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*Research Report*

# Lapse Experience under Term-to-100 Insurance Policies

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**CIA Experience Research Committee**

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# 1 Introduction

## *1.1 Overview*

This is the seventh lapse experience study covering Term-to-100 and similar insurance policies (collectively referred to as "T100"). That is, policies are included if they have a significant degree of lapse support; some policies may have cash values, but beginning at a higher duration than for normal policies, and the lapse support may continue even after cash values emerge.

Lapses have a significant impact on the financial results of these products. This study covers calendar years 2013–2019; the prior study covered 2005–2012. These studies have been useful to establish a benchmark for the possible level of the ultimate lapse rates.

Overall, compared to the prior study, lapse rates are lower than those observed before.

## *1.2 Data in study*

The scope of this study is limited to Term-to-100 and similar products. This study includes all data received, but there are few data after the first 30 policy years. Less than 3% of exposure is after the 30th policy year, and less than 0.2% after the 35th.

All of the companies contributed data for the seven calendar years of the study: 2013–2019. However, not all were able to contribute data for all requested fields. For example, some lacked information on cash values and premiums. For most, cash-value information was missing or poor in quality. Accordingly, this report contains no reporting by cash values.

Some records were rejected for reasons such as being outside the study period and missing essential information, like date of birth.

A pivot table is available based on the data – see Section 8.

Policies that are on waiver or are paid-up are excluded from the study because the motivation for lapse or surrender is different from the majority of policies. Section 5.9 is the only one that includes paid-up policies for comparison with premium-paying ones.

## *1.3 Issue age, policy year, and duration*

Data were submitted with dates of birth[1] and issue, and if appropriate dates of termination and conversion. The age used throughout this report is age nearest birthday. In the case of a conversion, issue age is the age at time of conversion, and not at the issue of the underlying policy.

"Policy year" and "duration" are often used as if synonyms. In this report a policy year is taken as starting on a policy anniversary and ending just before the next anniversary, a closed-open interval. By tradition, policy years are referred to by ordinals: first, second, third, etc., relative to the issue date. Duration is the exact number of years since issue and may be fractional. "Duration" can also refer to a year-long interval beginning at an integral number of years since

[1] Two companies submitted issue age rather than date of birth in accordance with their policy of not disclosing date of birth. In those cases, issue age was used directly.

issue; in that case, duration is referred to by cardinals: 0, 1, 2, etc. Both[2] terms are used in this report. Generally, "policy year" is used to refer to a one-year time interval, and "duration" to an exact time.

### *1.4 Table of lapse rates (LapseT100)*

This study, like the prior one, compares lapse experience to that of a table developed from the submitted data, called LapseT100. This table is the same one as in the prior study; that is, the table has not been updated for experience since 2012. Note that the table was developed on experience for issue ages 0–70 and policy years 1–30 and data of 2005–2012. The rates are extrapolated for another 10 policy years. Rates for issue age 70 are used for older ages, and rates for the 40th policy year are used for later policy years. There are separate rates for males and females, and for non-smokers, smokers, and smoking unknown.

LapseT100 is used to calculate actual-to-expected ratios that appear throughout the report. The actual-to-expected ratios are helpful in quantifying the variation in lapse rates between various subsets of the data and in highlighting the differences between this report and the prior one.

### *1.5 Data by subset*

Table 1 shows a summary of all valid data and various subsets of them. Data that did not conform to the specifications for the study are excluded.

For this study, unlike the prior one, records for paid-up policies are distinguished. A policy that is paid-up cannot terminate in a lapse, although it can be surrendered if there are cash values.

In most cases in this report, the subset used, referred to as the "standard subset of data", is all policies that are not paid-up or on disability waiver, have guaranteed rates, are base policies as opposed to riders, are single-life, and were issued as standard and not as a result of a conversion or a guaranteed insurability election (GIE). Although the standard subset is only about 63% of the valid data, it is more useful to consider because it is more homogeneous. Additional comparisons in Section 5 extend beyond the standard subset.

Table 1 includes columns of aggregate lapse rates; however, these columns should be used with care. The distribution by age and duration may differ substantially between the various subsets.

[2] Policy years are sometimes referred to by cardinals, but not in this report. Thus, the experience underlying the calculation of $q_{[x]+2}$, for example, might be referred to as "duration 2", "third policy year", or "policy year 3". To avoid confusion, this report uses the second form almost exclusively.

| **Table 1. Summary of valid records submitted by category. Volume in thousands.** | | | | | | |
|---|---|---|---|---|---|---|
| | Exposure | | Lapses | | Agg Lapse Rate | |
| | Count | Vol (000) | Count | Vol (000) | Count | Vol (000) |
| All valid records | 3,792,158 | 327,690,649 | 30,552 | 2,274,813 | 0.8% | 0.7% |
| *less*Paid-up | 276,559 | 18,380,481 | 1,586 | 113,621 | 0.6% | 0.6% |
| Premium-paying | 3,515,599 | 309,310,168 | 28,966 | 2,161,192 | 0.8% | 0.7% |
| *less* Adjustable | 90,004 | 8,024,430 | 693 | 63,863 | 0.8% | 0.8% |
| Guaranteed policies | 3,425,595 | 301,285,738 | 28,273 | 2,097,329 | 0.8% | 0.7% |
| *less* Riders | 415,148 | 26,146,441 | 5,512 | 261,721 | 1.3% | 1.0% |
| Guaranteed, Base records | 3,010,447 | 275,139,297 | 22,761 | 1,835,608 | 0.8% | 0.7% |
| *less* Joint | 176,523 | 31,076,402 | 893 | 166,193 | 0.5% | 0.5% |
| Single, Gtd, Base records | 2,833,925 | 244,062,895 | 21,868 | 1,669,414 | 0.8% | 0.7% |
| *less* Substd, Conv, GIE | 533,245 | 38,836,223 | 4,899 | 362,589 | 0.9% | 0.9% |
| Standard subset of data | 2,300,680 | 205,226,672 | 16,969 | 1,306,825 | 0.7% | 0.6% |

### *1.6 Contributing companies*

On behalf of the CIA, we wish to thank the companies that contributed data to the study. We acknowledge their work and diligence in ensuring that their data were accurate.

There were eight contributing companies[3] – see Table 2. The distribution of data by company differs from that of the prior study, as is to be expected with a seven-year gap between. In order to protect the confidentiality of company-specific experience, no comments will be made on the impact of the change.

| **Table 2. Distribution of exposure by volume by contributing company within the standard subset of data.** | |
|---|---|
| Company | Distribution |
| Canada Life | 10.3% |
| Desjardins | 12.4% |
| Empire Life | 3.9% |
| Industrial Alliance | 10.3% |
| ivari | 19.9% |
| Manulife | 32.9% |
| RBC Insurance | 7.5% |
| Sun Life | 2.9% |
| All | 100.0% |

[3] In the previous report, London Life was shown separately, but here is combined with Canada Life; Standard Life was distinguished, but it has been merged into Manulife; and ivari was known as Transamerica Life.

The overall ratios of actual to expected lapses vary considerably by company. Most have lower ratios in this study than in the prior one. After dropping the two highest and lowest ratios, the remaining ones are 75%, 76%, 77%, and 90%. Standard deviations are mostly in the neighbourhood of 5% but some are much higher. (Further details are not provided in order to keep company-specific information confidential.)

### *1.7 Standard deviation*

Standard deviations are important in experience studies because they indicate how much fluctuation one might expect in the mean. Very approximately one might expect the "true" actual-to-expected ratio to be within one standard deviation either side of the observed mean two-thirds of the time, and within two standard deviations 95% of the time. If two ratios differ by more than the sum of their standard deviations, it is very likely that the difference is statistically significant. If the difference is more than double the sum of the standard deviations, the difference is highly significant.

It is important to note that the standard deviations calculated for this report are accurate if the underlying true lapse rates are those of LapseT100 and if policies are independent of each other with respect to their risk of lapsing. The formula for standard deviation is the one for the binomial distribution. To the extent that factors are at play other than age, duration, gender, and smoking, the actual standard deviation could be different from that calculated. For example, the variation in the overall actual-to-expected ratio by calendar year is greater than can be accounted for solely by statistical fluctuation; the volatility needs to be explained by some additional factors, such as changes in the economic environment. Nonetheless, the standard deviation is useful in assessing how much credibility to attach to a particular observation.

### *1.8 Calculating exposure and standard deviation*

Exposure commences when a policy enters the study, either on January 1, 2013, or at issue if later, and continues until December 31, 2019, or the date of termination if earlier. The exception is that for a lapse, under the Balducci hypothesis, exposure continues to the next policy anniversary even if it be after December 31, 2019. Exposure by volume of insurance or premium is obtained by multiplying the exposure by policy by the relevant amount.

Standard deviations in the actual-to-expected ratios are calculated by the following formula,[4] where $K$ represents the relevant amount (volume of insurance or simply 1 if used for policy count) for a policy and $n$ is the exposure by policy for that duration. The amounts are summed over all the policies included in the calculation. The formula assumes that the lapse amount is a linear combination of binomial distributions within each sex–smoking–age–duration cell.

[4] A more precise formula could have been used instead, as was done in the recently published individual life mortality study, but LapseT100 was considered to be close enough to the observed experience that the simpler formula is sufficiently accurate.

$$\text{Standard deviation of A/E by relevant amount} = \frac{\left(\sum_i K_i^2 n_i p_i q_i\right)^{0.5}}{\sum_i K_i n_i q_i}$$

## 2 Overall Results and Comparison with 2005–2012

Table 3 shows the overall exposure and lapse rates by policy count and by volume[5] of insurance in thousands of dollars. The numbers for both the current and prior study use the standard subset of data.

Three observations are immediately apparent. The lapse rates for the current study are lower in every duration other than the first. The amount of data has decreased significantly, particularly in the earlier policy years, suggesting that much less T100 is being sold. The amount of data after about the 25th policy year has increased substantially, thereby improving the credibility of the lapse rates in those years.

[5] In this report "volume" is synonymous with "sum assured" and "face amount".

**Table 3. Ungraduated lapse rates by policy year for the current and prior studies for the standard subset of data. Volume is sum assured in thousands of dollars.**

| Study of 2013–2019 | | | | Policy Year | Study of 2005–2012 | | | |
|---|---|---|---|---|---|---|---|---|
| Exposure | | Lapse Rates | | | Exposure | | Lapse Rates | |
| Count | Vol (000) | Count | Volume | | Count | Vol (000) | Count | Volume |
| 28,191 | 1,944,786 | 6.2% | 5.0% | 1st | 93,590 | 7,540,503 | 4.8% | 4.2% |
| 25,578 | 1,928,973 | 4.1% | 3.9% | 2nd | 102,373 | 8,183,301 | 3.8% | 4.0% |
| 25,283 | 2,174,267 | 2.8% | 2.8% | 3rd | 107,843 | 8,495,181 | 3.6% | 3.5% |
| 26,063 | 2,340,510 | 2.5% | 2.4% | 4th | 111,829 | 8,688,229 | 2.8% | 2.9% |
| 28,242 | 2,704,896 | 2.0% | 1.8% | 5th | 114,963 | 8,668,689 | 2.4% | 2.6% |
| 31,488 | 3,087,468 | 1.6% | 1.5% | 6th | 120,482 | 8,809,975 | 1.9% | 1.9% |
| 36,424 | 3,620,427 | 1.5% | 1.5% | 7th | 120,414 | 8,423,105 | 1.7% | 1.6% |
| 42,008 | 4,221,990 | 1.2% | 1.1% | 8th | 126,776 | 8,194,009 | 1.5% | 1.6% |
| 47,917 | 4,702,655 | 1.1% | 0.9% | 9th | 136,912 | 8,326,237 | 1.4% | 1.5% |
| 53,169 | 5,029,967 | 1.1% | 1.0% | 10th | 149,351 | 8,787,573 | 1.6% | 2.7% |
| 55,339 | 5,170,975 | 1.3% | 1.5% | 11th | 166,337 | 9,687,039 | 1.3% | 1.6% |
| 56,797 | 5,103,187 | 0.8% | 0.7% | 12th | 189,945 | 11,963,632 | 1.0% | 1.0% |
| 56,732 | 4,885,617 | 0.8% | 0.8% | 13th | 215,240 | 14,490,978 | 0.9% | 0.9% |
| 58,440 | 4,741,023 | 0.7% | 0.7% | 14th | 228,414 | 15,991,309 | 0.8% | 0.8% |
| 60,630 | 4,586,805 | 0.6% | 0.6% | 15th | 235,545 | 16,983,963 | 0.8% | 0.7% |
| 68,820 | 4,760,784 | 0.6% | 0.6% | 16th | 236,640 | 17,756,950 | 0.8% | 0.6% |
| 79,701 | 5,094,279 | 0.5% | 0.5% | 17th | 236,523 | 18,433,395 | 0.6% | 0.5% |
| 89,327 | 5,482,502 | 0.5% | 0.4% | 18th | 228,167 | 18,349,027 | 0.5% | 0.4% |
| 101,368 | 6,445,752 | 0.5% | 0.4% | 19th | 205,183 | 16,894,271 | 0.5% | 0.4% |
| 120,467 | 8,728,768 | 0.5% | 0.4% | 20th | 172,833 | 14,101,863 | 0.8% | 0.7% |
| 123,380 | 10,325,164 | 0.8% | 0.7% | 21st | 138,423 | 11,074,917 | 0.7% | 0.8% |
| 131,498 | 11,803,769 | 0.5% | 0.4% | 22nd | 112,205 | 8,844,182 | 0.5% | 0.5% |
| 132,813 | 12,742,110 | 0.4% | 0.4% | 23rd | 90,250 | 6,945,253 | 0.5% | 0.4% |
| 130,097 | 13,418,704 | 0.4% | 0.3% | 24th | 66,979 | 4,991,599 | 0.4% | 0.4% |
| 131,581 | 14,227,735 | 0.4% | 0.3% | 25th | 41,593 | 2,935,185 | 0.5% | 0.5% |
| 126,074 | 13,867,798 | 0.3% | 0.3% | 26th | 22,672 | 1,488,561 | 0.5% | 0.4% |
| 108,315 | 11,805,150 | 0.3% | 0.3% | 27th | 14,147 | 875,121 | 0.4% | 0.4% |
| 87,897 | 9,191,237 | 0.3% | 0.2% | 28th | 9,784 | 566,048 | 0.5% | 0.4% |
| 71,918 | 7,168,415 | 0.3% | 0.2% | 29th | 6,111 | 317,441 | 0.5% | 0.3% |
| 57,845 | 5,559,545 | 0.3% | 0.2% | 30th | 2,764 | 88,780 | 0.6% | 0.3% |
| 107,277 | 8,361,414 | 0.3% | 0.3% | >30th | 1,947 | 47,953 | 1.0% | 0.9% |
| 2,300,680 | 205,226,672 | 0.7% | 0.6% | All | 3,806,236 | 276,944,268 | 1.3% | 1.3% |

Table 4 shows exposure and lapse rates by policy year for the standard subset of data for issue ages 18 and up, for non-smokers only, separately for males and females, and Table 5 similarly for smokers only. Policies classified as aggregate (not smoker-distinct) or issued under age 18 are excluded from both tables.

**Table 4. Ungraduated lapse rates by policy year for the standard subset of data, for non-smokers only, issue ages 18+. Volume is sum assured in thousands of dollars.**

| Adult Male Non-Smokers | | | | Policy Year | Adult Female Non-Smokers | | | |
|---|---|---|---|---|---|---|---|---|
| Exposure | | Lapse Rates | | | Exposure | | Lapse Rates | |
| Count | Vol (000) | Count | Volume | | Count | Vol (000) | Count | Volume |
| 9,667 | 755,570 | 5.3% | 3.8% | 1st | 13,856 | 978,439 | 5.6% | 5.1% |
| 9,008 | 789,275 | 4.1% | 4.2% | 2nd | 12,602 | 954,765 | 3.5% | 3.2% |
| 9,200 | 934,473 | 2.8% | 2.6% | 3rd | 12,432 | 1,049,933 | 2.4% | 2.7% |
| 9,641 | 1,002,721 | 2.4% | 2.2% | 4th | 12,689 | 1,130,673 | 2.2% | 2.3% |
| 10,536 | 1,173,251 | 2.0% | 1.7% | 5th | 13,501 | 1,275,625 | 1.8% | 1.6% |
| 11,780 | 1,374,050 | 1.6% | 1.5% | 6th | 14,684 | 1,396,783 | 1.4% | 1.2% |
| 13,625 | 1,629,076 | 1.6% | 1.8% | 7th | 16,690 | 1,597,646 | 1.2% | 1.1% |
| 15,668 | 1,907,738 | 1.2% | 1.1% | 8th | 19,091 | 1,833,099 | 1.0% | 0.9% |
| 17,799 | 2,114,856 | 1.0% | 0.8% | 9th | 21,532 | 2,023,571 | 0.9% | 0.9% |
| 19,688 | 2,277,585 | 1.1% | 1.1% | 10th | 23,723 | 2,129,954 | 0.8% | 0.8% |
| 20,740 | 2,373,679 | 1.6% | 1.8% | 11th | 24,898 | 2,182,917 | 0.9% | 1.0% |
| 21,097 | 2,331,922 | 0.8% | 0.7% | 12th | 25,626 | 2,165,266 | 0.6% | 0.6% |
| 20,964 | 2,233,965 | 0.8% | 0.9% | 13th | 25,630 | 2,077,250 | 0.7% | 0.6% |
| 21,438 | 2,165,472 | 0.7% | 0.8% | 14th | 26,106 | 1,998,485 | 0.5% | 0.5% |
| 21,871 | 2,067,577 | 0.6% | 0.7% | 15th | 26,858 | 1,937,930 | 0.4% | 0.3% |
| 24,130 | 2,111,640 | 0.7% | 0.6% | 16th | 30,679 | 2,020,169 | 0.5% | 0.7% |
| 27,317 | 2,248,241 | 0.5% | 0.5% | 17th | 35,396 | 2,126,941 | 0.4% | 0.4% |
| 30,390 | 2,452,625 | 0.4% | 0.4% | 18th | 39,467 | 2,228,734 | 0.4% | 0.4% |
| 34,826 | 2,971,989 | 0.5% | 0.4% | 19th | 44,260 | 2,516,464 | 0.4% | 0.3% |
| 43,001 | 4,344,764 | 0.5% | 0.4% | 20th | 51,322 | 3,142,729 | 0.4% | 0.3% |
| 46,649 | 5,502,294 | 0.8% | 0.7% | 21st | 52,196 | 3,514,658 | 0.6% | 0.5% |
| 50,521 | 6,456,928 | 0.5% | 0.4% | 22nd | 54,866 | 3,889,536 | 0.4% | 0.4% |
| 52,466 | 7,108,303 | 0.4% | 0.4% | 23rd | 53,828 | 4,070,585 | 0.3% | 0.3% |
| 53,061 | 7,633,815 | 0.3% | 0.3% | 24th | 51,192 | 4,150,042 | 0.4% | 0.3% |
| 55,106 | 8,219,461 | 0.3% | 0.2% | 25th | 50,341 | 4,271,915 | 0.3% | 0.2% |
| 53,975 | 8,145,545 | 0.3% | 0.2% | 26th | 47,269 | 4,062,311 | 0.3% | 0.2% |
| 46,792 | 6,962,684 | 0.3% | 0.3% | 27th | 40,194 | 3,446,631 | 0.2% | 0.2% |
| 38,077 | 5,422,150 | 0.2% | 0.2% | 28th | 32,225 | 2,652,780 | 0.3% | 0.2% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 31,474 | 4,220,267 | 0.3% | 0.3% | 29th | 25,935 | 2,047,150 | 0.2% | 0.2% |
| 25,443 | 3,291,916 | 0.2% | 0.2% | 30th | 20,629 | 1,564,016 | 0.2% | 0.2% |
| 44,705 | 4,960,855 | 0.3% | 0.3% | >30th | 37,710 | 2,280,489 | 0.2% | 0.2% |
| 890,654 | 107,184,689 | 0.7% | 0.6% | All | 957,424 | 72,717,487 | 0.6% | 0.6% |

**Table 5. Ungraduated lapse rates by policy year for the standard subset of data, for smokers only, issue ages 18+. Volume is sum assured in thousands of dollars.**

| Adult Male Smokers | | | | Policy Year | Adult Female Smokers | | | |
|---|---|---|---|---|---|---|---|---|
| Exposure | | Lapse Rates | | | Exposure | | Lapse Rates | |
| Count | Vol (000) | Count | Volume | | Count | Vol (000) | Count | Volume |
| 1,959 | 92,627 | 10.0% | 8.4% | 1st | 2,189 | 81,908 | 9.9% | 10.0% |
| 1,703 | 83,677 | 6.5% | 4.6% | 2nd | 1,842 | 74,513 | 6.1% | 6.8% |
| 1,591 | 87,970 | 5.0% | 4.2% | 3rd | 1,709 | 78,265 | 3.9% | 4.2% |
| 1,634 | 94,604 | 4.0% | 4.3% | 4th | 1,730 | 86,023 | 3.8% | 4.0% |
| 1,747 | 108,458 | 3.2% | 3.2% | 5th | 1,815 | 97,199 | 2.5% | 2.6% |
| 1,944 | 119,307 | 2.5% | 3.2% | 6th | 2,014 | 111,397 | 2.5% | 1.9% |
| 2,236 | 136,361 | 2.3% | 1.8% | 7th | 2,304 | 129,881 | 2.3% | 2.5% |
| 2,565 | 163,547 | 2.2% | 2.7% | 8th | 2,671 | 153,964 | 1.6% | 1.4% |
| 2,957 | 186,417 | 2.0% | 2.0% | 9th | 3,126 | 180,470 | 1.5% | 1.0% |
| 3,292 | 204,191 | 2.0% | 1.6% | 10th | 3,532 | 196,693 | 1.4% | 1.6% |
| 3,403 | 210,557 | 2.7% | 2.5% | 11th | 3,740 | 207,312 | 1.6% | 2.3% |
| 3,494 | 203,063 | 1.2% | 1.5% | 12th | 3,995 | 214,386 | 0.8% | 0.7% |
| 3,588 | 198,094 | 1.6% | 2.0% | 13th | 4,159 | 213,561 | 1.0% | 0.8% |
| 3,833 | 204,757 | 1.1% | 1.3% | 14th | 4,548 | 224,370 | 0.7% | 0.4% |
| 4,132 | 213,154 | 1.1% | 0.9% | 15th | 4,941 | 226,243 | 0.8% | 0.6% |
| 4,825 | 236,354 | 0.8% | 0.5% | 16th | 6,079 | 255,038 | 0.7% | 0.8% |
| 5,881 | 275,514 | 0.9% | 1.4% | 17th | 7,518 | 296,832 | 0.5% | 0.4% |
| 6,734 | 308,072 | 0.5% | 0.3% | 18th | 8,656 | 331,938 | 0.6% | 0.5% |
| 7,695 | 373,419 | 0.7% | 0.7% | 19th | 9,817 | 387,657 | 0.5% | 0.8% |
| 9,092 | 520,301 | 0.7% | 0.7% | 20th | 11,354 | 484,027 | 0.5% | 0.5% |
| 9,280 | 596,354 | 1.0% | 0.8% | 21st | 11,280 | 523,486 | 0.8% | 0.9% |
| 9,831 | 677,864 | 0.7% | 0.7% | 22nd | 11,842 | 577,071 | 0.5% | 0.5% |
| 9,919 | 727,390 | 0.5% | 0.3% | 23rd | 11,550 | 600,627 | 0.5% | 0.4% |
| 9,736 | 772,045 | 0.5% | 0.5% | 24th | 10,887 | 604,627 | 0.4% | 0.4% |
| 10,062 | 830,730 | 0.4% | 0.3% | 25th | 10,895 | 640,633 | 0.3% | 0.2% |
| 9,874 | 820,723 | 0.5% | 0.4% | 26th | 10,388 | 611,129 | 0.4% | 0.4% |
| 8,573 | 696,081 | 0.4% | 0.4% | 27th | 9,011 | 517,098 | 0.2% | 0.2% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7,118 | 554,349 | 0.4% | 0.4% | 28th | 7,465 | 413,723 | 0.2% | 0.2% |
| 5,924 | 440,318 | 0.3% | 0.2% | 29th | 6,163 | 337,084 | 0.3% | 0.3% |
| 4,854 | 350,277 | 0.3% | 0.3% | 30th | 4,999 | 262,227 | 0.2% | 0.2% |
| 8,874 | 533,080 | 0.3% | 0.3% | >30th | 9,489 | 393,044 | 0.3% | 0.2% |
| 168,348 | 11,019,654 | 1.1% | 0.9% | All | 191,708 | 9,512,427 | 0.8% | 0.8% |

Tables 6 and 7 are based on the same data as tables 4 and 5, but by volume of insurance only. The columns are exposure, lapse rates, the ratio of actual to expected lapses, and the standard deviation in the actual-to-expected ratios. The volume of expected lapses and the standard deviations are calculated on LapseT100.

**Table 6. Ungraduated lapse rates by policy year for the standard subset of data, for non-smokers only, issue ages 18+. Expected on LapseT100. Volume is sum assured in thousands of dollars.**

| Adult Male Non-Smokers | | | | Policy Year | Adult Female Non-Smokers | | | |
|---|---|---|---|---|---|---|---|---|
| Vol (000) | Lapse Rate | A/E | Std Dev | | Vol (000) | Lapse Rate | A/E | Std Dev |
| 755,570 | 3.8% | 113% | 15% | 1st | 978,439 | 5.1% | 145% | 15% |
| 789,275 | 4.2% | 136% | 16% | 2nd | 954,765 | 3.2% | 105% | 16% |
| 934,473 | 2.6% | 94% | 17% | 3rd | 1,049,933 | 2.7% | 99% | 16% |
| 1,002,721 | 2.2% | 83% | 15% | 4th | 1,130,673 | 2.3% | 100% | 16% |
| 1,173,251 | 1.7% | 69% | 15% | 5th | 1,275,625 | 1.6% | 81% | 16% |
| 1,374,050 | 1.5% | 65% | 14% | 6th | 1,396,783 | 1.2% | 71% | 14% |
| 1,629,076 | 1.8% | 78% | 13% | 7th | 1,597,646 | 1.1% | 75% | 12% |
| 1,907,738 | 1.1% | 53% | 14% | 8th | 1,833,099 | 0.9% | 65% | 12% |
| 2,114,856 | 0.8% | 42% | 13% | 9th | 2,023,571 | 0.9% | 76% | 12% |
| 2,277,585 | 1.1% | 58% | 13% | 10th | 2,129,954 | 0.8% | 73% | 12% |
| 2,373,679 | 1.8% | 111% | 13% | 11th | 2,182,917 | 1.0% | 107% | 13% |
| 2,331,922 | 0.7% | 55% | 14% | 12th | 2,165,266 | 0.6% | 72% | 14% |
| 2,233,965 | 0.9% | 78% | 16% | 13th | 2,077,250 | 0.6% | 88% | 17% |
| 2,165,472 | 0.8% | 90% | 18% | 14th | 1,998,485 | 0.5% | 85% | 18% |
| 2,067,577 | 0.7% | 111% | 18% | 15th | 1,937,930 | 0.3% | 61% | 19% |
| 2,111,640 | 0.6% | 104% | 19% | 16th | 2,020,169 | 0.7% | 145% | 19% |
| 2,248,241 | 0.5% | 100% | 24% | 17th | 2,126,941 | 0.4% | 82% | 18% |
| 2,452,625 | 0.4% | 84% | 23% | 18th | 2,228,734 | 0.4% | 98% | 18% |
| 2,971,989 | 0.4% | 94% | 21% | 19th | 2,516,464 | 0.3% | 73% | 17% |
| 4,344,764 | 0.4% | 86% | 17% | 20th | 3,142,729 | 0.3% | 84% | 16% |
| 5,502,294 | 0.7% | 146% | 16% | 21st | 3,514,658 | 0.5% | 131% | 19% |
| 6,456,928 | 0.4% | 69% | 17% | 22nd | 3,889,536 | 0.4% | 87% | 19% |
| 7,108,303 | 0.4% | 71% | 16% | 23rd | 4,070,585 | 0.3% | 71% | 19% |
| 7,633,815 | 0.3% | 50% | 16% | 24th | 4,150,042 | 0.3% | 70% | 19% |
| 8,219,461 | 0.2% | 50% | 15% | 25th | 4,271,915 | 0.2% | 58% | 18% |
| 8,145,545 | 0.2% | 54% | 16% | 26th | 4,062,311 | 0.2% | 56% | 19% |
| 6,962,684 | 0.3% | 67% | 18% | 27th | 3,446,631 | 0.2% | 53% | 21% |
| 5,422,150 | 0.2% | 58% | 22% | 28th | 2,652,780 | 0.2% | 70% | 21% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4,220,267 | 0.3% | 82% | 22% | 29th | 2,047,150 | 0.2% | 56% | 22% |
| 3,291,916 | 0.2% | 56% | 25% | 30th | 1,564,016 | 0.2% | 52% | 23% |
| 4,960,855 | 0.3% | 106% | 19% | >30th | 2,280,489 | 0.2% | 67% | 17% |
| 107,184,689 | 0.6% | 77% | 3% | All | 72,717,487 | 0.6% | 86% | 3% |

**Table 7. Ungraduated lapse rates by policy year for the standard subset of data, for smokers only, issue ages 18+. Expected on LapseT100. Volume is sum assured in thousands of dollars.**

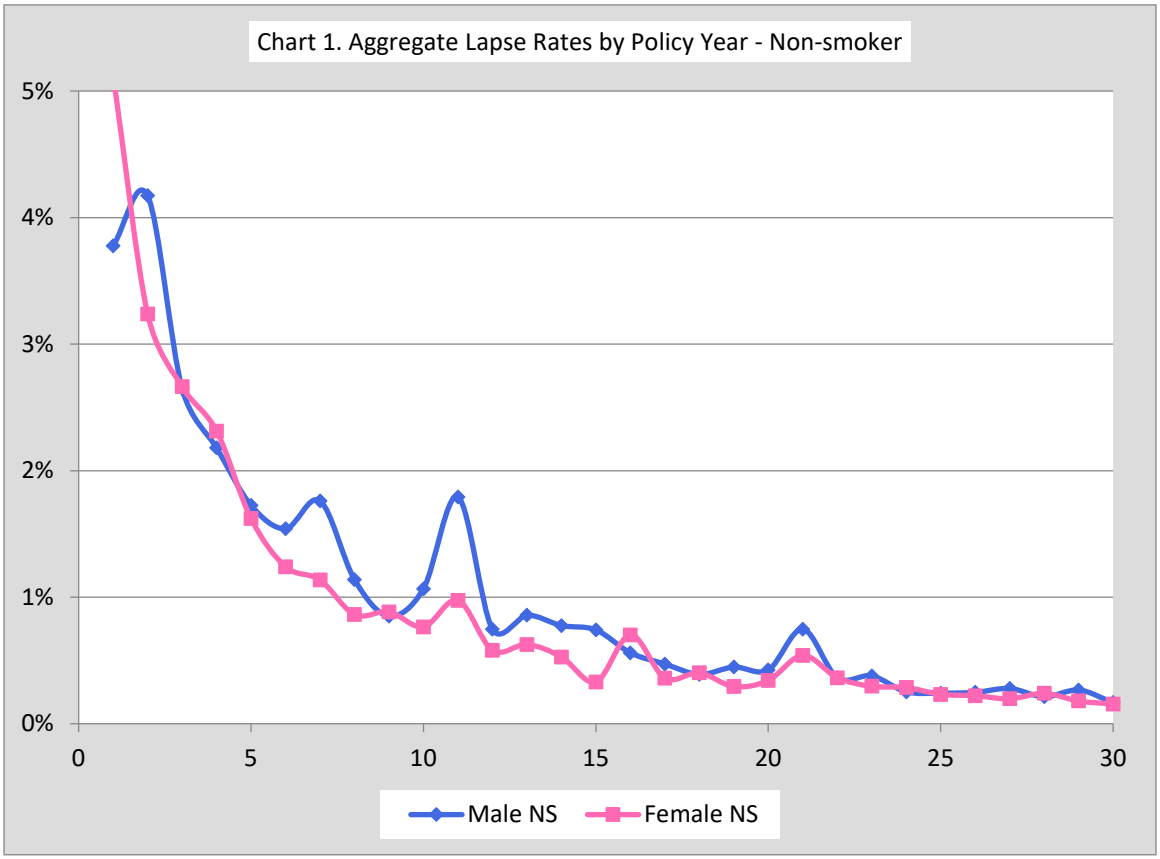
| Adult Male Smokers | | | | Policy Year | Adult Female Smokers | | | |
|---|---|---|---|---|---|---|---|---|
| Vol (000) | Lapse Rate | A/E | Std Dev | | Vol (000) | Lapse Rate | A/E | Std Dev |
| 92,627 | 8.4% | 103% | 18% | 1st | 81,908 | 10.0% | 144% | 14% |
| 83,677 | 4.6% | 66% | 17% | 2nd | 74,513 | 6.8% | 115% | 15% |
| 87,970 | 4.2% | 70% | 18% | 3rd | 78,265 | 4.2% | 89% | 17% |
| 94,604 | 4.3% | 85% | 19% | 4th | 86,023 | 4.0% | 100% | 18% |
| 108,458 | 3.2% | 75% | 20% | 5th | 97,199 | 2.6% | 77% | 19% |
| 119,307 | 3.2% | 87% | 20% | 6th | 111,397 | 1.9% | 69% | 20% |
| 136,361 | 1.8% | 59% | 20% | 7th | 129,881 | 2.5% | 109% | 20% |
| 163,547 | 2.7% | 100% | 22% | 8th | 153,964 | 1.4% | 74% | 35% |
| 186,417 | 2.0% | 87% | 22% | 9th | 180,470 | 1.0% | 65% | 42% |
| 204,191 | 1.6% | 76% | 23% | 10th | 196,693 | 1.6% | 113% | 42% |
| 210,557 | 2.5% | 135% | 25% | 11th | 207,312 | 2.3% | 195% | 46% |
| 203,063 | 1.5% | 94% | 26% | 12th | 214,386 | 0.7% | 72% | 59% |
| 198,094 | 2.0% | 137% | 27% | 13th | 213,561 | 0.8% | 86% | 72% |
| 204,757 | 1.3% | 103% | 28% | 14th | 224,370 | 0.4% | 46% | 72% |
| 213,154 | 0.9% | 77% | 27% | 15th | 226,243 | 0.6% | 77% | 65% |
| 236,354 | 0.5% | 52% | 26% | 16th | 255,038 | 0.8% | 119% | 53% |
| 275,514 | 1.4% | 157% | 28% | 17th | 296,832 | 0.4% | 66% | 47% |
| 308,072 | 0.3% | 40% | 26% | 18th | 331,938 | 0.5% | 81% | 43% |
| 373,419 | 0.7% | 88% | 24% | 19th | 387,657 | 0.8% | 129% | 30% |
| 520,301 | 0.7% | 89% | 32% | 20th | 484,027 | 0.5% | 95% | 24% |
| 596,354 | 0.8% | 112% | 32% | 21st | 523,486 | 0.9% | 163% | 28% |
| 677,864 | 0.7% | 97% | 31% | 22nd | 577,071 | 0.5% | 93% | 33% |
| 727,390 | 0.3% | 43% | 30% | 23rd | 600,627 | 0.4% | 90% | 33% |
| 772,045 | 0.5% | 86% | 31% | 24th | 604,627 | 0.4% | 89% | 34% |
| 830,730 | 0.3% | 53% | 32% | 25th | 640,633 | 0.2% | 50% | 35% |
| 820,723 | 0.4% | 80% | 33% | 26th | 611,129 | 0.4% | 101% | 36% |
| 696,081 | 0.4% | 109% | 31% | 27th | 517,098 | 0.2% | 54% | 30% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 554,349 | 0.4% | 118% | 34% | 28th | 413,723 | 0.2% | 71% | 28% |
| 440,318 | 0.2% | 53% | 37% | 29th | 337,084 | 0.3% | 97% | 30% |
| 350,277 | 0.3% | 95% | 41% | 30th | 262,227 | 0.2% | 58% | 34% |
| 533,080 | 0.3% | 86% | 31% | >30th | 393,044 | 0.2% | 65% | 26% |
| 11,019,654 | 0.9% | 86% | 5% | All | 9,512,427 | 0.8% | 97% | 6% |

As shown in the tables above, there are peaks in actual lapse rates relative to expected for the 11th, 16th, and 21st policy years with valleys in-between. A study of the durations of cash-value onset shows that there is a heaping at durations 10 and 20, and at 15 to a lesser extent. It is likely that there are higher lapses at these policy years because cash values have become available and some policyholders were holding off on lapsing until cash values commenced. Ideally the experience for policy years in which cash values are available would be analyzed separately from policy years with no cash values, but unfortunately not enough companies were able to provide information on cash values, their size, or when they commenced.

It is worth noting that although in the prior study the overall actual-to-expected ratios are close to 100% in each of the four cases, in this study only female smokers are statistically close to 100%. This is confirmation that actual lapse rates have continued to decline.

Charts 1 and 2 show the raw aggregate lapse rates for non-smokers and smokers, respectively. The information is taken from tables 6 and 7. The blue lines are for males and the pink for females.



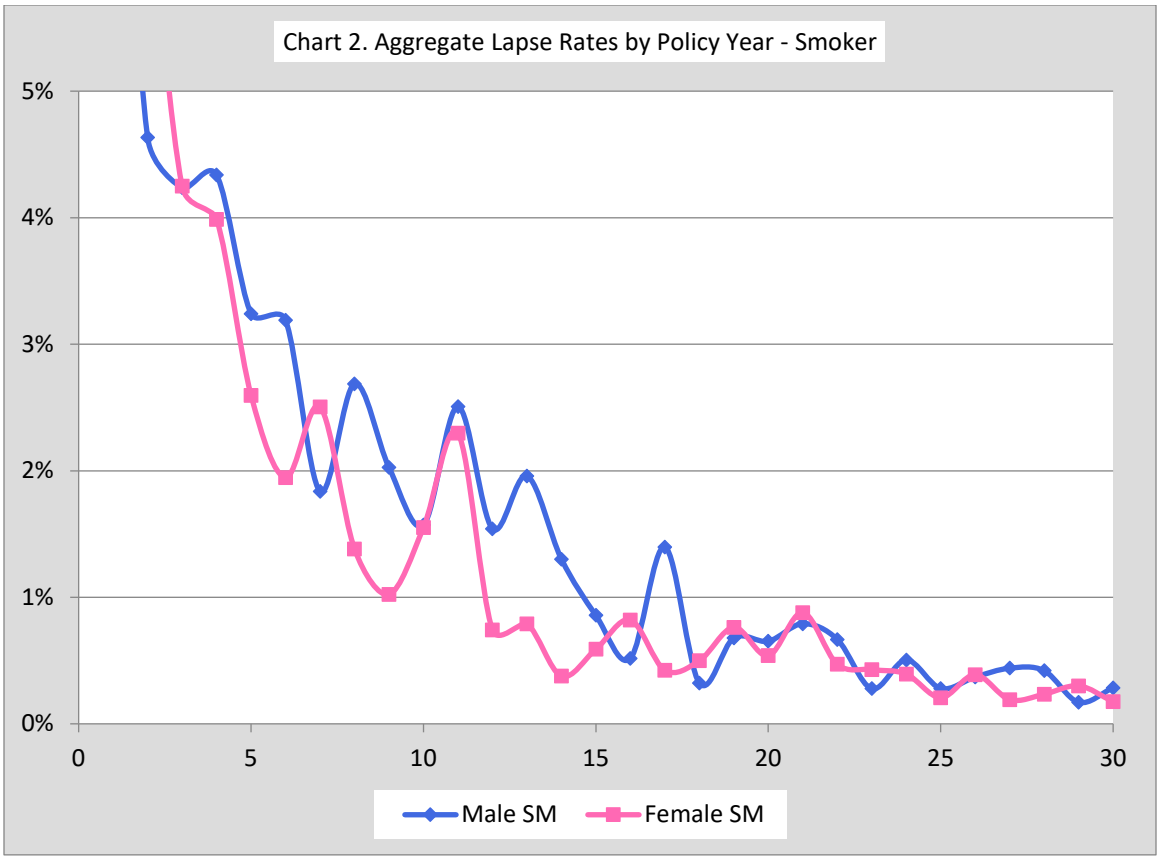



Table 8 shows the ratio of actual lapses to tabular lapses on male non-smoker LapseT100; that is, the male non-smoker table is used to calculate the tabular lapses for all four subsets. (The word "tabular" is used rather than "expected" because one does not expect lapses to be consistent with rates for male non-smokers in the other three cases.) The same tabular is used for all to emphasize the variation in lapse rates across sex and smoking status.

**Table 8. Ratio of actual to tabular lapses for issue ages 18+. Tabular on LapseT100 male non-smoker.**

| Pol Yr | M NS | M Sm | F NS | F Sm |
|---|---|---|---|---|
| 1–5th | 98% | 166% | 103% | 187% |
| 6–10th | 59% | 104% | 46% | 75% |
| 11–15th | 88% | 141% | 56% | 81% |
| 16–20th | 93% | 137% | 84% | 115% |
| 21–25th | 73% | 95% | 66% | 90% |
| 26–30th | 62% | 91% | 52% | 70% |
| >25th | 67% | 91% | 54% | 69% |
| >15th | 75% | 103% | 67% | 91% |
| All | 77% | 119% | 68% | 101% |

The difference in ratios is much larger between smoker and non-smoker than between male and female. The differentials generally trend downward with increasing duration. Male lapse ratios are generally higher than female, and those for smoker higher than non-smoker.

For those who relate better to lapse rates than actual-to-tabular ratios, Table 9 presents the same data as Table 8 but with the aggregate lapse rates for each cell.

**Table 9. Average lapse rates for issue ages 18+, measured by volume.**

| Pol Yr | M NS | M Sm | F NS | F Sm |
|---|---|---|---|---|
| 1–5th | 2.8% | 4.9% | 2.9% | 5.4% |
| 6–10th | 1.2% | 2.2% | 1.0% | 1.6% |
| 11–15th | 1.0% | 1.6% | 0.6% | 0.9% |
| 16–20th | 0.5% | 0.7% | 0.4% | 0.6% |
| 21–25th | 0.4% | 0.5% | 0.3% | 0.5% |
| 26–30th | 0.2% | 0.4% | 0.2% | 0.3% |
| >25th | 0.3% | 0.3% | 0.2% | 0.3% |
| >15th | 0.3% | 0.5% | 0.3% | 0.4% |
| All | 0.6% | 0.9% | 0.6% | 0.8% |

## 3 Experience by Calendar Year

Table 10 shows ratios of actual to expected lapses by volume of insurance for each calendar year included in the study. The last column shows the standard deviation in the actual-to-expected ratio for 2019 only; the standard deviations for other years are fairly similar.

**Table 10. Actual-to-expected ratios for the standard subset of data by calendar year of experience. Expected is calculated on LapseT100.**

| Policy Year | Calendar Year of Experience | | | | | | | | Std Dev |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2013–19 | 2019 |
| 1–5th | 72% | 106% | 116% | 102% | 108% | 103% | 131% | 102% | 13% |
| 6–10th | 58% | 69% | 75% | 59% | 71% | 61% | 74% | 66% | 15% |
| 11–15th | 100% | 84% | 91% | 66% | 95% | 84% | 99% | 88% | 14% |
| 16–20th | 85% | 119% | 98% | 69% | 83% | 78% | 82% | 90% | 19% |
| 21–25th | 82% | 83% | 71% | 68% | 71% | 78% | 93% | 77% | 15% |
| 26–30th | 46% | 43% | 55% | 65% | 72% | 67% | 70% | 64% | 15% |
| >25th | 46% | 42% | 76% | 64% | 74% | 69% | 69% | 67% | 12% |
| >15th | 80% | 86% | 79% | 67% | 74% | 74% | 77% | 77% | 9% |
| All | 74% | 86% | 87% | 71% | 84% | 79% | 92% | 81% | 6% |

There is no clear pattern of increase or decrease by year of experience. Actual-to-expected ratios were lowest in 2016 and highest in 2019. The difference between the ratios for those two

years is greater than could be accounted for on statistical fluctuation alone, but there is nothing in the data to suggest another explanation.

Table 11 is based on the same data as Table 10, but it shows the aggregate lapse rate each year for the ranges of policy years shown.

**Table 11. Aggregate lapse rates for the standard subset of data by calendar year of experience.**

| Policy Year | Calendar Year of Experience | | | | | | | | Std Dev |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2013–19 | 2019 |
| 1–5th | 2.14% | 3.10% | 3.39% | 3.03% | 3.26% | 3.08% | 3.91% | 3.04% | 0.37% |
| 6–10th | 1.05% | 1.24% | 1.32% | 1.04% | 1.25% | 1.04% | 1.22% | 1.17% | 0.24% |
| 11–15th | 0.96% | 0.83% | 0.91% | 0.66% | 0.92% | 0.80% | 0.94% | 0.86% | 0.14% |
| 16–20th | 0.44% | 0.61% | 0.50% | 0.35% | 0.42% | 0.39% | 0.40% | 0.46% | 0.09% |
| 21–25th | 0.41% | 0.42% | 0.36% | 0.34% | 0.35% | 0.38% | 0.45% | 0.38% | 0.08% |
| 26–30th | 0.19% | 0.18% | 0.22% | 0.25% | 0.27% | 0.26% | 0.27% | 0.25% | 0.06% |
| >25th | 0.18% | 0.17% | 0.30% | 0.24% | 0.28% | 0.26% | 0.25% | 0.25% | 0.04% |
| >15th | 0.40% | 0.42% | 0.37% | 0.31% | 0.33% | 0.31% | 0.31% | 0.35% | 0.04% |
| All | 0.68% | 0.74% | 0.71% | 0.55% | 0.62% | 0.55% | 0.61% | 0.64% | 0.04% |

## 4 Experience by Age and Policy Year

Tables 12–15 show actual-to-expected ratios of lapses by volume for quinquennial groups of policy years and decennial groups of adult issue ages. There is a separate table for each of male non-smoker, female non-smoker, male smoker, and female smoker. To provide a wider range of information each table also includes a section with standard deviations of the actual-to-expected ratios and the aggregate lapse rates.

In all four tables, we see lapse rates tend to decrease with increasing issue age within each policy-year group. The trend in actual-to-expected ratios is less clear, but there appears to be a general downward trend in the ratios with increasing issue age; that implies that the negative slope in lapse rates by age is somewhat steeper in 2013–2019 than in 2005–2012.

**Table 12. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of issue ages and policy years. Expected is calculated on LapseT100.**

| | Policy Year | Male Non-Smoker by Issue Age Group | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 18–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70+ | 18+ |
| Actual-to-Expected | 1–5th | 103% | 100% | 76% | 113% | 102% | 91% | 98% |
| | 6–10th | 64% | 71% | 60% | 46% | 51% | 112% | 59% |
| | 11–15th | 91% | 87% | 98% | 66% | 113% | 163% | 88% |
| | 16–20th | 72% | 100% | 104% | 110% | 68% | 47% | 93% |
| | 21–25th | 87% | 75% | 83% | 63% | 36% | 46% | 73% |
| | 26–30th | 69% | 70% | 64% | 30% | 33% | 25% | 62% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | >25th | 73% | 76% | 68% | 33% | 51% | 25% | 67% |
| | >15th | 78% | 79% | 82% | 63% | 47% | 45% | 75% |
| | All | 81% | 81% | 78% | 66% | 74% | 100% | 77% |
| Standard Deviation | 1–5th | 13% | 20% | 17% | 16% | 10% | 28% | 7% |
| | 6–10th | 11% | 13% | 14% | 10% | 14% | 58% | 6% |
| | 11–15th | 14% | 14% | 16% | 11% | 22% | 98% | 7% |
| | 16–20th | 16% | 14% | 16% | 19% | 48% | 104% | 9% |
| | 21–25th | 16% | 13% | 13% | 16% | 33% | 69% | 7% |
| | 26–30th | 15% | 14% | 19% | 25% | 55% | 163% | 9% |
| | >25th | 13% | 13% | 17% | 24% | 53% | 162% | 8% |
| | >15th | 9% | 8% | 9% | 11% | 24% | 60% | 5% |
| | All | 6% | 6% | 6% | 6% | 9% | 27% | 3% |
| Aggregate Lapse Rate | 1–5th | 3.7% | 3.0% | 2.2% | 2.9% | 2.8% | 2.1% | 2.8% |
| | 6–10th | 1.3% | 1.2% | 1.3% | 1.3% | 0.8% | 1.2% | 1.2% |
| | 11–15th | 1.0% | 0.9% | 1.1% | 1.1% | 0.9% | 0.7% | 1.0% |
| | 16–20th | 0.5% | 0.5% | 0.5% | 0.4% | 0.3% | 0.2% | 0.5% |
| | 21–25th | 0.5% | 0.4% | 0.4% | 0.3% | 0.2% | 0.2% | 0.4% |
| | 26–30th | 0.3% | 0.3% | 0.3% | 0.1% | 0.1% | 0.1% | 0.2% |
| | >25th | 0.3% | 0.3% | 0.3% | 0.1% | 0.2% | 0.1% | 0.3% |
| | >15th | 0.4% | 0.4% | 0.4% | 0.3% | 0.2% | 0.2% | 0.3% |
| | All | 0.6% | 0.5% | 0.6% | 0.7% | 0.7% | 0.8% | 0.6% |

**Table 13. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of issue ages and policy years. Expected is calculated on LapseT100.**

| | Policy Year | Female Non-Smoker by Issue Age Group | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 18–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70+ | 18+ |
| Actual-to-Expected | 1–5th | 128% | 118% | 122% | 106% | 78% | 131% | 108% |
| | 6–10th | 65% | 83% | 62% | 78% | 84% | 58% | 72% |
| | 11–15th | 71% | 72% | 90% | 106% | 104% | 47% | 85% |
| | 16–20th | 77% | 96% | 87% | 180% | 61% | 45% | 96% |
| | 21–25th | 96% | 104% | 73% | 54% | 45% | 43% | 82% |
| | 26–30th | 55% | 65% | 58% | 44% | 33% | 16% | 57% |
| | >25th | 56% | 67% | 57% | 49% | 31% | 16% | 59% |
| | >15th | 77% | 89% | 73% | 93% | 49% | 43% | 79% |
| | All | 82% | 91% | 84% | 96% | 73% | 85% | 86% |
| rd Deviati | 1–5th | 13% | 21% | 18% | 15% | 14% | 23% | 7% |
| | 6–10th | 9% | 12% | 10% | 15% | 19% | 47% | 6% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 11–15th | 12% | 15% | 13% | 18% | 21% | 65% | 7% |
| | 16–20th | 13% | 13% | 17% | 20% | 30% | 59% | 8% |
| | 21–25th | 15% | 13% | 15% | 36% | 28% | 46% | 8% |
| | 26–30th | 14% | 15% | 21% | 58% | 51% | 108% | 10% |
| | >25th | 12% | 13% | 20% | 54% | 50% | 107% | 9% |
| | >15th | 8% | 8% | 10% | 21% | 19% | 38% | 5% |
| | All | 5% | 6% | 6% | 9% | 9% | 19% | 3% |
| Aggregate Lapse Rate | 1–5th | 4.6% | 3.8% | 3.5% | 2.6% | 1.8% | 2.7% | 2.9% |
| | 6–10th | 1.2% | 1.4% | 1.0% | 0.8% | 0.6% | 0.4% | 1.0% |
| | 11–15th | 0.8% | 0.6% | 0.9% | 0.6% | 0.3% | 0.1% | 0.6% |
| | 16–20th | 0.4% | 0.4% | 0.4% | 0.6% | 0.2% | 0.1% | 0.4% |
| | 21–25th | 0.4% | 0.4% | 0.3% | 0.2% | 0.2% | 0.2% | 0.3% |
| | 26–30th | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.2% |
| | >25th | 0.2% | 0.2% | 0.2% | 0.2% | 0.1% | 0.1% | 0.2% |
| | >15th | 0.3% | 0.4% | 0.3% | 0.3% | 0.2% | 0.1% | 0.3% |
| | All | 0.6% | 0.6% | 0.7% | 0.7% | 0.5% | 0.5% | 0.6% |

**Table 14. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of issue ages and policy years. Expected is calculated on LapseT100.**

| | Policy Year | Male Smoker by Issue Age Group | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 18–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70+ | 18+ |
| Actual-to-Expected | 1–5th | 88% | 74% | 92% | 60% | 103% | 81% | 81% |
| | 6–10th | 79% | 74% | 79% | 85% | 106% | 228% | 82% |
| | 11–15th | 107% | 58% | 139% | 125% | 338% | 166% | 112% |
| | 16–20th | 54% | 100% | 63% | 73% | 546% | 0% | 86% |
| | 21–25th | 97% | 76% | 74% | 69% | 50% | 0% | 78% |
| | 26–30th | 138% | 68% | 120% | 34% | 41% | 0% | 92% |
| | >25th | 132% | 68% | 120% | 34% | 40% | 0% | 91% |
| | >15th | 91% | 79% | 81% | 66% | 233% | 0% | 84% |
| | All | 90% | 75% | 92% | 74% | 141% | 129% | 86% |
| Standard Deviation | 1–5th | 16% | 18% | 24% | 15% | 17% | 52% | 8% |
| | 6–10th | 18% | 20% | 20% | 20% | 20% | 72% | 10% |
| | 11–15th | 21% | 25% | 23% | 22% | 66% | 188% | 12% |
| | 16–20th | 25% | 28% | 21% | 22% | 103% | 294% | 13% |
| | 21–25th | 23% | 25% | 22% | 37% | 92% | 222% | 14% |
| | 26–30th | 24% | 25% | 35% | 82% | 147% | 505% | 16% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | >25th | 22% | 23% | 33% | 77% | 143% | 505% | 15% |
| | >15th | 14% | 15% | 14% | 22% | 64% | 178% | 8% |
| | All | 8% | 10% | 10% | 10% | 15% | 41% | 5% |
| Aggregate Lapse Rate | 1–5th | 6.5% | 4.7% | 5.5% | 3.8% | 4.4% | 2.5% | 4.9% |
| | 6–10th | 2.3% | 2.6% | 2.2% | 1.6% | 2.0% | 3.4% | 2.2% |
| | 11–15th | 2.0% | 1.0% | 2.2% | 1.3% | 1.6% | 0.7% | 1.6% |
| | 16–20th | 0.7% | 0.7% | 0.5% | 0.5% | 1.9% | 0.0% | 0.7% |
| | 21–25th | 0.6% | 0.5% | 0.5% | 0.4% | 0.3% | 0.0% | 0.5% |
| | 26–30th | 0.5% | 0.3% | 0.5% | 0.1% | 0.2% | 0.0% | 0.4% |
| | >25th | 0.5% | 0.3% | 0.5% | 0.1% | 0.2% | 0.0% | 0.3% |
| | >15th | 0.6% | 0.4% | 0.5% | 0.4% | 1.1% | 0.0% | 0.5% |
| | All | 1.1% | 0.6% | 1.0% | 1.0% | 1.9% | 1.7% | 0.9% |

**Table 15. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of issue ages and policy years. Expected is calculated on LapseT100.**

| | Policy Year | Female Smoker by Issue Age Group | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 18–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70+ | 18+ |
| Actual-to-Expected | 1–5th | 76% | 98% | 164% | 112% | 110% | 156% | 110% |
| | 6–10th | 85% | 59% | 119% | 87% | 111% | 46% | 86% |
| | 11–15th | 79% | 91% | 94% | 106% | 241% | 790% | 100% |
| | 16–20th | 77% | 141% | 79% | 94% | 118% | 0% | 98% |
| | 21–25th | 117% | 90% | 114% | 82% | 20% | 32% | 98% |
| | 26–30th | 81% | 84% | 59% | 88% | 21% | 0% | 79% |
| | >25th | 76% | 84% | 54% | 94% | 19% | 0% | 77% |
| | >15th | 91% | 100% | 90% | 88% | 63% | 12% | 93% |
| | All | 85% | 91% | 112% | 100% | 108% | 151% | 97% |
| Standard Deviation | 1–5th | 16% | 13% | 20% | 16% | 20% | 115% | 7% |
| | 6–10th | 19% | 15% | 51% | 27% | 43% | 141% | 15% |
| | 11–15th | 20% | 24% | 78% | 42% | 64% | 155% | 28% |
| | 16–20th | 17% | 21% | 60% | 27% | 59% | 166% | 17% |
| | 21–25th | 23% | 17% | 32% | 87% | 61% | 199% | 14% |
| | 26–30th | 22% | 18% | 43% | 182% | 182% | 659% | 16% |
| | >25th | 20% | 16% | 39% | 166% | 177% | 659% | 14% |
| | >15th | 12% | 10% | 28% | 46% | 42% | 126% | 9% |
| | All | 8% | 7% | 22% | 17% | 17% | 68% | 6% |
| Aggregate Lapse Rate | 1–5th | 5.9% | 9.0% | 7.2% | 4.2% | 3.0% | 2.4% | 5.4% |
| | 6–10th | 2.3% | 2.2% | 1.8% | 1.0% | 0.8% | 0.4% | 1.6% |
| | 11–15th | 1.2% | 1.1% | 0.9% | 0.6% | 0.9% | 2.5% | 0.9% |
| | 16–20th | 0.6% | 0.9% | 0.4% | 0.5% | 0.5% | 0.0% | 0.6% |
| | 21–25th | 0.5% | 0.4% | 0.5% | 0.4% | 0.1% | 0.2% | 0.5% |
| | 26–30th | 0.3% | 0.3% | 0.2% | 0.3% | 0.1% | 0.0% | 0.3% |
| | >25th | 0.3% | 0.3% | 0.2% | 0.3% | 0.1% | 0.0% | 0.3% |
| | >15th | 0.4% | 0.4% | 0.4% | 0.4% | 0.3% | 0.1% | 0.4% |
| | All | 0.7% | 0.7% | 0.9% | 0.9% | 0.9% | 1.0% | 0.8% |

Table 16 completes the picture of Tables 12–15 by showing quinquennial issue age groups for juveniles. Neither gender nor smoking status is distinguished.

**Table 16. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of issue ages and policy years. Expected is calculated on LapseT100.**

| | Policy Year | Male and Female, All Smoking Types | | | |
|---|---|---|---|---|---|
| | | 0–4 | 5–9 | 10–17 | 0–17 |
| Actual-to-Expected | 1–5th | 145% | 98% | 182% | 153% |
| | 6–10th | 91% | 81% | 68% | 79% |
| | 11–15th | 67% | 34% | 72% | 65% |
| | 16–20th | 37% | 35% | 57% | 47% |
| | 21–25th | 63% | 75% | 77% | 72% |
| | 26–30th | 65% | 105% | 91% | 87% |
| | >25th | 65% | 103% | 82% | 82% |
| | >15th | 54% | 66% | 71% | 65% |
| | All | 75% | 67% | 79% | 76% |
| Standard Deviation | 1–5th | 44% | 34% | 21% | 20% |
| | 6–10th | 15% | 25% | 15% | 10% |
| | 11–15th | 18% | 27% | 14% | 10% |
| | 16–20th | 14% | 20% | 13% | 9% |
| | 21–25th | 14% | 23% | 14% | 9% |
| | 26–30th | 22% | 29% | 22% | 14% |
| | >25th | 21% | 27% | 20% | 13% |
| | >15th | 9% | 13% | 9% | 6% |
| | All | 8% | 10% | 6% | 4% |
| Aggregate Lapse Rate | 1–5th | 3.9% | 3.1% | 5.7% | 4.5% |
| | 6–10th | 1.6% | 1.4% | 1.2% | 1.4% |
| | 11–15th | 0.7% | 0.5% | 1.2% | 0.9% |
| | 16–20th | 0.4% | 0.5% | 0.8% | 0.6% |
| | 21–25th | 0.7% | 0.9% | 0.9% | 0.8% |
| | 26–30th | 0.8% | 1.2% | 1.1% | 1.0% |
| | >25th | 0.8% | 1.2% | 1.0% | 1.0% |
| | >15th | 0.6% | 0.8% | 0.9% | 0.8% |
| | All | 1.0% | 1.0% | 1.2% | 1.1% |

Table 17 is organized similarly to the five tables above. However, it shows numbers by groups of attained ages for experience after the first 15 policy years. The section for lapse rates shows that smoker lapse rates continue to be higher than non-smoker. There is a general downward trend as attained age increases.

**Table 17. Actual-to-expected ratios, standard deviations and lapse rates for the standard subset of data by groups of attained age. Expected is calculated on LapseT100.**

| | Risk Class | Attained Ages, Excluding First 15 Policy Years | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 18–39 | 40–49 | 50–59 | 60–69 | 70–79 | 80+ | 18+ |
| Act/Exp | M NS | 82% | 92% | 77% | 85% | 65% | 43% | 75% |
| | M Sm | 44% | 98% | 88% | 70% | 98% | 84% | 84% |
| | F NS | 80% | 90% | 84% | 95% | 58% | 46% | 79% |
| | F Sm | 55% | 122% | 95% | 85% | 90% | 42% | 93% |
| Std Dev | M NS | 22% | 12% | 9% | 8% | 11% | 18% | 5% |
| | M Sm | 31% | 19% | 15% | 14% | 22% | 51% | 8% |
| | F NS | 21% | 11% | 7% | 9% | 14% | 22% | 5% |
| | F Sm | 28% | 16% | 10% | 22% | 35% | 62% | 9% |
| Lapse Rate | M NS | 0.8% | 0.5% | 0.4% | 0.4% | 0.3% | 0.2% | 0.3% |
| | M Sm | 0.6% | 0.8% | 0.5% | 0.4% | 0.5% | 0.4% | 0.5% |
| | F NS | 0.6% | 0.4% | 0.3% | 0.4% | 0.2% | 0.2% | 0.3% |
| | F Sm | 0.5% | 0.7% | 0.4% | 0.4% | 0.4% | 0.2% | 0.4% |

## 5 Experience for Other Subsets

### *5.1 Joint type*

Records submitted distinguish between single life policies, joint first-to-die, joint last-to-die, and other or unknown joint policies. (Because not many companies classified records as Other or Unknown, and because the experience could vary considerably by the actual joint type, these records are excluded from this report and from the pivot table.) The lapse experience varies markedly between these joint types. Note that LapseT100 was constructed on single life policies only.

Table 18 shows the actual-to-expected ratios for the various joint types for issue ages 18 and higher. The table is based on the standard subset of data expanded to include joint policies. There is one note of caution for the expected lapses for joint policies. The expected lapses are calculated on LapseT100 for sex and smoking status of the older life in the case of joint policies. The reason is that the records for joint policies show only the older life. Nothing is known of the other life.

**Table 18. Experience by joint type for ages 18+ for standard subset expanded for joint. Expected lapses are calculated on LapseT100. Volume in thousands.**

| Policy Year | Joint Type | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | Single | 2,218,217 | 200,969,920 | 95% | 82% |
| | First to die | 101,011 | 9,768,703 | 99% | 100% |
| | Last to die | 50,492 | 18,181,566 | 49% | 72% |
| | All | 2,369,720 | 228,920,190 | 94% | 81% |
| 1–15th | Single | 607,098 | 54,448,840 | 97% | 84% |
| | First to die | 11,962 | 1,299,343 | 111% | 132% |
| | Last to die | 18,108 | 5,328,824 | 55% | 53% |
| | All | 637,168 | 61,077,008 | 96% | 83% |
| >15th | Single | 1,611,119 | 146,521,080 | 92% | 77% |
| | First to die | 89,049 | 8,469,360 | 93% | 83% |
| | Last to die | 32,384 | 12,852,743 | 40% | 94% |
| | All | 1,732,552 | 167,843,182 | 91% | 79% |
| All | Other | 3,659 | 1,266,210 | 59% | 45% |
| 1–15th | Other | 1,214 | 588,646 | 68% | 56% |
| >15th | Other | 2,444 | 677,564 | 46% | 21% |

Actual-to-expected ratios for joint first-to-die are a little higher than for single life. The ratios for joint last-to-dies are markedly lower than for single life, especially for earlier policy years. However, the mix of business within each category can be very different. Note that the average face amount for single is $91k, for first-to-die $97k, and $360k for last-to-die.

### *5.2 Base/rider*

Records distinguish between base coverages and riders. LapseT100 was constructed using records from base coverages only. Table 19 shows summaries for base coverages compared to riders. The table is based on the standard subset expanded to include riders.

**Table 19. Experience by base or rider for standard subset expanded for coverage type. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Coverage Type | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | Base | 2,300,680 | 205,226,672 | 95% | 81% |
| | Rider | 377,865 | 24,244,375 | 109% | 80% |
| | All | 2,678,544 | 229,471,047 | 98% | 81% |
| 1–15th | Base | 632,302 | 56,243,546 | 97% | 84% |
| | Rider | 234,874 | 15,943,450 | 95% | 69% |
| | All | 867,176 | 72,186,997 | 97% | 81% |
| >15th | Base | 1,668,377 | 148,983,126 | 92% | 77% |
| | Rider | 142,990 | 8,300,925 | 163% | 139% |
| | All | 1,811,368 | 157,284,050 | 100% | 81% |

Riders experience lower actual-to-expected ratios than base plans in earlier policy years and higher in later policy years.

### *5.3 Rating*

Most companies indicated the mortality rating on each record. Two could not distinguish, and all records were marked as standard. LapseT100 was constructed from records marked as standard only.

Table 20 compares the lapse experience of standard policies and two bands of substandard ratings. The table is based on the standard subset expanded to include all ratings.

**Table 20. Experience by mortality rating for standard subset expanded to all ratings. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Rating | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | Standard | 2,300,680 | 205,226,672 | 95% | 81% |
| | 101–200% | 174,612 | 8,080,780 | 89% | 87% |
| | >200% | 8,959 | 370,765 | 204% | 194% |
| | All | 2,484,251 | 213,678,217 | 95% | 82% |
| 1–15th | Standard | 632,302 | 56,243,546 | 97% | 84% |
| | 101–200% | 152,190 | 7,030,187 | 88% | 87% |
| | >200% | 3,060 | 119,203 | 214% | 195% |
| | All | 787,552 | 63,392,936 | 96% | 85% |
| >15th | Standard | 1,668,377 | 148,983,126 | 92% | 77% |
| | 101–200% | 22,422 | 1,050,593 | 129% | 104% |
| | >200% | 5,900 | 251,562 | 188% | 191% |
| | All | 1,696,699 | 150,285,281 | 93% | 77% |

The ratios are slightly higher for moderately substandard policies, and markedly higher for heavier ratings when compared to standard. This is in contrast to the 2015 study, which showed markedly higher ratios for all substandard ratings. Overall, the low level of exposure could explain the variability observed over time.

### *5.4 Conversion type*

Five of the eight companies were able to identify policies that issued by conversion. The other three companies either excluded converted policies or were unable to distinguish them. The allowed types were "group", "term", and "Other". Because only a quarter of conversions were other than "term", all conversion types are reported here combined. Table 21 shows the experience for not converted, converted, and both. In the case of converted policies, duration for expected lapses is measured from the date of conversion, not from the date of the original policy.

The table is based on the standard subset expanded to include conversions. Note that "no" may include unidentified conversions. Records with a conversion type identified were excluded for the data underlying LapseT100.

**Table 21. Experience by converted or not for the standard subset expanded for conversion. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Converted | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | No | 2,300,680 | 205,226,672 | 95% | 81% |
| | Yes | 342,526 | 29,713,869 | 58% | 70% |
| | All | 2,643,206 | 234,940,540 | 89% | 80% |
| 1–15th | No | 632,302 | 56,243,546 | 97% | 84% |
| | Yes | 145,026 | 12,568,781 | 55% | 71% |
| | All | 777,328 | 68,812,327 | 88% | 82% |
| >15th | No | 1,668,377 | 148,983,126 | 92% | 77% |
| | Yes | 197,500 | 17,145,088 | 68% | 70% |
| | All | 1,865,877 | 166,128,213 | 90% | 76% |

For the first 15 years after issue, there seems to be strong evidence that converted policies have lower lapse rates than those that were not converted. This observation certainly applies to term conversions, but it is not necessarily the case for other types of conversion.

### *5.5 Volume of insurance*

Table 22 summarizes experience into several ranges of volume of insurance. The table is based on the standard subset of data. The classification into ranges is based on the "current" volume indicated on the records submitted and ignores the fact that volume may be different in other years covered by the record.

**Table 22. Experience by ranges of volume of insurance for the standard subset of data. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Volume | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | 0–49K | 832,002 | 16,254,278 | 109% | 100% |
| | 50–99K | 580,227 | 30,560,161 | 93% | 87% |
| | 100–249K | 747,738 | 85,573,834 | 83% | 80% |
| | 250–499K | 87,028 | 24,468,225 | 92% | 87% |
| | 500–999K | 35,371 | 18,944,894 | 93% | 91% |
| | 1–2M | 14,204 | 15,112,160 | 83% | 81% |
| | 2M+ | 4,110 | 14,313,119 | 38% | 29% |
| | All | 2,300,680 | 205,226,672 | 95% | 81% |
| 1–15th | 0–49K | 254,476 | 5,107,042 | 108% | 101% |
| | 50–99K | 126,675 | 6,521,124 | 100% | 96% |
| | 100–249K | 208,948 | 23,920,700 | 85% | 84% |
| | 250–499K | 26,844 | 7,464,102 | 86% | 82% |
| | 500–999K | 10,392 | 5,522,966 | 94% | 91% |
| | 1–2M | 3,900 | 4,088,330 | 94% | 94% |
| | 2M+ | 1,066 | 3,619,282 | 43% | 31% |
| | All | 632,302 | 56,243,546 | 97% | 84% |
| >15th | 0–49K | 577,526 | 11,147,236 | 109% | 98% |
| | 50–99K | 453,552 | 24,039,037 | 85% | 76% |
| | 100–249K | 538,790 | 61,653,134 | 80% | 76% |
| | 250–499K | 60,183 | 17,004,124 | 101% | 96% |
| | 500–999K | 24,979 | 13,421,928 | 92% | 92% |
| | 1–2M | 10,304 | 11,023,830 | 65% | 63% |
| | 2M+ | 3,044 | 10,693,837 | 30% | 27% |
| | All | 1,668,377 | 148,983,126 | 92% | 77% |

There is no clear trend in actual-to-expected ratios by volume except for volumes of at least $2 million, for which the actual-to-expected ratios are substantially lower.

### *5.6 Premium amount*

Most companies provided premium amounts, but for some companies the premium amount is not reliable. For example, some companies appear often unable to get the premium after lapse. Table 23 shows experience by count and volume for each of several bands of premium. In all cases the annualized premium is used. The table is based on the standard subset of data. The numbers with a positive premium may be usable, but the numbers with premium shown as "none" are clearly not usable.

**Table 23. Experience by ranges of annualized premium for the standard subset of data. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Annualized Premium | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | Unknown | 228,065 | 21,153,170 | 114% | 90% |
| | None | 214,268 | 20,444,656 | 159% | 178% |
| | 1–249 | 570,046 | 25,771,993 | 99% | 69% |
| | 250–499 | 603,089 | 37,544,701 | 87% | 73% |
| | 500–999 | 375,313 | 30,196,785 | 82% | 71% |
| | 1000–1999 | 191,389 | 24,363,522 | 69% | 63% |
| | 2000+ | 118,509 | 45,751,846 | 60% | 46% |
| | All | 2,300,680 | 205,226,672 | 95% | 81% |
| 1–15th | Unknown | 41,608 | 5,706,886 | 97% | 71% |
| | None | 105,235 | 11,445,598 | 130% | 144% |
| | 1–249 | 48,597 | 1,414,668 | 140% | 111% |
| | 250–499 | 136,592 | 5,349,054 | 104% | 100% |
| | 500–999 | 144,954 | 7,514,990 | 87% | 82% |
| | 1000–1999 | 94,542 | 8,178,249 | 70% | 65% |
| | 2000+ | 60,775 | 16,634,103 | 61% | 51% |
| | All | 632,302 | 56,243,546 | 97% | 84% |
| >15th | Unknown | 186,457 | 15,446,284 | 122% | 105% |
| | None | 109,033 | 8,999,059 | 239% | 318% |
| | 1–249 | 521,449 | 24,357,325 | 86% | 61% |
| | 250–499 | 466,498 | 32,195,647 | 68% | 56% |
| | 500–999 | 230,359 | 22,681,795 | 68% | 57% |
| | 1000–1999 | 96,847 | 16,185,273 | 66% | 60% |
| | 2000+ | 57,734 | 29,117,743 | 55% | 35% |
| | All | 1,668,377 | 148,983,126 | 92% | 77% |

A decreasing trend with increasing premium is evident for earlier policy years, but there is little variation by amount of premium for later policy years except for the highest premium band.

### *5.7 Preferred class*

The specifications for data provided distinct codes for non-preferred (that is, no preferred underwriting for that plan), residual of preferred classes (that is, preferred rates were available, but the policy did not qualify), and various preferred classes as defined by the company (that is, preferred rates were available, and the policy qualified). There was also a code in this field for policies issued by GIE. Not all companies were able to distinguish GIE, and there is no consistency in the use of preferred classes between companies, and not necessarily even within companies. Only four of the companies provided data by preferred class. Therefore, Table 24, which summarizes experience by preferred, should be used with caution. Table 24 shows only

the first 15 policy years because there is little preferred experience at higher durations; only adult issue ages are included.

**Table 24. Experience by preferred class for the standard subset of data, for issue ages 18+ and the first 15 policy years. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Smoking | Preferred Class | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| No | Not pref | 320,363 | 29,383,093 | 94% | 81% |
| | Residual | 127,136 | 8,145,305 | 102% | 99% |
| | Preferred | 75,140 | 12,335,150 | 81% | 76% |
| | All | 522,639 | 49,863,548 | 94% | 83% |
| Yes | Not pref | 50,672 | 3,028,790 | 103% | 82% |
| | Residual | 28,382 | 963,807 | 113% | 104% |
| | Preferred | 5,336 | 590,373 | 114% | 124% |
| | All | 84,390 | 4,582,970 | 108% | 93% |
| Unknown | All | 68 | 2,323 | 82% | 124% |
| All | All | 607,098 | 54,448,840 | 97% | 84% |

### *5.8 Adjustability*

Records submitted distinguish between guaranteed policies, those for which premiums are adjustable, those for which benefits are adjustable, and those for which both are adjustable. No records were submitted for the last category. Too few companies submitted data for either adjustable type to justify displaying results in this report.

### *5.9 Premium-paying or paid-up*

Some companies provide the date on which premiums cease. It can then be deduced whether a policy is in a premium-paying state or has become paid-up. One would expect that lapse[6] rates would be much lower after premiums have ceased, but of course that would depend on the presence and magnitude of cash values. Table 25 shows that lapse rates are considerably lower in the earlier policy years. There is insufficient information to assess the influence of cash values on the decision to terminate the policy.

[6] Strictly speaking, they are not "lapse" rates but "voluntary termination" rates. There is no reason to terminate the policy voluntarily unless the policyholder receives some compensation for doing so.

**Table 25. Experience by premium-paying or paid-up for standard subset expanded to include paid-up. Expected lapses are calculated on LapseT100. Volume is sum assured in thousands.**

| Policy Year | Coverage Type | Exposure | | Actual/Expected | |
|---|---|---|---|---|---|
| | | Count | Vol (000) | Count | Volume |
| All | Prem-paying | 2,300,680 | 205,226,672 | 95% | 81% |
| | Paid-up | 231,453 | 14,275,994 | 60% | 62% |
| | All | 2,532,132 | 219,502,666 | 92% | 80% |
| 0–14 | Prem-paying | 632,302 | 56,243,546 | 97% | 84% |
| | Paid-up | 28,907 | 1,667,496 | 17% | 9% |
| | All | 661,209 | 57,911,042 | 95% | 83% |
| 15+ | Prem-paying | 1,668,377 | 148,983,126 | 92% | 77% |
| | Paid-up | 202,546 | 12,608,498 | 71% | 77% |
| | All | 1,870,923 | 161,591,623 | 89% | 77% |

## 6 Main Observations

The most significant observations from the study are:

1. Lapse rates for virtually all issue ages and policy years over 15 are under 1%, and most are under 0.5%;
2. Lapse rates continue to decrease as duration increases;
3. Lapse rates are generally lower than those reported in the prior studies;
4. Joint type is very important;
5. Lapse rates tend to decrease with increasing issue age;
6. Smoking status is more important than gender;
7. Variation by size is small except for very large policies; and
8. There is considerable variation in lapse ratios by year of experience.

## 7 Limitations

These observations are based on this industry study, which covers a range of product designs from different companies and different issue years. Lapse behaviour is sensitive to product design. The observations here may not be valid for any particular product, company, or year.

LapseT100 reflects the experience contributed for 2005–2012. LapseT100 is not a table officially endorsed by the CIA. It may not be appropriate as a best estimate assumption for any particular company. Because lapse rates can vary widely by company, it may be unwise for a company to adopt LapseT100, as is, for its own use. It is likely to be more appropriate for a company to develop its own lapse table or to modify LapseT100 to fit its own business and experience.

## 8 Pivot tables

Pivot tables of the UL-LCOI data are available on the CIA website. The pivot data include policies and volume, exposure, actual lapses and expected lapses, by sex, smoking, preferred, size group, and by issue age and policy year. More categories are available with groups of issue ages and policy years. The pivot data do not include adjustable policies and joint policies classified as Other. See the worksheet "Describe". A sample pivot table is shown below.

| | |
|---|---|
| PolYr | (All) |
| Age Group | 50–54 |
| Issue Age | (All) |
| Smoking | NS |
| Sex | M |
| Vol Band | (All) |
| Preferred | (All) |

| | Policy count | | | | | Volume in thousands | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **PolYrGrp** | **Pol Exposed** | **Pol Lapsed** | **P Lap Rate** | **P A/E Ratio** | **StdDev P A/E** | **Vol Exposed** | **Vol Lapsed** | **V Lap Rate** | **V A/E Ratio** | **StdDev V A/E** |
| 01–05 | 4,473 | 165 | 3.7% | 142% | 9.2% | 490,504 | 15,211 | 3.1% | 120% | 19.8% |
| 06–10 | 8,140 | 97 | 1.2% | 41% | 6.4% | 1,036,643 | 9,535 | 0.9% | 32% | 14.7% |
| 11–15 | 13,004 | 125 | 1.0% | 59% | 6.8% | 1,372,573 | 17,148 | 1.2% | 74% | 16.9% |
| 16–20 | 20,119 | 85 | 0.4% | 119% | 11.8% | 1,399,334 | 5,860 | 0.4% | 116% | 27.5% |
| 21–25 | 28,416 | 104 | 0.4% | 74% | 8.4% | 3,339,246 | 12,114 | 0.4% | 73% | 21.9% |
| 26–30 | 13,511 | 27 | 0.2% | 50% | 13.6% | 1,933,240 | 1,742 | 0.1% | 22% | 34.2% |
| 31–35 | 2,291 | 5 | 0.2% | 73% | 38.1% | 222,589 | 463 | 0.2% | 69% | 92.0% |
| 36+ | 285 | 0 | 0.0% | % | 108.0% | 14,306 | 0 | 0.0% | % | 258.0% |
| **Total** | **90,239** | **608** | **0.7%** | **73%** | **3.4%** | **9,808,434** | **62,073** | **0.6%** | **65%** | **8.3%** |

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