The preferred experience dynamic—observations from ILEC 2009-2013

Monitoring industry experience (mortality, morbidity, lapses) is a key objective for Munich Re's North American biometric research team. We hope to stimulate discussion with our business partners and across the insurance industry by sharing our key findings. We believe these discussions will lead to a better understanding of the emerging experience and its importance in assessing the underlying risk.

Over the last four decades, the life insurance risk selection process and product design across North America have transformed dramatically. Introduction of smoker-distinguished rates in the early 1980s was followed by preferred underwriting. The earliest generations of preferred products (two non-smoker classes) were replaced in the late 1990s and early 2000s by more refined products with three or four non-smoker classes. Accelerated underwriting is the most recent development on the underwriting front. On the design side, universal life (UL) products were introduced in the early-to-mid 1980s. This new variant brought a different dimension to policyholder behavior.[1] As a result of all of these changes, actual experience is a reflection of different underwriting eras, different types of products and their evolution, and new sales channels and vehicles. Understanding the complexity of experience once it emerges is a critical factor in setting appropriate mortality assumptions for new business pricing and for valuation of the in force portfolio.

The Individual Life Experience Committee (ILEC) of the Society of Actuaries performs mortality experience analysis on a regular basis. The most recent 2009-2013 Individual Life Insurance Mortality Experience Report provides a high level overview of industry experience in

terms of 2015 RR100 (2015 VBT) rates.[2] In 2016, ILEC also published a special study comparing emerging preferred experience against 2008 VBT rates using the 2009-2013 data.[3]

Fortunately, the level of detail in the ILEC 2009-2013 data allows actuaries to extend their analysis beyond the observations made in the ILEC reports. Munich Re's North American biometric research team monitors industry experience by looking at our own portfolio as well as available industry studies. As part of those monitoring efforts, we have identified several interesting observations from the ILEC data. Below we present a few of these observations for your consideration. We are focusing on actual to expected (A/E) by amount, with the 2015 VBT as the expected basis. Our analysis was limited to a core segment of the ILEC 0913 data:

- Non-smoker.
- Male and female combined.
- $100,000-$2,499,999 face amount.
- Durations 1-15.
- Issue ages 30-59.
- Issue year 1990 or later.

We are trying to answer four questions through our analysis:

1. Is there any significant variation in the underlying experience by type of product?

2. Is the historic mortality experience different for products with different numbers of preferred classes?

3. Is there any indication of preferred wear-off?

4. What is the preferred class mortality experience after the level term period for ten-year term products?

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This paper will look at the first two questions. A subsequent paper will look at preferred wear-off and post-level term mortality.

Variation by product

Preferred experience is dominated by term products. For the core data subset defined above,

- Term exposure (without post-level period) by amount is approximately $20.5 trillion and the number of deaths is approximately 45,000.
- Whole life (WL) policies and UL policies with secondary guarantees (ULSG) have roughly $1.7 trillion of exposure and 4,700 deaths.
- Other permanent products (other UL and VUL) are similar to WL and ULSG with about $1.8 trillion of exposure and approximately 7,700 deaths.

Based on the differences in mortality and lapse experience we have seen in our internal studies as well as other industry studies, we find that there is more adverse policyholder behavior in the UL and VUL products than in the ULSG and WL products, which has translated to a distinctly different pattern of mortality experience. Based on this observation, we separated permanent product experience into two groups as defined above (WL/ULSG and UL/VUL). A significant gap in A/E between the product groups (Chart 1) confirms our previously observed relationship.[4]

We can clearly see that experience—in terms of 2015 VBT—varies significantly by the type of product. The deviation of the actual ILEC 2009-2013 experience from the 2015 VBT slope is also different by product. There is a downward durational trend for term products

compared to an upward movement for WL & ULSG, and mixed results for other permanent products.[5]
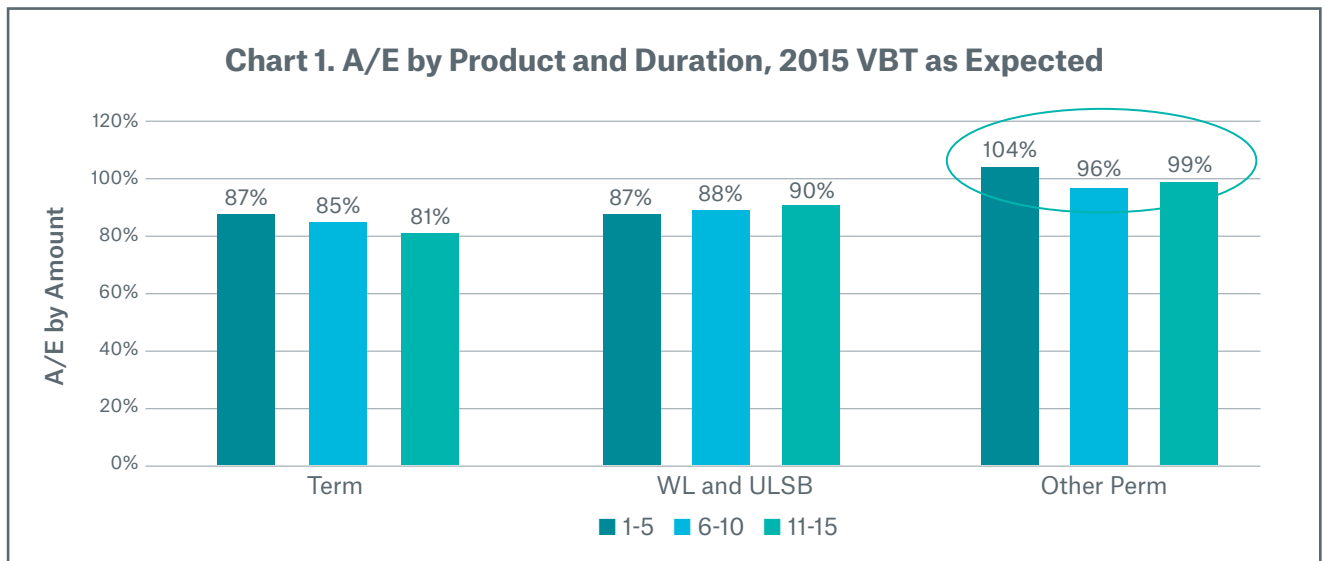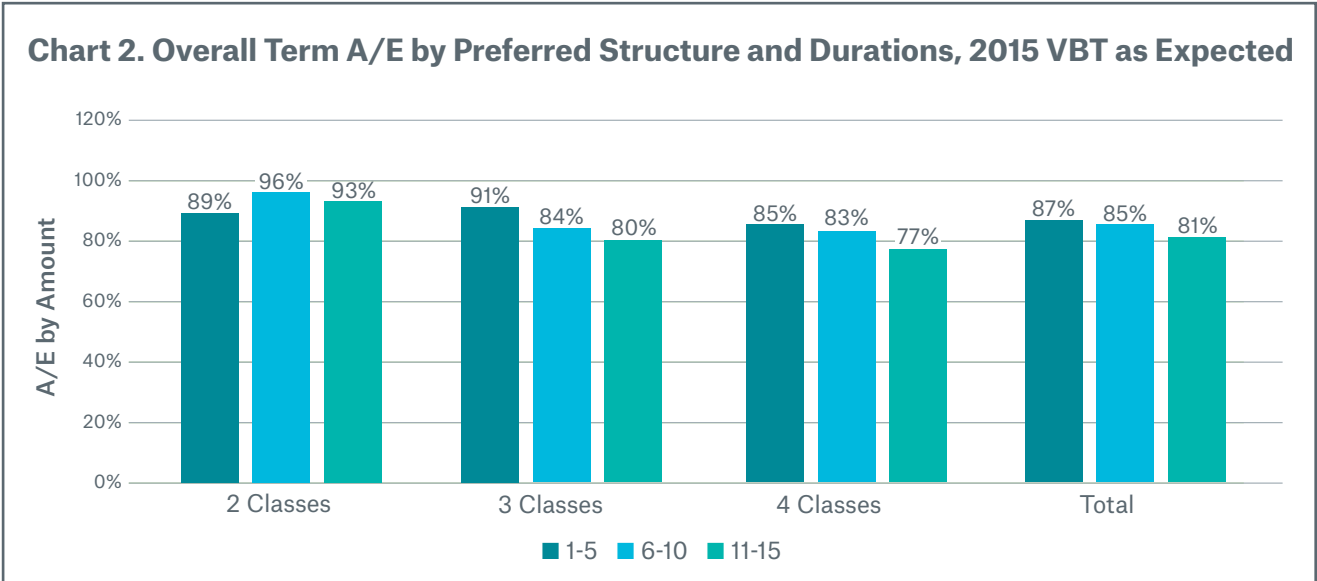
Differences by preferred structure

Term and permanent products each have a mix of different preferred structures—the number of non-smoker classes—that might affect their overall mortality. Exposure and number of deaths for term products are mainly driven by a three or four class structure, while permanent products skew toward a two or three class structure (Table 1).

Table 1. Distribution of Exposure by Amount and Number of Deaths						
	Exposure (Trillion)			**Number of Deaths**		
Preferred Structure	Term	WL and ULSG	Other Perm	Term	WL and ULSG	Other Perm
2 Classes	3.0	0.5	0.9	9,114	1,851	5,008
3 Classes	7.7	0.9	0.7	17,977	2,208	2,233
4 Classes	9.8	0.3	0.2	18.375	603	444

Exposure varies within each preferred structure by preferred class and durational group. For all products, there is a significant concentration of exposure in the best and second-best preferred classes. Early durations (one to 10) generate a majority of the term exposure. We were surprised to find that, for the two-class structure, the durational distribution is very different between WL and ULSG and other perm. The latter has more than 50 percent overall exposure at durations 11-15 compared to 28 percent in the same durations for WL and ULSG.

Chart 1. A/E by Product and Duration, 2015 VBT as Expected

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Chart 2. Overall Term A/E by Preferred Structure and Durations, 2015 VBT as Expected

A/E by Amount

- 2 Classes: 89% (1-5), 96% (6-10), 93% (11-15)
- 3 Classes: 91% (1-5), 84% (6-10), 80% (11-15)
- 4 Classes: 85% (1-5), 83% (6-10), 77% (11-15)
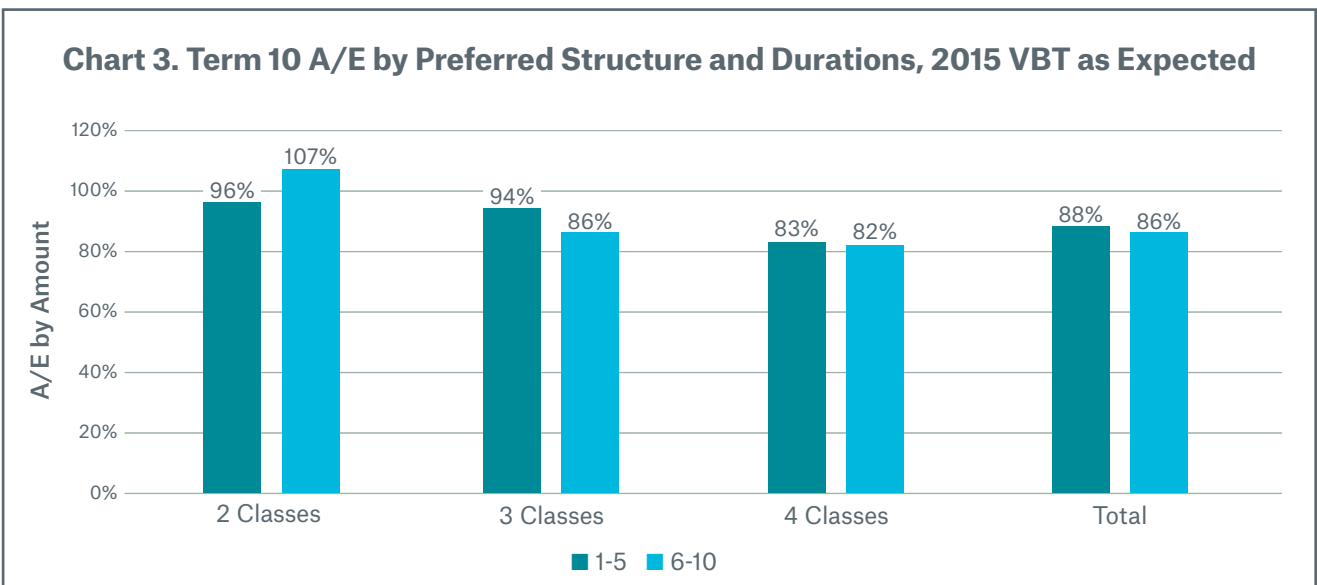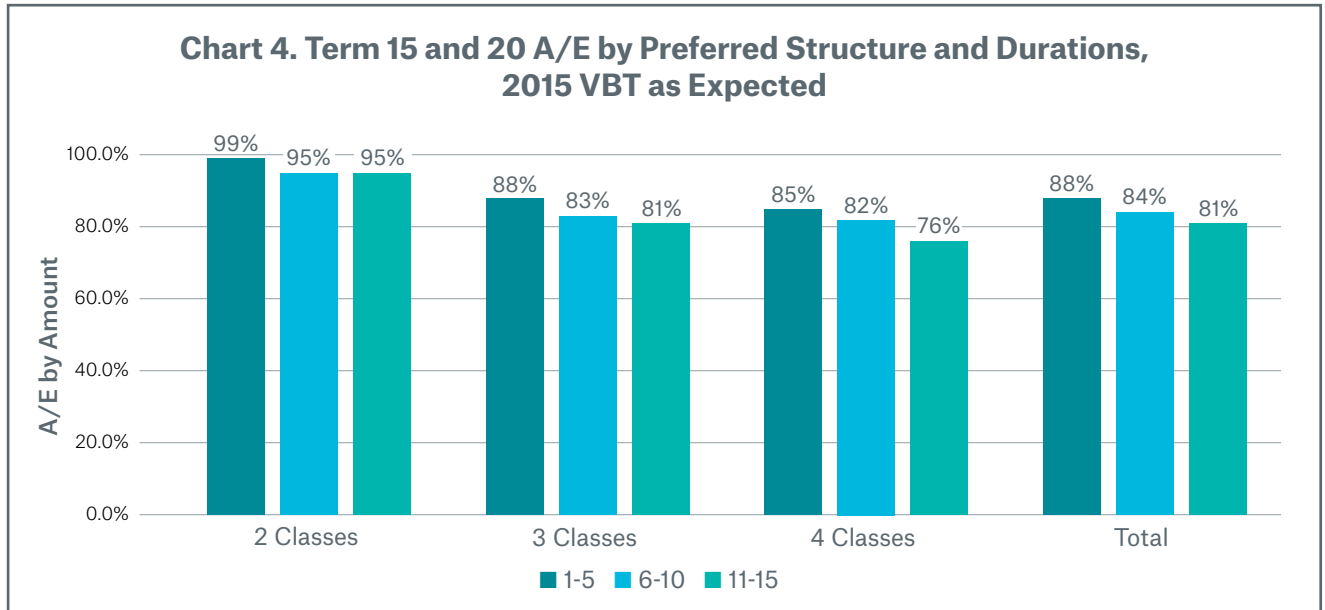- Total: 87% (1-5), 85% (6-10), 81% (11-15)

■ 1-5 ■ 6-10 ■ 11-15

Experience for term without post level term period is credible for all three preferred class structures. As a result, we are able to compare variation between preferred structures both overall and for different durational groups (Charts 2-4).

Charts 3 and 4 illustrate class structure/duration variation for term 10 and term 15 and 20 products respectively. For purposes of this analysis, 10, 15 and 20-year term experience was defined as SOA Anticipated Level Term Period (ILEC 0913 data base filter) = 10, 15, 20, or SOA Anticipated Level Term Period = Unknown and SOA Guaranteed Level Period = 10, 15, 20.

As indicated by Charts 2, 3 and 4, it appears that overall non-smoker term experience improves with the increasing number of preferred classes offered. Overall experience for the two-class segment is significantly worse than for the three- and four-class segments. This could be because higher proportions of healthy individuals chose to purchase more life insurance under the discounted premiums in the best preferred classes under the three- and four-class structure products or because the healthier lives who originally purchased products under one and two non-smoker class structures lapsed their old policies and purchased new policies with more competitive rates in the three- and four-class structures.

Chart 3. Term 10 A/E by Preferred Structure and Durations, 2015 VBT as Expected

A/E by Amount

- 2 Classes: 96% (1-5), 107% (6-10)
- 3 Classes: 94% (1-5), 86% (6-10)
- 4 Classes: 83% (1-5), 82% (6-10)
- Total: 88% (1-5), 86% (6-10)

■ 1-5 ■ 6-10

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Chart 4. Term 15 and 20 A/E by Preferred Structure and Durations, 2015 VBT as Expected

The durational experience on 2015 VBT is similar (A/E decreases with durations) for three- and four-class structures. It is interesting to note that there are some differences between term 10 and term 15 and 20: two- and three-class products perform better for term 15 and 20, but total experience is close for the two segments at durations 1-10. Overall term results are driven by term 15 and 20 products.

Perm experience is not as conclusive as term due to limited four-class experience at durations 1-15 and limited three-class experience at durations 11-15. Note that movement from a two-class structure to a three-class structure and later to a four-class structure occurred first for term products. This is the main reason why perm experience is still very limited for four-class structure products.

Conclusion

When setting mortality expectations, it is typical for actuaries to differentiate their assumptions by age, gender, class, face amount and risk class. This analysis suggests that other variables should be considered as well. In particular, we see that number of available preferred class and product type are both variables that should be considered.

Of course, when considering multiple variables, it is best to use robust multivariate techniques to understand

and control for interactions and correlations between them. A subsequent paper will present findings of these interactions and correlations using predicative analytics techniques.

Endnotes

1. For example in 2015 we highlighted to the industry later durational mortality deterioration in early generation UL business which was caused by excess lapses.
2. All supporting data files can be found at **https://www.soa.org/experience-studies/2017/2009-13-indiv-life-ins-mort-exp/**.
3. **https://www.soa.org/experience-studies/2016/2016-preferred-class-structure-2/**
4. The presence of confounding variables could lead to these differences. Even when we control for items such as age, gender, underwriting and preferred prevalence in our own data these patterns still seem to persist.
5. Of course we are not following a single cohort in this analysis because of the very short experience period of the study. However for studies in which we can split the experience at this level, similar conclusions can be made. Also note that issue year era is another significant driver behind product-specific mortality patterns.

Nikolai Serykh, PhD
FSA, FCIA, CFA
Assistant Vice President
Munich Re

NOT IF, BUT HOW