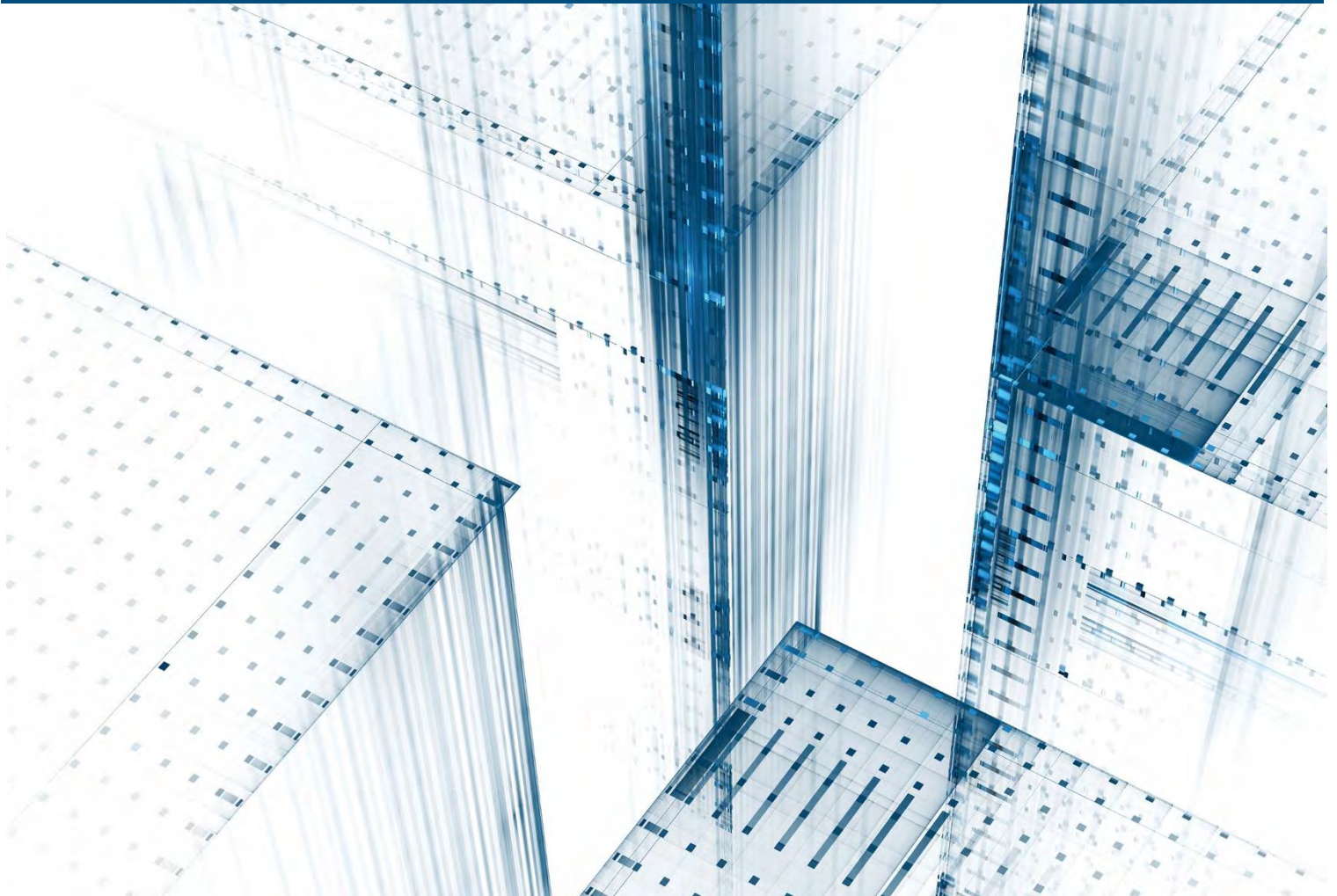




2018 Universal Life with Secondary Guarantees Survey

Survey of Assumptions for Policyholder Behavior
in the Tail





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Contents

Survey Highlights	4
Background.....	7
Parameters of Stochastic Capital Calculation	9
Tail Scenario.....	12
Lapse Assumptions	20
Lapses by Distribution System	27
Lapses by Premium Assumption.....	29
Sources of Base Lapse Assumption.....	30
Mortality Assumptions	34
Critical Assumptions	41

Survey Highlights

In 2018, the Policyholder Behavior in the Tail (PBITT) committee distributed its annual survey to insurers and asked for information on assumptions used in their modeling of Universal Life with Secondary Guarantees. The goal of the survey was to gain further insight into the ranges of companies' assumptions in the tail of a stochastic risk based capital calculation.

There were 13 respondents in 2018. While the identities of the responding companies for a particular response remain anonymous to the Policyholder Behavior in the Tail (PBITT) committee, companies were given a chance to identify themselves as a participating company. The committee would like to thank all respondents for their contribution.

Ameriprise Financial
John Hancock
Lincoln Financial Group
MetLife
Nationwide
New York Life Insurance Company
Penn Mutual
Principal
Sammons Financial Group
Sun Life Financial
Symetra
Transamerica Life Insurance Company
Voya Financial

Overview

- The latest survey regarding Universal Life with Secondary Guarantees reflects a different response group from those in the prior survey. Some of the changes described below reflect different respondents, not necessarily a change by any given company. The SOA research office was able to confirm that 9 of the participating companies this year also participated in the prior survey.
- Most companies continue to view the investment returns in tail scenarios (cited by 85% of respondents) and lapse assumptions (77%) to be their most critical risk assumptions when analyzing policyholder behavior in the tail for secondary guarantees (Figure 46).

Tail Scenarios

- Overall, 54% of companies use stochastic scenarios to set or analyze capital levels. It is less common for companies with a small block of business to use stochastic scenarios (Figure 3). Of the companies that do use stochastic scenarios, 86% projected more than 100 scenarios and 57% project 1,000 or more (Figure 4).
- A strong majority of companies (82%) project for at least 51 years (Figure 5).
- The tail scenarios used are summarized in Figure 6 through Figure 17.

Lapse Assumptions

- Lapse rates in the tail continue to vary widely among insurers. Projected lapse rates do not show substantial variation by issue age for most individual insurers, but are lower for the highest issue ages (70-79). Only select age groups are shown in Figure 21 and Figure 23.
- Median lapse rates for 2018 are similar to those in past surveys for the 40-49 age group (Figure 22), but somewhat lower than before for the 70-79 age group (Figure 24).
- The percentage of companies that reported using dynamic lapse assumptions continues to increase relative to past surveys. Dynamic lapses were used by 69% this year (Figure 19).
- Companies were asked how many policies on a block of business that experienced the tail scenario would be kept in force by the secondary guarantee. After 31 years, the average response was 43% of policies and median response was 44% of policies (Figure 25).
- For the third survey in a row, the 2018 survey saw a small percentage of companies that measure lapses by distribution system (11%; 1 of 9) (Figure 28). No company reported varying their lapse assumptions by distribution system in this year's survey.
- Over half (9 of 13) of companies vary lapse assumptions by premium. This is slightly higher than recent surveys (Figure 29). Several responses mentioned higher lapse rates for level premium patterns and/or lower lapse rates for single premiums.
- Regarding sources of base lapse assumptions, "Company Experience" (100%) and "Actuarial Best Estimate" (77%) were cited as the most common sources (Figure 30).

- When asked about the number of years of experience companies use in their lapse studies, the most common response was “5-7 years” (54%) with no companies using less than 5 years in this year’s survey (Figure 32).
- Actuarial best estimate continues to be the most common source of dynamic assumptions at 67%, although that response rate has been declining in recent surveys. A variety of other sources were reported, similar to past surveys (Figure 34).

Mortality Assumptions

- Companies showed a wide range of mortality assumptions (Figure 36 through Figure 41).
- This year’s survey continued to see a strong response for the number of companies using 2008 VBT as their reference table. In addition, there has been a significant increase in the number of companies using 2014/15 VBT as their reference table (31%; 4 of 13) (Figure 35).
- Median mortality rates are comparable to the 2008 VBT (Figure 36 through Figure 41).
- Future mortality improvement is modeled by 77% of responding companies, a similar but slightly lower rate as compared to past surveys. Improvements vary by a variety of factors, particularly gender and age (Figure 45).

Background

In 2018, the Policyholder Behavior in the Tail (PBITT) committee distributed a survey to insurers and asked for information on assumptions used in their modeling of Universal Life with Secondary Guarantees. The goal of the survey was to gain insight into companies' assumptions in the tail of a stochastic capital calculation. This survey had 13 responses, down from 23 in 2017 and 19 in 2015. The survey was not distributed in 2016.

The distribution of responses by company size in 2018 trended toward larger companies. The number of responses from companies with medium and large block of UL (\$15B+ face) was similar to past years, while the number of responses from smaller companies (under \$15B face) was much lower, as seen in Figure 1.

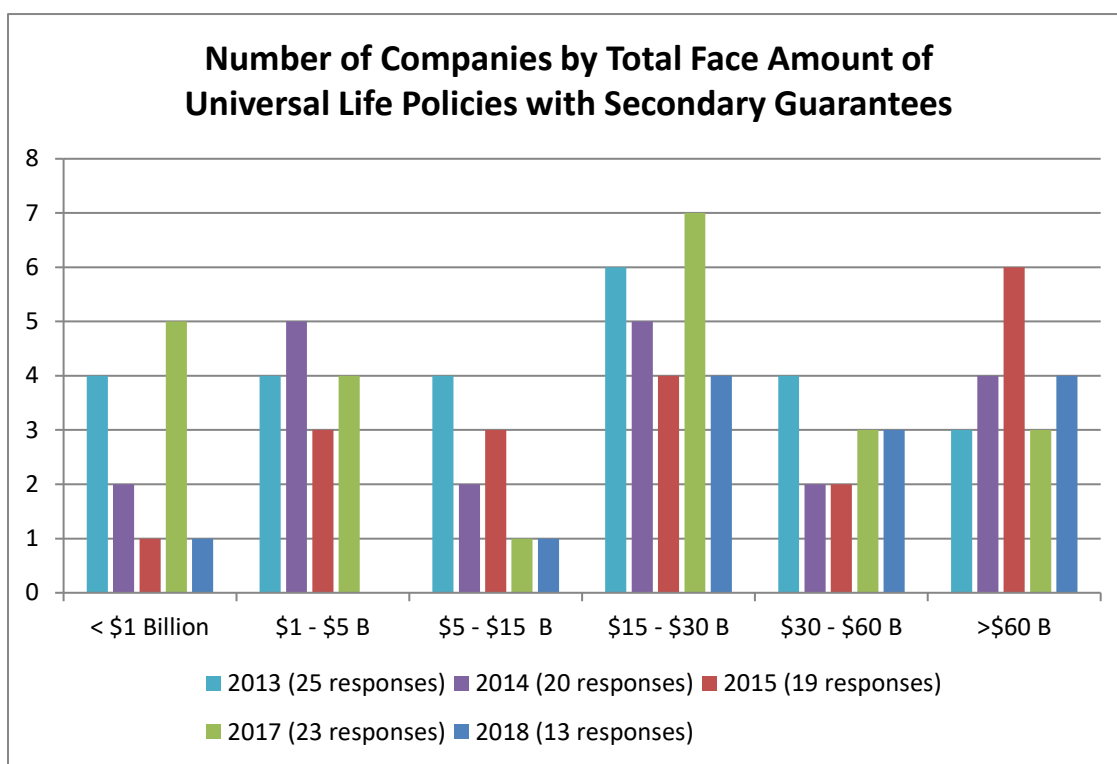


Figure 1

At the total survey level, we were able to confirm 9 respondents from 2017 repeated in 2018, out of 13 total responses in 2018. Therefore, some of the changes described below reflect different respondents, not necessarily a change by any given company. The relationship of new versus prior respondents varies by individual question as not every company answers every question. To suggest the credibility of results, most charts indicate how many companies responded to the question. The reader should be aware that changes in the set of companies participating in each survey may influence some of the observed changes in survey responses over time.

It is the intention of the PBITT committee to continue to conduct this survey annually by distributing it each year in April. It is our hope that with the publication of these and future survey results, we will increase the awareness of expected industry experience for all companies to consider when setting assumptions or when extrapolating to the tail. Others may wish to consider the relative financial impact of the various assumptions shown. Individual companies may also want to use the results to help design stress tests and experience studies. The committee welcomes comments or suggestions for new or revised questions in future surveys.

Parameters of Stochastic Capital Calculation

Insurers were asked in Question 2 of the survey to indicate whether they analyze capital levels for UL with Secondary Guarantees using stochastic scenarios, as well as how many scenarios are used and the length of the projection. Figure 2 shows that 54% of insurers used stochastic scenarios to set or analyze capital levels, continuing a generally upward trend in affirmative responses. Figure 3 looks at stochastic scenario use by company size. Of those reporting company size and stochastic scenario usage, the companies with larger UL blocks are more likely to use stochastic modeling.

In the 2018 survey, 57% (4 of 7) of the respondents that reported using stochastic scenarios indicated that they use 1,000 or more scenarios, as shown in Figure 4. The number of companies that reported using “100 or fewer” was again very low, as it was in the prior two surveys, with only 1 of 7 (14%) marking that selection.

Figure 5 shows the distribution of number of years modeled, which includes both companies that use stochastic modeling as well as those that use a deterministic tail. The most common response continues to be over 75 years (6 of 11; 55%).

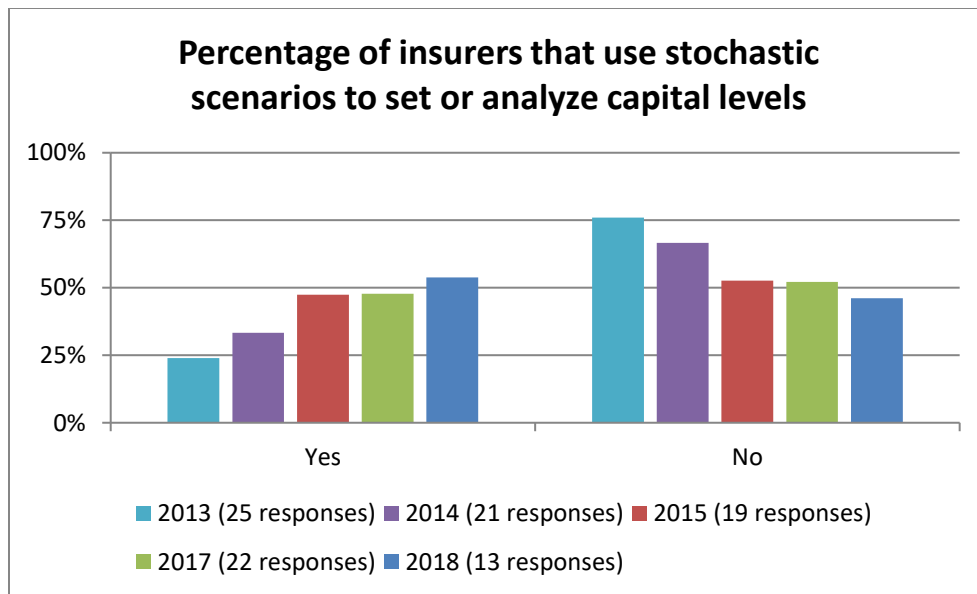


Figure 2

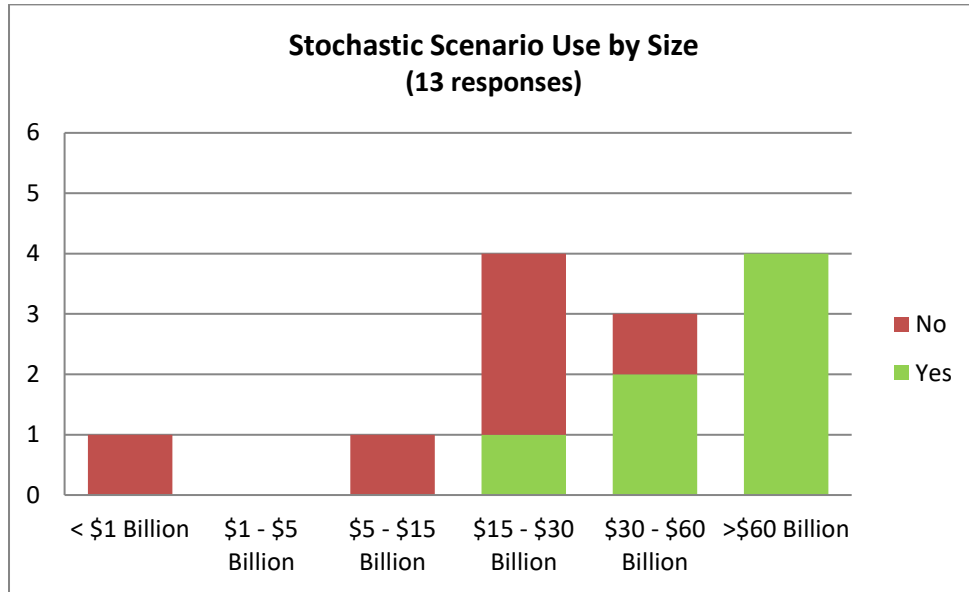


Figure 3

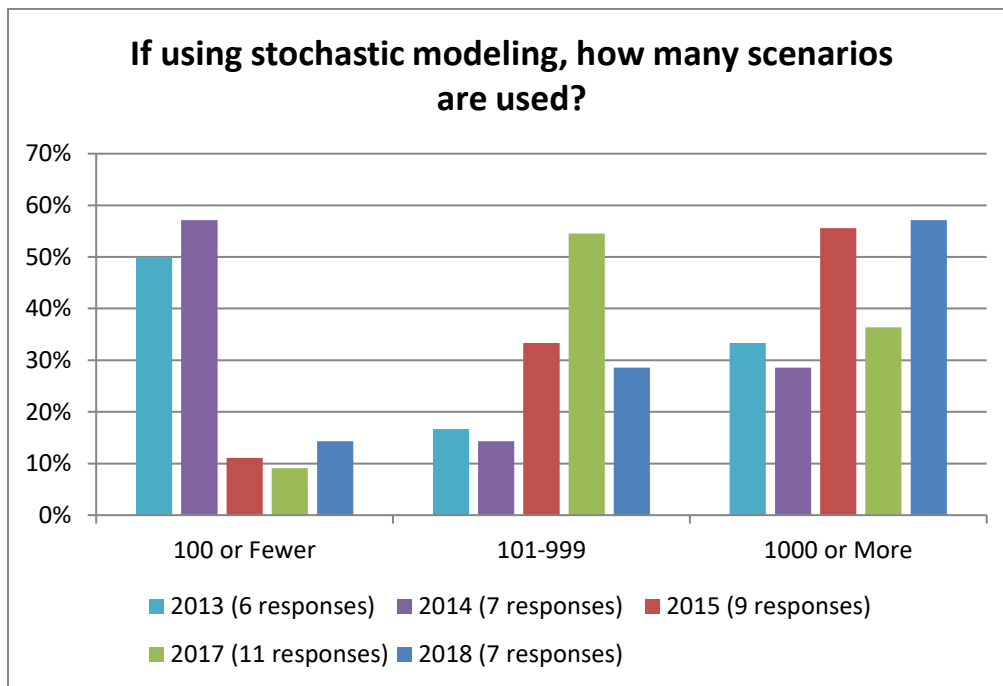


Figure 4

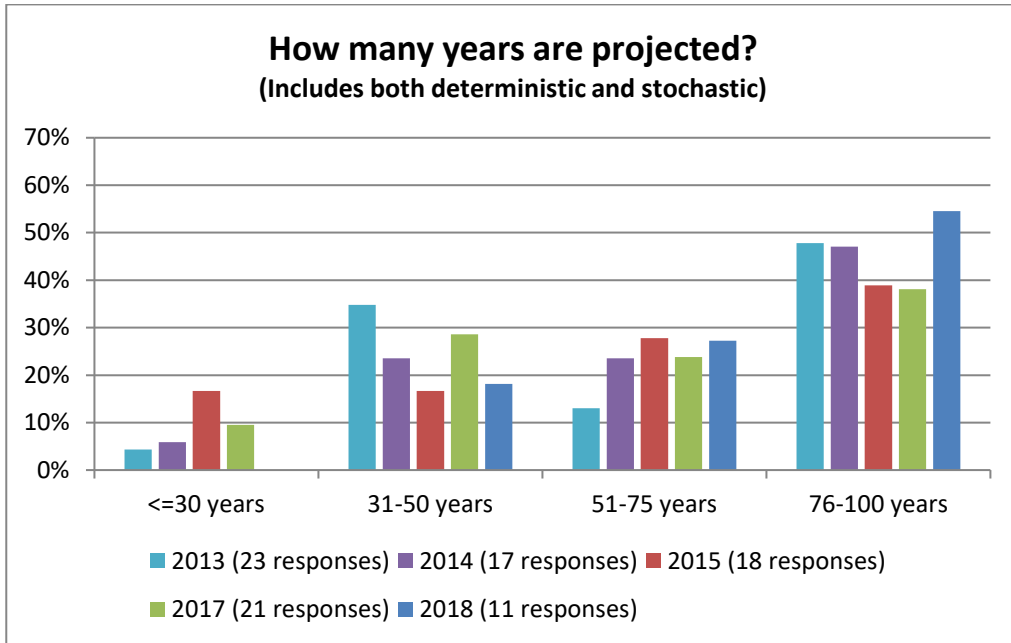


Figure 5

Tail Scenario

The tail scenario is defined as the scenario which gives the largest present value of the death benefits paid in all years where no COI is collected. (This differs from the tail scenario definition used in the committee’s VA survey.) Insurers were asked to list 1 year, 7 year, and 30 year interest rates in the tail scenario (whether a stochastic scenario or a deterministic scenario depending on the respondent’s methodology). Responses varied widely across insurers regarding the description of the tail scenario. The charts below show each insurer’s tail scenario for the three maturities, separated between those that report using a stochastic methodology and those that report not using a stochastic methodology, which we then label “deterministic” methodology.

Of the seven companies that reported using stochastic modeling, six provided requested interest rate scenarios. And of the six that reported using deterministic modeling for capital analysis, three of them provided their deterministic interest rate scenarios.

The companies are comparable across the figures (e.g. Stochastic, 2 in Figure 6 is the same company as Stochastic, 2 in Figure 8 and Figure 10.)

To respect the confidential nature of responses, individual results are only shown when there are at least 5 companies responding to a particular question.

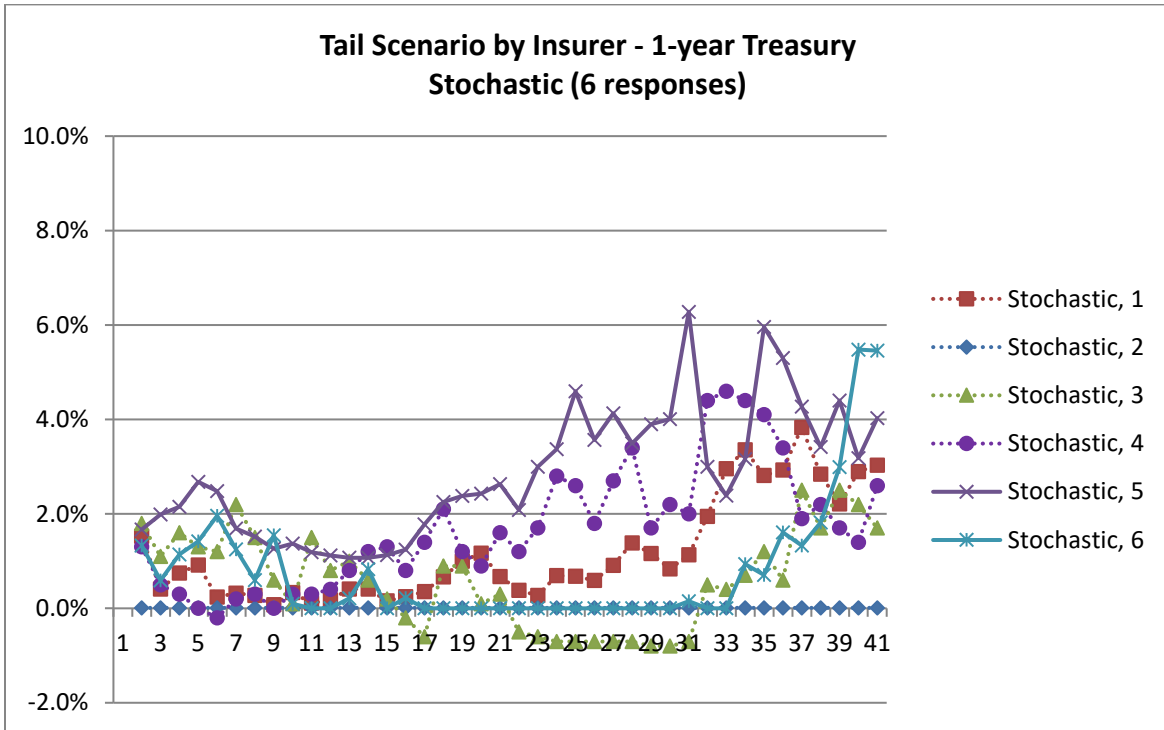


Figure 6

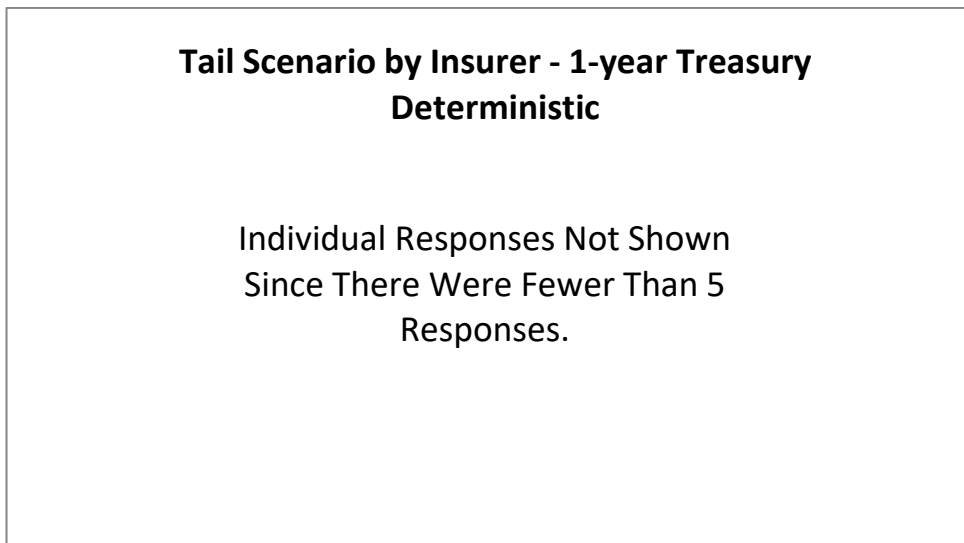


Figure 7

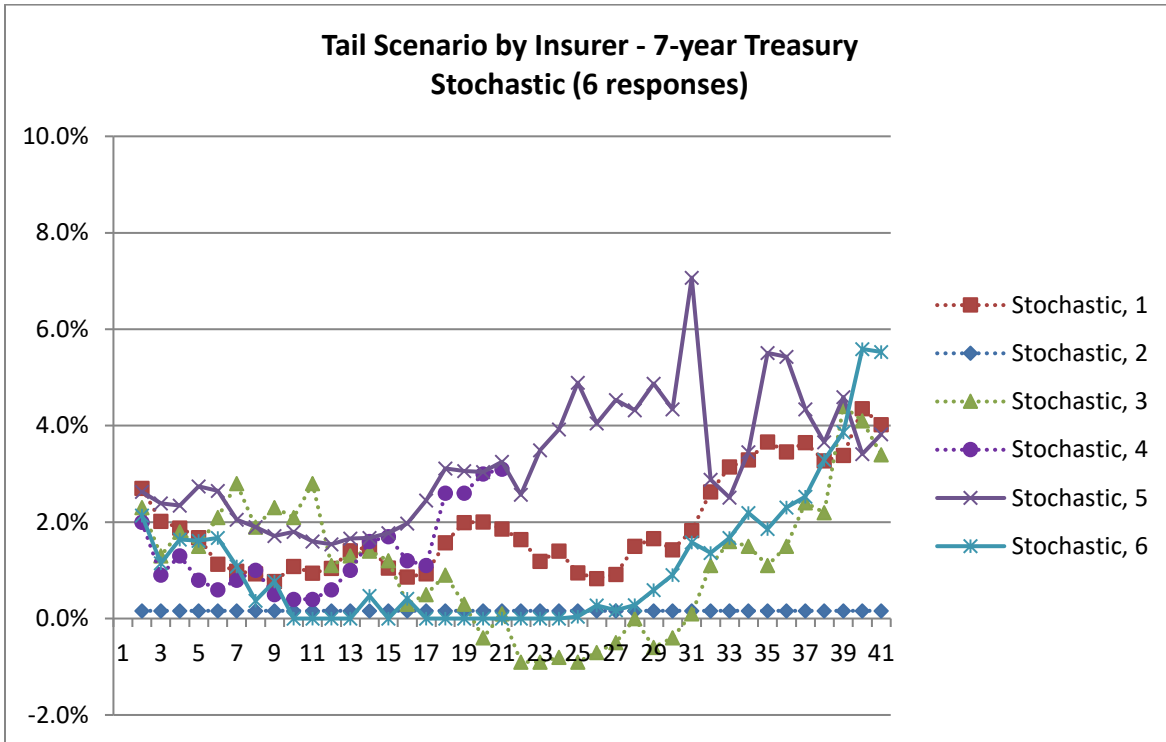


Figure 8

Tail Scenario by Insurer - 7-year Treasury Deterministic

Individual Responses Not Shown Since There Were Fewer Than 5 Responses.

Figure 9

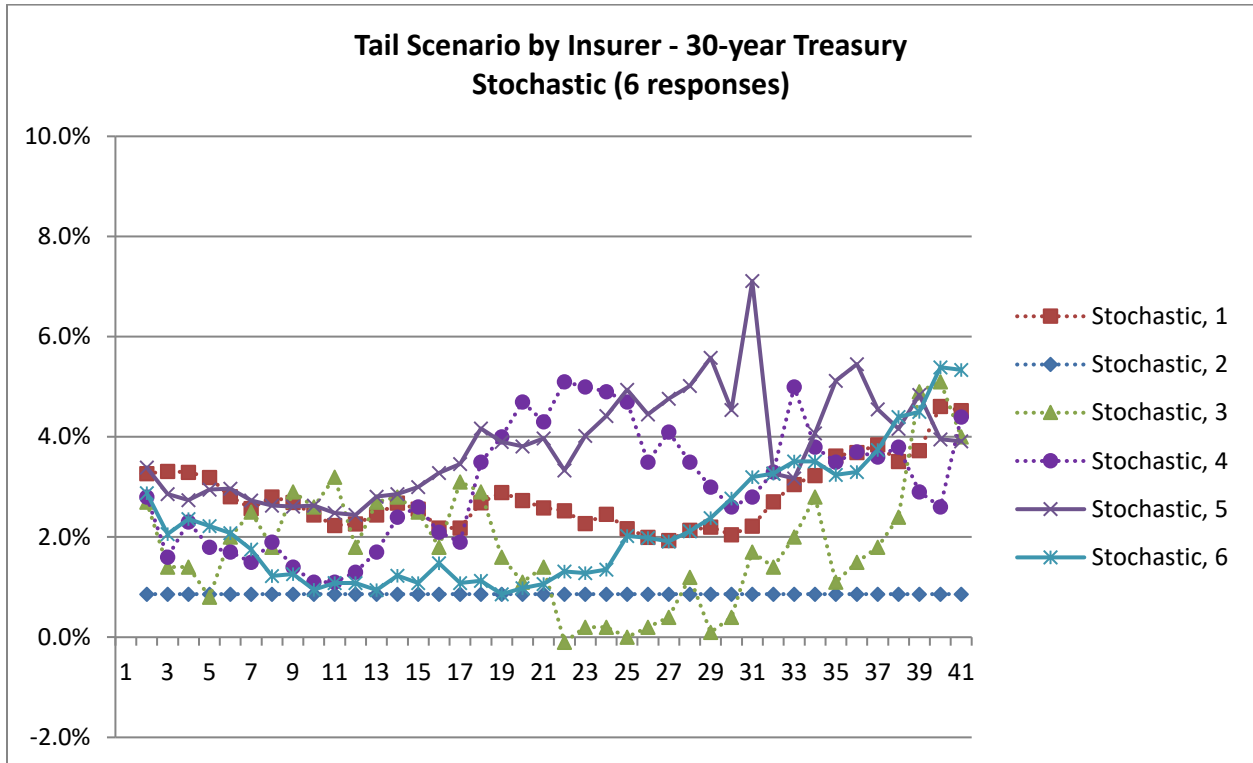


Figure 10

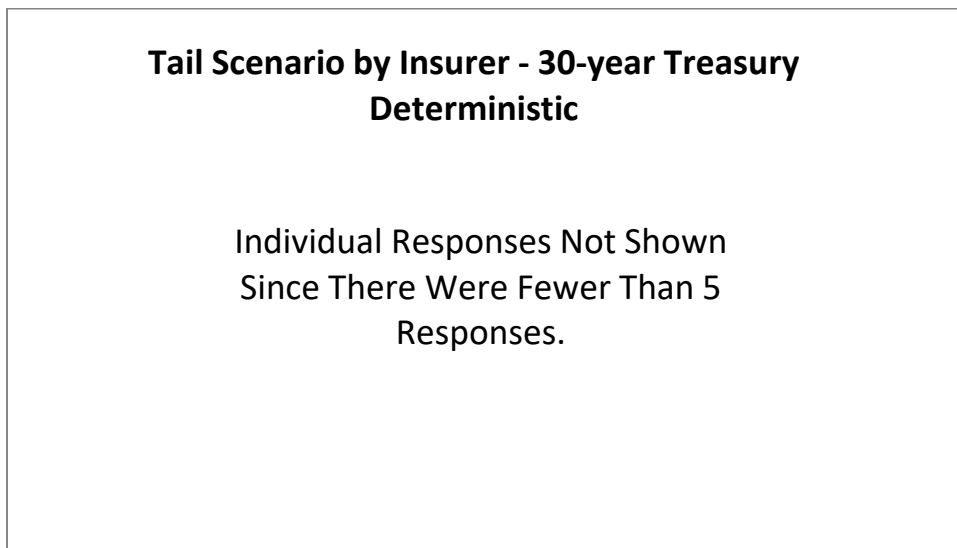


Figure 11

The following graphs of tail scenarios show the median reported value across insurers for each of three maturities (1, 7 and 30 Year Treasuries). The first pair of graphs separates stochastic from deterministic for 2018, followed by their combination. Thereafter, combinations only are shown from recent survey results.

These lines do not represent any one single company's response, but rather the median of the rates across all companies' responses calculated independently at each projection year duration.

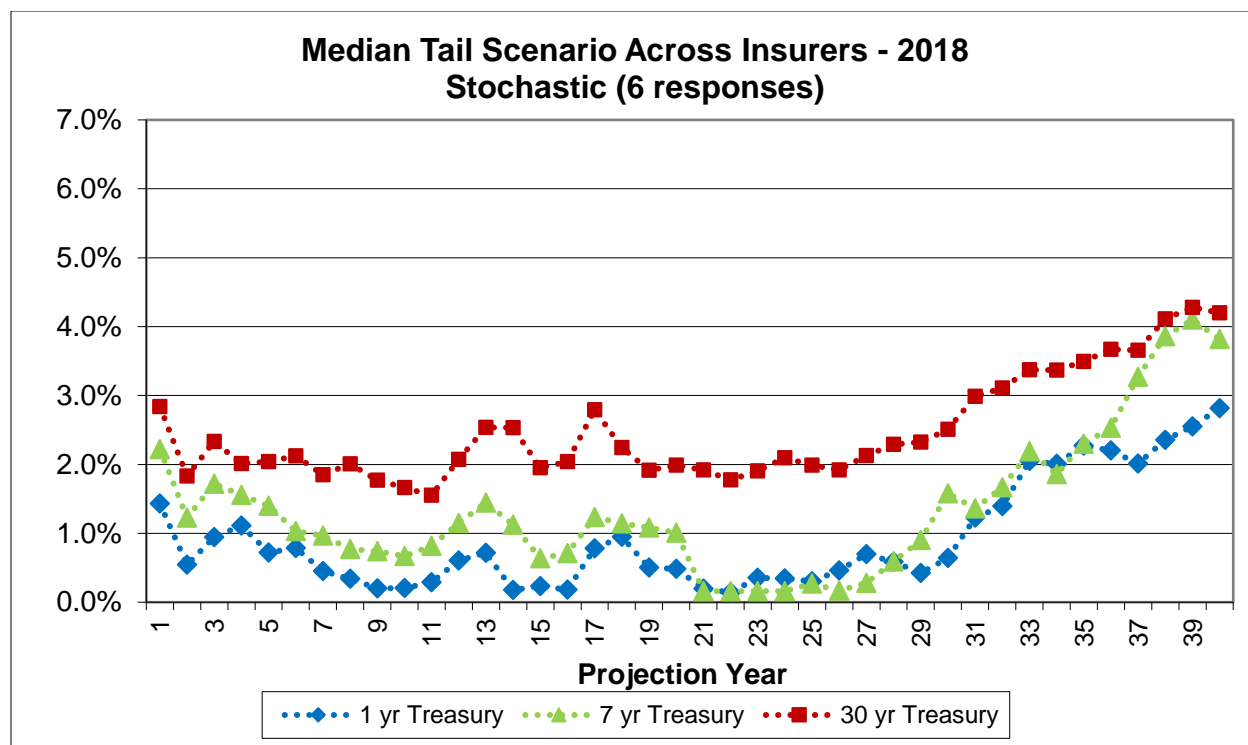


Figure 12

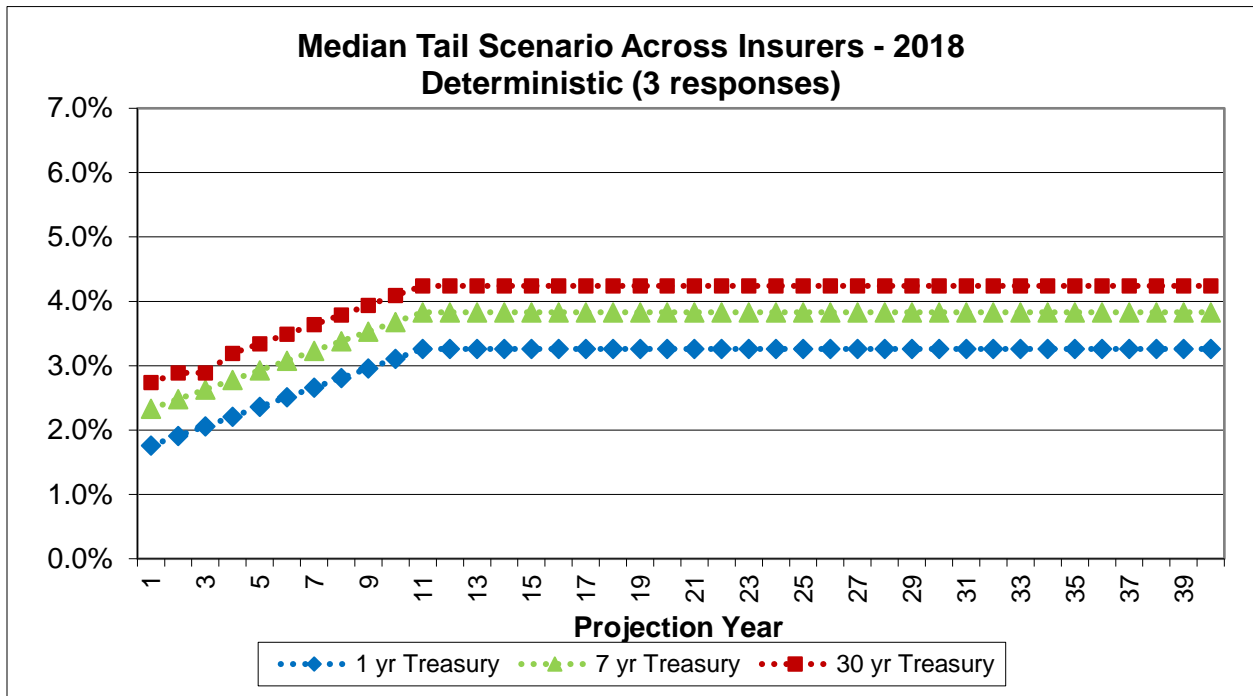


Figure 13

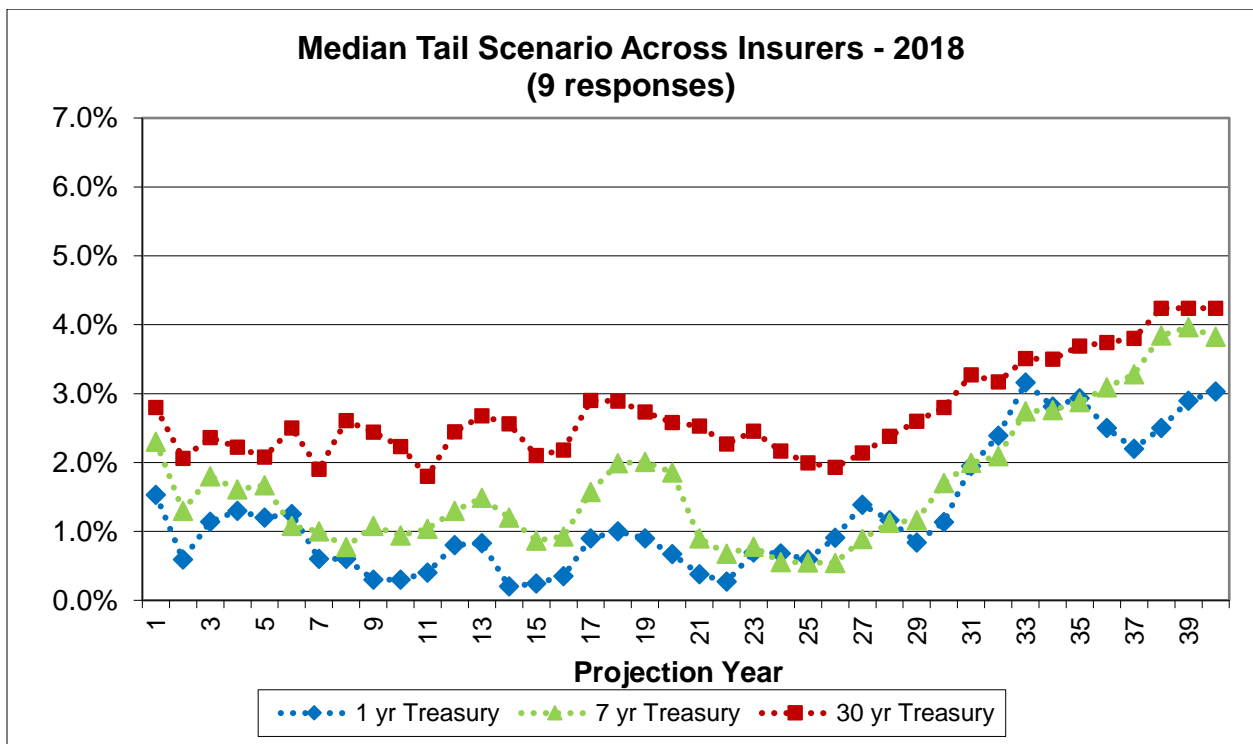


Figure 14

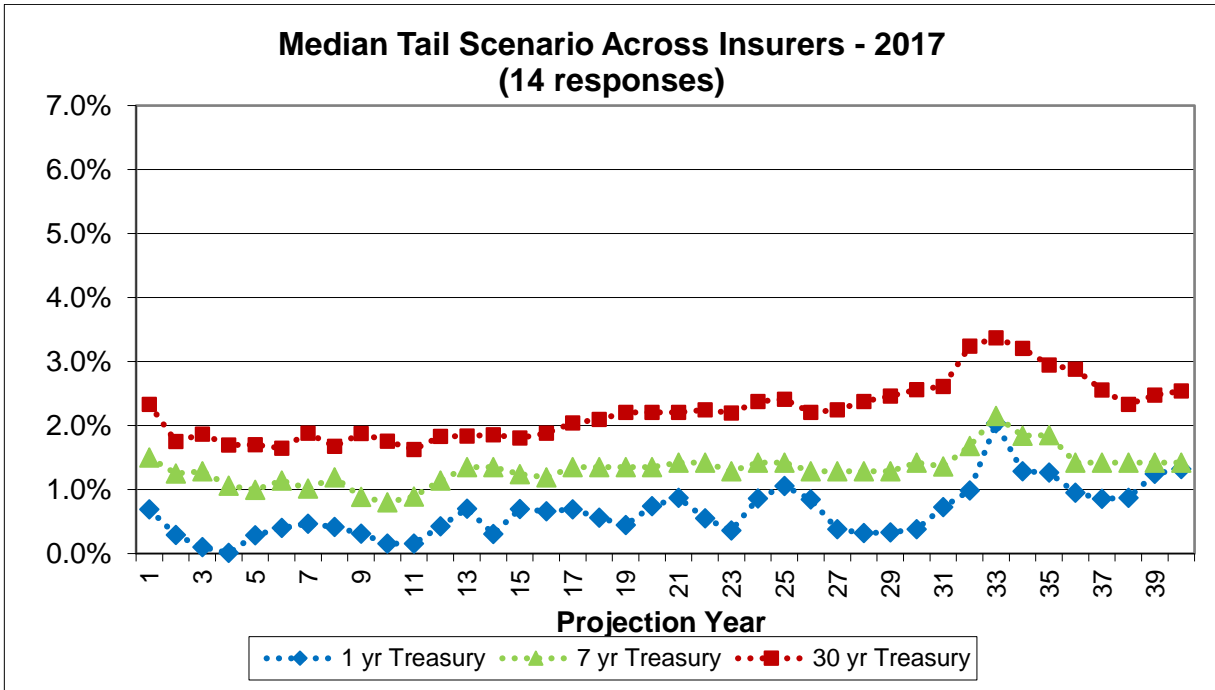


Figure 15

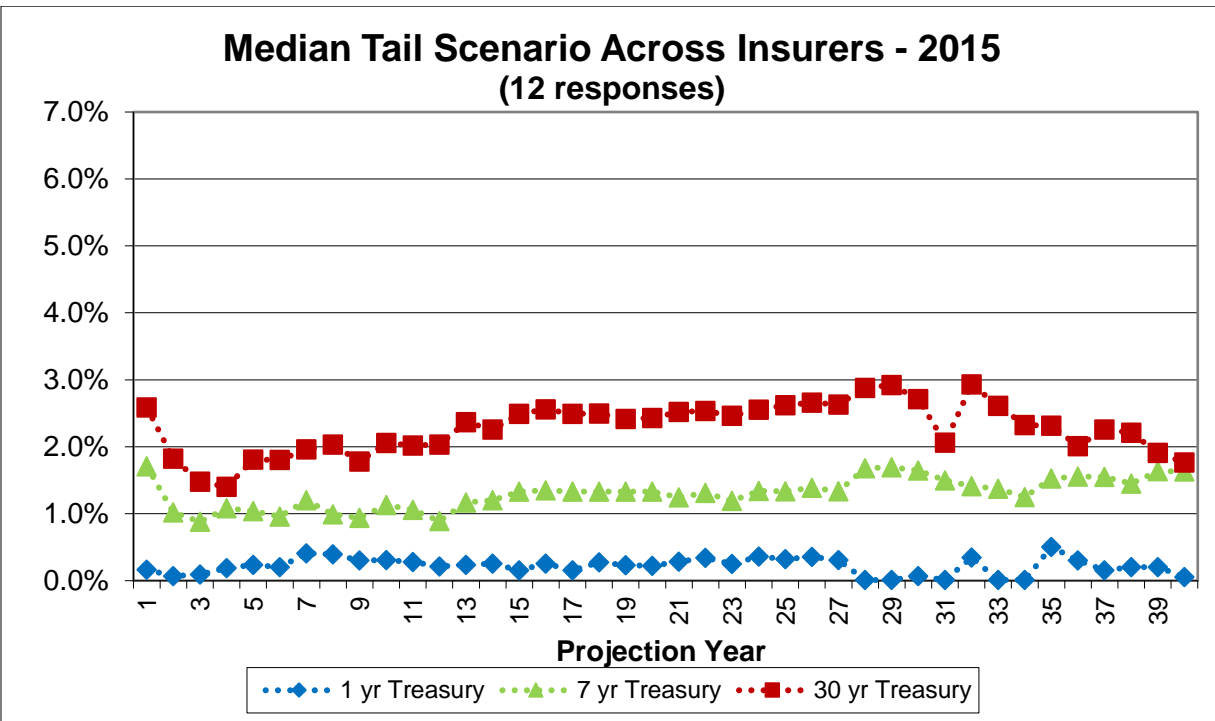


Figure 16

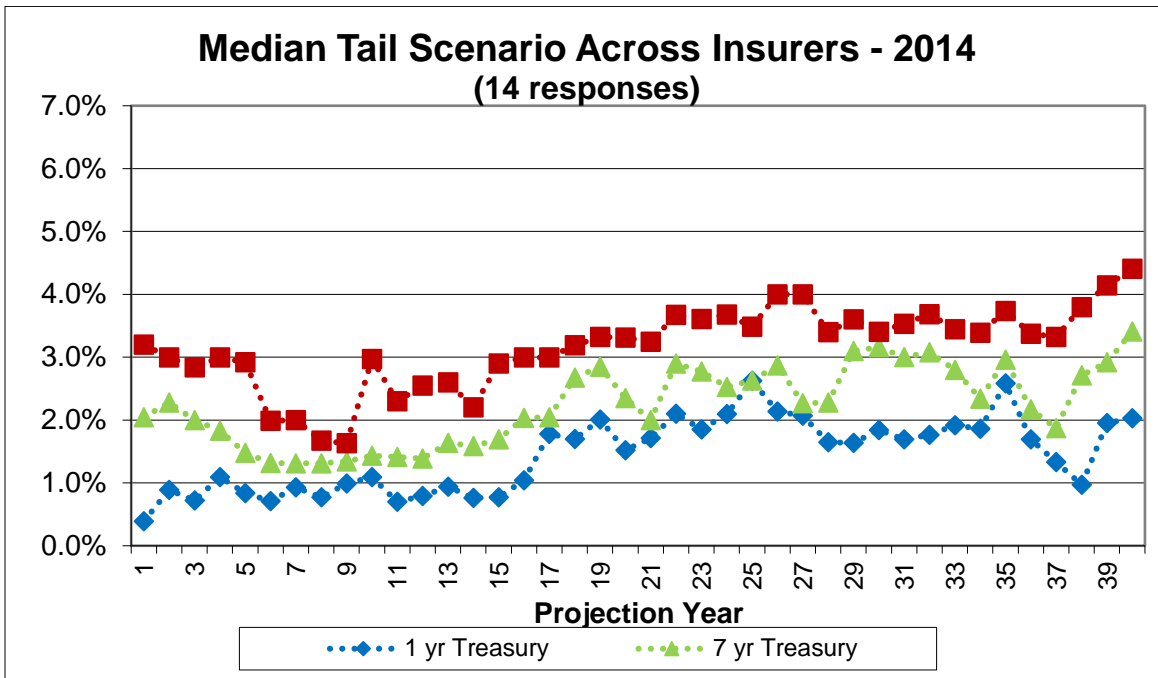


Figure 17

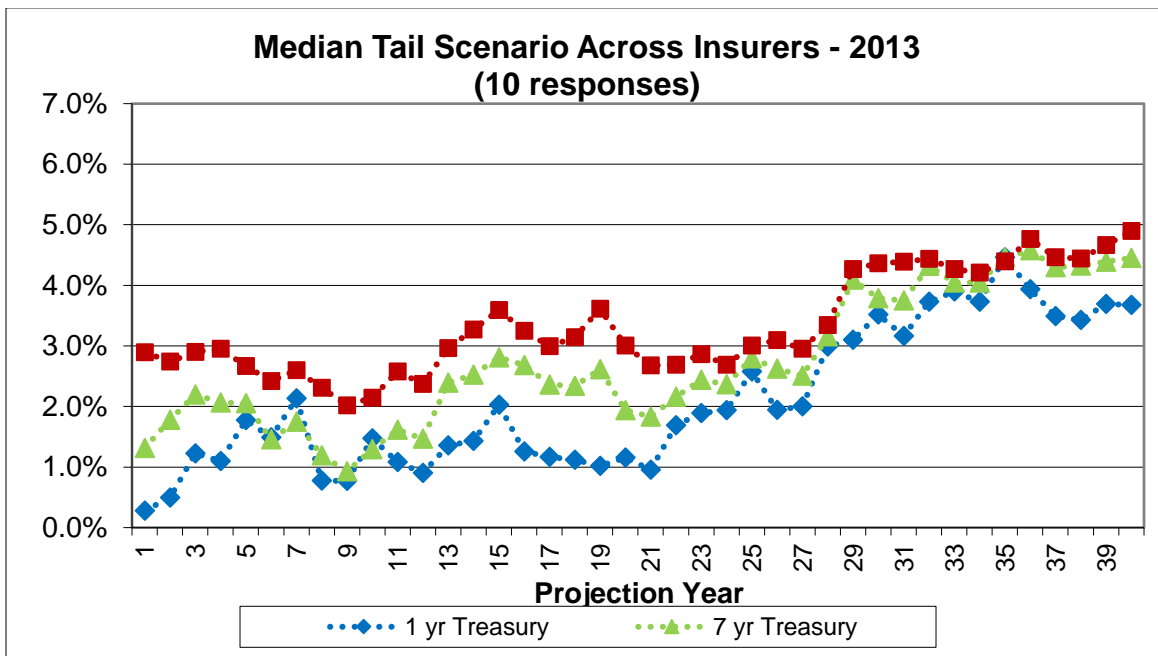


Figure 18

Lapse Assumptions

Question 3 asked about lapse assumptions. The following chart shows the percentage of insurers who use dynamic lapse functions for policies with secondary guarantees. The number of insurers using dynamic lapse functions continues to trend higher with 69% doing so in 2018 (9 of 13). See Figure 19.

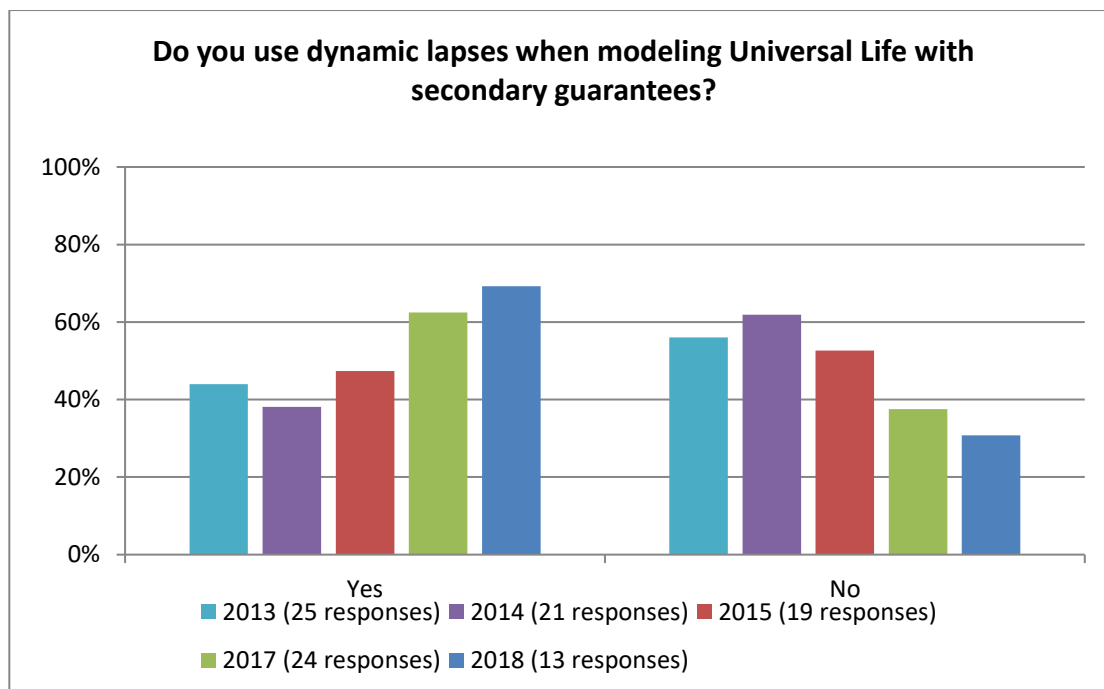


Figure 19

A follow-up question asked those companies that had dynamic lapses whether lapses could be greater than zero if a secondary guarantee renders a policy to be paid-up. In 2018, three of nine responders (33%) indicated that it could. This is a lower percentage than in past surveys, as seen in Figure 20. Additional commentary indicated that this was generally only possible if the policy was paid up, but the policy still had a positive cash surrender value.

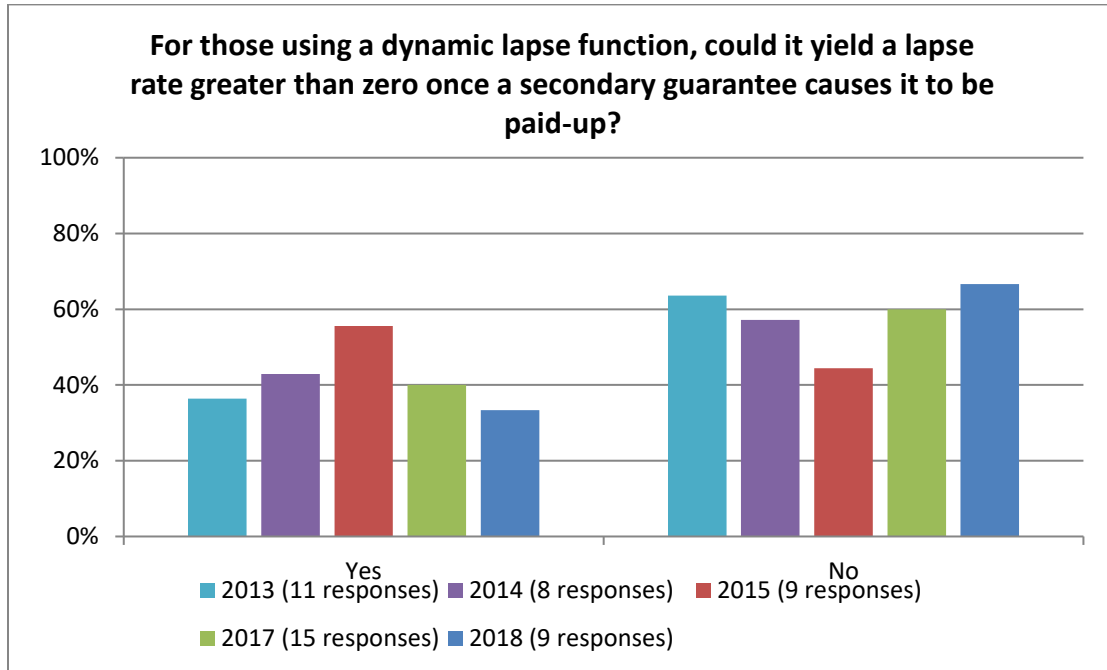


Figure 20

In Question 4, insurers were asked to list their lapse assumption in the tail scenario by duration and by various issue ages. The charts below show the highest, median, and lowest lapse rates used across duration. The graphs show the responses for issue ages 40-49 and 70-79. The 2018 median responses for ages 40-49 are in line with those from the past two years. However, the 2018 median responses for ages 70-79 are lower than in past surveys. The responses for other issue ages were very similar to those for age 40-49.

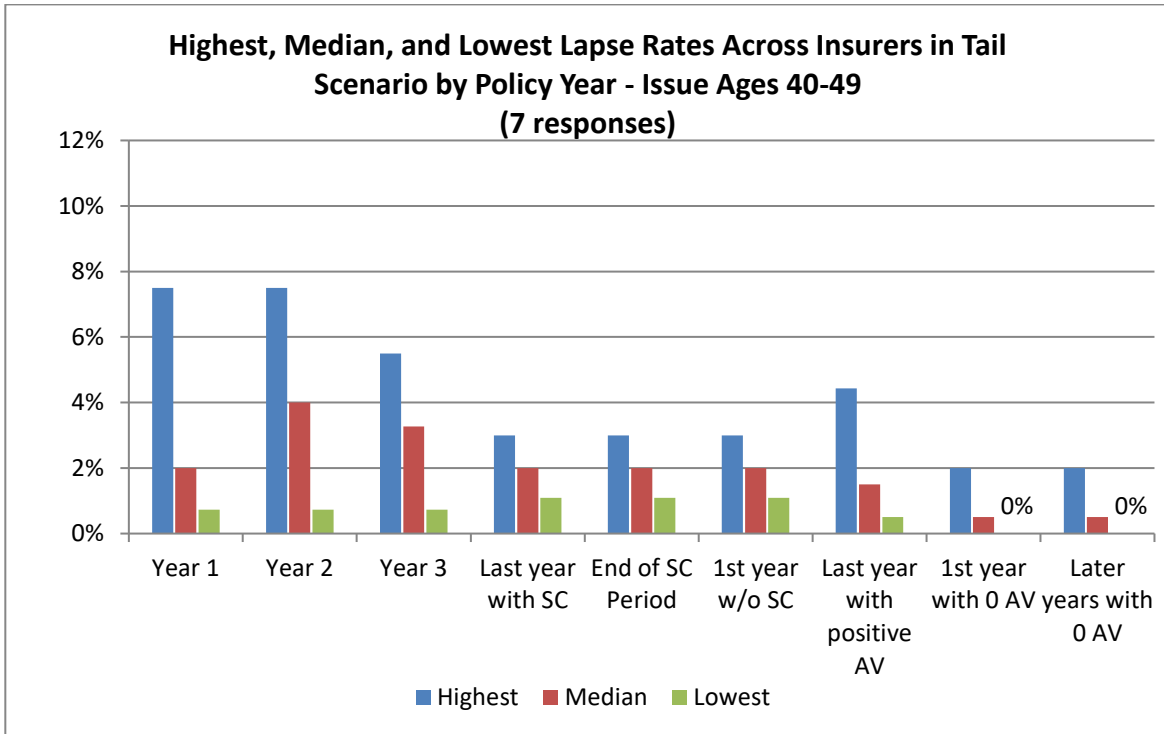


Figure 21

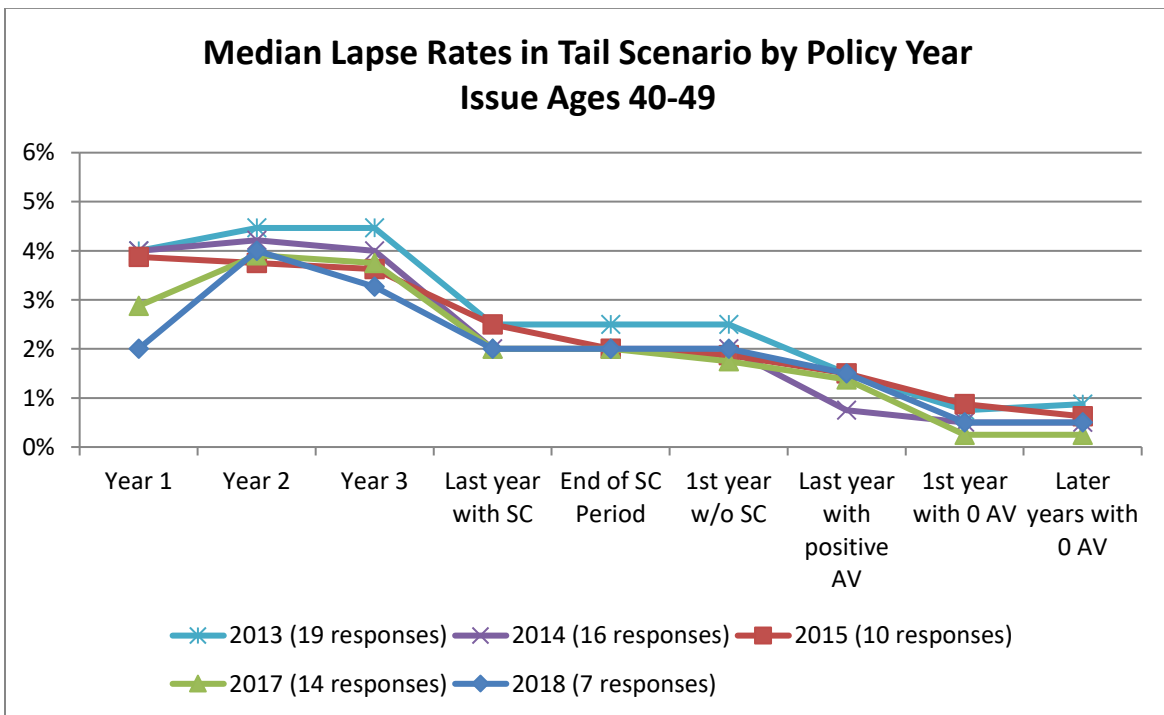


Figure 22

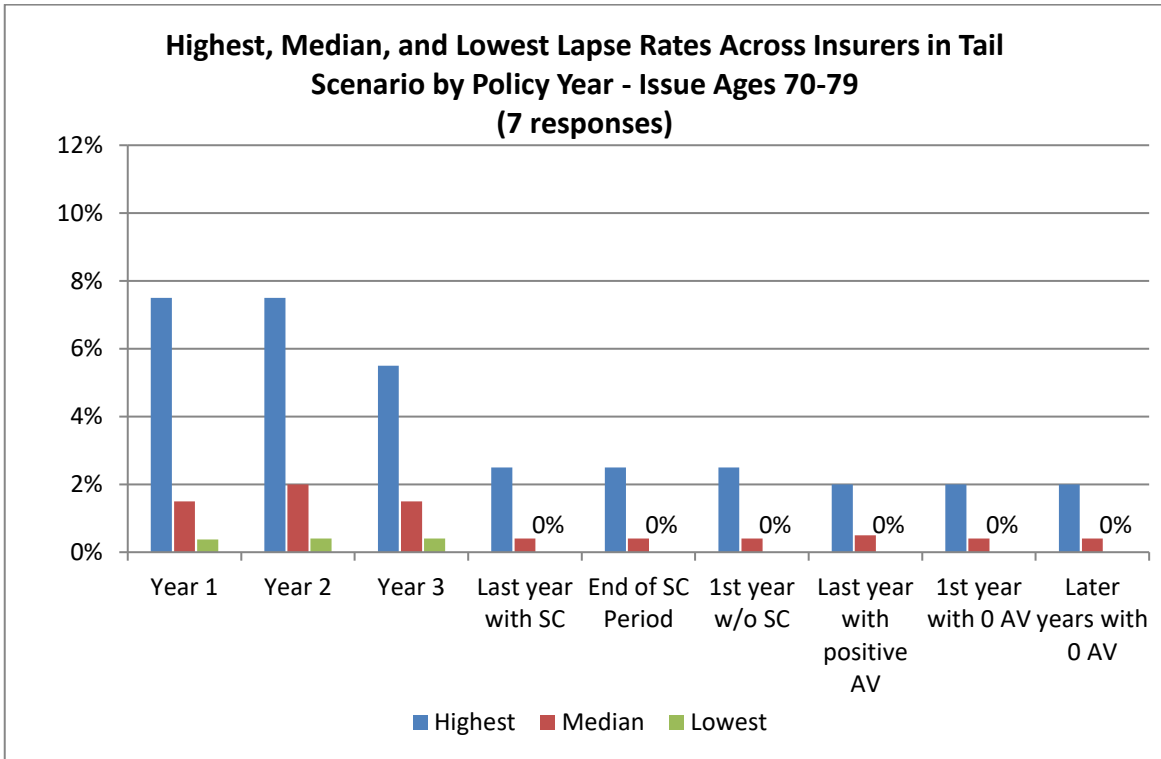


Figure 23

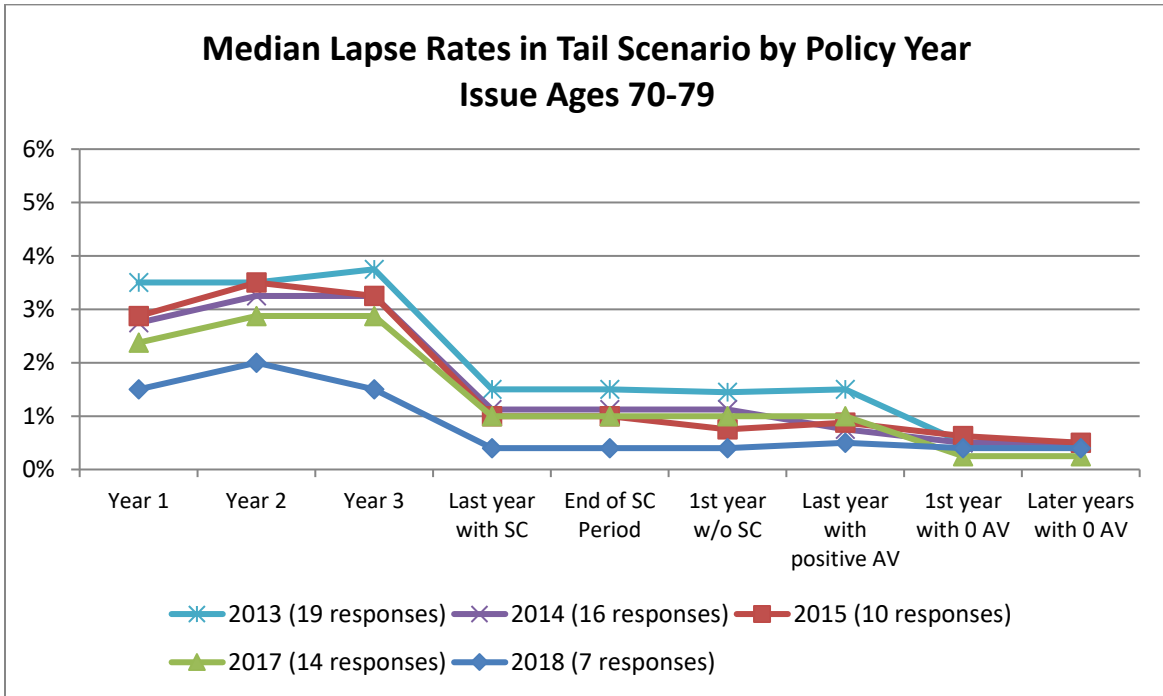


Figure 24

Next, in Question 5, the insurers were asked, out of 10,000 newly issued policies that would experience the tail scenario, how many would first have a zero cash surrender value but be kept in force by the secondary guarantee at a given duration for issue ages 50-59. The results were then converted to a cumulative basis in Figure 25.

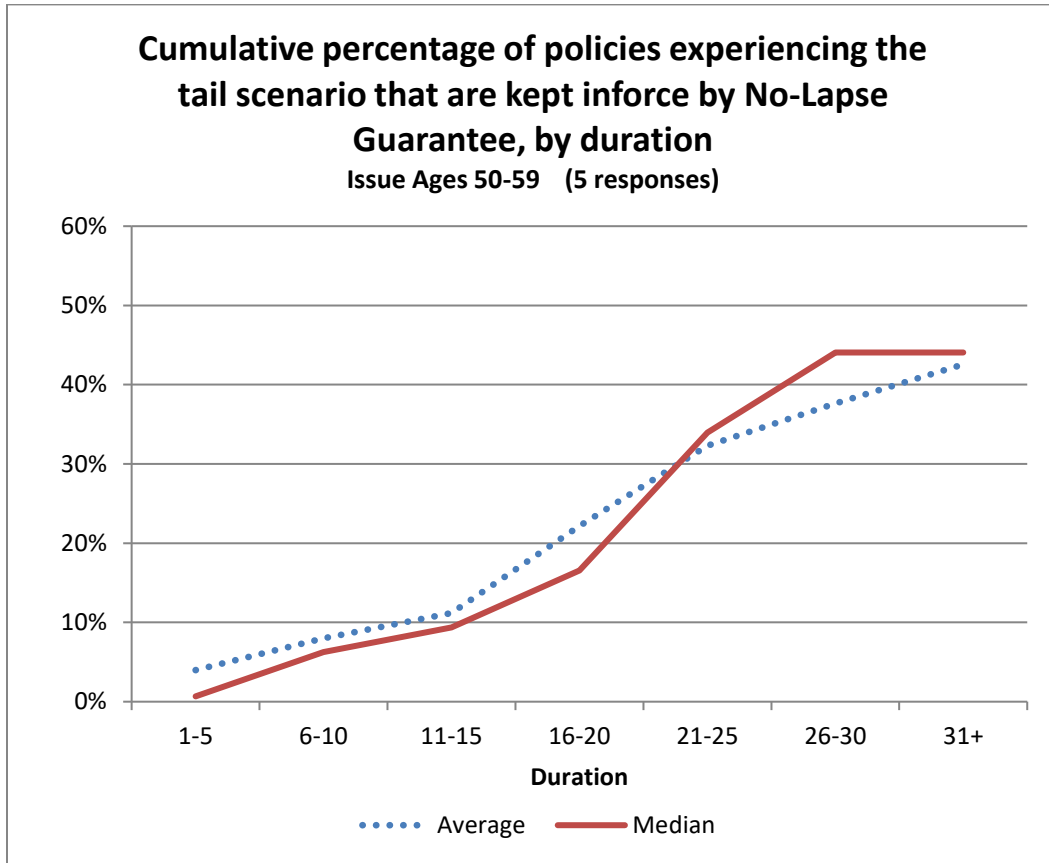


Figure 25

Comparing the median result over time, the 2018 survey showed similar number of policies being kept in force by the secondary guarantee in the early durations relative to the last few surveys. This is shown in Figure 26.

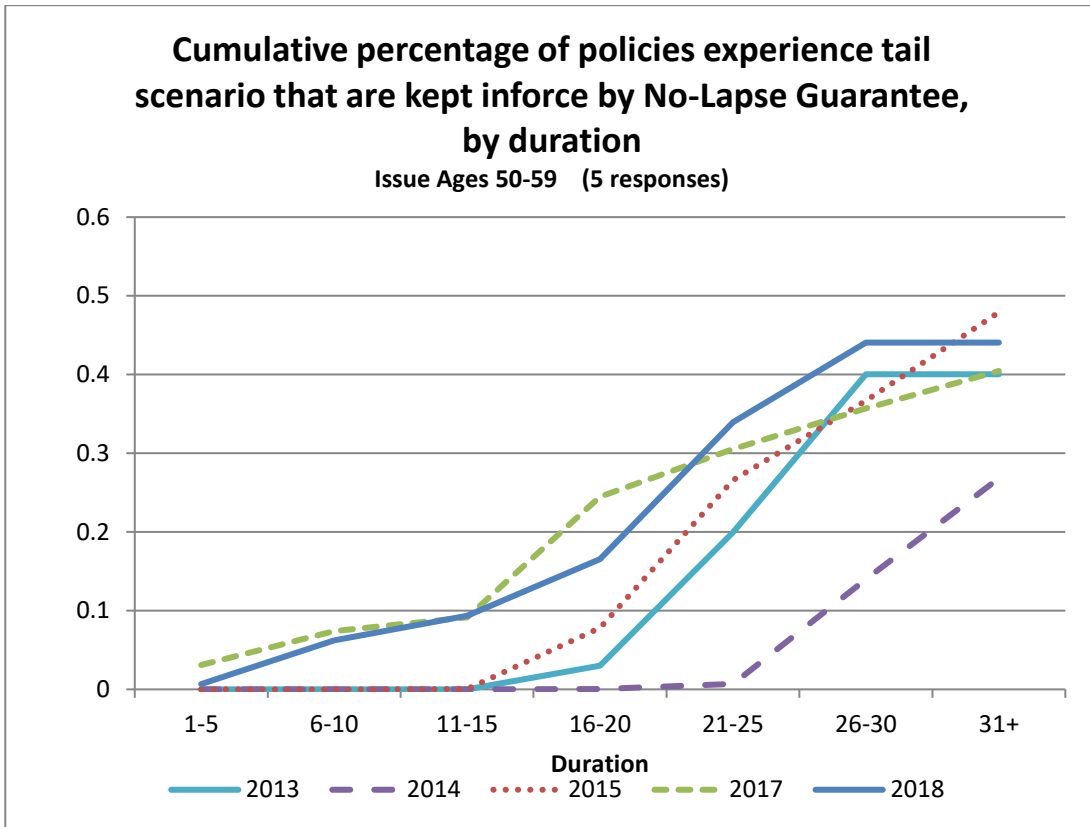


Figure 26

Lapses by Distribution System

In Question 6, the survey asked insurers whether their lapse assumptions vary by distribution. Out of thirteen respondents, nine (69%) indicated that they sell through multiple distributions. This is a similar positive response rate to past years.

Figure 27 indicates the distribution systems used by these respondents, with respondents able to select more than one distribution. A heavier proportion cited using bank and wirehouse distributions relative to prior years.

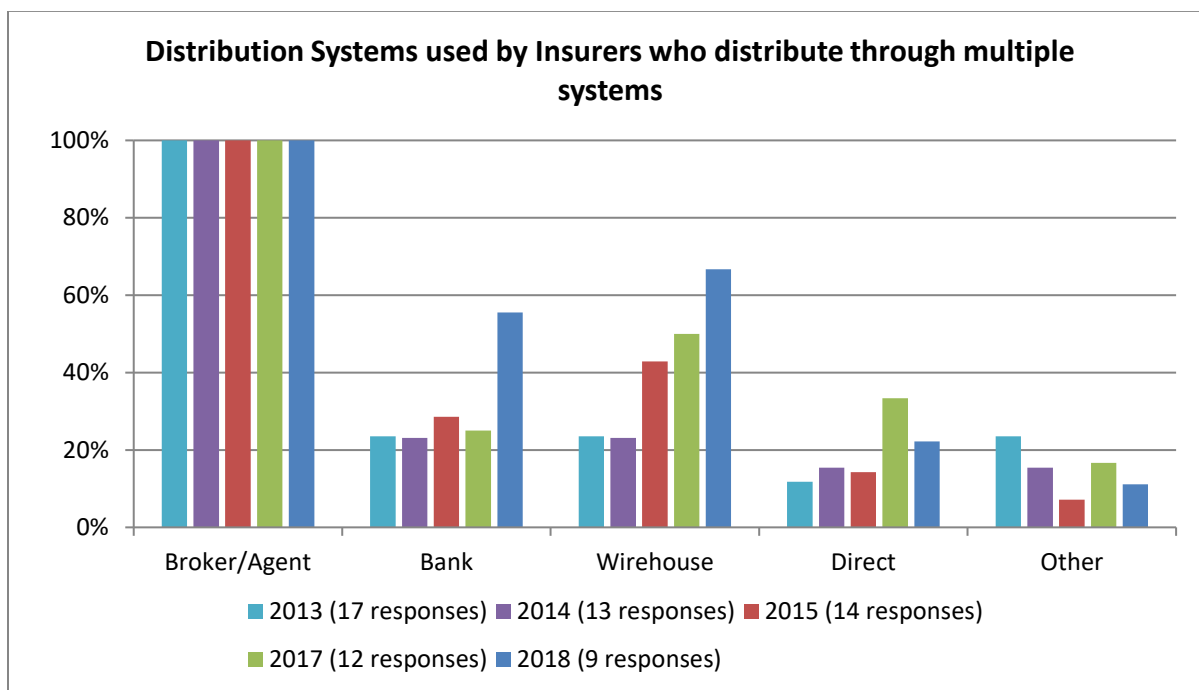


Figure 27

An additional question asked insurers whether they measure lapses by distribution system. Of the 9 insurers who responded, one (11%; 1 of 9) measures lapses by distribution system as seen in Figure 28.

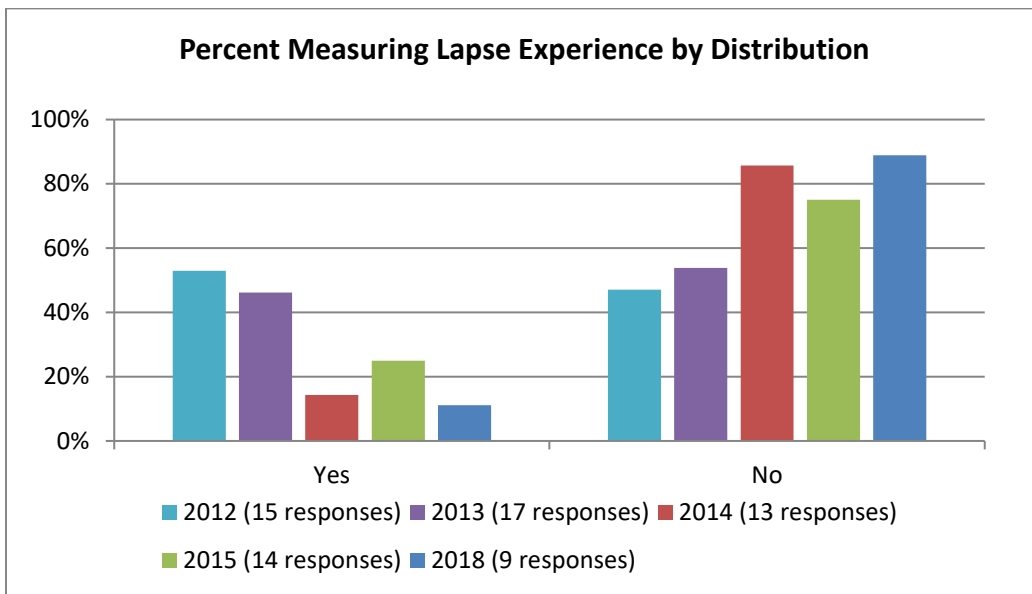


Figure 28

No company reported varying lapse assumptions by distribution system. By contrast, in each of the last three surveys, two companies per year indicated that they varied lapse assumption by distribution system.

Lapses by Premium Assumption

Question 7 asked about lapses relative to premium assumptions. Most respondents (9 of 13; 69%) indicated that lapse rates vary by premium assumption, which is higher than past surveys (Figure 29). Where the lapse rates do vary by premium assumption, they are typically bucketed by single pay, level pay, 10-pay, and paid up or else by the level of funding (high/medium/low) relative to, for example, planned premium. Comments indicated that commonly single pay has lower lapse rates, followed by 10-pay then level. Also, paid up policies have lower lapse rates.

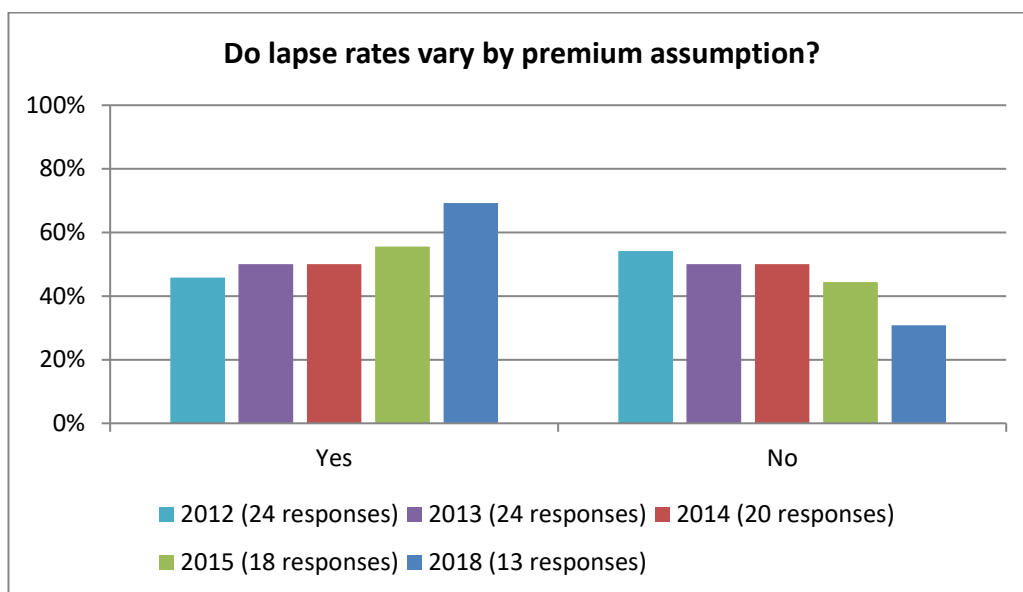


Figure 29

Sources of Base Lapse Assumption

In question 8, insurers were asked about the source of their base lapse assumptions. Respondents could include more than one source. Responses were similar to past surveys including a continued declining trend in the number selecting “Industry Study” (23%; 3 of 13 in 2018). “Company experience” (100%) and “Actuarial best estimate” (77%) remained the most commonly cited sources (Figure 30).

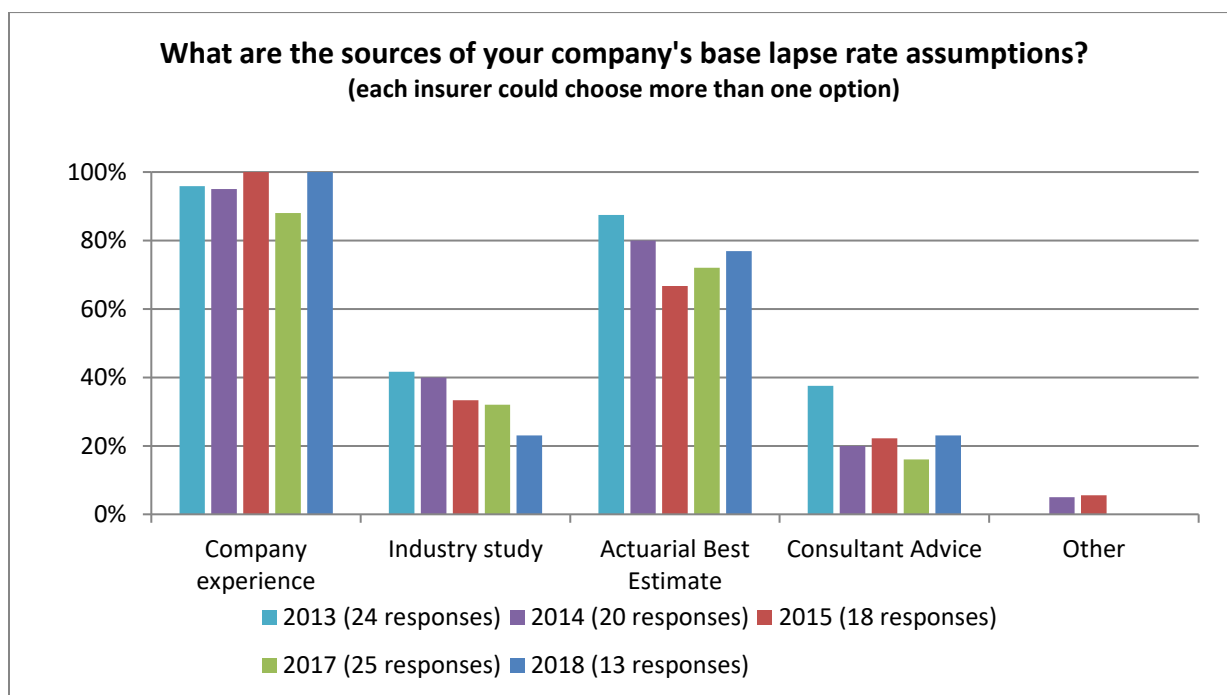


Figure 30

The survey then asked if companies perform lapse studies for UL policies with secondary guarantees, and if so, how frequently. As in past surveys, a strong majority of companies (100%; 13 of 13 in 2018) perform such lapse studies. Of those 13 companies that perform lapse studies of UL policies with secondary guarantees, “Annually” remained the dominant frequency for doing so (10 of 13; 77%) (Figure 31).

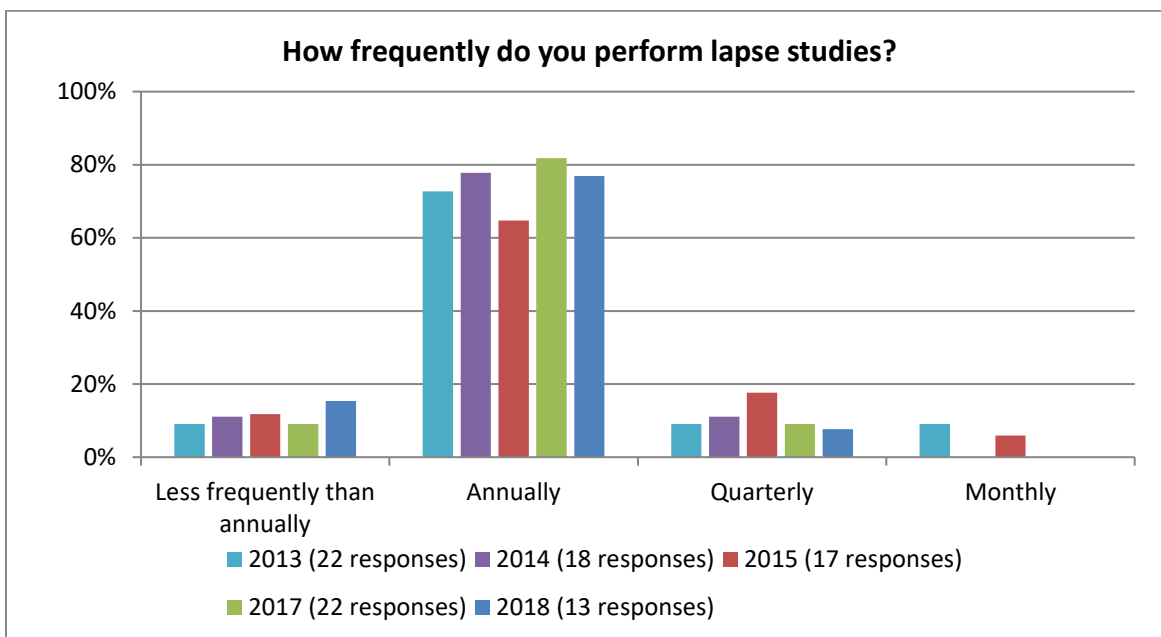


Figure 31

Companies were asked how many years of experience data were used in their latest lapse study. Over half of the respondents indicated “5-7 years” (54%; 7 of 13). Longer time periods were also cited, with no companies using less than 5 years in the 2018 survey.

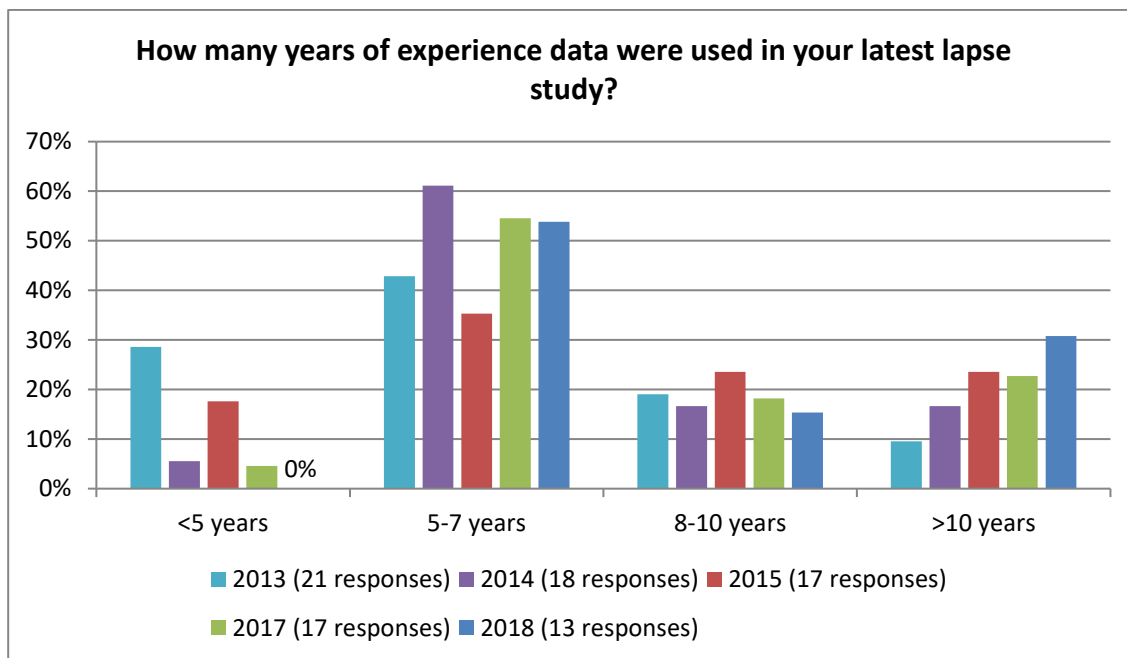


Figure 32

Companies were asked about their dynamic lapse assumptions specifically. Of the 13 respondents, 9 (69%) vary their assumptions dynamically (Figure 33). Of those 9 companies that vary assumptions dynamically, “Actuarial Best

Estimate” continues to be the most commonly cited source although less so than in prior surveys. Fewer companies reported using industry studies as compared to prior surveys (Figure 34).

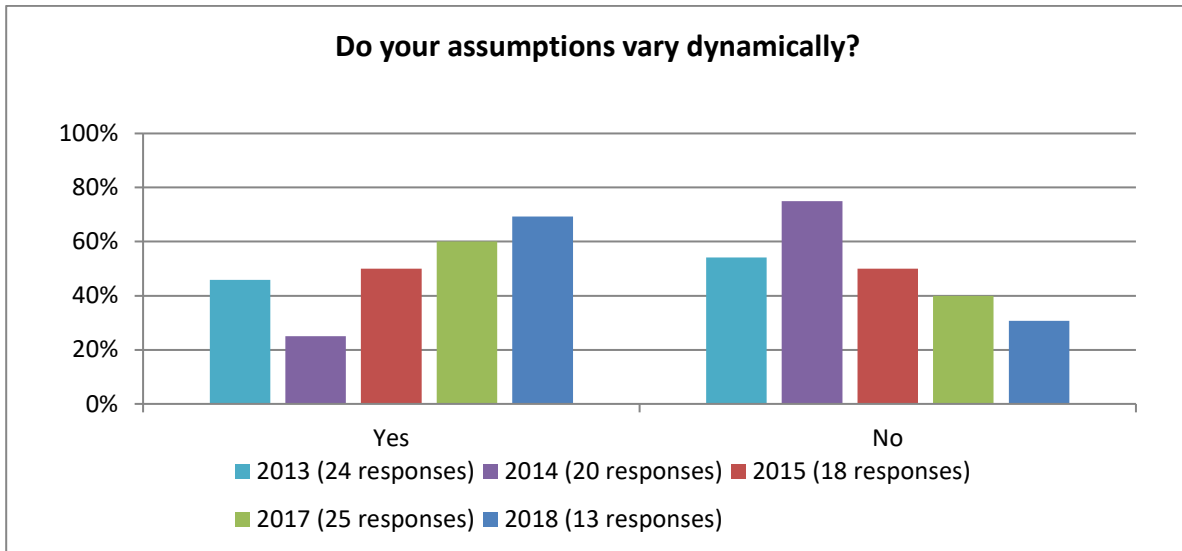


Figure 33

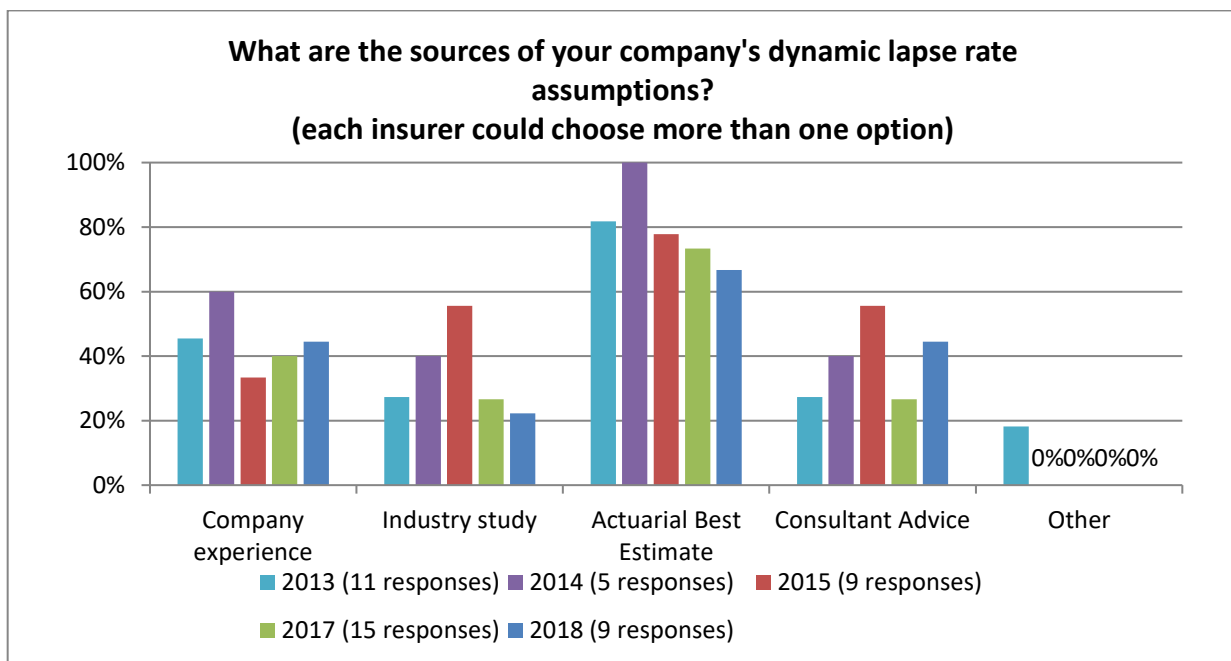


Figure 34

Mortality Assumptions

Companies were asked about their mortality assumptions in the tail in Question 9. About half of the companies use 2008 VBT as their reference table. No company reported using the 2001 VBT table in the 2018 survey. Four of the thirteen companies (31%) reported using either the 2014 or 2015 VBT tables which is an increasing proportion relative to past surveys (Figure 35). Those marking “Other” indicated that they derived mortality from company experience or tables from reinsurer experience.

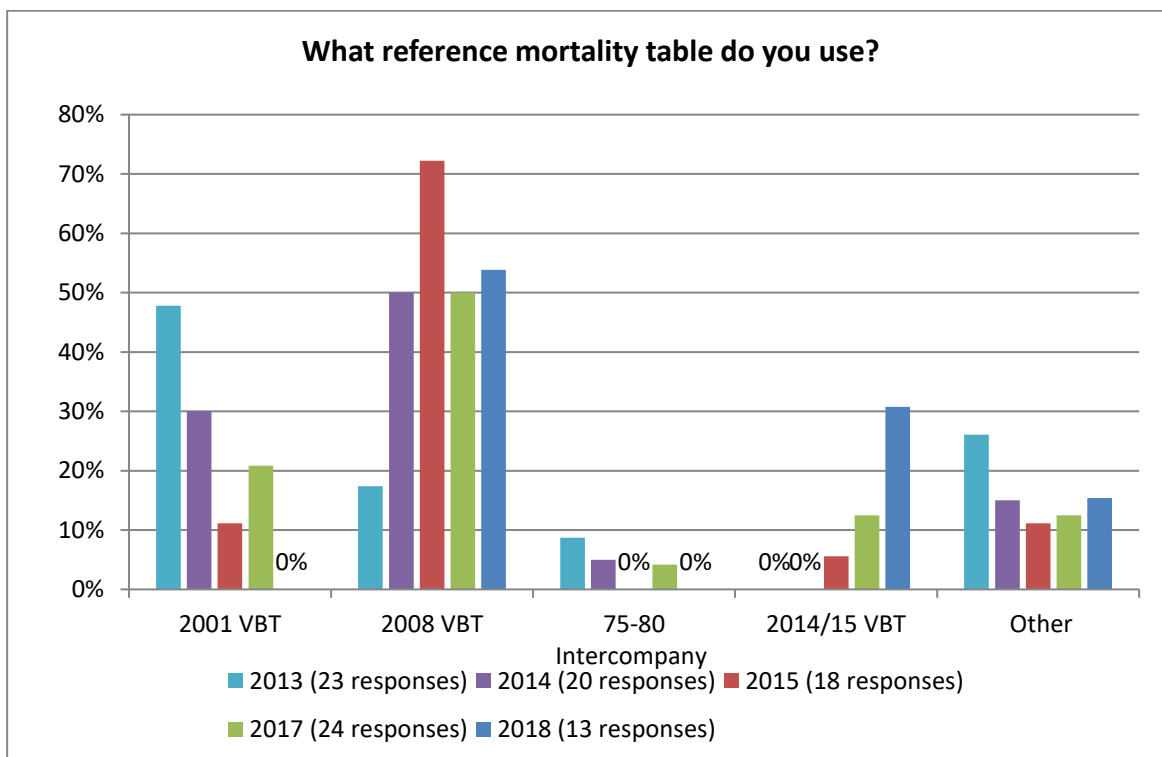


Figure 35

Eight companies provided ultimate mortality rates per 1000 assumed at higher attained ages for various underwriting classes for males and females. The minimum, maximum and median of those responses are summarized below, alongside the 2008 VBT rates (ultimate, gender and tobacco distinct, age nearest birthday) for comparison (Figure 36 through Figure 41). The median mortality rates tend to be similar to the 2008 VBT. Note that the minimum, maximum, and median responses do not necessarily represent the response of any given company, but are determined independently for each age. In addition, some companies did not provide mortality rates for the older ages.

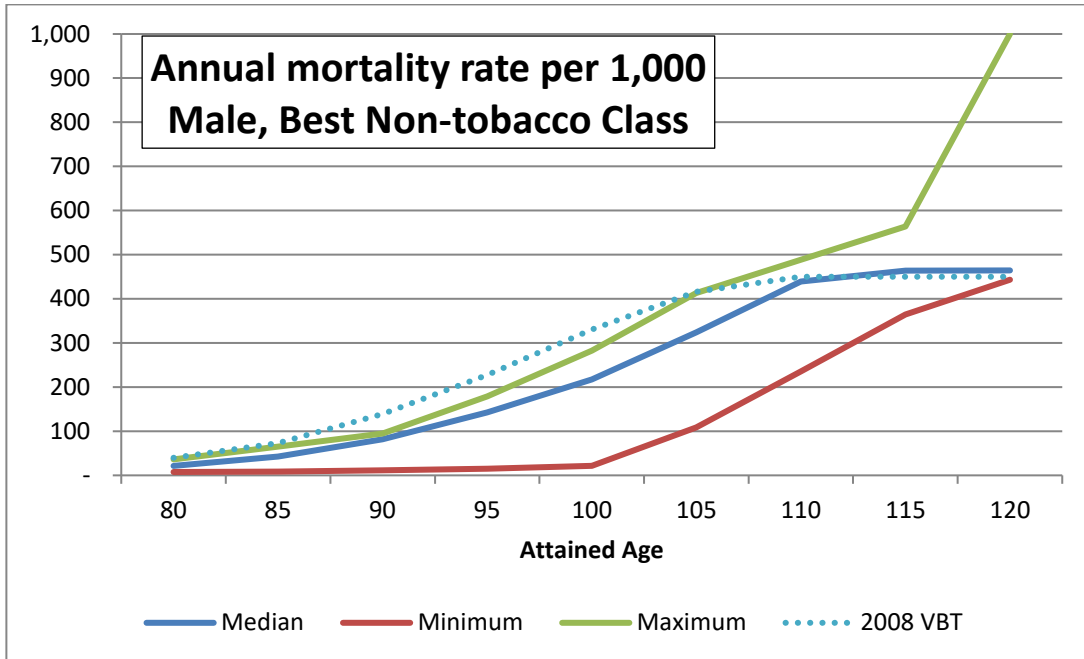


Figure 36

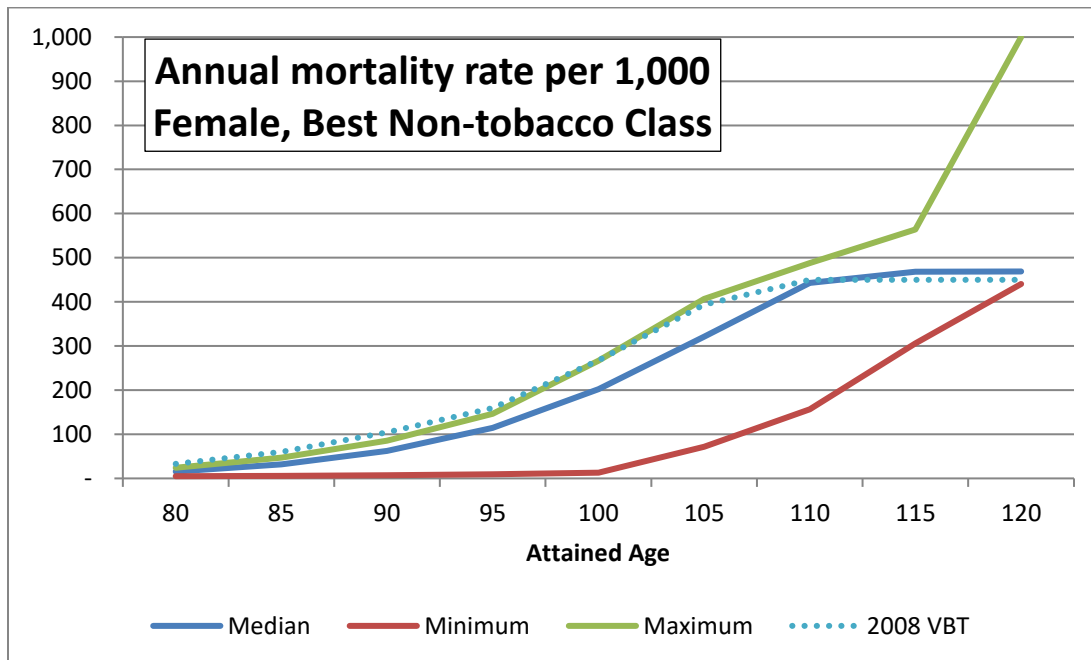


Figure 37

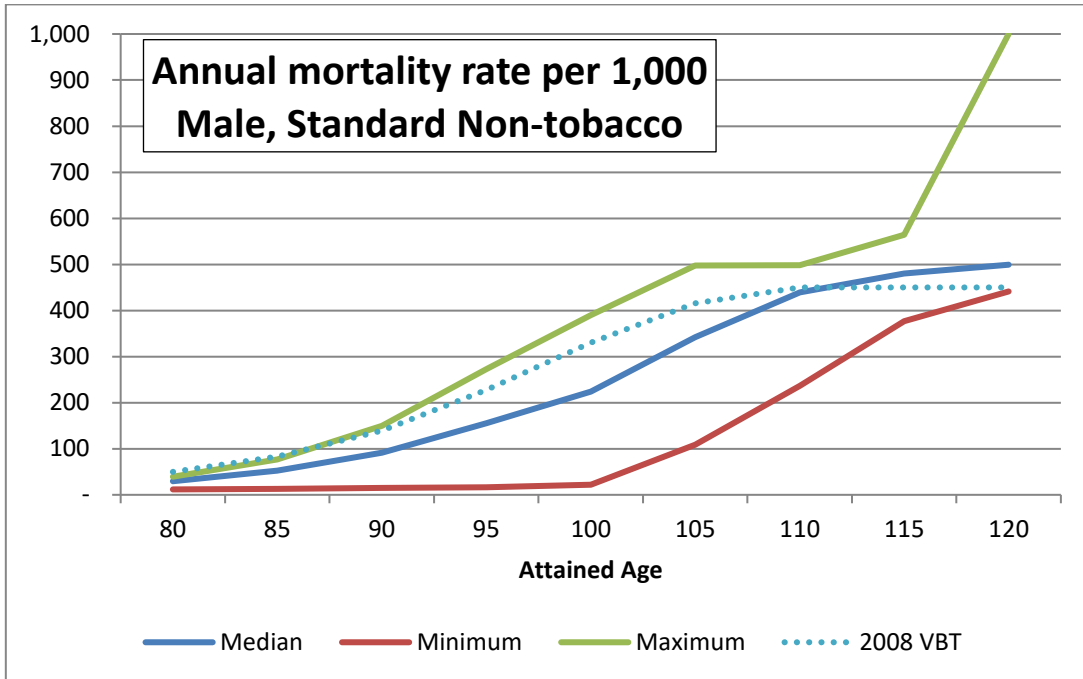


Figure 38

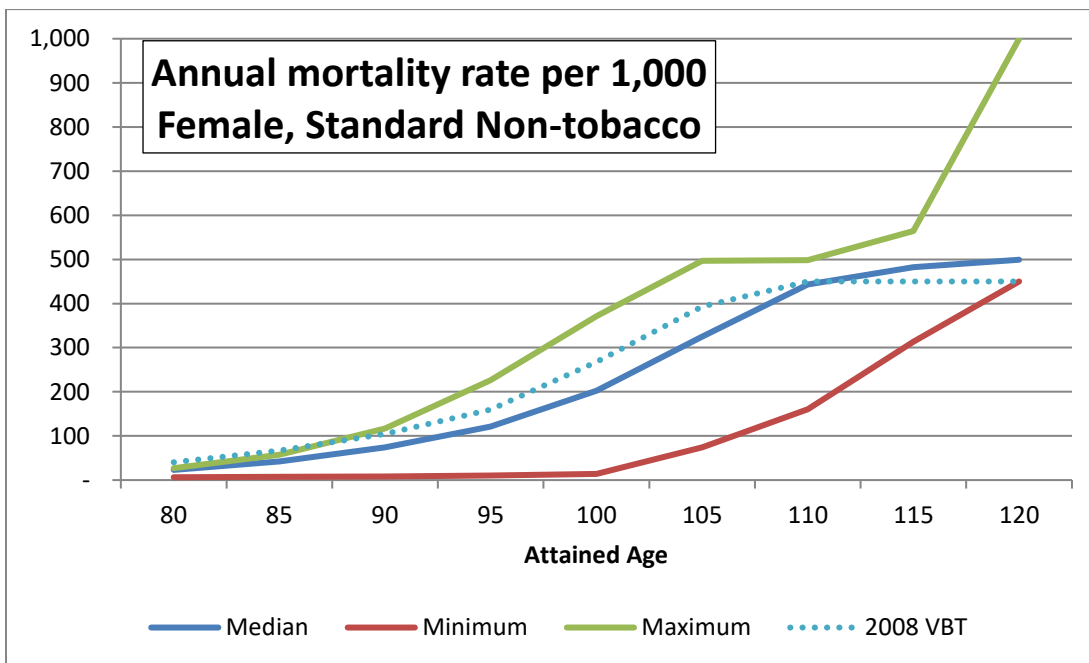


Figure 39

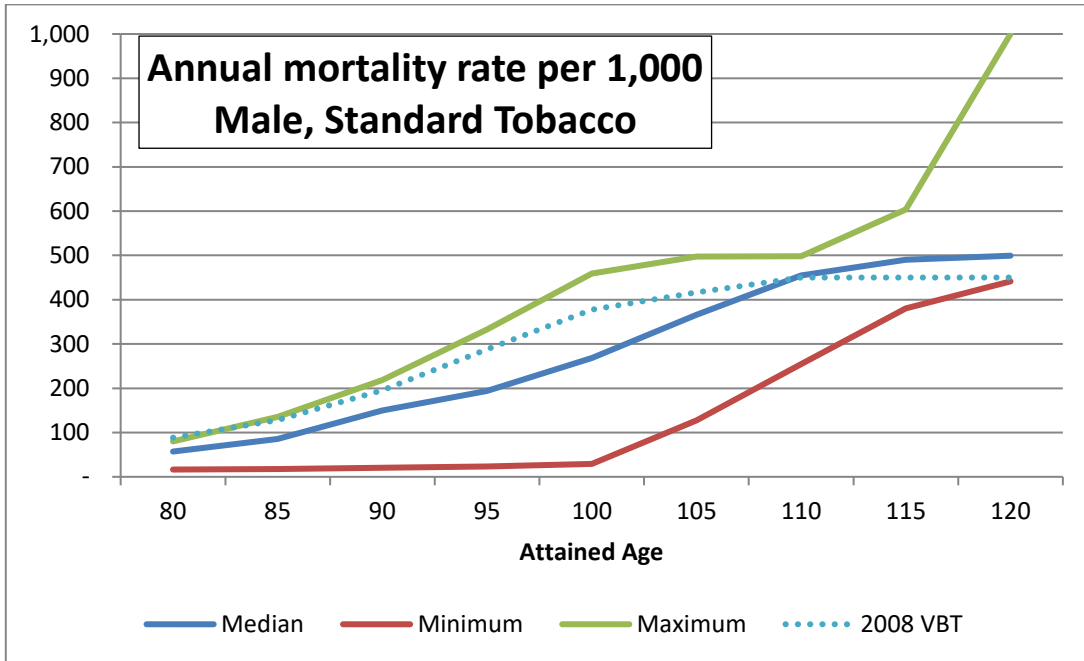


Figure 40

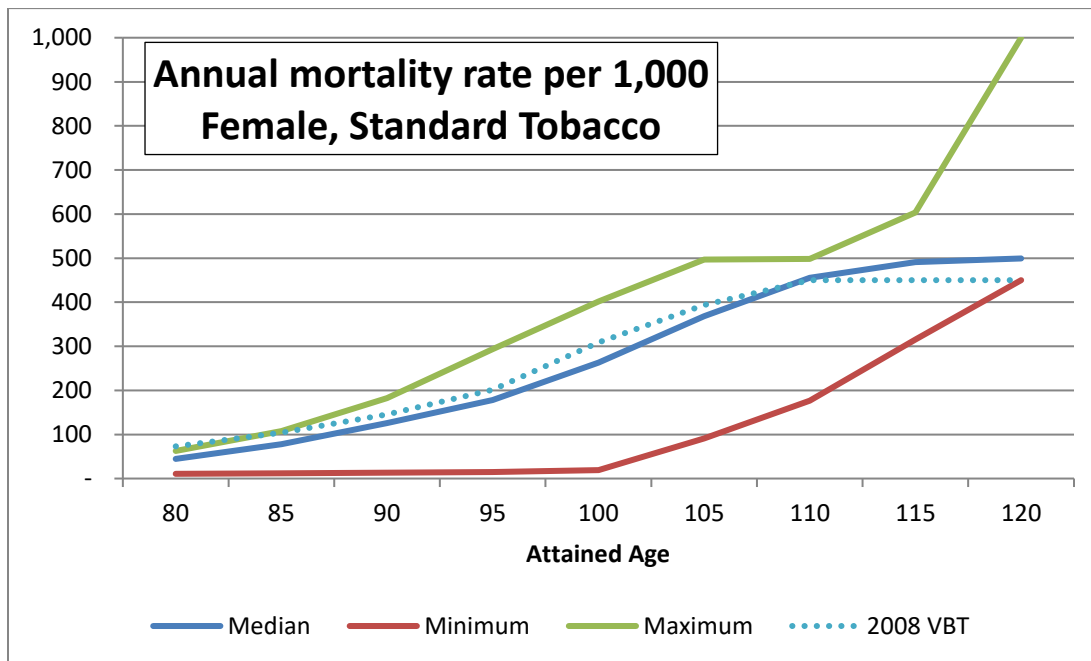


Figure 41

Companies were asked again this year about the number of underwriting classes used. Most companies (69%; 9 of 13) responded with three non-tobacco classes, and 3 of 13 (23%) responded with four non-tobacco classes (Figure 42). For tobacco classes, two continues to be the predominant response with 100% (13 of 13) citing two tobacco classes this year (Figure 43).

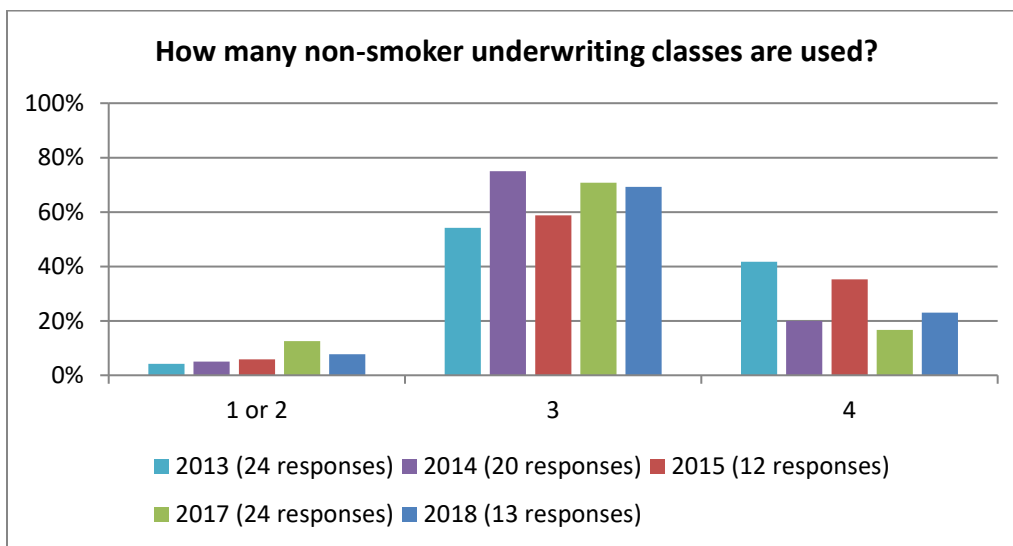


Figure 42

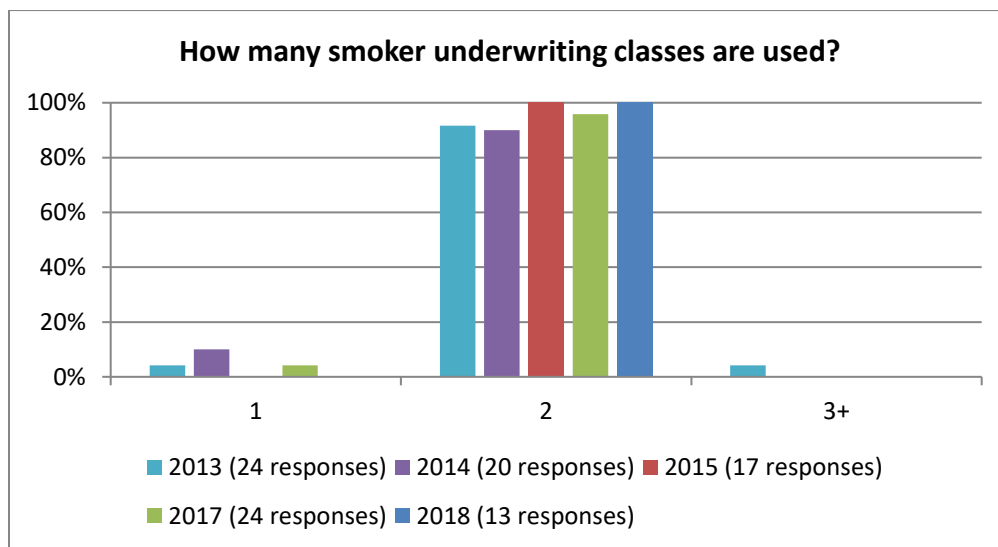


Figure 43

The percentage of respondents incorporating future mortality improvement into their models increased to 77% (10 of 13).

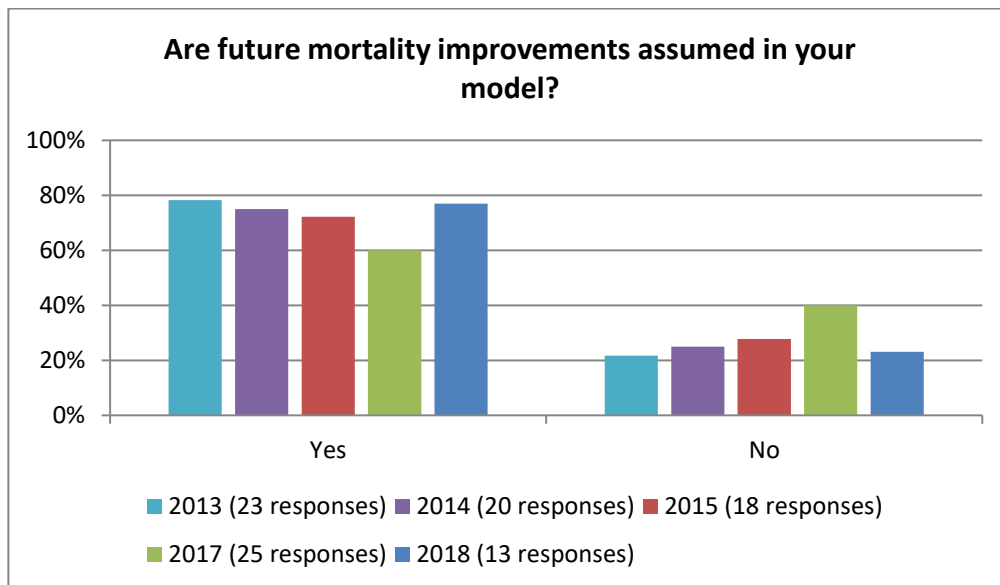


Figure 44

Most of the 10 companies modeling future mortality improvements had improvement assumptions that were gender or age distinct, and about half made a distinction by smoker status or duration (Figure 45).

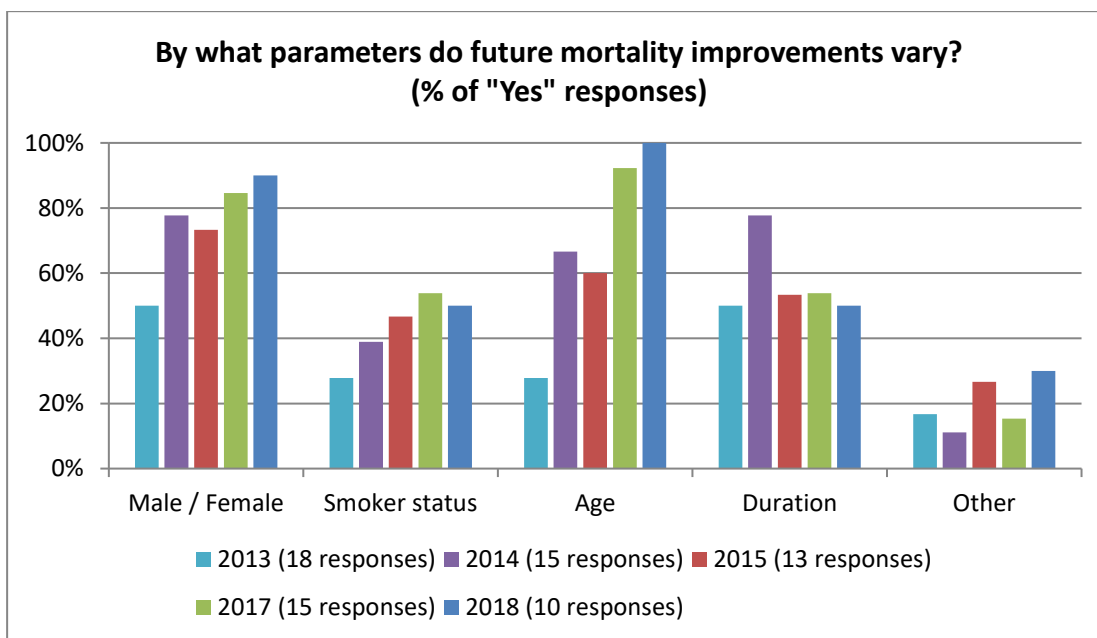


Figure 45

Companies responded to a question about whether mortality assumptions change when the secondary guarantee is in-the-money and the account value is zero. In the 2018 survey, all 13 companies indicated that they do not.

Critical Assumptions

The survey finally asked for assumptions that the companies considered critical to analyzing experience in the tail. A company could indicate more than one response. Investment return and lapse assumptions continue to be cited as the most critical assumptions for analyzing experience in the tail (Figure 46).

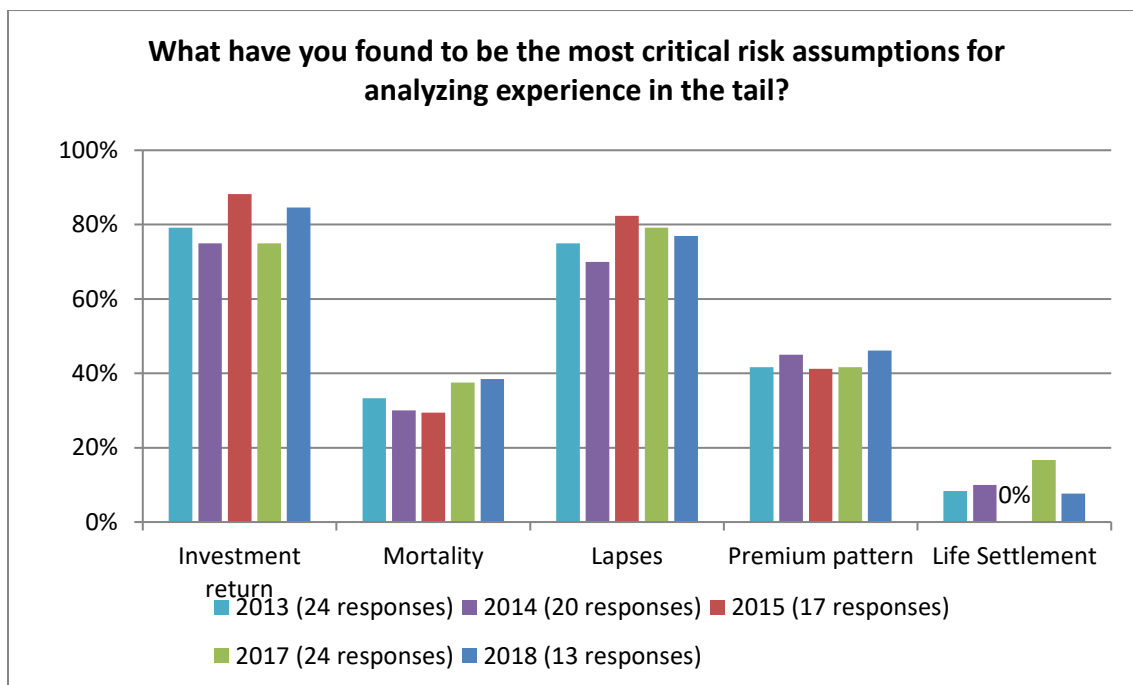


Figure 46

About The Society of Actuaries

The Society of Actuaries (SOA), formed in 1949, is one of the largest actuarial professional organizations in the world dedicated to serving more than 30,000 actuarial members and the public in the United States, Canada and worldwide. In line with the SOA Vision Statement, actuaries act as business leaders who develop and use mathematical models to measure and manage risk in support of financial security for individuals, organizations and the public.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

Quality: The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and nonactuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

Relevance: The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

Quantification: The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

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