SOA Research INSTITUTE

Update on Life Insured Mortality Improvement Recommendation

Mortality Improvement Life Working Group
of the SOA Mortality and Longevity Oversight Advisory Council

JUNE| 2025

Presentation Disclaimer

The material and information contained in this presentation is for general information only. It does not replace independent professional judgment and should not be used as the basis for making any business, legal or other decisions. The Society of Actuaries assumes no responsibility for the content, accuracy or completeness of the information presented.

SOA Research INSTITUTE

Agenda

Provide an update on a preliminary recommendation for individual life insured historical mortality improvement (HMI) and future mortality improvement (FMI) for fully underwritten business

SOA Research INSTITUTE

HMI Recommendation – Fully Underwritten Business
Overview of Work to Date

- Predictive model built

To identify and quantify the primary non-biometric factors impacting mortality improvement results in the individual life insured population data. Non-biometric factors include changes in distribution of business by face amount band, risk class, plan of insurance, issue year and policy duration.

- MI analysis tool developed

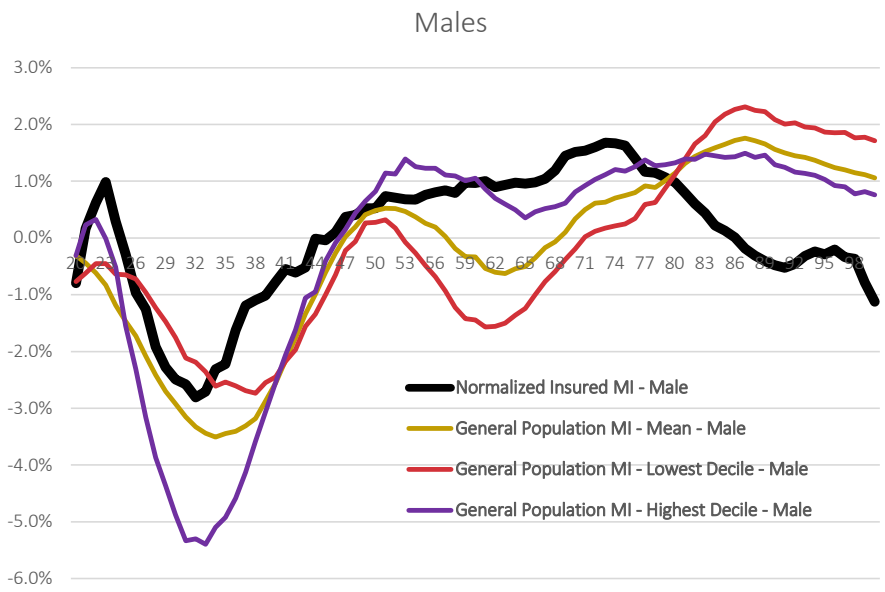
Excel-based tool that allows for "normalization" of data for non-biometric factors identified in the predictive modeling work

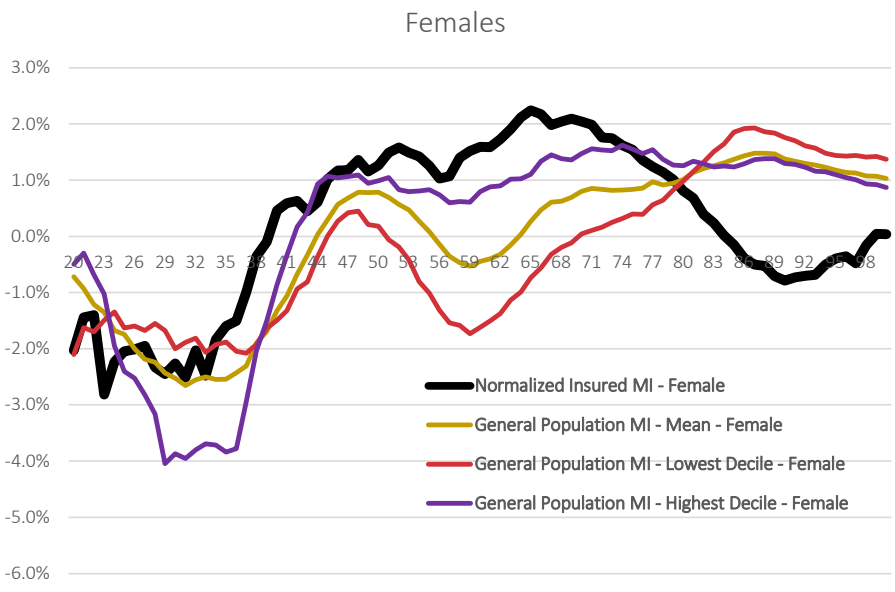
  - Allows for better understanding of true biometric mortality improvement levels
  - Allows for comparison to general population deciles

SOA Research INSTITUTE

Comparison of Population and Insured Mortality Improvement Rates

Experience Period = 2011-2019

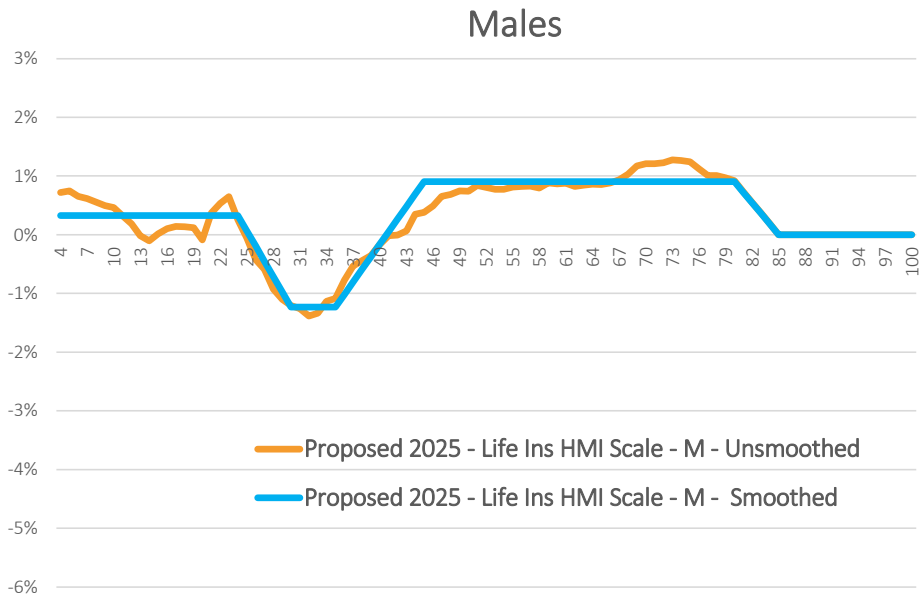


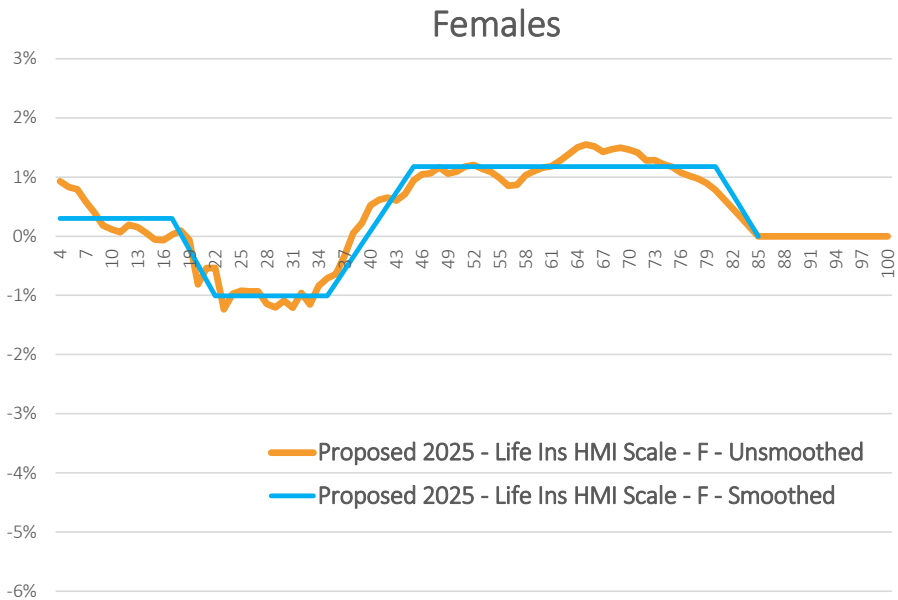


Individual life insured data (black lines) – basis for derivation of mortality improvement rates shown:

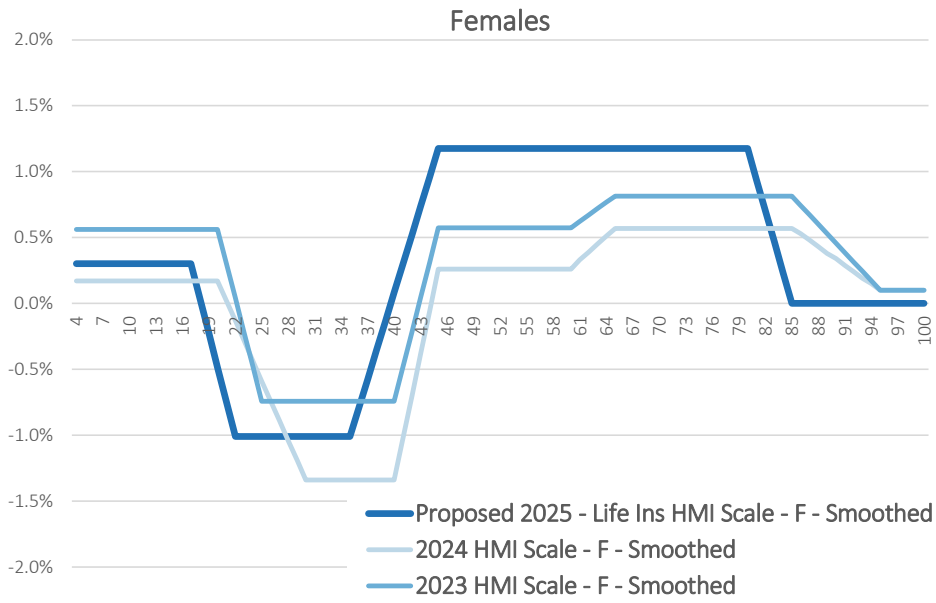
- MI determined on a policy count basis
- Data normalized for changes in face amount distribution
- Term and permanent products combined (post level term excluded)

HMI Recommendation – Fully Underwritten Business - 2025





HMI Recommendation – Fully Underwritten Business



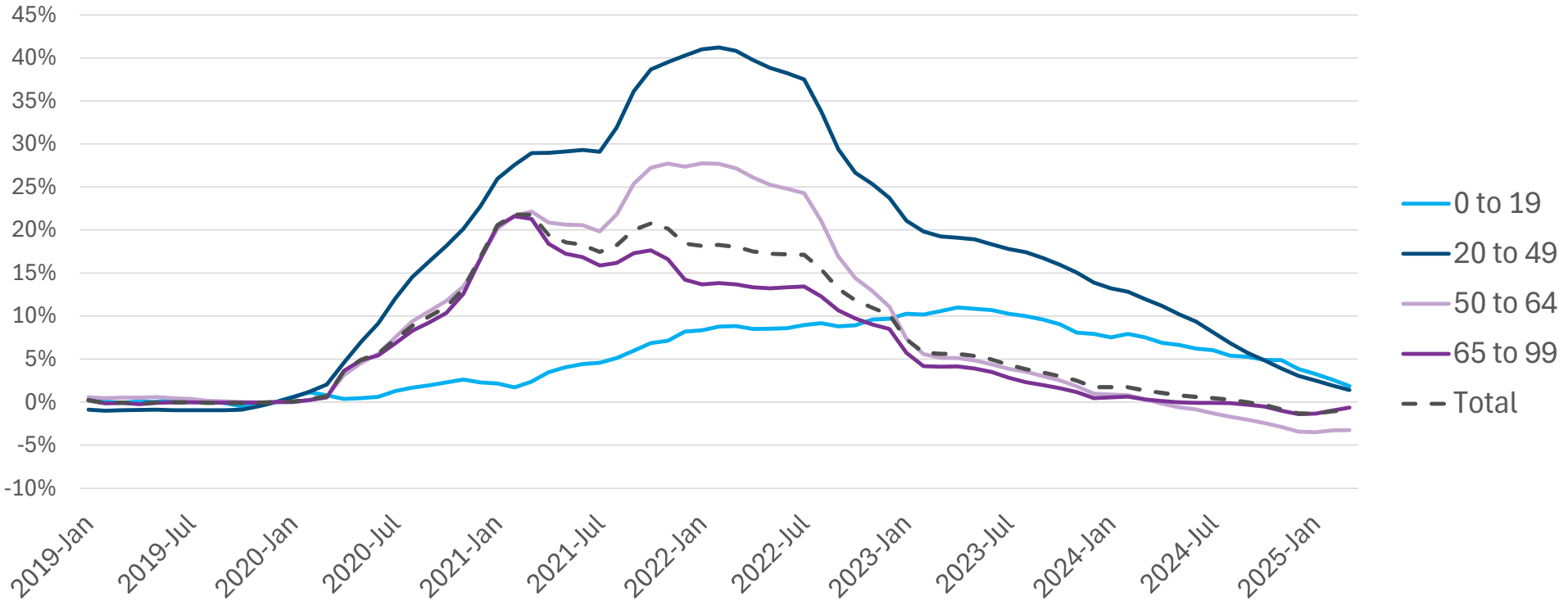
MI Recommendation – Individual Life Fully Underwritten Business
Update on Next Steps (from March 2025 update)

- HMI recommendation
  - Consider practical issues involved with using insured mortality data rather than general population sources (lags in data, regular updates will be needed)
  - Additional considerations to be addressed – COVID impact
  - Working with NAIC staff on impact testing using model office
- FMI recommendation
  - Review long-term MI rates assumption
  - Consider impact of COVID and opioid use in recent years
  - *Review risk margin for FMI*
- *HMI recommendation for Limited Underwriting Business*
  - *Considering applicability of planned new VM 51 underwriting data elements for limited underwriting study (underway)*

SOA Research INSTITUTE

Completed items in blue font.

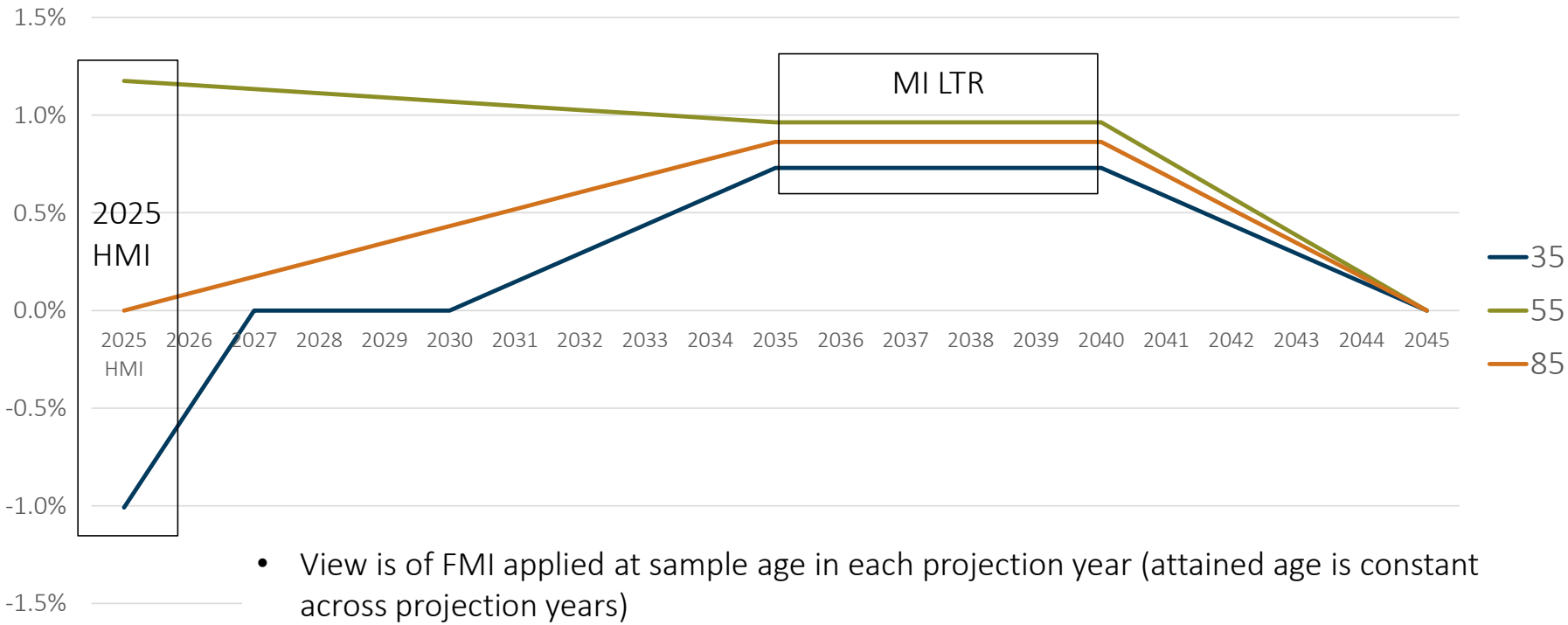
General Population Data
Age Standardized Excess Mortality versus 2019 Level
2019-2025 – Male and Female Combined



SOA Research Institute

Source: SOA CDC Mortality Analysis Tool, SSA, CDC, HMD

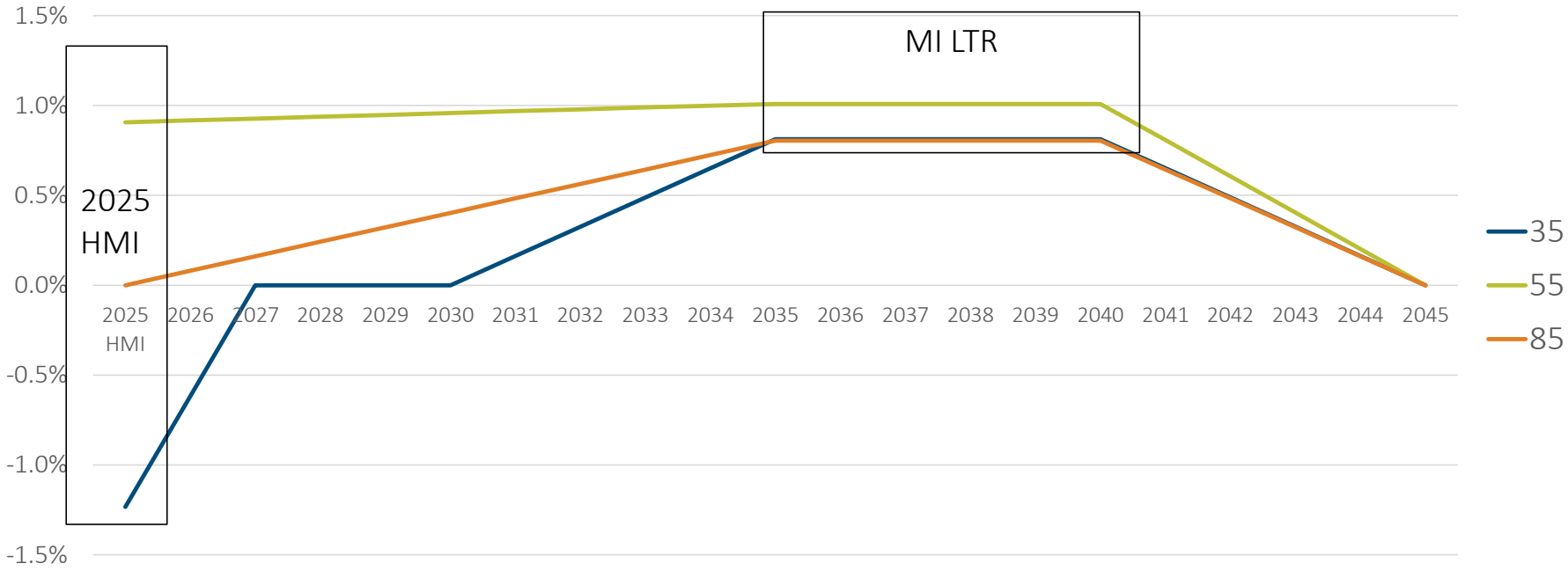
Preliminary FMI Recommendation
Males – Fully Insured Lives



- View is of FMI applied at sample age in each projection year (attained age is constant across projection years)
- Above are sample ages – all ages in Appendix view
- FMI starts at HMI levels and is projected to the MI Long-Term-Rate (MI LTR) over first 10 years of the reserve projection. MI LTR subject to change based on recent SSA publications.

SOA Research INSTITUTE

Preliminary FMI Recommendation
Females – Fully Insured Lives



- View is of FMI applied at sample age in each projection year (attained age is constant across projection years)
- FMI starts at HMI levels and is projected to the MI Long-Term-Rate (MI LTR) over first 10 years of the reserve projection.

SOA Research INSTITUTE

Appendix

Preliminary Insured Historical Mortality Improvement (HMI) Recommendation

	Options Considered	Current Recommendation
Basis for Measuring Historical Improvement	1. Fully underwritten insured mortality experience (after normalization) 2. General population decile chosen to represent insured 3. Combination of both	<u>Combination of both</u> • Primary insured ages (25-80) : normalized insured data to measure MI for primary insured ages (25-80) • Ages 0-25 : general population data grading to insured data at age 25 • Ages 80-85 : grade from insured data to 0 at age 85
Subset of Insured Historical Data for Measuring MI	1. Experience Period Subset (full period available 2009-2019) 2. Unismoke, smoker distinct, or all data 3. Post level term 4. Conversion business 5. Survivorship business 6. Substandard business	1. 2011-2019 2. Smoker distinct only 3. Excluded post level term 4. Conversion business (TBD) 5. Survivorship excluded 6. Substandard excluded * May want to consider adding to data formats in future
Methodology	1. MI calculation basis (face amt/policy count) 2. Factors for variations in scale (gender, attained age, smoker status, risk class, select vs ultimate) 3. Smoothing approach 4. COVID adjustments if needed 5. Impact of opioid and mental health crises 6. Risk margin approach	1. Policy count 2. Gender and attained age only 3. Averaging across attained age groups 4. COVID adjustments TBD 5. Included in both insured and general population data 6. Risk margin considerations TBD

HMI Recommendation – Fully Underwritten Business

Background

- It has been difficult to measure true life insured HMI due to inconsistency in the past industry experience data for insured lives
  - Changes in the mix of companies included in the data
  - Shifts in industry focus over time

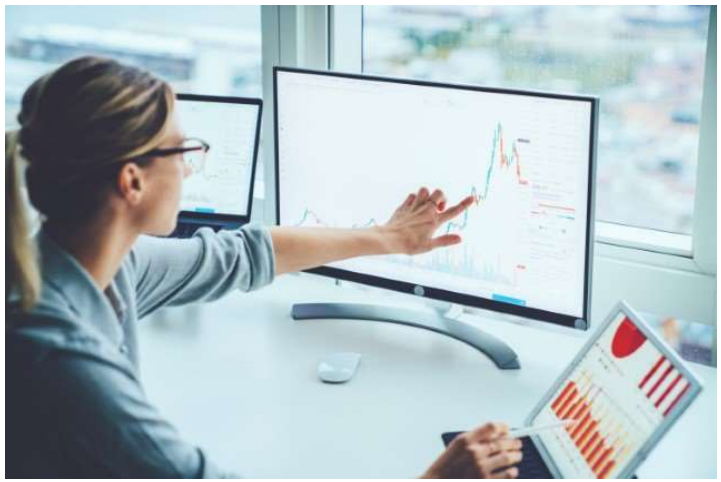
  (ex. changes in underwriting definitions, changes in risk class structure, changes in market/distribution focus over time)
- Revisited this given the new data source from mandatory data calls
- Also, reviewed SOA general population socioeconomic decile work
  - Industry insured data is now included in SOA Mortality Improvement Model (MIM) tool as a data option for users in considering their own HMI assumptions
- Predictive modeling approach pursued to help better quantify and adjust for the impact of industry shifts affecting the mortality trend over time
- Focusing first on the HMI approach (future mortality improvement (FMI) will be the next)

SOA Research INSTITUTE

HMI Recommendation – Fully Underwritten Business

MI Analysis Tool

- Data included in tool
  - General population data from socioeconomic decile study
  - Insured data from SOA based on the NAIC/NYDFS data calls (2009-2019 experience years)
    - Includes all fully underwritten business issued standard (no substandard)
- Tool Methodology
  - Informed by predictive modeling work
  - Insured mortality experience is normalized across the experience years for factors having the greatest effect on mortality
  - Currently the tool can only normalize for one factor at a time
- Results
  - Normalized insured data was compared to general population data
  - Normalized insured data appears reasonably consistent with general population trends



SOA Research Institute

HMI Recommendation – Fully Underwritten Business

Predictive Modeling Results

- Data: 2011-2017 fully insured mortality data provided by SOA
- Five separate models were developed by product category
    1. Term products
        a) Face Amounts <100K, excluding post level term
        b) Face Amounts 100K+, excluding post level term
        c) Post level term, all face amounts
    2. Permanent products
        a) Whole life unismoke
        b) All other permanent business
- Results: confirmed hypothesis that the primary industry-related factors impacting MI for the total insured population include:
    - Face amount
    - Risk class
    - Plan of insurance (term, whole life, universal life)
    - Issue year era
    - Policy Duration

The same primary factors were identified across product category models, but there are differences by product category in order of factor importance.

SOA Research INSTITUTE

Contact Information

Marianne Purushotham, FSA, MAAA

Corporate Vice President, Research Data Services

LLGlobal/LIMRA

mpurushotham@limra.com

SOA Research INSTITUTE


SOA
Research
INSTITUTE