

# AMERICAN ACADEMY of ACTUARIES



## Report from the AAA/SOA Joint Preferred Mortality Project Oversight Group

Presented to the National Association of Insurance Commissioners' Life and Health Actuarial Task Force

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The group would also like to acknowledge the work of Korrel Crawford.

The following discusses work/analysis completed by the AAA/SOA Preferred Valuation Basic Table Working Group (VBT Team). The VBT Team is continuing to work on resolving the issues still outstanding, which are highlighted at the end of this document. It is the intent of the VBT Team that the aggregate tables as well as some, if not all, of the UCS tables will be completed by the end of June, subject to quick resolution of the outstanding issues.

## **Starting Data Sources:**

SOA 2002-2004 Individual Life Experience Study

- 35 contributing companies
- Over \$7.4 trillion in exposure by face amount
- Over 200,000 deaths in select period; over 495,000 deaths in ultimate period
- Significant exposure in lower face amounts (< \$25,000)
- Expected basis is 2001 VBT ANB Sex Distinct, Smoker Distinct Tables
- Loses credibility at older ages and later durations
  - Suspect an under-reporting issue at the oldest attained ages
- Reviewed data with capping the claims to \$2,499,999.
- Removing term experience beyond the tenth duration to avoid including anti-selective mortality beyond the level premium period (the majority of the term business beyond the tenth duration is for 10-year term plans).
- Review SM/NS mortality through the first 20 durations; composite mortality beyond.

Population Data

- Reviewed several sources including:
  - Social Security Administration (SSA) data (based on Medicare death records from 2002 with projections beyond);
  - o CDC data (also based on Medicare data);
  - Veterans Administration data (based on 2003 claims); and
  - o 2003 RP2000 Annuity Mortality Experience
- All sources have pluses and minuses.
- No sources have credible experience beyond attained age 95
- SSA data is most conservative (see charts below), but task force also feels is the most reliable.
- Will use SSA data as population data through age 95
- Beyond age 95, will grade from SSA data to omega mortality rate at age yet to be determined.



UCS Data

- A subset of contributors to the 2002-2004 ILEC study.
- Contributors provided preferred underwriting guidelines along with mortality.
- Data from 28 contributors was used.
- Company-specific underwriting guidelines were run through a scoring algorithm.
- Scores ranged from 26 to 142, with 141 equal to the residual standard NT class and 142 equal to the residual standard TB class.
  - The Experience Analysis Team believes the experience associated with UCS scores less than 35/40 is suspect.

Papers and Research from SOA 2005 Living to 100 and Beyond Seminar

• The VBT Team is currently reviewing information from these studies along with additional research on longevity issues to determine an omega mortality rate and age at which it begins.

### **Table Development**

- Based on the experience analysis, we will begin with 3 aggregate tables, representing experience for face amounts \$10,000-\$49,999, \$50,000-\$99,999, and \$100,000-\$2,499,999 (Male/Female and Smoker/Nonsmoker distinct).
  - Disregarding experience for face amounts less than \$10,000 because the VBT Team suspects it includes simplified/guaranteed issue business, which is outside the scope for these tables.
  - o The VBT Team has reason to believe that much of the business below \$50,000 is non-medical or tested without fluids and is therefore, the mortality experience is not consistent with that for face amounts with more underwriting, such as amounts \$100,000 and above. The VBT Team also believes some of the business between \$50,000 and \$99,999 may be non-medical. The VBT Team does not believe nor recommend companies be required to use these tables based on a specific policy's size. Rather, the VBT Team plans to develop descriptions as to what the underlying experience represents so that an actuary may better determine which table is more representative of their business. For example, if a company blood tests all business above \$50,000, it is likely their mortality more closely associates with the \$100,000+ business. Also, the VBT Team does not want to discourage innovations in the risk selection process for use of proxies to fluid testing and other new underwriting tools. Therefore, we will provide descriptions and information to the LRWG regarding the underlying experience to the various tables and recommend that they provide guidance around utilizing a policy's size in determining the table to choose.
- For the \$100,000+ table only, the VBT Team will separate this table into multiple tables based upon UCS scores/relative risk levels. The VBT Team will provide a conversion calculator to get from a UCS score to a relative risk factor.
- The number of UCS tables will vary between smokers and nonsmokers.
- We analyzed the scattering of various UCS scores. The following graph represents the estimate of each Non-tobacco UCS class relative to an aggregate Non-tobacco mortality assumption (i.e., the relative risk):



# Range of Relative Risk Scores for Non-Tobacco Risks

- The VBT Team will develop tables for Nonsmokers based upon the following Relative Risk/UCS scores:
  The table with the lowest mortality expectation will be based upon a Relative Risk of 70 (UCS = 35) and tables will be developed to represent increments in the Relative Risk of 10, up to a Relative Risk of 160 for a total of 10 tables (each for male and female).
- The VBT Team will develop fewer tobacco tables due to the limited UCS smoker/tobacco data.
- The following graph represents the estimate of each Tobacco UCS class relative to an aggregate Tobacco mortality assumption (i.e., the relative risk):



# **Range of Relative Risk Scores for Tobacco Risks**

- The VBT Team will develop tables for Smokers based upon the following Relative Risk/UCS scores:
  The table with the lowest mortality expectation will be based upon a Relative Risk of 75 (UCS = 40) and tables will be developed to represent increments in the Relative Risk of 25, up to a Relative Risk of 150 for a total of 4 tables (each for male and female).
- Develop tables on an Age-Nearest-Birthday basis.
- Develop equal number of tables for males and females. The VBT Team does not plan on developing specific unisex tables unless specifically requested by LHATF.

## **Adjustments to Mortality Experience**

Preferred Wear-off:

• The VBT Team has agreed upon a methodology for the wear-off of preferred underwriting but is still finalizing the actual wear-off factors. The wear-off is both attained age and duration based. The following is an example of the latest wear-off factors the VBT Team is discussing.

Issue							
Age	Dur 1	Dur 6	Dur 11	Dur 16	Dur 21	Dur 26	Att.Age
25	0%	0%	0%	0%	0%	2%	50
30	0%	0%	0%	0%	0%	4%	55
35	0%	0%	0%	0%	2%	8%	60
40	0%	0%	0%	0%	6%	14%	65
45	0%	0%	0%	4%	12%	22%	70
50	0%	0%	2%	10%	19%	32%	75
55	0%	0%	8%	16%	28%	45%	80
60	0%	6%	13%	25%	43%	62%	85
65	0%	10%	25%	43%	62%	81%	90
70	0%	20%	40%	60%	80%	100%	95
75	0%	25%	50%	75%	100%	100%	100
80	0%	33%	67%	100%	100%	100%	105
85	0%	50%	100%	100%	100%	100%	110
90	0%	100%	100%	100%	100%	100%	115
95	0%	100%	100%	100%	100%	100%	120

May 1 P	roposal
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### Older Ages:

- The VBT Team feels the industry data loses almost all credibility beyond age 85.
- We plan to begin blending the industry data to the population mortality at or near age 85.
- The VBT Team has developed a methodology to determine a narrow range of reasonable ages at which the insured mortality equals the population mortality (as defined above) but does not yet have a final recommendation for the age of convergence. It will most likely fall between attained ages 101 and 105.
- Unlike prior tables, we do not plan on having an omega age with a mortality rate of 1.00. Rather, we propose having an omega mortality percentage beginning at some advanced age (for example, the mortality rate equal to 0.45 beginning at age 110 and continuing indefinitely). We are reviewing the recent literature and studies to make a recommendation on both the age and rate. We anticipate the valuation tables will need to grade to an omega rate of 1.00 at some attained age.

#### Other Adjustments:

- Experience table will be improved to 2008.
- Consistent with prior SOA mortality studies, we will use the Whittaker-Henderson methodology for graduation.

Open Issues that the VBT Team still needs to resolve before June:

- How to develop female tables due to limited experience;
- How to develop smoker tables due to limited experience;
- The maximum issue age in the table;
- The improvement factors to use; and
- Whether tables will be graduated for fit (i.e., show duration three spike) or smoothness.