# Future Mortality Improvement Scale Development (VM-20) LATF Update #2


Mortality Improvements Life Work Group (MILWG), the Academy's Life Experience Committee and the SOA's Preferred Mortality Project Oversight Group ("Joint Committee")



Life Actuarial Task Force (LATF) Meeting—June 23, 2022

# Agenda

- Items to be addressed in the 2022 scale recommendation
- UPDATE: COVID-19 approach
- Next steps/discussion

# Items to be addressed in 2022 scale recommendation

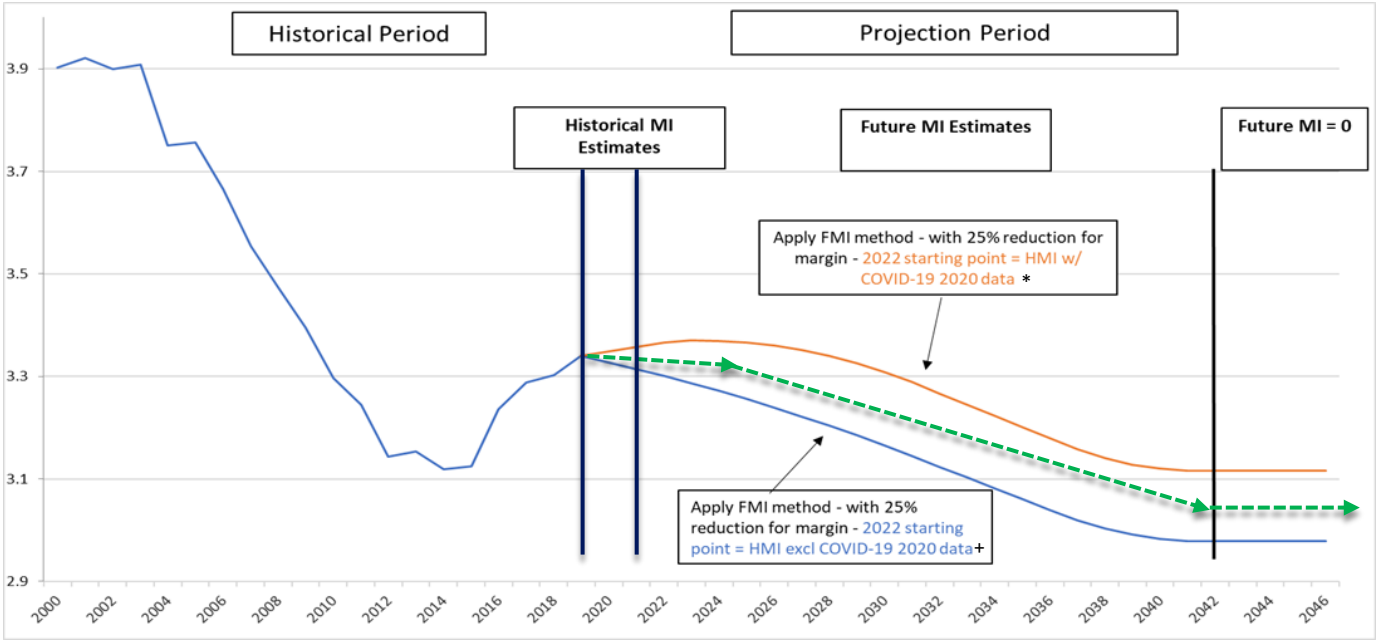
Develop Historical Mortality Improvement (HMI) and FMI Future Mortality Improvement (FMI) scales for use in 2022 valuation year.

The 2022 scales will address the following:

- Reflecting COVID-19 impacts
- Review of margin development
- Review of smoothing method

# Approach to COVID-19 impact

## Example: Male Age 45—SSA Mortality Rates
## w/ HMI estimates and FMI estimates and Expected Recommendation




*HMI-1, FMI-1 scenario, explained on p. 5
+HMI-2, FMI-1 scenario, explained on p. 5

# COVID-19 Impact— FMI/HMI Model Scenarios

| Scenario Label | Historical MI—Scenarios being assessed | Description/Notes |
|---|---|---|
| HMI-0 | No HMI | used with FMI-0 to determine baseline for comparison |
| HMI-1 | 10-year historical average ending in 2020 | includes full deterioration effect of 2020 COVID-19 (most conservative line on slide 4) |
| HMI-2 | 10-year historical average ending in 2019 | exclude 2020 COVID-19 shock (most optimistic line on slide 4) |
| HMI-3 | 9-year historical average ending in 2019 | exclude 2020 COVID-19 shock (intermediate) |
| HMI-4 | 10-year historical average ending in 2020 | exclude 2020 COVID-19 shock by assuming zero improvement from 2019 to 2020 (intermediate) |

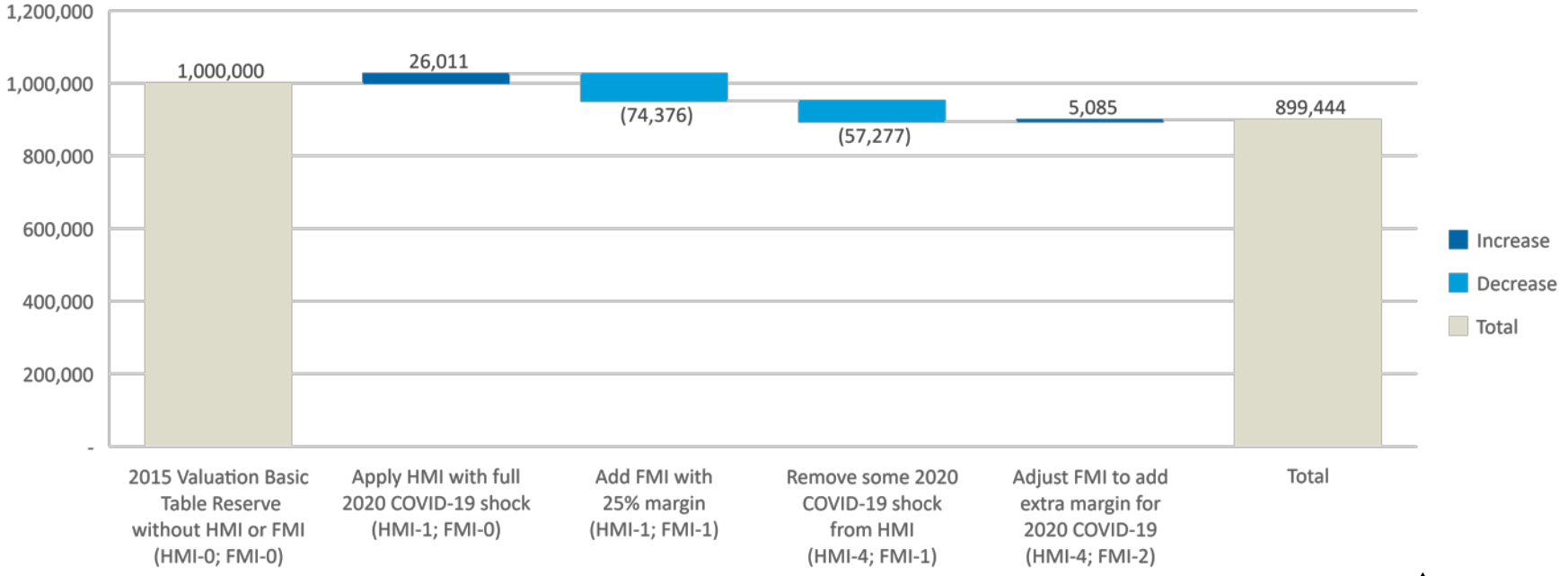
| | Future MI—Scenarios being assessed | Description |
|---|---|---|
| FMI-0 | No FMI | used with HMI-0 to determine baseline for comparison |
| FMI-1 | Basic FMI scale = Use grading to Long Term (LT) average based on SSA Alt 2 with margin approach #1 (recommended method) | Loaded Mortality Improvement (MI) scale = Basic FMI with explicit margin for uncertainty around the future trend (= 25% reduction of Basic FMI rates in all years) |
| FMI-2 | Basic FMI scale = Use grading to LT average based on SSA Alt 2 with margin approach #2 | Loaded MI scale = FMI Basic with explicit margin for uncertainty in future trend<br>(= 25% reduction of Basic FMI rates in all years)<br>and<br>*an additional explicit margin for uncertainty around the COVID-19 medium-/long-term impacts that grades off over time*.<br><br>Additional COVID-19 explicit margin:<br>50% margin in 2023 grades to margin of 25% over 5 years. |

# Reserve Impact - NAIC Model Office

- Universal Life with Secondary Guarantees (ULSG) focus—long-duration product, larger potential for reserve reduction
  - Model office and assumptions same as used in the yearly renewable term (YRT) representative model analysis
  - Lifetime shadow account secondary guarantee
  - No reinsurance in the model
- Combined model office

| Component | Values |
|---|---|
| Issue ages | Decennial issue ages<br>30 – 70 |
| Gender | Male<br>Female |
| Risk classes | Preferred non-tobacco<br>Standard non-tobacco<br>Standard tobacco |
| Face bands | Low ($250,000)<br>High ($1,000,000) |

# Reserve Impact Results



# Next Steps

- Review of smoothing method
- Review approach for MI rates near 0
- Finalize margin methodology
- Margin and smoothing recommendation to be presented to LATF on 7/7/22 call

# Questions?

# Contact Information

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# Appendix 1

RECAP:

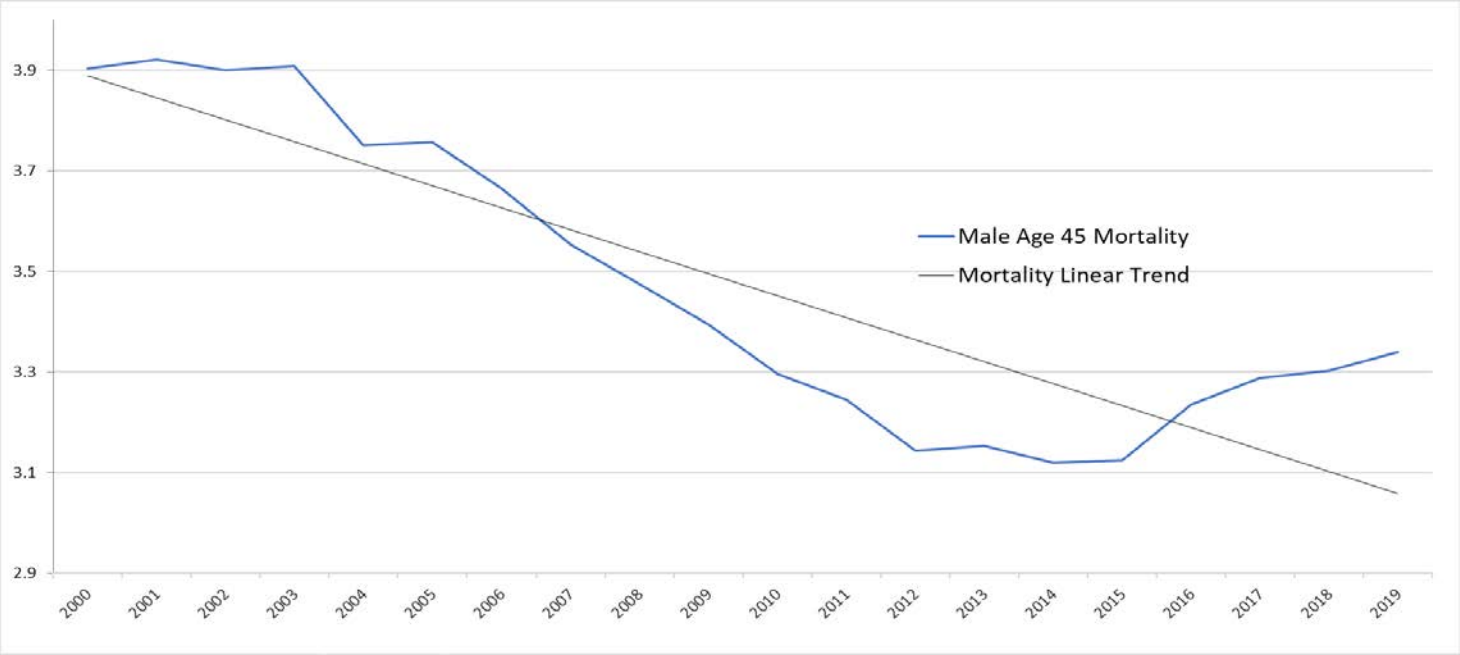
Slides from LATF UPDATE #1
6/2/22

# Approach to COVID-19 impact

- Quantification of COVID-19 impact
  - Data sources
  - Short- vs. medium- vs. longer-term impacts
  - Return to previously projected mortality level over time or residual excess mortality
  - Insured vs. general population considerations
  - Direct adjustment to MI rates or reflected in additional margins
- Implicit margins in MI scale development
  - Data source—general population data unadjusted for insured population differences (largest source of margin)
    - Starting MI level (HMI)
    - Long-term rate (FMI)
  - Limit on FMI assumption (20 years)

# Approach to COVID-19 impact

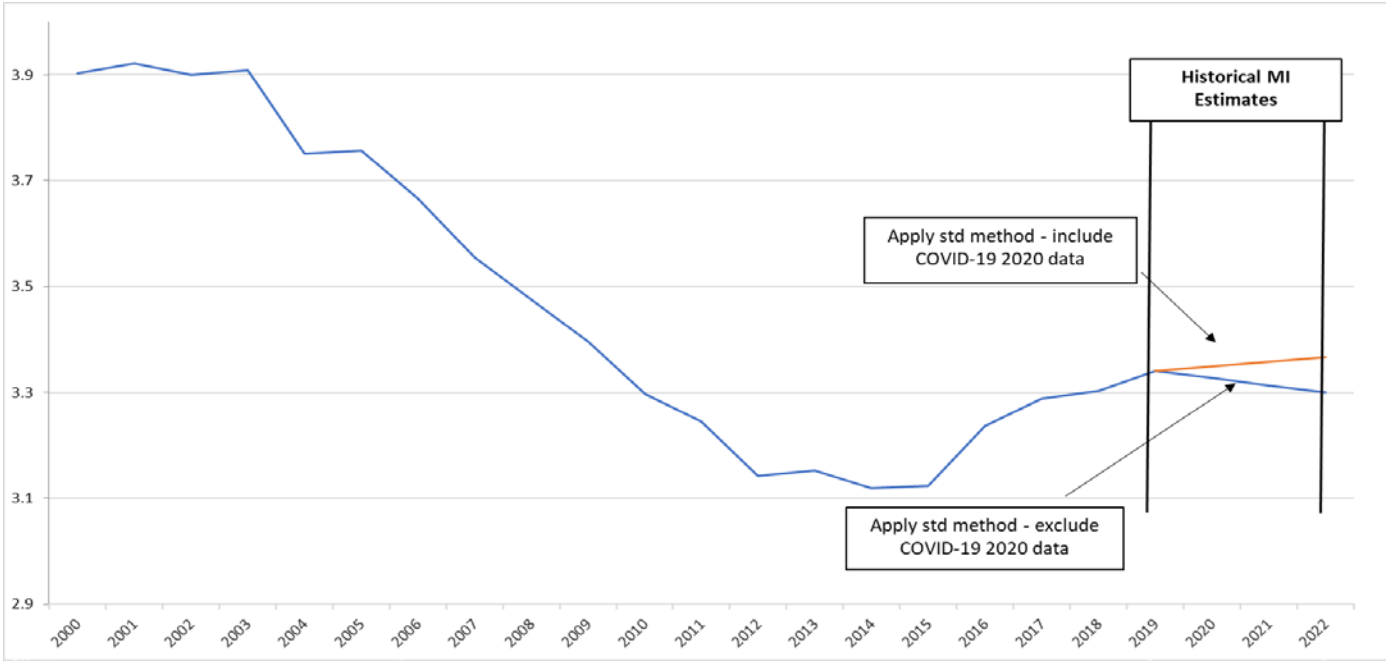
## Example: Male Age 45—Social Security Administration (SSA) Mortality Rates—Pre-COVID-19



# Approach to COVID-19 impact

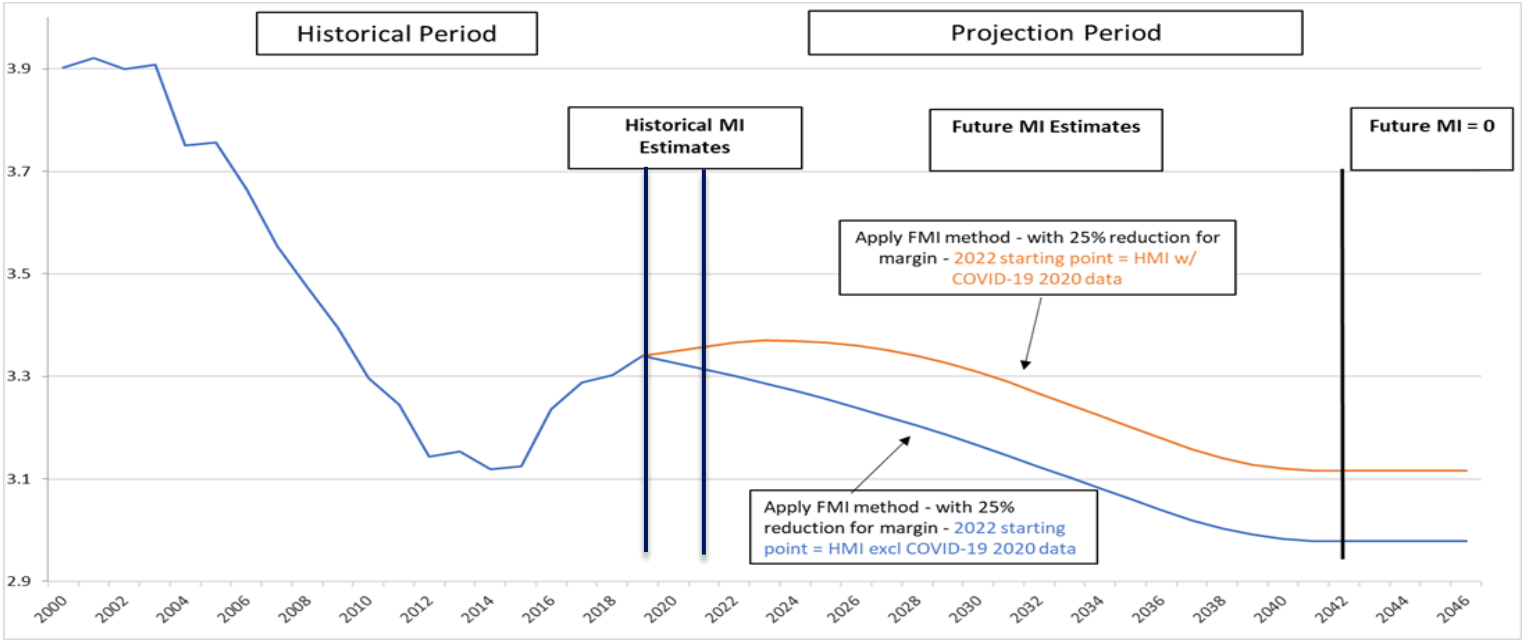
## Example: Male Age 45—SSA Mortality Rates

## w/ HMI estimates both including and excluding 2020 COVID-19 impact in data



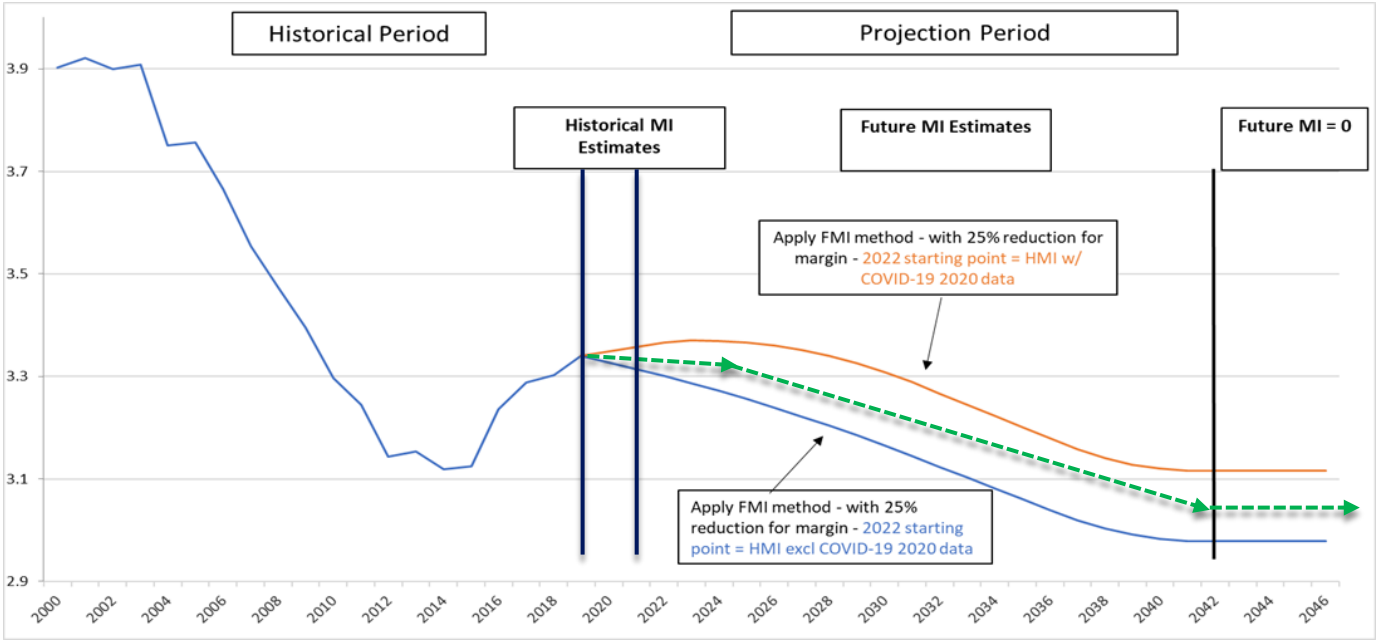
# Approach to COVID-19 impact

## Example: Male Age 45—SSA Mortality Rates w/ HMI estimates and FMI estimates



# Approach to COVID-19 impact

## Example: Male Age 45—SSA Mortality Rates
## w/ HMI estimates and FMI estimates and Expected Recommendation



# COVID-19 Impact—Modeling Scenarios

| Historical MI—Scenarios being assessed | Description |
|---|---|
| 1. 10-year historical average ending in 2020 | including full deterioration for 2020 (most conservative) |
| 2. 10-year historical average ending in 2019 | exclude COVID-19 shock impact in 2020 (most optimistic) |
| 3. 9-year historical average ending in 2019 | exclude COVID-19 shock impact in 2020 (alternate) |
| 4. 10-year historical average ending in 2020 (assuming no improvement from 2019 to 2020) | muted impact of 2020 (intermediate) |

| Future MI—Scenarios being assessed | Description |
|---|---|
| 1. Basic FMI scale = Use grading to LT average based on SSA Alt 2 (recommended method) | Loaded MI scale = Basic plus explicit margin for uncertainty around the future trend (= 25% reduction of Basic FMI rates in all years) |
| 2. Basic FMI scale = Use grading to LT average based on SSA Alt 2 (recommended method) | Loaded MI scale = Basic plus explicit margin for uncertainty in future trend (= 25% reduction of Basic FMI rates in all years) and *an additional explicit margin for uncertainty around the COVID-19 medium-/long-term impacts that grades off over time*.<br><br>Additional COVID-19 explicit margin—options for model testing:<br>1. 50% margin grades to normal margin of 25% over 5 years.<br>2. Decrease mortality improvement by 1% in year 1 grading linearly down to 0% in year 5. |

# 2022 MI scale development timeline (VM-20)

## Updated May 2022

| Milestones | Target Date |
|---|---|
| 1. Receive 2020 data from the Centers for Medicare and Medicaid Services (CMS). SOA creates preliminary mortality estimates for 2020. | 2/28/2022 (completed) |
| 2. Identify options for reflecting COVID-19 impact on HMI and FMI scale recommendations including margin. | 4/28/2022 (completed) |
| 3. Assess reserve impact of COVID-19 adjustment recommendation—run National Association of Insurance Commissioners (NAIC) model office under several scenarios. | 5/15/2022 (in progress) |
| 4. Determine smoothing method for FMI and HMI scales. | 6/15/2022 (in progress) |
| 5. Receive SSA Trustees Report—Intermediate Projections for 2022. | Est. 6/15/2022 |
| 7. Finalize recommendation for reflecting COVID-19 based on NAIC model office results. | 7/1/2022 |
| 8. Present to LATF for approval for exposure (LATF call in early July). *Assumes 60-day exposure period.* | 7/15/2022 |
| 9. Update SSA mortality estimates for 2020 from SOA (final SOA estimates). | 8/15/2022 |
| 10. Respond to exposure comments obtain LATF approval of 2022 HMI and FMI. | 9/15/2022 |
| 11. Publish 2022 HMI and FMI scales on SOA website. | 9/30/2022 |

# Appendix 2

## NAIC Model Office: Background Information

# FMI - Reserve Impact Estimates

## NAIC Model Office

- Universal Life with Secondary Guarantees (ULSG) focus—long-duration product, larger potential for reserve reduction
  - Model office and assumptions same as used in the YRT representative model analysis
  - Lifetime shadow account secondary guarantee
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| Component | Values |
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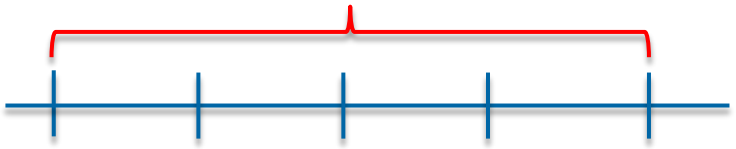
# Reserve Impact Estimates

## Future Mortality Improvement Assumption Model Implementation

- The 2021 and prior versions of VM-20 prohibited including FMI in the calculation of deterministic and stochastic reserves, while allowing the mortality assumption to be improved up to the valuation date using a historical mortality improvement (HMI) assumption developed by the MILWG
- An **"exact" approach** to including FMI in the calculation of deterministic and stochastic reserves would utilize the MILWG's HMI assumption to bring the mortality table up to the valuation date and then apply the separate FMI assumptions beyond the valuation date

Historical mortality improvement (HMI) application period for 2015 VBT and a 12/31/2020 valuation date



7/1/2015

Applicable date from which to start applying HMI for 2015 VBT

12/31/2020

HMI is allowed to be applied up to the current valuation date

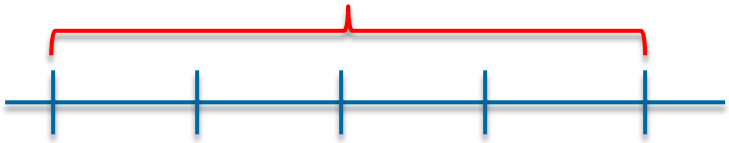
# Reserve Impact Estimates

## Future Mortality Improvement Assumption Model Implementation

A modeling simplification was employed that utilized the new MILWG FMI assumption as both HMI and FMI in the deterministic reserve projection.

This simplification allows for the impact of including FMI in current and future deterministic reserve calculations to be quantified.

Historical mortality improvement (HMI) application period for 2015 VBT and a 12/31/2020 valuation date



7/1/2015

Applicable date from which to start applying HMI for 2015 VBT

12/31/2020

HMI is allowed to be applied up to the current valuation date

# Reserve Impact Estimates

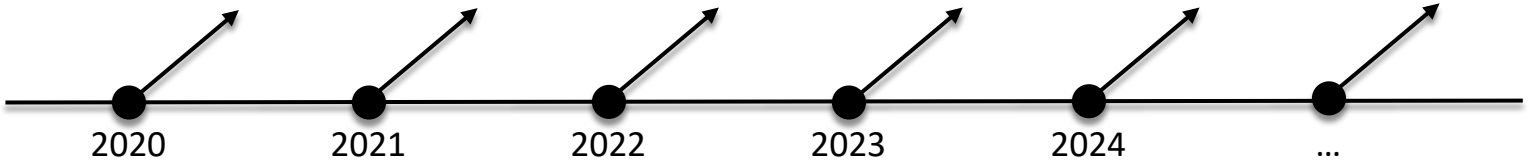
## ULSG Model Office Results

- Baseline reserves—no FMI
- Best estimate—reserves with FMI at best estimate level
- Margin 25%—FMI at best estimate level with 25% reduction across all gender/ages
- Margin 35%—FMI at best estimate level with 35% reduction across all gender/ages

# Reserve Impact Estimates

## Model Office—Deterministic Reserve Projection Illustration

**Deterministic Reserve Projection**




**Baseline**

- 2020 Valuation
- 2024 Valuation

No HMI to 2020

No FMI included in Deterministic Reserve

No HMI to 2020

HMI applied from the beginning of 2021 to year-end 2024

No FMI included in Deterministic Reserve

**Best Estimate - FMI**

- 2020 Valuation
- 2024 Valuation

No HMI to 2020

Remaining FMI (19 years) **included** in Deterministic Reserve

No HMI to 2020

HMI applied from the beginning of 2021 to year-end 2024

Remaining FMI (15 years) **included** in Deterministic Reserve



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