Mortality Aggregation

National Association of

Agenda

- Key Concepts and Applicable VM-20 Language
- Examples and Comparison of Approaches
- Next Steps

Key Concepts for Mortality Aggregation

Mortality segments subject to the same or similar underwriting processes may be aggregated to calculate credibility

Using separate mortality segment experience to set each corresponding assumption and then simply grouping the segments together to calculate credibility is not mortality aggregation under VM-20

The aggregate experience must inform the mortality segment assumptions; two approaches ar8 96.8W* n 22

Applicable VM-20 Language

VM-20 Section 9.C.2.d

vi. If the company uses the aggregate company experience for a group of mortality segments when determining the company experience mortality rates for each of the individual mortality segments in the group, the company shall either:

Top Down Approach

a. Use techniques to further subdivide the aggregate experience into the various mortality segments (e.g., start with aggregate non-smoker then use the conservation of total deaths principle, normalization or other approach to divide the aggregate mortality into super preferred, preferred and residual standard non-smoker class assumptions), or

Bottom Up Approach

b. Use techniques to adjust the experience of each mortality segment in the group to reflect the aggregate company experience for the group (e.g. by credibility weighting the individual mortality segment experience with the aggregate company experience for the group).

Mortality Aggregation Examples

Disclaimer:

The examples presented are for illustrative purposes to demonstrate acceptable approaches. They are not intended to cover all complexities that may arise in practice. Additional variations and other methods may be appropriate. These examples are intended to illustrate general principles, not to be an exhaustive presentation of acceptable methods.

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Mortality Aggregation Example

Approach:
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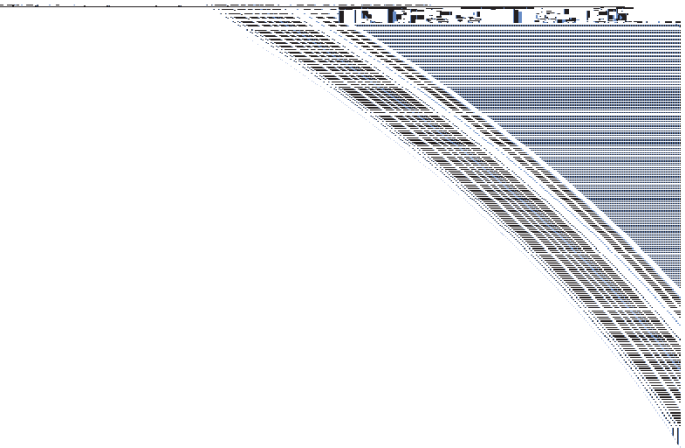
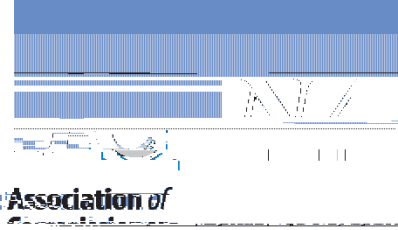
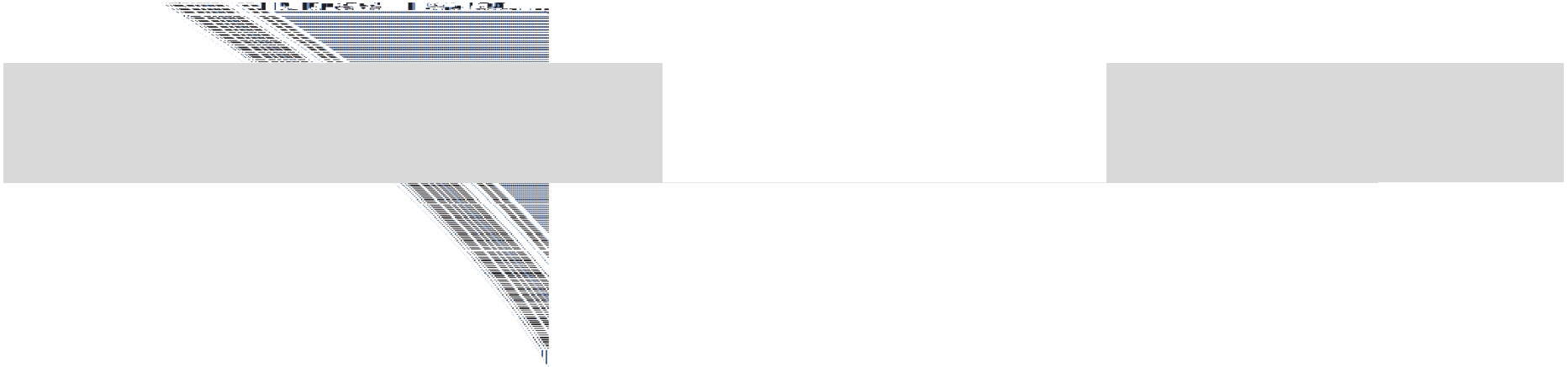
Level of Aggregation:
All Segments

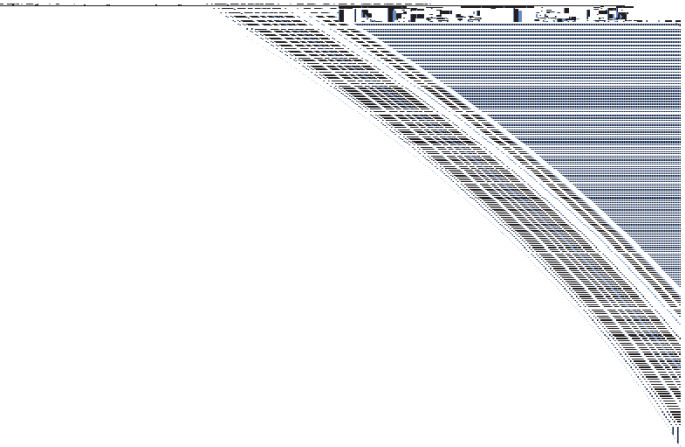
Identify Segments for Aggregation





Calculate Expected Claims and A/E Ratios





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Set the Assumption for Company Experience Mortality Rates

(1)	(3)	(13)	(15)
Groups of Policies	Mortality Tables: 2015 VBT ALB	Normalized CW A/E	Company Experience Mortality Rates
Segment 1	MNS RR 70	80.6%	80.6% of

Applicable VM-20 Language

vi. If the company uses the aggregate company experience for a group of mortality segments when determining the company experience mortality rates for each of the individual mortality segments in the group, the company shall either:

a. Use techniques to further subdivide the aggregate experience into the various mortality segments (e.g., start with aggregate non-smoker then use the conservation of total deaths principle, normalization or other approach to divide the aggregate mortality into super preferred, preferred and residual standard non-smoker class assumptions), or

b. Use techniques to adjust the experience of each mortality segment in the group to reflect the aggregate company experience for the group (e.g. by

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Mortality Aggregation Example

Approach:
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2 Levels of Aggregation:
Smoker Segments,
Non-Smoker Segments

Calculate Relativity Structure (here based on RR Tool output)

(1)	(3)	(4)	(5)	(6)
Groups of Policies	Mortality Tables: 2015 VBT ALB	Expected Claim Amounts Using (3)	Actual Claim Amounts	A/E
Segment 1	MNS RR 70	200	187	93.5%
Segment 2	MNS RR 80	484	495	102.3%
Segment 3	MNS RR 90	533	520	97.6%
Segment 4	MNS RR 110	582	563	96.7%
Segment 5	MSM RR 100	525	545	103.8%
Segment 6	MSM RR 125	833	850	102.0%
Segment 7	FNS RR 70	175	182	104.0%
Segment 8	FNS RR 80	335	320	95.5%
Segment 9	FNS RR 90	425	384	90.4%
Segment 10	FNS RR 110	542	531	98.0%
Segment 11	FSM RR 100	490	500	102.0%
Segment 12	FSM RR 150	725	745	102.8%
Aggregate NS		3276	3182	97.1%
Aggregate SM		2573	2640	102.6%

Comparison of Approaches

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Methodology	Uses relativities to subdivide the aggregate experience into mortality segments.	Uses credibility weighting to adjust the experience of each mortality segment to reflect the aggregate experience.
Source of experience data	Uses a company experience study A/E for the aggregate class(es), along with pre-defined expected relativities between mortality segments determined from a reliable and applicable external source.	Uses company experience study A/E and credibility results for all individual mortality segments and for the aggregate class.

Comparison of Approaches

Updates based on new experience studies	The aggregate class A/E ratios(s) and aggregate credibility must be updated based on each new company experience study. The relativities would not change unless the external source (e.g. RR Tool, reinsurer) indicates that relationships between segments have changed or the external source data is no longer representative of the company experience.	The aggregate class and individual mortality segment credibilities and A/E ratios must be updated based on each new company experience study.

Comparison of Approaches

Next Steps

Consider exposing examples for public comment

Review comments and revise accordingly

Post examples to the Industry Tab on the NAIC website