Group Life Waiver Premium Valuation Table Work Group Updates Presentation

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May 16, 2022—NAIC Health Actuarial (B) Task Force (HATF) Meeting

Agenda

- Background, Scope and Approach
- Recommendation
- Proposed table
- Predictive Analytics
- Comparison of 2005 and 2022 Tables
- Considerations for AG 44
  - Credibility
  - Retroactive
  - Margins
- How can we best support HATF in its approval process?

Background: Description of Benefits and Reserves

- Waiver of Premium is a disability benefit on group term life coverage
- If the insured is disabled under the terms of the contract, premiums are waived and benefits are payable upon death
  - Unless the insured recovers or benefits expire, e.g., upon attainment of age 65
  - Possible company variations include: definition of disability, elimination period, benefit period, benefit reduction schedules based on age
- Reserves are the actuarial present value of future benefits
  - Calculated using a double decrement of mortality and recovery, as described in Actuarial Guideline 44 (AG 44)

Background: Evolution of Waiver Tables

- Historically insurers used 75% of the face amount as the reserve
- Krieger Table published in 1971, based on 1955-65 data
  - 135,000 life-years of experience
  - Table dimensions:
    - recovery/death decrements separated
    - disability duration (quarters 4-8 and years 3-10 select, then ultimate by attained age)
    - age at disability
  - A de facto standard
- SOA 2005 Table published in 2006, based on 1993 through 2002 data
  - 750,000 life-years (~6x more than Krieger study)
  - 17 companies
  - Added gender to table dimensions
  - AG 44 introduced 2005 Table as a valuation standard
- New table (SOA 2022) is based on 2006 to 2015 data
  - Over 2 million life-years (~3x more than 2005 study)
  - 20 companies
  - Adding “diagnosis group” dimension to SOA 2005 table structure
  - Developed using predictive analytics

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Background, Scope, and Approach

Who we are:

- A group of volunteers representing a good cross-section of companies, reinsurers and consultants working in group life
- The group commenced in 2019
- Volunteers represent members of the SOA and the Academy, and we are ably supported by their staff
- We had an external consultant conducting the data analytics under our direction

Our purpose in meeting with HATF:

- Provide an overview of our process
- Present our recommended Group Life Waiver of Premium Valuation Table and Actuarial Guideline 44, as well as supporting information
- Develop a better understanding of how we can support HATF in your review process

Recommendation

Supporting Documents:

- Table
- Revised AG 44
- Paper supporting predictive analytics by external consultant, Jerry Holman

Improvements over 2005 Table:

- Significantly more (and better) data
- Using predictive analytics better reflects interaction of variables
- Including diagnosis as a new variable improves fit

Proposed Table

Structure Consistent with 2005:

- Select period based on:
  - gender
  - age at disability
  - duration of disability
- Durations 11+ are on an attained age basis

Enhancements:

- Factors reflecting diagnosis
  - Unisex basis
  - Used same 15 diagnosis variables Group Long-Term Disability (“LTD”)
    - Grouped low/medium/high separately for deaths and recoveries
  - Protocol established for unknown diagnosis
- Developed using predictive analytics

Predictive Analytics

From ASOP Exposure Draft on Assumptions :

If Predictive Analytics was utilized for any actuarial assumptions in the analysis:

- *Describe how each model was selected and explain why it was appropriate for the purpose*
- *Describe each algorithm in use, its parameterization, and changes in the parameter values from last year if applicable*
- *Describe how common data issues, (e.g., cleaning, partitioning, and overfitting) were addressed*
- *Provide an attribution analysis for each resultant assumption.*

Enhancements:

- Using predictive analytics has greatly improved the quality of the result as these techniques are designed to appropriately attribute interactions between variables
- Work was done by Jerry Holman, the SOA's external consultant, with oversight by the work group
- A paper outlining Holman's methodology is submitted with this recommendation—it addresses in detail the issues outlined in the ASOP

Comparison of 2005 and 2022 Tables

Total – All Benefit Periods	SOA 2005	SOA 2022	Compare %
Reserve: Experience Table	$4,319 B	$4,260 B	99%
Reserve: Valuation Table (Full margins)	$5,226 B	$4,784 B	92%
Margin: (Valuation Rsv/Experience Rsv) - 1	21.0%	12.3%	59%
NAR: 1- (Valuation Rsv/Face)	71.2%	73.7%	104%
Exposed Claims	239,381	239,381	100%

- To assess the impact of the new table, we calculated reserves for the 239,381 claims open at the end of 2014
- Reserves are calculated using the experience tables and then adding in the margins
  - Results are quite close 99% and 92%
- Margins are quite high for the 2005 Table. We feel that the lower margin is appropriate given that the 2022 Table has more data, more variables and a much stronger technique

Comparison of 2005 and 2022 Tables (cont.)

Total – All Benefit Periods	SOA 2005	SOA 2022	Compare %
Reserve: Experience Table	$4,319 B	$4,260 B	99%
Reserve: Valuation Table (Full margins)	$5,226 B	$4,784 B	92%
Margin: (Valuation Rsv/Experience Rsv) - 1	21.0%	12.3%	59%
NAR: 1- (Valuation Rsv/Face)	71.2%	73.7%	104%
Exposed Claims	239,381	239,381	100%

Lifetime Benefit Periods	SOA 2005	SOA 2022	Compare %
Reserve: Experience Table	$1,255 B	$1,212 B	97%
Reserve: Valuation Table (Full margins)	$1,383 B	$1,291 B	93%
Margin: (Valuation Rsv/Experience Rsv) - 1	10.2%	6.5%	64%
NAR: 1- (Valuation Rsv/Face)	43.8%	47.6%	109%
Exposed Claims	48,080	48,080	100%

To Age 65 Benefit Periods	SOA 2005	SOA 2022	Compare %
Reserve: Experience Table	$3,064 B	$3,047 B	99%
Reserve: Valuation Table (Full margins)	$3,845 B	$3,492 B	91%
Margin: (Valuation Rsv/Experience Rsv) - 1	25.5%	14.6%	57%
NAR: 1- (Valuation Rsv/Face)	75.5%	77.7%	103%
Exposed Claims	191,301	191,301	100%

- Results are shown Lifetime versus “To Age 65”
- Lifetime margins are lower than “To Age 65,” which seems reasonable given the lower Net Amount at Risk
- “To Age 65” margins are over 25% for the 2005 Table, which we felt were quite high

AG 44—Margins

- The current AG 44 assesses margin on each decrement separately
  - 25% for mortality, i.e., mortality rates are multiplied by 125%
  - 35% for recovery, i.e., recovery rates are multiplied by (1-35% or 65%)
  - These margins were based on Krieger's work in 1970 and result in a very high overall reserve margin of 21.0%, as well as even higher margins for "To Age 65"
- Under our proposal, the base reserve is first calculated on an experience basis, with the margin applied after
  - Margins start at 15% and grade down to 5% for companies with fully credible experience
  - The formula, which is based on that for group long-term disability, is provided in the proposed revision to AG 44

AG 44—Credibility

- We feel strongly that the proposed table is a very good representation of industry experience. We also want to enable companies to reflect their own experience.
- We continue the practice of assessing credibility separately for mortality and recovery. We assess credibility separately by duration group, as follows:
  - Group 1: durations up to 24 months
  - Group 2: durations 24 to 60 months
  - Group 3: duration over 60 months
- For full credibility, each mortality group requires 800 claims; recovery requires 1,700 claims.

AG 44—Retroactivity

- Our proposed revised AG 44 is provided.
- Because this table is an enhancement to the prior version, our proposal would allow companies to apply it, along with the AG 44 revisions, retroactively to all claims at their election.
  - Note that the current AG 44 allows an insurer to apply the 2005 Table retroactively to pre-AG 44 claims subject to the approval of the commissioner in the state of domicile.

Appendix

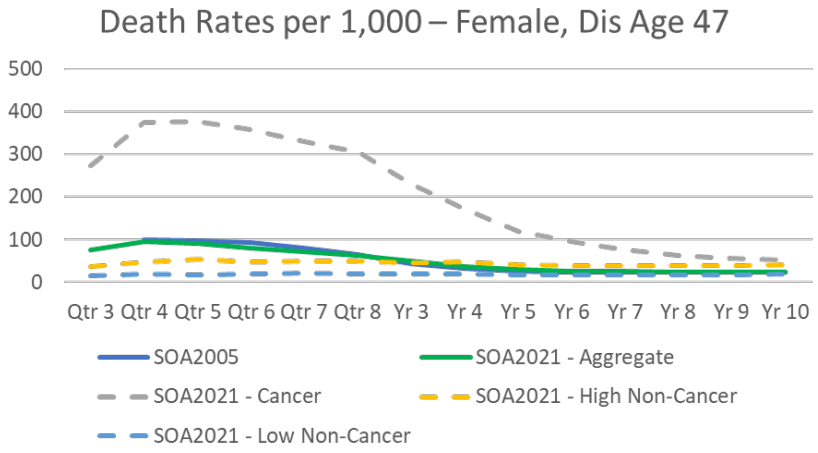
The following slides illustrate the impact of the diagnosis groupings

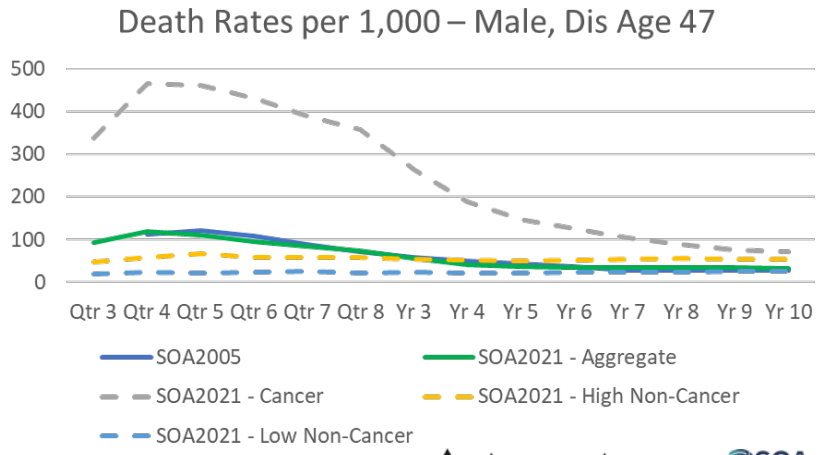
- Death decrement – select period
- Death rates – select period table compare
- Death rates – ultimate period
- Recovery decrement – select period
- Recovery rates – select period table compare
- Recovery rates – ultimate period

Note these slides were prepared for an SOA presentation November 9, 2021.

Death Decrement – Select Period

- A key enhancement in the SOA 2022 table is the addition of diagnosis groups to differentiate termination rates.
- Mortality rates in the 2022 table are generally lower than the 2005 table for durations <7 years, but higher in duration years 7 to 10.
  - The Male-to-female mortality ratio has not changed materially in the 2021 table.





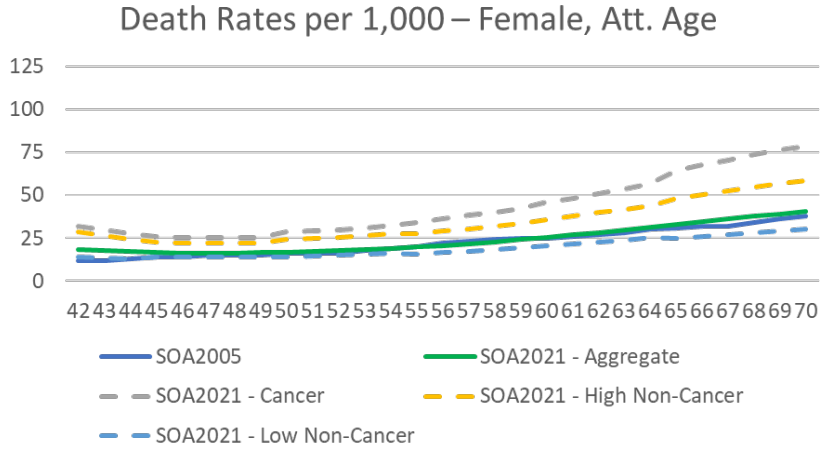
Death Rates – Select Period Table Compare

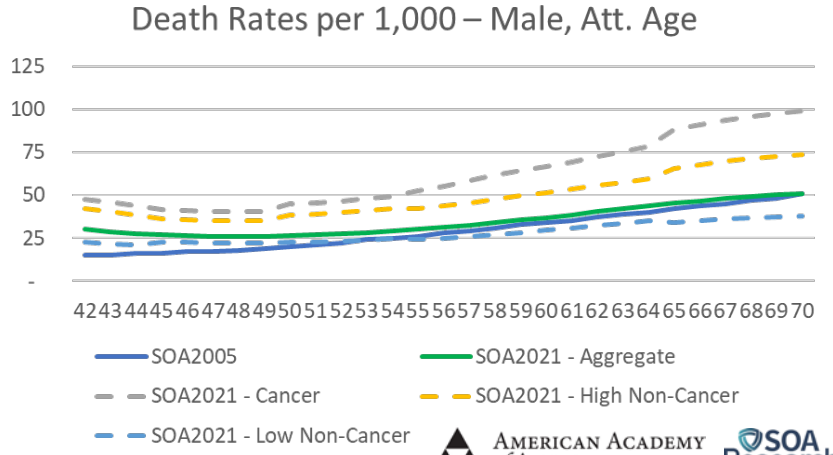
- Death rates are generally lower in the early ages and durations in the 2022 table, but higher in the later durations and older ages, when compared to the 2005 experience table.
  - Similar relationships exist for females

2022 Table Death Rates as a % of GLW2005 (Male)								
Disability Duration	Disability Age							
	27	32	37	42	47	52	57	62
Qtr 3	66%	66%	63%	72%	82%	88%	98%	81%
Qtr 4	85%	84%	80%	92%	105%	112%	125%	103%
Qtr 5	66%	62%	69%	80%	91%	105%	120%	119%
Qtr 6	57%	53%	65%	74%	89%	102%	116%	115%
Qtr 7	44%	51%	75%	86%	94%	108%	119%	117%
Qtr 8	35%	46%	77%	88%	101%	116%	141%	139%
Yr 3	58%	65%	74%	84%	94%	107%	113%	121%
Yr 4	49%	56%	63%	71%	82%	94%	98%	104%
Yr 5	63%	62%	69%	77%	87%	100%	107%	113%
Yr 6	66%	69%	77%	86%	97%	108%	109%	118%
Yr 7	88%	89%	99%	109%	121%	130%	114%	118%
Yr 8	96%	96%	101%	112%	124%	133%	100%	106%
Yr 9	105%	115%	109%	115%	123%	119%	97%	101%
Yr 10	126%	128%	131%	130%	122%	112%	96%	96%

Death Rates – Ultimate Period

- Diagnosis will differentiate ultimate death rates in the 2022 table.
- Notably, the 2022 table ultimate mortality for males is higher than the 2005 table for ages 42 to 70.
  - Female ultimate mortality is also generally higher, but to a lesser degree.





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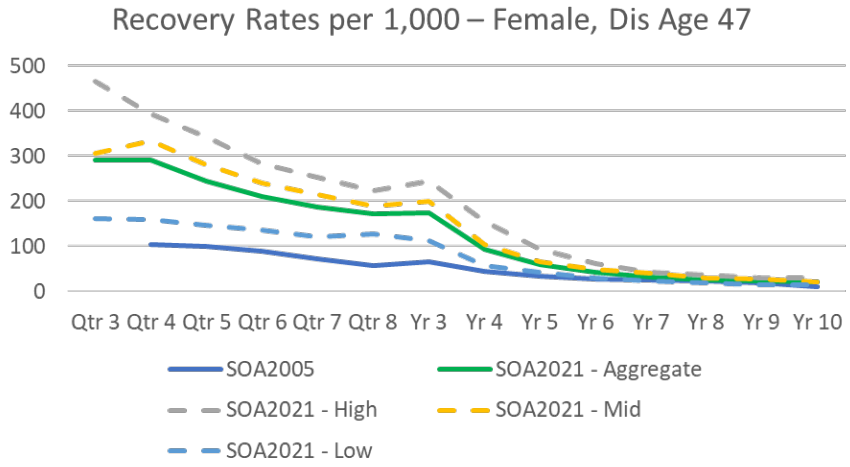
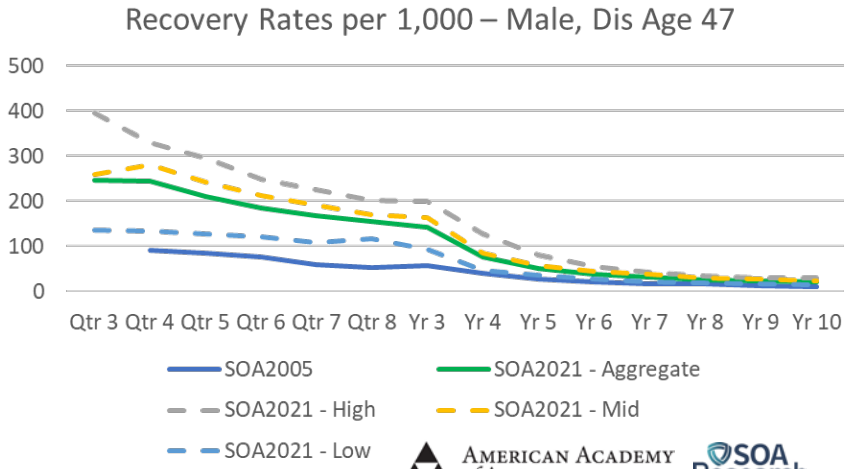
Recovery Rates – Select Period

- Like death rates, diagnosis group will be utilized to differentiate recovery rates in the 2022 table.
- The 2022 table has recovery rates 2-3x higher than the 2005 table for the first 4 years of disability for all disability ages.
  - Female recovery rates remain 10-20% higher than male rates, based on the underlying experience data.





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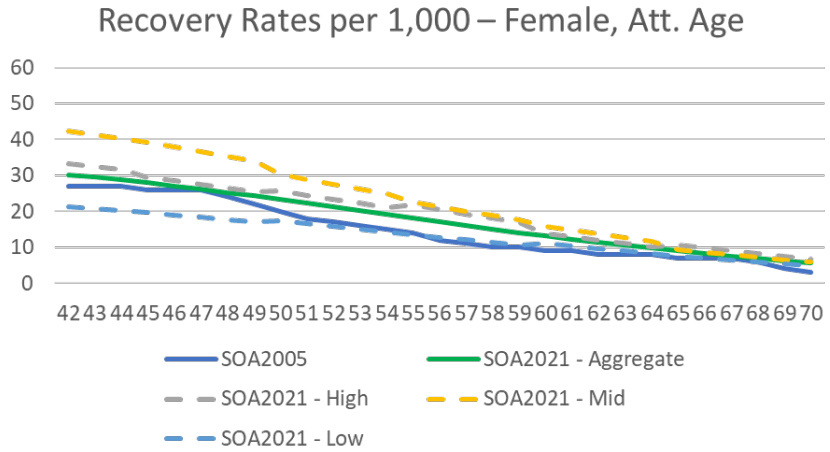
Recovery Rates – Select Period Table Compare

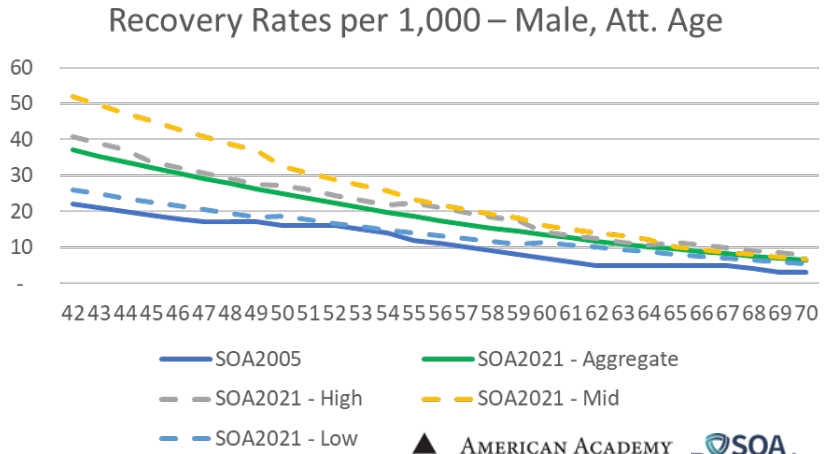
- Recovery rates are roughly ~250%+ in the early durations in the 2022 table, but about ~150% higher in duration years 4+, when compared to the 2005 experience table.
  - Similar relationships exist for males

2022 Table Recovery Rates as a % of GLW2005 (Female)								
Disability Duration	Disability Age							
	27	32	37	42	47	52	57	62
Qtr 3	260%	266%	239%	231%	280%	243%	253%	339%
Qtr 4	196%	200%	239%	230%	280%	243%	253%	339%
Qtr 5	214%	216%	215%	216%	244%	222%	236%	284%
Qtr 6	226%	233%	199%	210%	238%	208%	243%	288%
Qtr 7	219%	225%	193%	216%	259%	229%	270%	314%
Qtr 8	233%	232%	199%	223%	305%	275%	330%	431%
Yr 3	216%	223%	255%	235%	268%	275%	344%	391%
Yr 4	148%	172%	178%	173%	209%	201%	258%	235%
Yr 5	123%	143%	149%	143%	182%	194%	182%	159%
Yr 6	142%	128%	133%	135%	157%	186%	151%	116%
Yr 7	152%	125%	121%	127%	128%	171%	144%	110%
Yr 8	155%	127%	118%	127%	112%	148%	126%	119%
Yr 9	166%	128%	116%	127%	116%	147%	130%	129%
Yr 10	182%	142%	125%	151%	180%	178%	126%	158%

Recovery Rates – Ultimate Period

- Diagnosis will differentiate ultimate recovery rates in the 2022 as well.
  - The Mid diagnosis group does in fact exhibit higher recovery rates than the high diagnosis group.
- The 2022 table will have recovery rates 150-200% higher than the 2005 table in the ultimate period.





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Group Life Waiver Premium Valuation Table

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Thank You

Questions?

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