioration in the first year of the FMI scale for some ages. For 2026 to 2029, FMI is held at 0. From 2029, the FMI grades to the long-term assumption over the remaining five years of the standard FMI 10-year period. FMI rates then remain level at the long-term assumption until 2039 and then grade to zero in 2044 and later.

APPENDIX A

Considerations in developing mortality improvement factors for application with VM38 and VM20.

- **Recent Historical Experience Impact**—The desire for a methodology that weights the impact of recent historical rates of improvement with a longer-term assumption (i.e., SSA intermediate mortality projections) in determining projected improvement rates. This approach is (at a very high level) consistent with the current U.K. Continuous Mortality Investigation (CMI) projection models, as well as methods commonly used to develop other insured mortality projection scales. These methods project rates based on past experience, but trend toward a long-term assumed average annual improvement level.
- **Insured Data**—Aggregate insurance company data for the period 2002-2009 from the Society of Actuaries Research Institute regular studies of individual life insurance mortality was initially examined. It was eventually decided that, given (1) the relatively short period over which historical insured experience is available and (2) the year-over-year volatility of industry specific results (likely in part the result of both industry factors—such as changes in target market, distribution channel or underwriting mix and changes in underlying mortality rates), general population data is a preferable source for determining both an improvement scale for use in VBT table development efforts and as annual AG38/VM20 scale recommendations, at least for the near term.
- **General Population Data Source**—The MILWG examined several sources of general population data, including data from the U.S. Vital Statistics, the Human Mortality Database (HMD), and the SSA. The SSA data was selected as the source for general population analysis for several reasons, including the fact that it is strongly vetted, that it may have better data regarding age at death for the oldest ages than HMD, and that it includes projections of future estimated mortality.
- **Additional Factors Considered (Sex, Attained Age, Smoker Status, Socioeconomic Status, Differences in Cause of Death for Insured vs. General Population)**—In addition to data sources discussed above, the subgroup also researched and considered additional factors that could impact mortality improvement experience. The decision was made to regularly review the use of alternative or further adjustments to population mortality to eliminate potential basis risk (differences between the results using general population data in lieu of industry specific data) at the same time any changes for consistent framework recommendations are incorporated.

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