

Developments for New VBT

August 10, 2026

**Valuation Basic Table Working Group
of the SOA Mortality and Longevity Oversight Advisory Council**



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Agenda

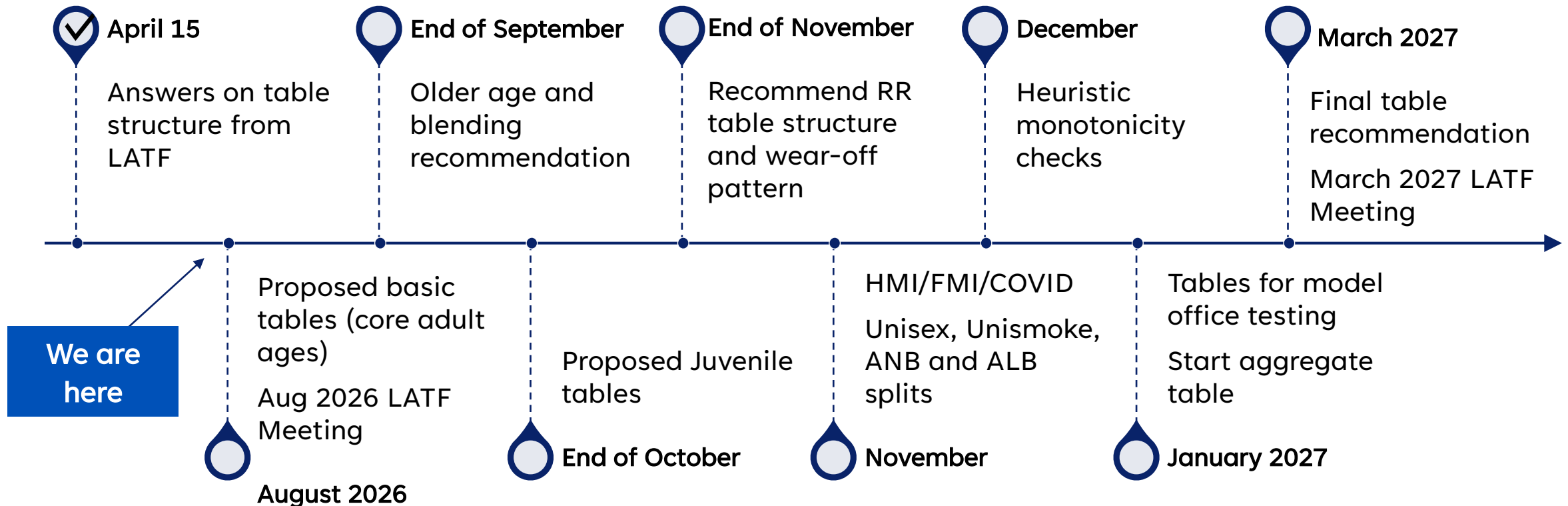
- Key Decisions and developments
- Core age model development
 - Data
 - Distinct model differentiators – model granularity
 - Select period
- Policy count vs policy amount tables
- Next steps

Key Decisions and Developments

Key Decisions from Spring 2026 Exposure

- Stick with 2018-2019 exposure years and validate with 2023, possibly 2024 data
 - Ignore COVID years
- Enable more data-driven development
 - Let the data and science drive analysis
 - Additional granularity okay
- Develop an aggregate table in addition to more granular tables
 - More consistent with existing VBT structure

Making Good Progress but Slightly Behind



New VBT Table Development Focus and Process – On step 4*



Core Age Model Development

Model Structure

- Explored different model structures
 - 25 yr, 20 yr and Fully select
 - Main, 2 way and Full effects
 - Poisson
 - Issue age
 - Two-dimensional binomial GAM
 - 5/6 knots per smooth variable
 - Adjusted logistic on policy and amount weighted data

Recommended model structure

- Two-dimensional binomial GAM
- Logistic link function:
 - Allows mortality rates to approach and converge to 0.55 at infinity
 - Enables convergence in a smooth, expected manner
 - Reflects implicit prior assumptions on later life mortality
- Improves explainability

Data Summary – Focus on Core Age Table

- Issue ages: 26 – 89
 - Projected to 99
- Durations 1 – 20
 - Projected to 21
 - Also examined durations 1 – 25, projecting to duration 26
- Attained ages: <99
- NS/SM
- M/F
- Plan, UW, Amount groups

Data not reflected in initial core table

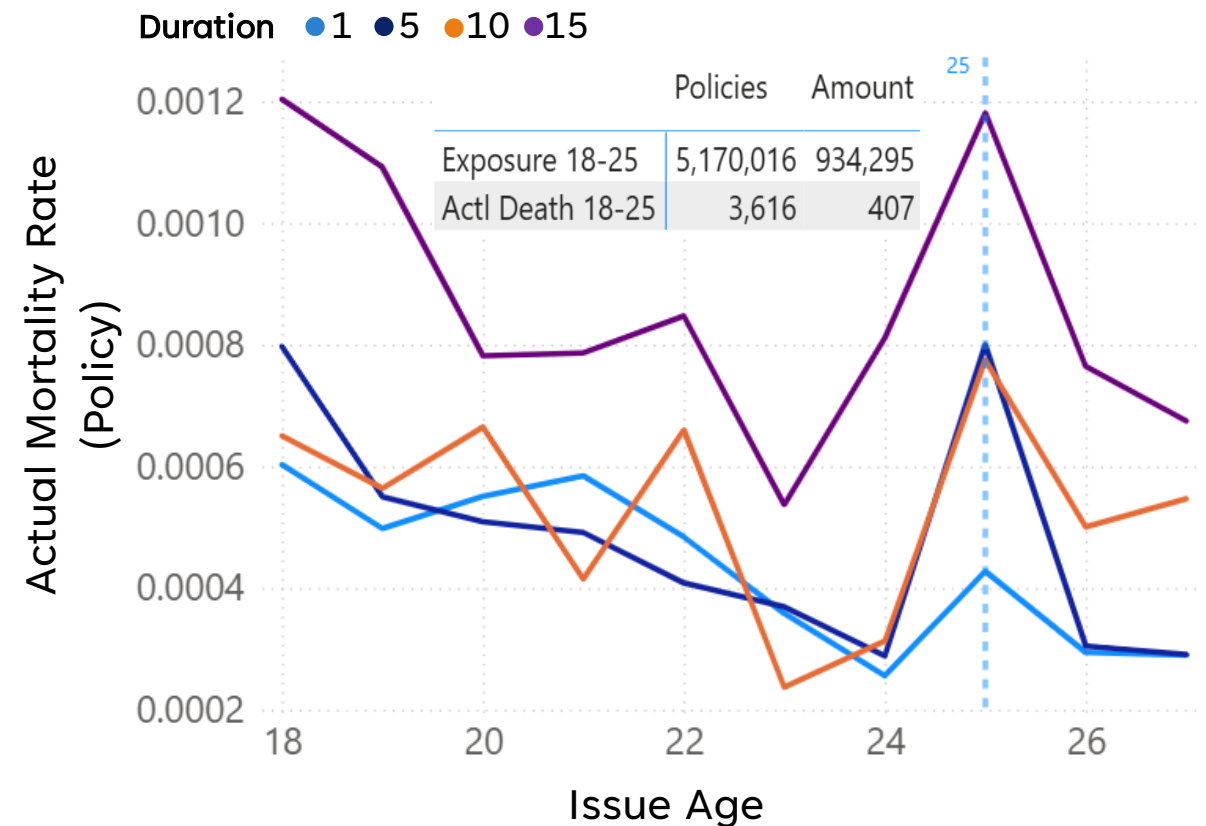
- Issue ages 18 – 25
 - Due to suspected child rider conversions
- Issue ages 70+
 - For issue years 2005 – 2008 and
 - With face amounts $\geq$ \$1 million
- Unknown smoker status
 - Irrational heterogeneous behavior
 - Current and future materiality*
- Post level term, Age basis

Data Summary – Issue Ages 18-25 Data Issue

Issues uncovered

- Mortality for this cohort significantly higher than later issue ages
 - Issue ages 18-25 show a significant spike then decreasing
 - Demonstrate minimal selection
- Inclusion results in model underestimation of mortality for subsequent issue ages
- Suspect spike is related to child rider conversions at age 25

Young Adult Mortality Rate by Issue Age and Duration

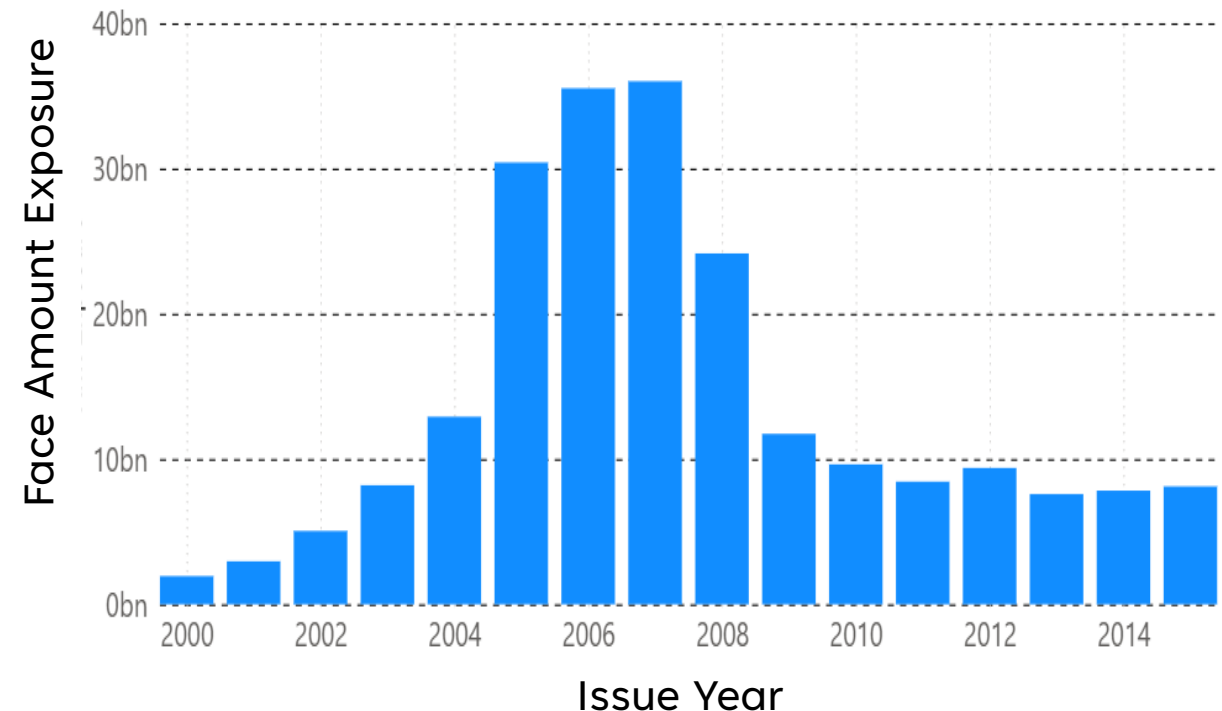


Data Summary – Issue Ages 70+, Issue Years 2005–08, Face Amount Bands 1M+ Data Issue

Issues uncovered

- Large bulge in exposure from UL and ULSG plans primarily from issue years 2005-2008 & face amounts $\geq$ \$1m
 - Mortality for this period is significantly lower than expected
- Results in:
 - “Plateau” in the age duration mortality surface
 - Average face amount in period 10 times higher than subsequent period
 - Older age mortality for durations 1-10 not consistent with durations 11-16
- Impacts results (lowers expected, not conservative)
- Past anomaly that should not affect future mortality

Distribution of Exposures for Face Amounts \$1M+
By Issue Year, Issue Ages 70+



Data Summary – Issue Ages 70+, Issue Years 2005–08, Face Amount Bands 1M+ Data Issue

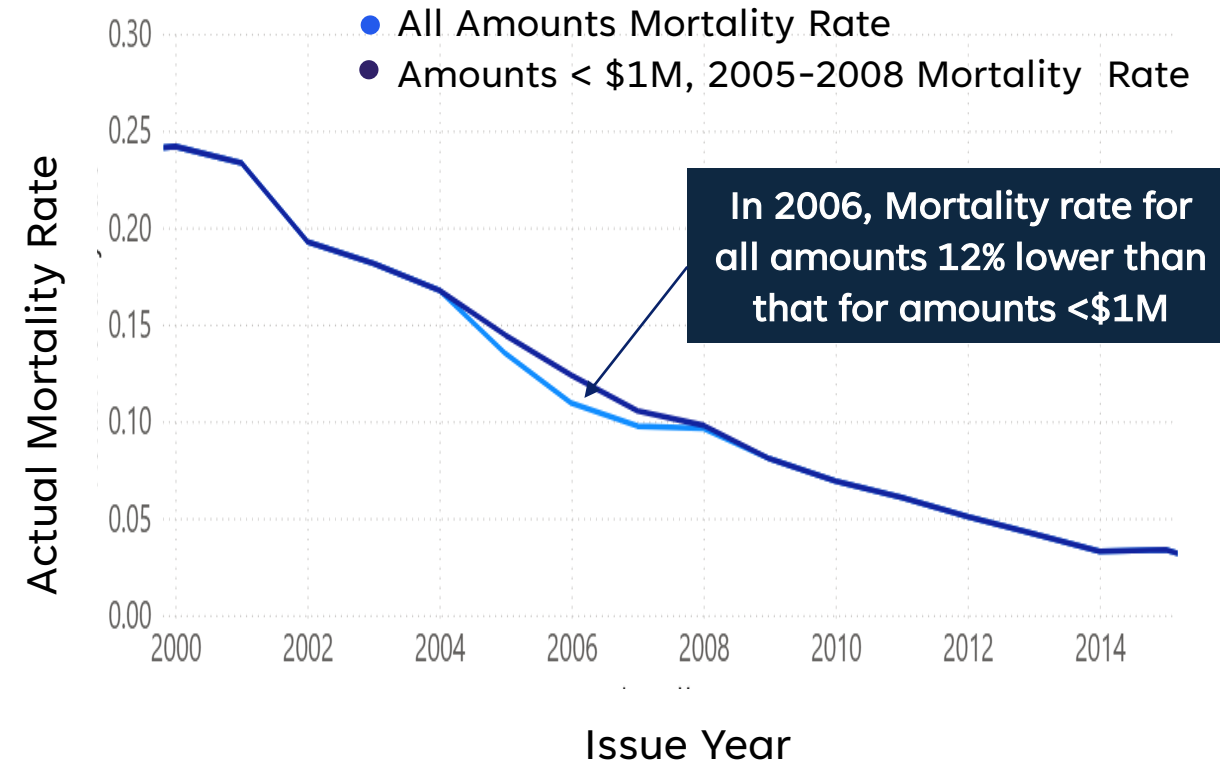
Recommendation

- Exclude this data from overall analysis
- Implication
 - Loss of exposure
 - Loss of claims (amount + count)

Data Excluded 2005-08

	Policies	Amount
Exposure	29,573	126,099
Actl Death	1,928	7,978

Mortality Comparison for Face Amounts \$1M+ Male, NS Issue Ages 76+



Model Granularity Refined Results in Fewer, but Still Many Distinct Tables

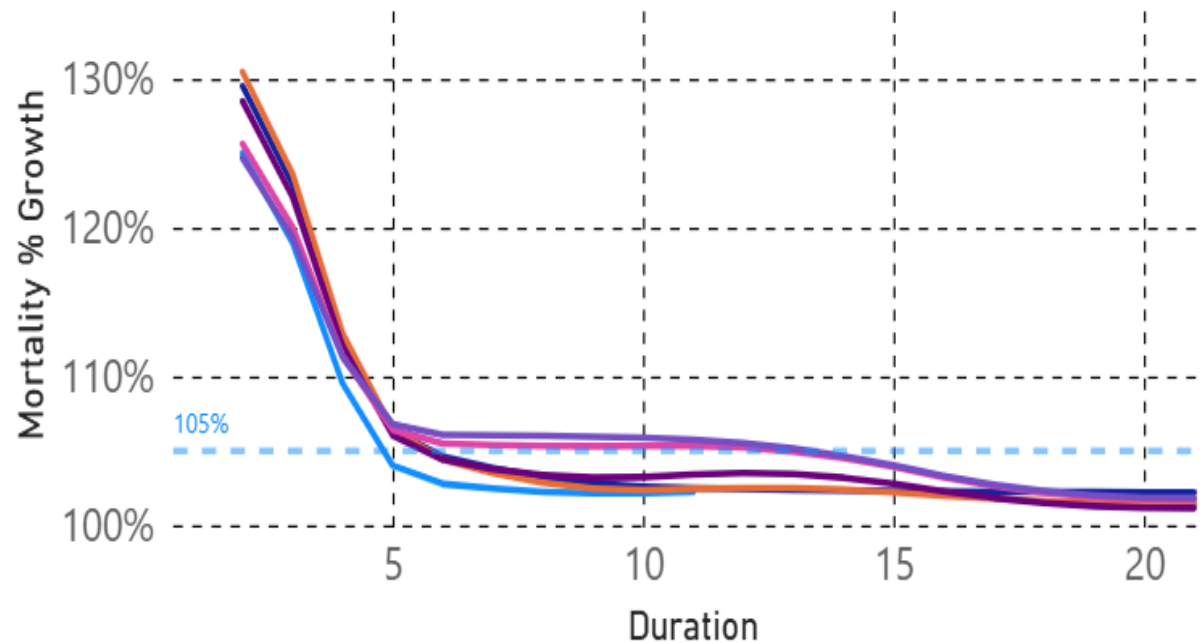
Reduces the number of attributes and interactions from March meeting

Modeling Interactions	Data Grouping*	
Plan Type	Non-term (N)	Term (T) – includes unknown level term
Face Amount Band	• < \$100k • \$100k +	• < \$250k • ≥ \$250k
Risk Class Grouping*	• H = Preferred: (1/2, 1/3, 1/4, 2/3, 2/4) • L = Residual: (2/2, 3/3, 4/4) • N = Non-preferred (preferred underwriting class = 0)	
Results in 48 distinct table combinations; prior to aggregate table		

Select Period Shows Slight Reduction for Male Risks

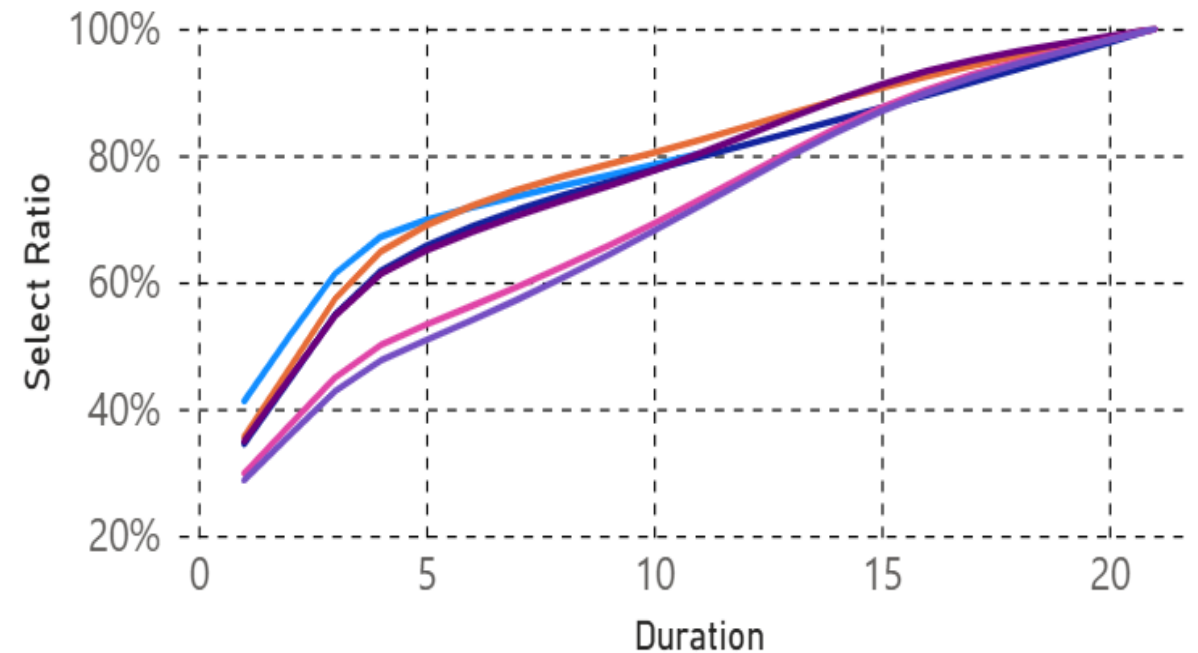
Mortality Growth by Duration and Attained Age

AttAge ● 36 ● 46 ● 56 ● 66 ● 76 ● 86



Select Ratio by Duration and Attained Age

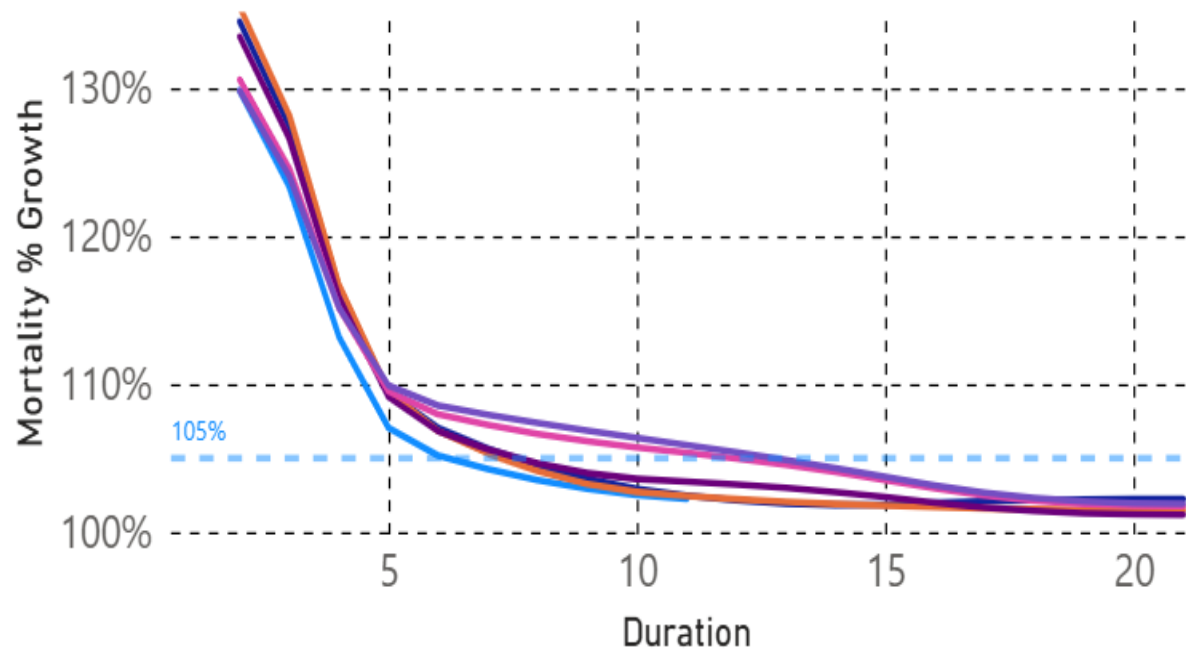
AttAge ● 36 ● 46 ● 56 ● 66 ● 76 ● 86



Select Period Shows Similar Pattern for Female Risks

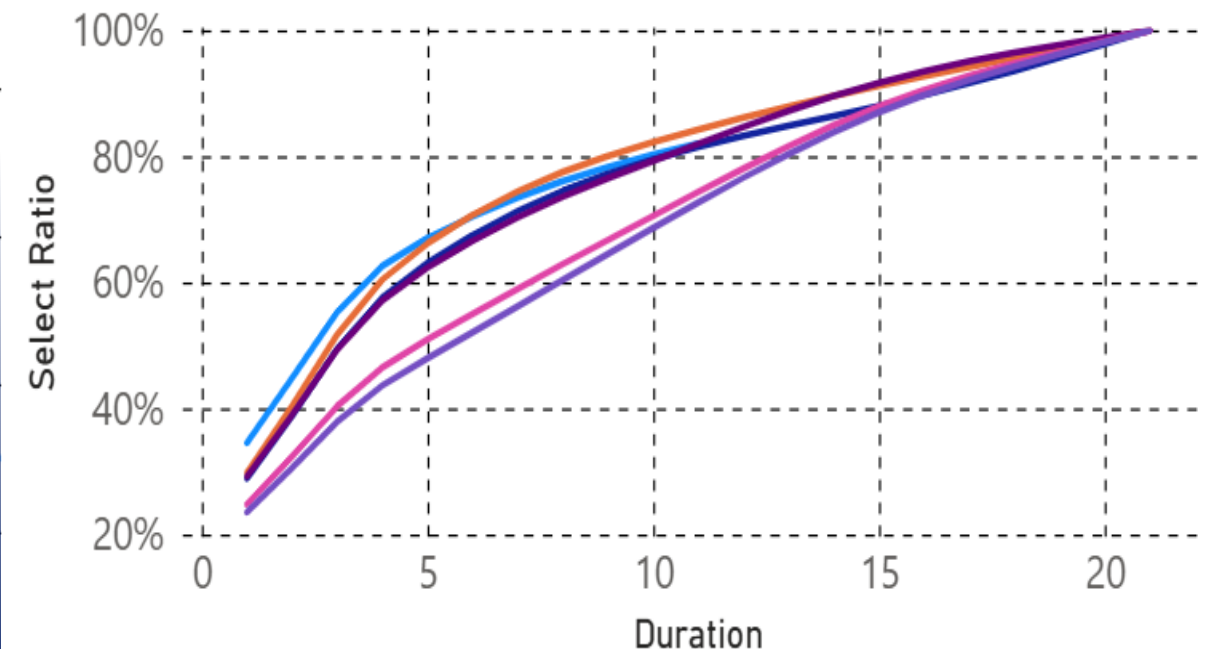
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Select Ratio by Duration and Attained Age

AttAge ● 36 ● 46 ● 56 ● 66 ● 76 ● 86



Recommend 20-year Select Period

2015 VBT Select Period

Issue Age	Male	Female
0-17	0	0
18-54	25	20
55	24	19
60	21	19
65	19	17
70	17	15
75	15	14
80	11	11
85	8	8
90	4	4
95	1	1

Recommended Select Period

Issue Age	Male	Female
0-17	0	0
18-25	0	0
26-69	20	20
70	Still in development	
75		
80		
85		
90		
95		

Likely
recommendation

Policy Count versus Policy Amount Table

Converting Policy-weighted Tables to Amount-weighted Tables

Issue uncovered

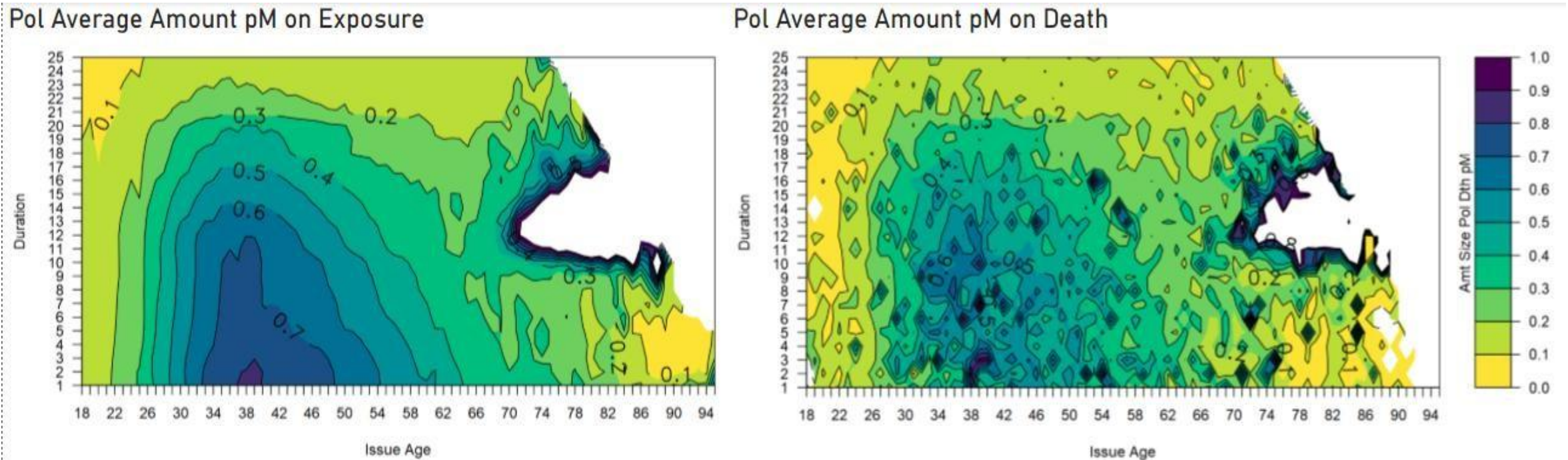
- Odd spike in A/E causes unreasonable relationship between amount and count weighted tables
- Likely due to random volatility from sporadic claims at largest face amounts
- Results in model giving higher weights to the very high face amount observations, adding volatility to the curve smoothness

A/E of amount v policy weighted

Amt Lwr	Pol A/E Excl	Amt A/E Excl	Pol A/E Tot	Amt A/E Tot
00000	100%	99%	100%	99%
00010	114%	109%	114%	109%
00025	105%	102%	105%	102%
00050	96%	94%	96%	94%
00100	97%	95%	97%	95%
00250	100%	99%	100%	99%
00500	98%	97%	98%	97%
01000	94%	95%	95%	95%
02500	100%	99%	97%	97%
05000	100%	99%	90%	91%
10000	100%	98%	88%	90%
Total	100%	97%	100%	95%

Select Policy Average Amounts: Exposures and Deaths

Average amounts on death* lower than average amounts on exposure and are more volatile driven by more claims at face amounts over \$1 M



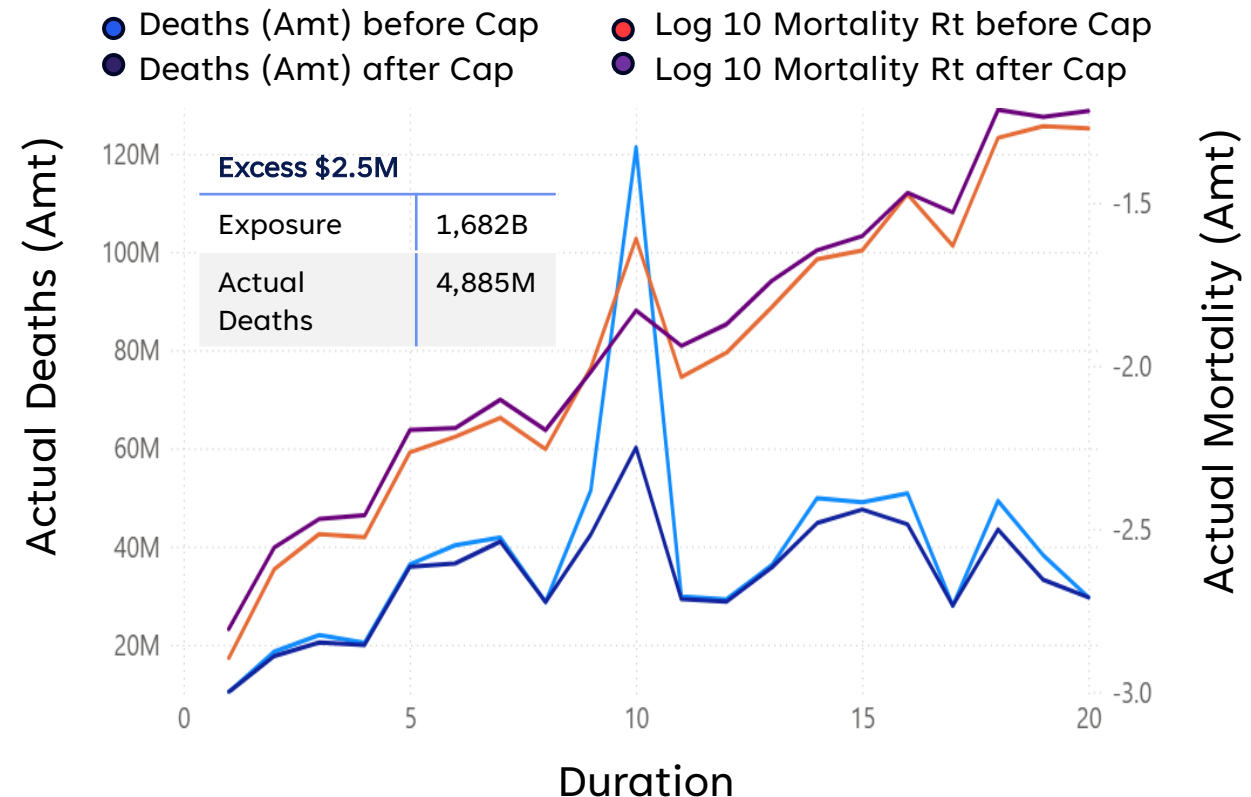
Converting Policy-weighted Tables to Amount-weighted Tables

Recommendation

- Provide a cap on the face amount exposure of \$X Million
 - Does not reduce # claims
 - Reduces average size of claim at largest face amounts
 - Smooths out experience by reducing weight of observations
 - Reduces volatility of model results at highest face amounts across all ages
 - Value of X still under review
 - \$1M, \$2.5M or \$5M

Excess Exposure Amounts			Excess Death Amounts		
1.0M+	2.5M +	5.0M +	1.0M+	2.5M +	5.0M+
4,402bn	1,682bn	720bn	9,677M	4,885M	2,322M

Effect of \$2.5M Cap on Deaths and Mortality Rates*



* Analysis already excludes data from higher face amount, 70+, 2005-2008

Next Steps

Directional Feedback Requested

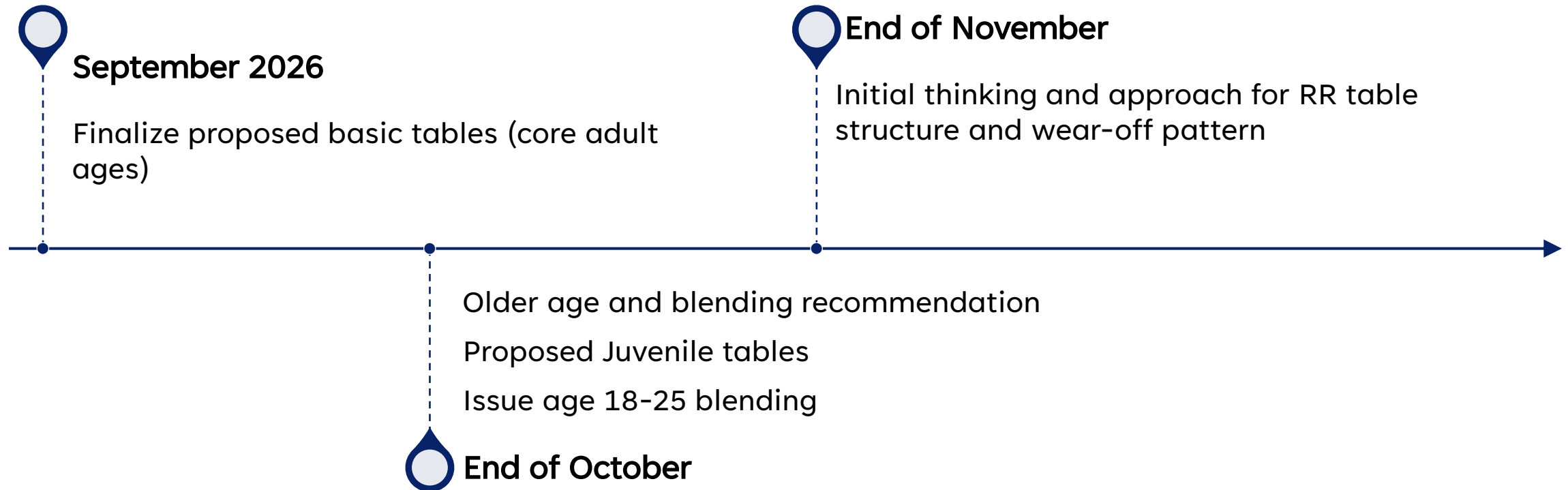
Data exclusions

Table parameters / granularity and # tables

Capping of large face amount claims

20-year select period

Between Now and Fall National Meeting



Contact Information

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