

Life and Health Actuarial Task Force Amendment Proposal Form*

1. Identify yourself, your affiliation and a very brief description (title) of the issue.

Dave Neve, chairperson, American Academy of Actuaries Life Reserves Work Group (LRWG)
Simplified approach for determining prudent estimate mortality assumption for VM-20

2. Identify the document, including the date if the document is “released for comment,” and the location in the document where the amendment is proposed:

VM-20: Requirements for Principle-based Reserves for Life Products, Draft dated 10/6/2011, Section 9C

3. Show what changes are needed by providing a red-line version of the original verbiage with deletions and identify the verbiage to be deleted, inserted or changed by providing a red-line (turn on “track changes” in Word®) version of the verbiage. (You may do this through an attachment.)

See attached documents. Since there were so many changes from the current VM-20 wording, both a clean version and a tracked version are shown.

4. State the reason for the proposed amendment? (You may do this through an attachment.)

The feedback from the participants in the VM20 Impact Study conducted by Towers Watson on behalf of the NAIC indicated that the determination of the mortality assumption, as stated within VM20, was overly complex and complicated. In addition, the results from the study showed a fairly high margin on the mortality assumption. For the participants in the study, there appeared to be some uncertainty as to the differences between a credibility segment and mortality segment. The incorporation of statistical credibility theory added complexity and the process for blending anticipated experience assumptions with industry experience was not clear. In addition, the resulting prudent estimate assumptions had excessive conservatism through application of both an explicit margin, as defined within Section 9C of VM20, and an implicit margin through the credibility blending process.

Therefore, changes are necessary to simplify the process for determining the anticipated experience and prudent estimate experience assumptions. The significant recommended changes include:

1. Eliminate the concept of credibility segments and clarify concept/purpose of mortality segments;
2. Eliminate the 30 deaths trigger to qualify for the simplified approach;
3. Added clarity and more prescription in terms of how to grade and when to begin grading anticipated experience assumptions with industry experience;
4. Provide more flexibility to blend mortality experience with an industry table by allowing any credibility procedure that follows accepted actuarial practice;
5. Require companies to grade into 100% industry mortality for attained ages 90 and above;
6. Explicitly allow for adjustments to mortality rates to ensure appropriate and reasonable relationships exist by attained age, within select period within each mortality segment;
7. Allow industry table to incorporate mortality improvement factors, as determined by either SOA or NAIC from mid-point of underlying study period for table to the valuation date; and
8. Remove two-step margin which varies by level of a company's credibility of their mortality experience and replace with a flat margin, which varies by age. The margin levels are still under discussion.

These changes we discussed on a LATF call on 2/2/2012, and LATF voted to adopt the changes, subject to final review once the VM-20 wording was revised to incorporate the changes. This proposal incorporates these changes in the VM-20 wording, but three new items were added to the changes discussed and adopted by LATF on 2/2/12:

1. A limit on the maximum number of years for data to be considered sufficient has been added to address the LATF concern that a company could have low credible experience but still meet the data sufficient requirement, thereby extending the time to grade to the industry table. These limits are shown in the third column of the table in 9.C.4.iv, based on the level of credibility.
2. The number of claims in a particular policy duration that triggers the point when data is considered to be insufficient is no longer 10, but is now a number to be determined. We plan to ask the SOA to look at the individual company mortality experience for the contributing companies in the latest study to see what might be reasonable. Probably will use a method to determine 90% or 95% probability with 10% specificity, which might result in a number more like 30 or 40.
3. The attained age where the company data must grade to an industry table was increased from age 90 to age 95 or 15 years after policy underwriting.

* This form is not intended for minor corrections, such as formatting, grammar, cross-references or spelling. Those types of changes do not require action by the entire group and may be submitted via letter or email to the NAIC staff support person for the NAIC group where the document originated.

NAIC Staff Comments:

Dates: Received	Reviewed by Staff	Distributed	Considered
Notes:			

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Section 9. Assumptions

C. Mortality Assumptions

1. Procedure for Setting Prudent Estimate Mortality Assumptions

- a. The company shall determine mortality segments for the purpose of determining separate prudent estimate mortality assumptions for groups of policies that the company expects will have different mortality experience than other groups of policies (such as male vs. female, smoker vs. non-smoker, preferred vs. super-preferred vs. residual, etc.).
- b. For each mortality segment, the company shall establish prudent estimate mortality assumptions using the following procedure:
 - i. Determine the company experience mortality rates as provided in subsection 9.C.2. If company experience data is limited or not available, the company can use an applicable industry mortality table in lieu of company experience as provided in subsection 9.C.3.
 - ii. If the company determines company experience mortality rates as provided in subsection 9.C.2., then use the procedure described in subsection 9.C.3 to determine the applicable industry table for each mortality segment to grade company experience to the industry table.
 - iii. Use the procedure described in subsection 9.C.4 to determine the anticipated experience mortality assumptions rates.
 - iv. Determine the mortality margin as provided in subsection 9.C.5
 - v. Set the prudent estimate mortality assumption equal to the anticipated experience mortality assumptions increased by the margin determined in subsection 9.C.5.

2. Determination of Company Experience Mortality Rates

- a. For each mortality segment, the company shall determine company experience mortality rates derived from company experience data. If company experience data is not available or limited, the company can choose to use an applicable industry mortality table in lieu of its own company experience, as provided in subsection 9.C.3.
- b. Company experience data shall be based on experience in the following order of priority:
 - i. Actual company experience for book of business within the mortality segment.
 - ii. Experience from other books of business within the company with similar underwriting.
 - iii. Experience data from other sources, if available and appropriate such as actual experience data of one or more mortality pools in which the policies participate under the term of a reinsurance agreement. Data from other sources is appropriate if the source has underwriting and expected mortality experience characteristics that are similar to policies in the mortality segment.
- c. The company experience mortality rates shall not be lower than the mortality rates the company expects to emerge and which the company can justify.
- d. When determining the company experience mortality rates for each mortality segment, the company can base the mortality on more aggregate experience and use other techniques to further sub-divide the aggregate class into various sub-classes or mortality segments (e.g., start with

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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). In doing so, the company must ensure that when the mortality segments are weighted together, the total number of expected claims is not less than the company experience data for the aggregate class.

- e. The company shall review, and update as needed, the company experience data described in subsection 9.C.2.b, whether based on actual experience or data from other sources, at least every three years. If updated experience becomes available prior to the end of three years since the last review or update, which alters the company's expected mortality for the mortality segments in a significant manner and such impact is expected to continue into the future, the company shall reflect the changes implied by the updated data in the current year.
 - i. The company experience data for each mortality segment shall include the most recent three year study and shall include the in force and claim data pertaining to the study period for all policies currently in the mortality segment or that would have been in the mortality segment at any time during the period over which experience is being evaluated.
 - ii. The period of time used for data should be at least three exposure years and should not exceed ten exposure years.
- f. The company may remove from the company experience data any policies for which the experience is reflected through adjustments to the anticipated experience assumptions as provided under subsection 9.C.4.e below, including policies insuring impaired lives and those for which there is a reasonable expectation, due to conditions such as changes in premiums or other policy provisions, that policyholder behavior will lead to mortality results that vary significantly from those that would otherwise be expected.
- g. The company may adjust the company experience rates for each mortality segment to reflect the expected incremental change due to the adoption of risk selection and underwriting practices different from those underlying the company experience data identified above, provided that:
 - i. The adjustments are supported by published medical or clinical studies or other published studies that correlate a specific risk selection criteria to mortality or longevity experience (for example, criterion and correlations determined through predictive analytics); and
 - ii. The rationale and support for the use of the study and for the adjustments are disclosed in the PBR Actuarial Report.

Guidance Note: It is anticipated that the adjustment described in 9.C.2.g to experience will rarely be made. Since these adjustments are expected to be rare, and since it is difficult to anticipate the nature of these adjustments, the commissioner may wish to determine the level of documentation or analysis that is required to allow such adjustments. The NAIC may want to consider whether approval by a centralized examination office would be an acceptable alternative to approval by the commissioner.

- h. Mortality improvement shall not be incorporated beyond the valuation date. However, historical mortality improvement from the central point of the underlying company experience data to the valuation date may be incorporated.
3. Determination of Applicable Industry Basic Tables
- a. The industry basic table shall be based on the 2008 VBT table, including the Primary, Limited Underwriting and RR Table forms.

Guidance Note: Paragraph 9.C.3.a. will need to be revised every time the industry table is updated.

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- b. A modified industry basic table is permitted in a limited number of situations where an industry basic table does not appropriately reflect the expected mortality experience, such as joint life mortality, simplified underwriting, substandard or rated lives. In cases other than modification of the table to reflect joint life mortality, the modification must not result in mortality rates lower than those in the industry table without approval by the Commissioner.
- c. The company may apply the underwriting criteria scoring procedure described in Subparagraph d below to determine:
 - i. The industry basic table that can serve as the industry experience rates when company experience data is limited or not available.
 - ii. The applicable industry basic table for grading company experience mortality to industry experience mortality using the grading method described in subsection 9.C.4.b.iv.
- d. The underwriting criteria scoring procedure is the algorithm described in pages 8 to 27 of the Interim 2007 Report of the Society of Actuaries and American Academy of Actuaries Joint Preferred Mortality Project and embedded in the Underwriting Criteria Score Calculator which is maintained on the Society of Actuaries web site, <http://www.soa.org/research/individual-life/2008-score-calc.aspx> .

- i. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for a particular mortality segment, the company shall take into account factors that are not recognized in the underwriting scoring algorithm but which are applicable to policies that are issued in that mortality segment.

Guidance Note: Examples of such factors include the number of underwriting exceptions that are made, the quality and experience level of the underwriters, and characteristics of the distribution system. For example, if a company deviates from its preferred criteria on a regular basis, then it needs to take that into consideration since the underwriting criteria scoring procedure is not designed to quantify that risk.

- ii. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for policies that are issued subject to simplified underwriting and policies that are issued without underwriting, the company shall take into account factors not recognized in the underwriting scoring algorithm but which are applicable to such policies.
- iii. In taking into account factors that are not recognized in the underwriting scoring algorithm, a company may, to the extent it can justify, adjust the industry basic tables up or down two tables from that determined by application of the underwriting criteria scoring procedures. Further adjustments to reflect risk characteristics not captured within the underwriting criteria scoring tool may be allowed upon approval by the Commissioner.

- e. As an alternative to the Underwriting Criteria Scoring Tool, the company may use other actuarially sound methods to determine the applicable basic tables related to subdivisions of mortality segments. The company shall document the analysis performed to demonstrate the applicability of the chosen method and resulting choice in tables and reasons why the results using the Underwriting Criteria Scoring Tool may not be suitable.

Guidance Note: For example, the company may determine a more all inclusive basic table as a table appropriate for the whole mortality segment (appropriately modified by the removal of classified lives, term conversions or any other legitimately excludable class) and then subdivide that segment using actuarially sound methods including but not limited to the UCS

- f. If no industry basic table appropriately reflects the risk characteristics of the mortality segment, the company may use any well-established industry table that is based on the experience of policies having the appropriate risk characteristics in lieu of an industry basic table.

Guidance Note: Subsection 9.C.3.f above is intended to provide flexibility needed to handle products based on group-type mortality, etc., for which there might not be an industry basic table.

- g. Mortality improvement shall not be incorporated beyond the valuation date. However, historical mortality improvement from the date of the industry basic table (e.g., 2008 for the 2008 VBT) to the valuation date may be incorporated using the improvement factors for the applicable industry table as determined by the SOA and published [name location where published].

Guidance Note: The improvement factors for the industry mortality table will be determined by the SOA.

4. Process to Determine Anticipated Experience Assumptions.

- a. If applicable industry basic tables are used in lieu of company experience, the anticipated experience assumptions for each mortality segment shall equal the respective mortality rates in the applicable industry mortality tables as provided in subsection 9.C.3.
- b. If the company determines company experience mortality rates, the anticipated experience assumptions will be determined as follows:
 - i. For each mortality segment, use the company experience mortality rates (as defined in Subsection 9.C.2) for policy durations in which there exists sufficient company experience data (as defined below in paragraph ii.)
 - ii. The company shall determine the sufficient data period by identifying the last policy duration at which sufficient company experience data exists (using all the sources defined in Subsection 9.C.2.b). This period ends at the last policy duration which has a minimum of [X] claims within the exposure period. The sufficient data period may be determined at a more aggregate level than the mortality segment if the company based its mortality on aggregate experience and then used a methodology to sub-divide the aggregate class into various sub-classes or mortality segments.

Drafting Note: Need to determine the number of claims for this purpose. The idea is to use last duration at which there are [X] or more claims; not the first duration in which there are less than [X] claims. Alternatively, could use amount of exposure or possibly the level of credibility rather than number of claims.

- iii. Determine an aggregate credibility factor over the period where sufficient company experience data exists (as defined in Subsection 9.C.4 .a.ii. above), using a methodology to determine the level of credibility that follows accepted actuarial practice. Credibility may be determined at either (a) the mortality segment level or (b) at a more aggregate level if the mortality for the sub-classes (mortality segments) was determined using an aggregate level of mortality experience.
- iv. Beginning in the policy duration at which sufficient company experience data no longer exists, as defined in paragraph ii. above, linearly grade from the company experience mortality rates to 100% of the applicable industry table (the determination of the applicable industry table is described in Section 9.C.3). Grading must begin and end no later than the policy durations shown in the table below.

The resulting anticipated experience mortality rates may be no lower than the mortality rates that are actually expected to emerge and that the company can justify. It is not anticipated that every mortality rate will meet this requirement as a result of the application of smoothing (as permitted in paragraph c below) and in order to maintain appropriate mortality relationships among the mortality segments (as permitted in paragraph d below).

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Credibility of company data	# of years in which to begin blending after sufficient data no longer exists	# of years in which the assumption must grade to 100% to an applicable industry table (from the duration where sufficient data no longer exists)	Maximum # of years for data to be considered sufficient
0-19%	2	10	10
20-39%	4	15	20
40-59%	6	18	30
60-79%	8	20	40
80-100%	10	25	50

v. Notwithstanding paragraph iv. above, the company must grade into 100% of the applicable industry table mortality by the later of attained age [95] or 15 years after policy underwriting.

- c. Smoothing may be utilized within each mortality segment to ensure that an appropriate relationship exists by attained age within each mortality segment.
- d. The company may adjust the resulting mortality rates within each mortality segment to ensure the resulting anticipated assumptions produce a reasonable relationship with assumptions in other mortality segments that reflects the underwriting class or risk class of each mortality segment. Such adjustments must be done in a manner that does not result in a material change in total expected claims for all mortality segments in the aggregate.
- e. Adjust the anticipated experience mortality assumptions to reflect differences associated with impaired lives, and differences due to policyholder behavior if there is a reasonable expectation that due to conditions such as changes in premiums or other policy provisions, policyholder behavior will lead to mortality results that vary from the mortality results that would otherwise be expected.
 - i. The adjustment for impaired lives shall follow established actuarial practice, including the use of mortality adjustments determined from clinical and other data.
 - ii. The adjustment for policyholder behavior shall follow accepted actuarial practice, including the use of dynamic adjustments to base mortality

5. Determination of Mortality Margin

a. The mortality margin shall be in the form of a percentage increase applied to the Anticipated Experience Assumption.

Drafting Note: The margin percentages need to be determined.

b. This margin shall be increased, as appropriate, to reflect the level of uncertainty related to situations, including but not limited to, the following:

- i. The reliability of the company’s experience studies is low due to imprecise methodology, length of time since the data was updated or other reasons.
- ii. The longer the time since the experience data was updated.

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- iii. The underwriting or risk selection risk criteria associated with the mortality segment have changed since the experience on which the company experience mortality rates are based was collected.
- iv. The data underlying the company experience mortality rates lack homogeneity.
- v. Unfavorable environmental or health developments are unfolding and are expected to have a material and sustained impact on the insured population.
- vi. Changes to the company's marketing or administrative practices or market forces expose the policies to the risk of anti-selection.

Guidance Note: For example, the secondary market for life insurance policies

- vii. Underwriting is less effective than expected.

Section 9. Assumptions

C. Mortality Assumptions

1. Procedure for Setting Prudent Estimate Mortality Assumptions

- a. ~~a.~~ The company shall determine ~~mortality~~ ~~credibility~~ segments for the purpose of determining ~~separate prudent estimate mortality assumptions for groups of which policies that the company expects will have different mortality experience than other groups of policies (such as male vs. female, smoker vs. non-smoker, preferred vs. super-preferred vs. residual, etc.).~~
- b. For each mortality segment, the company shall establish prudent estimate mortality assumptions using the following procedure:
- i. Determine the company experience mortality rates as provided in subsection 9.C.2. If company experience data is limited or not available, the company can use an applicable industry mortality table in lieu of company experience as provided in subsection 9.C.3.
 - ii. If the company determines company experience mortality rates as provided in subsection 9.C.2., then use the procedure qualify for the simplified method described in subsection 9.C.3 to determine the applicable industry table for each mortality segment to grade company experience to the industry table.
 - iii. Use the procedure described in subsection 9.C.4 to determine the anticipated experience mortality assumptions rates.
 - iv. Determine the mortality margin as provided in subsection 9.C.5
 - v. Set the prudent estimate mortality assumption equal to the anticipated experience mortality assumptions increased by the margin determined in subsection 9.C.5.

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2. Determination of Company Experience Mortality Rates

- a. For each mortality segment, the company shall determine company experience mortality rates derived from company experience data. If company experience data is not available or limited, the company can choose to use an applicable industry mortality table in lieu of its own company experience, as provided in subsection 9.C.3.
- b. Company experience data ~~9.C.1.e. The determination of each credibility segment~~ shall be based on experience in subject to the following order of priority:
- i. Actual company experience for book of business within the mortality ~~Each credibility segment.~~
 - ii. Experience from other books of business within the company ~~shall consist of policies with similar underwriting.~~
 - iii. Experience data from other sources, if available and appropriate such as actual experience data of one or more mortality pools in which the policies participate under the term of a reinsurance agreement. Data from other sources is appropriate if the source has underwriting and expected ~~methods~~ and mortality experience characteristics that are similar to policies in the mortality segment. ~~.~~
- c. The company experience mortality rates shall not be lower than the mortality rates the company expects to emerge and which the company can justify.

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- d. When determining the company experience mortality rates for each mortality segment, the company can base the mortality on more aggregate experience and use other techniques to further sub-divide the aggregate class into various sub-classes or 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). In doing so, the company must ensure that when the mortality segments are weighted together, the total number of expected claims is not less than the company experience data for the aggregate class.
- e. The company shall review, and update as needed, the company experience data described in subsection 9.C.2.b, whether based on actual experience or data from other sources, at least every three years. If updated experience becomes available prior to the end of three years since the last review or update, which alters the company's expected mortality for the mortality segments in a significant manner and such impact is expected to continue into the future, the company shall reflect the changes implied by the updated data in the current year.
 - i. The company experience data for each mortality segment shall include the most recent three year study and shall include the in force and claim data pertaining to the study period for all policies currently in the mortality segment or that would have been in the mortality segment at any time during the period over which experience is being evaluated.
 - ii. The period of time used for data should be at least three exposure years and should not exceed ten exposure years.
- f. The company may group policies with different plans of insurance into the same credibility segment, if underwriting and mortality experience characteristics are similar for all the policies.

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Guidance Note: ~~It is anticipated that most companies will define a credibility segment to be a block of policies with similar underwriting rules, such as guaranteed issue, or regularly underwritten policies.~~

- iii. ~~The company may remove from the company experience data credibility segments any policies for which the experience is reflected through adjustments to the anticipated experience prudent estimate mortality rate assumptions as provided under subsection 9.C.4.e Paragraph f below, including policies insuring impaired lives and those for which there is a reasonable expectation, due to conditions such as changes in premiums or other policy provisions, that policyholder behavior will lead to mortality results that vary significantly from those that would otherwise be expected.~~
- g.b. ~~The company may adjust the company experience rates for each shall determine mortality segment to reflect the expected incremental change due to the adoption of risk selection and s for the purpose of determining separate credibility adjusted experience rates and prudent estimate mortality tables by grouping policies within each credibility segment that the company expects will have similar underwriting practices different from those underlying the company methods and mortality experience.~~
 - h. ~~The company shall determine the credibility data identified set subject to the following:~~
 - j. ~~The company shall review the mortality experience described in subparagraph i and ii above, at least once every three years and update as needed.~~
 - k.i. ~~The company shall review the mortality experience described in subparagraph i and ii above, at least once every three years and update as needed.~~
 - l. ~~The credibility data set for each credibility segment shall include the most recent three year study as defined in subparagraph i and shall include the in force and claim data pertaining to the study period for all policies currently in the credibility segment or that would have been in the credibility segment at any time during the period over which experience is being evaluated.~~
 - m.ii. ~~The period of time used for data should be at least three years and should not exceed ten years.~~

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- ~~P-~~
- ~~q.iv. — The company shall use actual mortality experience directly applicable to the credibility segment, when available.~~
- ~~F-~~
- ~~g. v. — The company may use actual experience data of one or more mortality pools in which the policies participate under the terms of a reinsurance agreement, provided that the policies in the credibility segment have underwriting methods and mortality experience characteristics similar to those of the policies in the pool and the aggregate pool data are available to the company.~~
- ~~d. — If the number of deaths within the credibility data set for a credibility segment is at least 30, the company shall establish mortality assumptions using experience mortality rates, blended with industry experience as appropriate. The company should use the following procedure:~~
- ~~i. — Select a credibility procedure that describes the method by which the experience data for a mortality segment and appropriate industry experience are used to produce credibility adjusted experience rates subject to the following:~~
- ~~1) — The credibility procedure shall be based on a statistical method consistent with accepted actuarial practice; and~~
- ~~2) — As the credibility in the experience data set for a mortality segment or for a cell or group of cells included in a mortality segment increases, the credibility adjusted experience rates produced by the credibility procedure shall approach the actual experience rates.~~
- ~~ii. — Use the procedure described in subsection 9.C.2 to determine which of the industry basic tables shall serve as the applicable industry table for that mortality segment required by the selected credibility procedure.~~
- ~~iii. — Determine the experience mortality rates.~~
- ~~iv. — Apply the selected credibility procedure to determine credibility adjusted experience rates, as provided in subsection 9.C.3.~~
- ~~v. — Determine the Credibility Factor for the credibility segment using the same credibility procedure as in subsection 9.C.1.d.i.~~
- ~~vi. — Determine margin for each credibility segment as provided in subsection 9.C.4 below using the Credibility Factor determined in subsection 9.C.1.d.vi.~~
- ~~vii. — Set the prudent estimate mortality assumption equal to the credibility adjusted experience rates increased by the margin determined in subsection 9.C.1.d.vi.~~

~~In order to determine mortality expectations for the mortality experience of subsets of a credibility segment that were recently subdivided into smaller classes, mortality for the new classes could be determined by using the actual experience from the credibility segment prior to being subdivided and reclassifying policies based on the new criteria used for more recent issues.~~

~~Other actuarially sound methods of determining credibility blended mortality expectations are also acceptable.~~

~~**Guidance Note:** Based on a Limited Fluctuation Method calculation which sets the standard for full credibility as being within 3% of the true value with 90% probability, assuming a Poisson distribution for the number of deaths and assuming no variation in net amount at risk, the number of deaths required for 10% credibility is 30 and for 20% credibility it is 120. Because the purpose of the credibility criterion is to provide a simple test that would improve the efficiency of the principles based valuation process by exempting small blocks of business, it may be appropriate to determine the level of deaths that is consistent with this goal by, for example, surveying small companies.~~

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- e. ~~If the number of deaths within the credibility data set for a credibility segment is less than 30, the company shall use the following simplified method to determine prudent estimate assumption for the credibility segment:~~
- i. ~~Determine the applicable industry basic table using the underwriting scoring procedure described in subsection 9.C.2, or by other actuarially sound methods.~~
 - ii. ~~Set the Credibility Factor for the credibility segment equal to zero.~~
 - iii. ~~Determine the margin as provided in subsection 9.C.4.~~
 - iv. ~~Set the prudent estimate mortality equal to the applicable industry basic table determined in Subparagraph 9.C.1e.i increased by the margin determined in subparagraph e.iii above.~~
- f. ~~Adjust the prudent estimate mortality assumptions to reflect differences associated with impaired lives, and differences due to policyholder behavior if there is a reasonable expectation that due to conditions such as changes in premiums or other policy provisions, policyholder behavior will lead to mortality results that vary from the mortality results that would otherwise be expected.~~
- i. ~~The adjustment for impaired lives shall follow established actuarial practice, including the use of mortality adjustments determined from clinical and other data.~~
 - i. ~~The adjustments are supported by published medical or clinical studies or other published studies that which correlate a specific risk selection criteria to mortality or longevity experience (for example, criterion and correlations determined through predictive analytics); and~~
 - ii. ~~The rationale and support for the use of the study and for the adjustments are disclosed in the PBR Actuarial Report.~~

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Guidance Note: ~~It is anticipated that the adjustment described in 9.C.2.g to experience will rarely be made. Since these adjustments are expected to be rare, and since it is difficult to anticipate the nature of these adjustments, the commissioner may wish to determine the level of documentation or analysis that is required to allow such adjustments.ii. The NAIC may want to consider whether approval by a centralized examination office would be an acceptable alternative to approval by the commissioner.~~

- h. ~~Mortality improvement adjustment for policyholder behavior shall not be incorporated beyond the valuation date. However, historical follow accepted actuarial practice, including the use of dynamic adjustments to base mortality improvement from the central point of the underlying company experience data to the valuation date may be incorporated.~~

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3.2 Determination of Applicable Industry Basic Tables

- a. ~~The industry basic table shall be based on the 2008 VBT table, including the Primary, Limited Underwriting and RR Table forms.~~

Guidance Note: ~~Paragraph 9.C.3.a. will need to be revised every time the industry table is updated.~~

- b. ~~A modified industry basic table is permitted in a limited number of situations where an industry basic table does not appropriately reflect the expected mortality experience, such as joint life mortality, simplified underwriting, substandard or rated lives. In cases other than modification of the table to reflect joint life mortality, the modification must not result in mortality rates lower than those in the industry table without approval by the Commissioner.~~

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- c. ~~a.~~—The company may apply the underwriting criteria scoring procedure described in Subparagraph ~~d~~^b below to determine:
- i. The industry basic table that can serve as the industry experience rates when company experience data is limited or not available ~~table under the selected credibility procedure for mortality segments within those credibility segments that do not qualify for the simplified method to determine the prudent estimate mortality assumptions as described in subsection 9.C.1.d above.~~
 - ii. The applicable industry basic table for grading company experience ~~mortality segments within those credibility segments that qualify for the simplified method to industry experience~~ determine prudent estimate mortality using the grading method assumptions as described in subsection 9.C.4.b.iv.9.C.1.e above.

~~d.b.~~ The underwriting criteria scoring procedure is the algorithm described in pages 8 to 27 of the Interim 2007 Report of the Society of Actuaries and American Academy of Actuaries Joint Preferred Mortality Project and embedded in the Underwriting Criteria Score Calculator which is maintained on the Society of Actuaries web site, <http://www.soa.org/research/individual-life/2008-score-calc.aspx> .

- i. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for a particular mortality segment, the company shall take into account factors that are not recognized in the underwriting scoring algorithm but which are applicable to policies that are issued in that mortality segment.

Guidance Note: Examples of such factors include the number of underwriting exceptions that are made, the quality and experience level of the underwriters, and characteristics of the distribution system. For example, if a company deviates from its preferred criteria on a regular basis, then it needs to take that into consideration since the underwriting criteria scoring procedure is not designed to quantify that risk.

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- ii. In using the underwriting criteria scoring procedure to determine the appropriate industry basic table for policies that are issued subject to simplified underwriting and policies that are issued without underwriting, the company shall take into account factors not recognized in the underwriting scoring algorithm but which are applicable to such policies.
- iii. In taking into account factors that are not recognized in the underwriting scoring algorithm, a company may, to the extent it can justify, adjust the industry basic tables up or down two tables from that determined by application of the underwriting criteria scoring procedures. Further adjustments to reflect risk characteristics not captured within the underwriting criteria scoring tool may be allowed upon approval by the Commissioner.

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~~c. Drafting Note: Should the number of tables that could be adjusted equal 2 in subparagraph iii?~~

- ~~e.~~ As an alternative to the Underwriting Criteria Scoring Tool, the company may use other actuarially sound methods to determine the applicable basic tables related to subdivisions of mortality segments. ~~The company shall document the analysis performed to demonstrate the applicability of the chosen method and resulting choice in tables and reasons why the results using the Underwriting Criteria Scoring Tool may not be suitable.~~

Guidance Note: For example, the company may determine a more all inclusive basic table as a table appropriate for the whole mortality~~credibility~~ segment (appropriately modified by the removal of classified lives, term conversions or any other legitimately excludable class) and then subdivide that segment using actuarially sound methods including but not limited to the UCS

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f.d. If no industry basic table appropriately reflects the risk characteristics of the mortality segment, the company may use any well-established industry table that is based on the experience of policies having the appropriate risk characteristics in lieu of an industry basic table.

Guidance Note: Subsection 9.C.3.f ~~9.C.2.e~~ above is intended to provide flexibility needed to handle products based on group-type mortality, etc., for which there might not be an industry basic table.

g. Mortality improvement shall not be incorporated beyond the valuation date. However, historical mortality improvement from the date of the industry basic table (e.g., 2008 for the 2008 VBT) to the valuation date may be incorporated using the improvement factors for the applicable industry table as determined by the SOA and published [name location where published].

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Guidance Note: The improvement factors for the industry mortality table will be determined by the SOA.

4. Process to Determine Anticipated ~~e.~~ The industry basic table shall be based on the 2008 VBT table.

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Determination of Company Experience Assumptions, Mortality Rates

a. If applicable industry basic tables are used in lieu of company experience, the anticipated experience assumptions for each mortality segment shall equal the respective mortality rates in the applicable industry mortality tables as provided in subsection 9.C.3.

b. If the company determines company experience mortality rates, the anticipated experience assumptions will be determined as follows:

~~i.~~

i. For each mortality segment, use the company experience mortality rates (as defined in Subsection 9.C.2) for policy durations in which there exists sufficient company experience data (as defined below in paragraph ii.)

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ii. The company shall determine the sufficient data period by identifying the last policy duration at which sufficient company experience data exists (using all the sources defined in Subsection 9.C.2.b). This period ends at the last policy duration which has a minimum of [X] claims within the exposure period. The sufficient data period may be determined at a more aggregate level than the mortality segment if the company based its mortality on aggregate experience and then used a methodology to sub-divide the aggregate class into various sub-classes or mortality segments, experience mortality rates based on the experience data set defined in subsection 9.C.3.b.

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Drafting Note: Need to determine. If the number of claims for this purpose. The idea is to use last duration at which there are [X] or more claims; not the first duration in which there are less than [X] claims. Alternatively, could use amount of exposure or possibly the level of deaths within the credibility rather than number of claims.

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iii. Determine an aggregate data set for a credibility factor over the period where sufficient segment is less than 30, the company experience data exists (as defined in Subsection 9.C.4.a.ii. above), using a methodology to determine the level of credibility that follows accepted actuarial practice. Credibility may be determined at either (a) shall set the mortality segment level or (b) at a more aggregate level if the mortality for the sub-classes (mortality segments) was determined using an aggregate level of mortality experience.

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iv. Beginning in the policy duration at which sufficient company experience data no longer exists, as defined in paragraph ii. above, linearly grade from the company experience

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~~mortality experience rates equal to 100% of the applicable industry table (the determination of the applicable industry table is described in Section 9.C.3). Grading must begin and end no later than the policy durations shown in the table below, determined in subsection 9.C.1.e.i.~~

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~~The resulting anticipated. If the number of deaths within the credibility data set for a credibility segment is at least 30, the company shall determine the experience data set used to determine experience mortality rates may be no lower than the mortality rates that which are actually expected to emerge and that which the company can justify. It is not anticipated that every mortality rate will may not meet this requirement as a result of the application follows:~~

~~i. — The experience data set shall include, at a minimum, the portion of smoothing (as permitted the credibility data set defined in paragraph c below) and subsection 9.C.1.e for the class of business.~~

~~ii. — The company may use actual experience data of one or more mortality pools in order which the policies participate under the terms of a reinsurance agreement, provided that the policies in the credibility segment have underwriting and mortality experience characteristics similar to maintain those of the policies in the pool and the aggregate pool data are available to the company.~~

~~iii. — If actual experience data is not available or has limited credibility, the company may include in the experience data set data from other sources if available and appropriate. Data from other sources is appropriate if the source has underwriting and mortality relationships among the experience characteristics that are similar to policies in the credibility segment.~~

~~iv. — The company shall review, and update as needed, the experience mortality segments (as permitted in paragraph d below), described in subsections 9.C.3.e.i, 9.C.3.e.ii and 9.C.3.e.iii, whether based on actual experience or data from other sources, at least every five years; however, whenever updated experience data becomes available, the company shall reflect changes implied by the updated data to the extent such changes are significant and are expected to continue into the future. More frequent updates should result in lower margins under in subsection 9.C.4.~~

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Credibility of company data	# of years in which to begin blending after sufficient data no longer exists	# of years in which the assumption must grade to 100% to an applicable industry table (from the duration where sufficient data no longer exists)	Maximum # of years for data to be considered sufficient
0-19%	2	10	10
20-39%	4	15	20
40-59%	6	18	30
60-79%	8	20	40
80-100%	10	25	50

~~v. — Notwithstanding paragraph iv. above, the company must grade into 100% of the applicable industry table d. — — — The company may adjust the mortality by the later of attained age [95] or 15 years after policy underwriting.~~

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- c. ~~Smoothing may be utilized within experience rates for each mortality segment to ensure that an appropriate relationship exists by attained age within each mortality segment.~~
- d. ~~The company may adjust the resulting mortality rates within each mortality segment to ensure reflect the expected incremental change due to the adoption of risk selection and underwriting practices different from those underlying the experience data identified above, provided that the resulting anticipated assumptions produce a reasonable relationship with assumptions in other mortality segments that reflects the underwriting class or risk class of each mortality segment. Such adjustments must be done in a manner that does not result in a material change in total expected claims for all mortality segments in the aggregate.~~
- e. ~~Adjust the anticipated experience mortality assumptions to reflect differences associated with impaired lives, and differences due to policyholder behavior if there is a reasonable expectation that due to conditions such as changes in premiums or other policy provisions, policyholder behavior will lead to mortality results that vary from the mortality results that would otherwise be expected.~~
 - i. ~~The adjustment for impaired lives shall follow established actuarial practice, including the use of mortality adjustments determined from clinical and other data.~~

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- i. ~~The adjustment_s are supported by published medical or clinical studies; and~~
- ii. ~~The rationale and support for the use of the study and for the adjustments are disclosed in the PBR Actuarial Report.~~

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~~**Guidance Note:** It is anticipated that such adjustments to experience will rarely be made. Since these adjustments are expected to be rare, and since it is difficult to anticipate the nature of these adjustments, the commissioner may wish to determine the level of documentation or analysis that is required to allow such adjustments. for policyholder behavior shall follow accepted actuarial practice, including the use of dynamic adjustments. The NAIC may want to consider whether approval by a centralized examination office would be preferable to approval by the commissioner.~~

~~4. Process to base Blend Company and Industry Experience Rates:~~

- a. ~~If the number of deaths within the credibility data set for a credibility segment is at least 30, the company shall determine credibility adjusted experience rates using the credibility procedure selected in accordance with subsection 9.C.1.d above.~~
- b. ~~The company shall use, in conjunction with the credibility method, the industry basic table or appropriate weighted average of industry basic tables determined in subsection 9.C.2 for the mortality segment or the mortality segments to which the mortality experience cell or cells belong.~~
- c. ~~If company experience mortality rates by age and duration only exist for some of the mortality experience cells within a mortality segment, the company shall determine the remainder of the table by grading into an industry mortality table or a modified industry mortality table where the modification is based on the credible experience in the earlier policy years. Such grading must be reasonable and consistent with accepted actuarial practice and shall take into account the level of partial credibility, the trend in actual to expected ratios, the shape and level of the resulting mortality rates, and the reasons for differences in mortality results relative to industry mortality rates such as differences in underwriting, market and other factors.~~
- d. ~~The company may reflect mortality improvement only up to the projection start date based on applicable published industry wide experience in the credibility adjusted experience rates. Any adjustment made shall be for the period from the experience weighted average date underlying the company experience used in the credibility process to the projection start date.~~

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~~**Drafting Note:** Because mortality improvement beyond the projection start date is not allowed to be reflected in the prudent estimate assumption, then the lack of using mortality improvement is an implicit margin, and should be included in the disclosure of the total margin (in addition to the explicit margin for mortality defined in Section 9.B).~~

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5. Determination of Mortality Margin

- a. The mortality margin shall be in the form of a percentage increase applied to the Anticipated Experience Assumption.

~~**Drafting Note:** The margin percentages need to be determined.~~

~~b. A mortality margin shall be included for Random Fluctuation Risk and Company Variation Risk.~~

~~i. Random Fluctuation Risk covers deviations in the mortality experience resulting from periodic variations of the experience from the mean (i.e., random fluctuation from the expected results of credible component of a company's mortality). The margin for random fluctuation risk shall:~~

- ~~1) take into consideration the sophistication of the method used to estimate credibility and the number of years experience modeled, i.e. using the number of claims to determine credibility might or fewer years to measure variation in experience from year to year indicate the need for a greater margin than using a more robust statistical approach or less years to measure variability;~~
- ~~2) be no less than 1% and no greater than 10%; and~~
- ~~3) vary by the size of the credibility factor whereby mortality segments with a lower credibility factor have a load at the higher end of the permitted range.~~

~~ii. Company variation risk covers deviations from a selected industry mortality due to differences in underwriting practices and the demographics of the underlying insured lives. The margin for company variation risk shall:~~

- ~~1) be set to zero for credibility segments in which the credibility factor is 1.00;~~
- ~~2) for credibility segments where the credibility factor is less than 1.00, be equal to the percentages in the American Academy of Actuaries' Mortality Margin Table in Appendix 3.~~

~~e. Within each mortality segment, the mortality margin shall be set equal to the Credibility Factor as determined in subsection 9.C.1.d.4 or subsection 9.C.1.e.ii times the margin for random fluctuation risk determined in Subparagraph 9.C.5.b.i plus (1 - the Credibility Factor) times the margin for company variation risk determined in subsection 9.C.5.b.ii.~~

~~f. This margin shall be increased, as appropriate, to reflect the level of uncertainty related to situations, including but not limited to, the following:~~

~~i. The reliability of the company's experience studies is low due to imprecise methodology, length of time since the data was updated or other reasons.~~

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~~ii. The longer the time since the experience data was updated, the larger the margin.~~

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~~iii. The underwriting or risk selection risk criteria associated with the mortality segment have changed since the experience on which the company ~~credibility-adjusted~~ mortality rates are based was collected.~~

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- iv. The data underlying the ~~company~~~~credibility adjusted~~ experience mortality rates lack homogeneity.
 - v. Unfavorable environmental or health developments are unfolding and are expected to have a material and sustained impact on the insured population.
 - vi. Changes to ~~t~~he company's marketing or administrative practices or market forces expose the policies to the risk of anti-selection.
- Guidance Note:** For example, the secondary market for life insurance policies
- vii. Underwriting is less effective than expected.
 - vii. ~~Errors occur.~~

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