

MILLIMAN RESEARCH REPORT

Long-term care insurance valuation:

An industry survey of assumptions and methodologies

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Overview

Milliman has conducted its sixth triennial long-term care (LTC) insurance valuation survey. Previous valuation surveys were conducted every three years from 2003 to 2015. We compiled survey responses from 23 individual carriers. This year's survey focused on individual LTC and did not include group business because there are only a limited number of companies in the group LTC insurance market. The focus on individual LTC is consistent with the 2015 survey. The survey does not include combination LTC products. Many of the survey questions remain consistent with the previous surveys, which allows for comparisons of the changes in responses over time.

The objectives of this survey are to review and document the assumptions and methodologies related to the determination and testing of active life and disabled life reserves, as well as the asset strategies and investments backing the reserves.

The information presented includes brief commentary on the application of various methods and approaches of several technical LTC valuation issues. This report assumes the reader is familiar with LTC insurance, including product design and benefits, as well as current valuation standards.

The results of this survey are intended to provide interested parties with general benchmarks regarding insurers' current valuation assumptions. In preparing this summary of the valuation survey, we relied on companies to accurately report their valuation assumptions and methodologies. While we reviewed the responses for general reasonableness, we included the responses as reported. The survey is merely a tally of valuation assumptions, not necessarily a carrier's actual experience. The reader should keep this in mind when evaluating the results in this report.

This survey included questions with regard to GAAP and statutory (STAT) reserve bases. Some companies do not hold GAAP reserves because of their financial structures. Therefore, GAAP results are presented for only a limited number of companies.

Responses are related to a carrier's most recently issued LTC product series. In order to avoid distortions from valuation assumptions used for policies issued many years ago, Section II, Active Life Reserve: Valuation Assumptions and Methodologies, generally includes only companies that are currently selling new business. Sections III through V of this survey include all companies. It should also be noted that not all companies answered every question, resulting in the number of responses varying by question.

The carriers included in the survey are listed in Appendix A.

Finally, commentary offered throughout this report includes the authors' opinions, which do not necessarily represent those of Milliman. Because the articles and commentary prepared by the professionals of our firm are often general in nature, we recommend that our readers seek the advice of an actuary or attorney before taking any action.

We, Allen Schmitz, Tim Kempen, and Kerry Fino, are associated with Milliman, Inc., and are members of the American Academy of Actuaries. We are qualified under the Academy's qualification standards to render the opinions with regard to the actuarial calculations set forth herein.

Active life reserves: valuation assumptions and methodologies

Active life reserves (ALR) reflect the liability for future contingent claim events and are typically the largest reserve held by LTC insurance companies. Active life reserves, contract reserves, and policy reserves are assumed to be synonymous in this report.

This section summarizes the responses relating to the valuation assumptions and methodologies used for a company's most recently issued policies. In order to avoid distortions from valuation assumptions used for policies issued many years ago, this ALR section of the survey generally includes only the seven companies currently selling new business who responded to the survey (for survey questions related to ALR methodology, all responses are included). Section III summarizes the responses relating to the assumptions and methodologies used by companies to test their ALRs. Topics covered in this section relating to active life reserves include:

- Mortality
- Ultimate lapse rates
- Morbidity sources
- Provision for adverse deviation
- Morbidity improvement
- Methodology and other issues
- Provision for loss adjustment expense
- Interest rate
- Waiver of premium methodology
- Active life reserves for disabled lives
- Reserving for rate increases
- System
- Reserving approach for complex riders
- Premium reserves

MORTALITY

As seen in Figure 1, the 1994 Group Annuity Mortality (GAM) table is the most common valuation assumption used throughout the industry for calculating active life reserves. One reason might be that the 1994 GAM table is the referenced table for LTC insurance in the current version of the National Association of Insurance Commissioners (NAIC) Health Insurance Reserves Model Regulation.

The survey indicates that 57% of companies use 1994 GAM for STAT active life reserves. This is lower than what was reported three years ago when all but one company used the 1994 GAM table. For GAAP, 40% of companies use the 1994 GAM, another 40% use the 2012 Individual Annuity Mortality (IAM) table, and the remaining companies use insured experience.

In addition, 43% of the companies responded that they applied mortality selection factors for their STAT valuation assumptions, and 80% responded that they assume mortality selection for GAAP reserves. More than half of the companies responded they include future mortality improvement in their STAT and GAAP valuation assumptions.

FIGURE 1: VALUATION MORTALITY TABLE

MORTALITY TABLE ASSUMPTION	PERCENT OF RESPONSES	
	STAT	GAAP
1983 GAM	0%	0%
1994 GAM	57%	40%
2000 ANNUITY	0%	0%
2012 IAM	14%	40%
INSURED EXPERIENCE	14%	20%
OTHER	14%	0%

Note: Some companies do not hold GAAP reserves.
Seven responses for STAT; five for GAAP.
Percentages may not add to 100% due to rounding.

ULTIMATE LAPSE RATES

A summary of ultimate lapse rates assumed by insurers in their active life reserve calculations is shown in Figure 2. Please note that survey respondents were asked to provide the STAT lapse rates prior to any NAIC lapse-limiting formulas. Companies indicated they vary their valuation lapse assumptions by issue age, attained age, gender, benefit period, inflation, marital status, premium payment option, and product. In order to consistently compare lapse assumptions, we requested the ultimate lapse rate for the following two different plans and demographic characteristics:

Plan 1

- Issue age 55
- Male
- Single
- No inflation protection
- Lifetime benefit period

Plan 2

- Issue age 65
- Female
- Married
- 5% compound inflation protection
- Five-year benefit period

In this year's survey, the median ultimate lapse rate assumed for STAT is 1.0% for Plan 1 and 0.7% for Plan 2. The ultimate lapse rate for Plan 1 is the same as the rate from the 2015 survey while the ultimate lapse rate for Plan 2 is slightly lower than the rate from the 2015 survey. Companies that reported GAAP ultimate lapse rates generally reported the same assumptions as STAT, with one company having slightly lower GAAP assumptions. Given the consistency of the assumptions between STAT and GAAP, Figure 2 only shows the ultimate lapse assumptions for STAT.

FIGURE 2: ULTIMATE LAPSE RATE ASSUMPTION, STAT

ULTIMATE LAPSE RATES	PERCENT OF RESPONSES	
	PLAN 1	PLAN 2
0% - 0.5%	29%	29%
0.51% - 1.0%	57%	71%
1.01% - 1.5%	0%	0%
1.51% - 2.0%	14%	0%
2.01%+	0%	0%

Notes: Seven responses for each plan.
Percentages may not add to 100% due to rounding.

In this year's survey, we asked companies for more information about how the lapse rates are applied. About 70% of companies indicated they apply lapse rates to total lives, as opposed to active lives. Further, about 70% of companies indicated they model exhaustion of benefits separately, rather than including in lapse rates.

MORBIDITY

As there is no standardized morbidity table for LTC, companies can set their own assumptions for STAT and GAAP reserves. The magnitude and slope of the age-cost curve can have a dramatic impact on the durational development of LTC active life reserves. When surveying companies regarding their morbidity assumptions, we limited the survey to three pieces of information:

- Morbidity sources
- Provision for adverse deviation (PAD)
- Morbidity improvement

Morbidity sources

We asked companies for the source of the claim cost assumptions that are used in the development of their active life reserves. The results are summarized in Figure 3. The source of the assumptions is split between a company's own data and that of a consultant (including times where a company started with consultant assumptions as a baseline and adjusted them to its own data). None of the companies use population-based data sources as the primary data sources for their morbidity assumptions, which was more common many years ago when LTC insurance was just emerging. The Company Data category in Figure 3 implies that the assumptions were developed solely from company data.

FIGURE 3: SOURCE OF MORBIDITY ASSUMPTION

MORBIDITY SOURCES	PERCENTAGE OF RESPONSES
COMPANY DATA	20%
CONSULTANT	80%

Note: Five responses.

Provision for adverse deviation

Based on the survey, we found the use of morbidity PADs varies widely, even among the seven companies currently selling, and some companies omit any explicit PADs altogether. Some companies apply a flat percentage increase to total incurred claims while others apply separate PADs to incidence, claim termination rates, and utilization. A few companies include a PAD on mortality and lapse. Given how the use of PADs varies widely, it is not feasible to provide a numerical representation of how much margin is included in the assumptions. It should also be noted that there may be additional margins in the reserves due to the prescribed valuation interest rates.

Morbidity improvement

The survey asked companies if they included future morbidity improvement in their valuation assumptions. As the NAIC Health Insurance Reserves Model Regulation prohibits the use of morbidity improvement in the calculation of statutory active life reserves, all companies indicated that they assumed no future morbidity improvement. However, three companies indicated they assumed future morbidity improvement for GAAP reserves. These results are generally consistent with prior years. It should be noted that while companies do not assume morbidity improvement when calculating their statutory reserves, some do include it when testing their reserves (see the next section for details).

METHODOLOGY AND OTHER ISSUES

The following several sections discuss ALR methodologies and other issues. For these sections, the results are based on responses from all companies (versus only those currently selling business) where appropriate.

PROVISION FOR LOSS ADJUSTMENT EXPENSE

Survey respondents were asked what provision for loss adjustment expense (LAE) is made, if any, in their active life reserve calculations. Figure 4 includes a summary of the LAE loads, as a percentage of the active life reserves (percentage of ALR is generally equivalent to percentage of incurred claims).

FIGURE 4: PROVISION FOR LOSS ADJUSTMENT EXPENSE (LAE)

LAE AS % OF ACTIVE LIFE RESERVES	PERCENT OF RESPONSES	
	STAT	GAAP
0%	57%	20%
0.1% - 2.5%	0%	20%
2.6% - 5.0%	29%	40%
> 5.0%	0%	0%
IMPLICITLY INCLUDED	14%	20%

Notes: Some companies do not hold GAAP reserves.
Seven responses for STAT; five for GAAP.

Consistent with the surveys from previous years, most companies omit explicit provisions for LAE in their STAT active life reserve bases. However, many companies implicitly reflect LAE in their reserve testing analyses, in which all reserves are compared with future benefit and expense payouts relative to premium income.

Because of GAAP reserving requirements and because GAAP reserves are typically developed with best estimate assumptions and modest PADs, most companies include more explicit LAE assumptions in the GAAP active life reserve development. GAAP LAE is typically reflected via a load to the benefit reserves or a separate expense reserve. In general, the level of GAAP LAE is consistent with prior surveys.

INTEREST RATE

From a STAT perspective, most companies surveyed used the prescribed valuation interest rate. A few companies provided different responses for GAAP interest rate assumptions.

The average GAAP interest rate was 4.2%, which continues the observed historical trend of generally decreasing GAAP interest rates. In prior surveys, the average interest rate has steadily decreased, going from 6.2% in 2003 to 5.8% in 2006 to 5.5% in 2009 and then to 4.6% in 2012 and 2015.

WAIVER OF PREMIUM METHODOLOGY

The survey asked about the treatment of waiver of premium in the active life reserve calculations. The most common approach, used by 71% of the companies currently selling LTC, was to increase benefit payments in the reserve calculation to reflect the cost associated with the waiver (waiver of premium is included in both premium and claims). The other approach used to develop active life reserves assumes that only active policyholders (versus both active and disabled policyholders) pay premiums (waiver of premium is excluded from both premium and claims).

ACTIVE LIFE RESERVE FOR DISABLED LIVES

Consistent with the prior survey, almost all companies in the survey (both currently still selling and those no longer selling) reported holding active life reserves for those on claim, although a few companies did indicate making a reduction to the ALR to reflect the claim reserve. Those making a reduction generally held a small percentage of the ALR if the policy was also on claim.

UNLOCKING RESERVES

We asked if any valuation assumptions have been unlocked for STAT or GAAP reserves for any business segment, and 78% of companies indicated assumptions had not been unlocked.

SYSTEM

Figure 5 shows the number of companies that use a commercial valuation system for their active life reserves versus those that have “homegrown” systems. In general, the results are consistent with prior surveys. All companies indicated that the reserving systems are done on a seriatim basis (as opposed to higher-level groupings).

FIGURE 5: ALR SYSTEM

SYSTEM	PERCENTAGE OF RESPONSES
Homegrown	19%
Commercial	81%

Note: 21 responses.

RESERVING APPROACH FOR COMPLEX RIDERS

Modeling for some riders for LTC can be quite complex. Perhaps the two most difficult to model are the shortened benefit period (SBP) and the shared care rider. Both riders require considerable formula changes to a typical valuation system. Of the 21 companies that answered the SBP question, 81% said they followed a simple approach of increasing the reserve by applying an adjustment to expected claim costs. The other companies indicated they followed a complex calculation of the benefits. A similar response was given for the shared care rider; 88% of the 16 companies that responded said they followed a simple approach of increasing the reserve by a constant percentage, while the others followed a more complex model.

PREMIUM RESERVES

The survey asked whether the unearned premium reserve was held on a gross or net basis (net valuation premium). The NAIC Health Insurance Reserves Model Regulation states that the sum of the unearned premium reserve and active life reserve cannot be less than the gross unearned premium reserve. Therefore, after the first few policy durations, companies can hold the net unearned premium reserve. Figure 6 summarizes the responses for STAT. It should be noted that most companies followed the same approach for GAAP, except two companies that switched to holding the unearned premium reserve on a gross basis for GAAP.

FIGURE 6: STAT PREMIUM RESERVE METHODOLOGY

METHODOLOGY	PERCENTAGE OF RESPONSES
GROSS	47%
NET	53%

Note: 19 responses.

Active life reserves: testing

This section describes the approach and methodologies used to test the adequacy of the active life reserves. The previous section described the valuation assumptions and methodologies used to calculate the ALR balance. As all companies are required to test their reserves, responses from all companies are included in this section (not just those companies currently selling business).

The survey separated assumptions used for testing STAT versus GAAP ALR. For the most part, the assumptions were the same. The responses in this section are based on the assumptions used to test statutory reserves. Comments are provided where GAAP testing assumptions differ from statutory.

Topics covered in this section relating to active life reserves include:

- Adequacy testing approach
- Monitoring and updating
- Mortality
- Ultimate lapse rates
- Interest rate
- Morbidity
 - Morbidity sources
 - Provision for adverse deviation
 - Morbidity improvement
 - Utilization
- Future rate increases

ADEQUACY TESTING APPROACH

The survey asked what approach is performed to test the active life reserve. The responses were categorized into those companies that only conduct a gross premium valuation (GPV) versus those that conduct some form of cash-flow (CF) testing, which includes asset modeling and may include testing stochastic interest rate scenarios. Some companies reported doing both a GPV and CF testing. Figure 7 shows the results of the type of active life reserve adequacy testing performed. Slightly fewer companies are doing only GPV compared with the 2015 survey, where 12% of the companies reported being in that category.

FIGURE 7: ALR ADEQUACY TESTING APPROACH

METHOD	PERCENTAGE OF RESPONSES
GPV ONLY	9%
CF TESTING AND GPV	39%
CF TESTING ONLY	52%

Note: 23 responses.

Different approaches are followed for aggregating the reserve testing results. Figure 8 shows the three main approaches companies use for aggregating statutory results. Compared to the 2015 survey, more companies are aggregating results at the company level rather than at the line of business level.

FIGURE 8: LEVEL OF AGGREGATION OF STATUTORY RESERVE TESTING RESULTS

METHOD	PERCENTAGE OF RESPONSES
LTC LINE OF BUSINESS	32%
HEALTH LINES COMBINED	4%
COMPANY LEVEL	64%

Note: 23 responses.

For cash-flow testing, most companies followed the same approach for dealing with deficiencies in interim years. For non-New-York business, interim negative results are usually ignored, as reserve testing is measured over the lifetime. For New York business, additional reserves are held to cover interim negative results.

As a result of reserve testing, 50% of companies responded that they needed to strengthen their STAT and GAAP reserves. This result is lower than in the 2015 survey, where 65% of companies strengthened STAT reserves and 54% strengthened GAAP reserves, though some companies interpreted the question to only apply to the past three years. For STAT reserves, the most common approach was establishing a premium deficiency reserve while several companies only strengthened reserves for New York entities.

MONITORING AND UPDATING

The survey asked how often companies monitor morbidity and persistency assumptions, as well as how often those assumptions are updated. Figure 9 shows how often companies monitor morbidity and persistency. Morbidity is monitored somewhat more frequently than persistency. Both assumptions are being monitored less frequently than reported in the 2015 survey, when morbidity and persistency were reported being monitored monthly or quarterly by 64% and 52% of the companies, respectively.

FIGURE 9: FREQUENCY OF MONITORING ASSUMPTIONS

FREQUENCY	MORBIDITY	PERSISTENCY
MONTHLY	35%	13%
QUARTERLY	17%	22%
ANNUAL	48%	65%

Note: 23 responses.

The most common approach is to update assumptions on an annual basis. One company reported changing assumptions quarterly while 75% of companies reported assumptions are changed annually. The remaining 21% of companies reported updating assumptions less than annually (one company reported morbidity updated annually and persistency less than annually). Also, over the last two years almost all companies reported making some change to the assumptions, with changes to morbidity, lapse, or mortality assumptions.

We asked if predictive modeling was used to develop assumptions and three of the 23 companies reported that they use predictive modeling for some of their assumption setting. Also, a few companies reported that they are considering using predictive modeling in the future.

Actuarial Guideline 51 (“The Application of Asset Adequacy Testing to Long-Term Care Insurance Reserves”) requires all insurers with more than 10,000 in-force LTC contracts, issued on a gross basis or assumed through reinsurance transactions, to perform specific asset adequacy testing as of December 31, 2017. The survey asked if companies made any changes as a result of Actuarial Guideline 51, and 70% reported no changes. Of the 30% of companies that made changes as a result of the Guideline, most reported adding additional documentation.

MORTALITY

The most common mortality tables used in testing the ALR are the 1994 Group Annuity Mortality (GAM), 2000 Annuity, and 2012 Individual Annuity Mortality (IAM) tables. Fewer companies are using the 1994 GAM table while more companies are using the 2000 Annuity and 2012 IAM tables than in the 2015 survey. Some companies indicated that they applied a factor (such as 85% or 90%) to the underlying table. A few companies indicated that they constructed their mortality assumptions based on their own experience. The table in Figure 10 shows the responses.

FIGURE 10: CURRENT MORTALITY ASSUMPTIONS: UNDERLYING TABLE

UNDERLYING TABLE	PERCENTAGE OF RESPONSES
1983 GAM	4%
1994 GAM	26%
2000 ANNUITY	22%
2012 IAM	17%
INSURED EXPERIENCE	13%
OTHER*	17%

* Other includes 2008 VBT, 2015 VBT, 75-80 Table, and the 1983 IAM.
Note: 23 responses.

In addition to the underlying table, 78% of the companies indicated that they apply mortality selection factors. While there is a great deal of variability in the selection factors reported, many start with a factor between 0.20 and 0.40 and grade up over 10 to 20 years. Some companies reported a longer grading period of 25 to 30 years. The majority of companies not using mortality selection factors are closed blocks of business beyond the early part of the select period.

The survey asked whether companies assume future mortality improvement, and 61% of the companies indicated they do assume future improvement. Some companies reported using one of the projection scales associated with the underlying tables, such as G2, while others reported using a flat amount, ranging from 0.5% to 1.0% per year. The number of companies assuming mortality improvement increased from the 52% reported in the 2015 survey.

The survey also asked about the modeling approach used in reserve testing related to projecting lives in aggregate or split between active lives and disabled lives. There are generally two approaches followed. The first approach models all lives combined. This implicitly treats mortality as a blend of active and disabled mortality. The majority of companies follow this approach, with 78% of the companies reporting that they apply mortality in aggregate. The other approach models active lives separate from disabled lives and includes explicit assumptions for active and disabled mortality. The remaining 22% of companies reported using this approach.

ULTIMATE LAPSE RATES

A summary of ultimate lapse rates assumed in reserve testing is shown in Figure 11. Overall, lapse rates are slightly lower than in the 2015 survey. Four companies reported they assume a single lapse rate that only varies by duration (and premium payment option). The other companies indicated they vary their lapse assumptions by issue age, attained age, gender, benefit period, inflation, marital status, premium payment option, or product. In order to consistently compare lapse assumptions, we requested the ultimate lapse rates for the following two different plans and demographic characteristics:

Plan 1

- Issue age 55
- Male
- Single
- No inflation protection
- Lifetime benefit period

Plan 2

- Issue age 65
- Female
- Married
- 5% compound inflation protection
- Five-year benefit period

Six companies reported different ultimate lapse rates between the two plans. The majority of companies assume a lapse rate in the range of 0.5% to 1.0%, with the median for Plan 1 and Plan 2 being about 0.9% and 0.8%, respectively (generally consistent with the median for the assumptions underlying the ALR calculations for those companies currently selling business).

FIGURE 11: ULTIMATE LAPSE RATE ASSUMPTION

ULTIMATE LAPSE RATE	PLAN 1	PLAN 2
0% - 0.5%	14%	24%
0.51% - 1.0%	48%	52%
1.01% - 1.5%	19%	10%
1.51% - 2.0%	14%	10%
2.01%+	5%	5%
MEDIAN*	1.0%	0.9%

Notes: 21 responses.

Percentages may not add to 100% due to rounding.

INTEREST RATE

The survey asked what interest rate was used in discounting if a gross premium valuation (GPV) or deferred acquisition cost (DAC) recoverability test was conducted. Some companies indicated they used an interest rate that varies based on future rates or stochastic interest rate projections. Most companies, however, indicated that they used a single discount rate. For testing STAT reserves, the single rate ranged from 3.6% to 6.2% with an average of about 5.2%. For testing GAAP reserves, the single rate was higher, ranging from 5.3% to 6.1% with an average of about 5.6%. For companies that provided responses for GAAP, most used higher GAAP interest rates than STAT. In general, the rates are consistent with the 2015 survey.

New in 2018, the survey asked about the assumed structure of the risk-free interest rates. About 35% of companies indicated they use a level risk-free interest rate assumption, while other companies use a variety of structures, including implied forward curve, mean reversion, and prescribed scenarios.

MORBIDITY

When surveying companies regarding their morbidity assumptions for testing the ALR, we asked for four pieces of information:

- Morbidity sources
- Provision for adverse deviation (PAD)
- Morbidity improvement
- Utilization

Morbidity sources

Because of confidentiality concerns, we did not ask each company for a sample of its claim cost assumptions. Instead, we simply asked companies for the source of the claim cost assumptions that are used in the testing of their active life reserves. The results are summarized in Figure 12. The source of the assumptions is split between a company's own data and that of an external source. Most external sources are from consultants, although a few companies used the SOA Intercompany Study. The most common approach used for "external sources" is to use the external data as a starting point and adjust to company experience.

FIGURE 12: SOURCE OF MORBIDITY ASSUMPTION

METHOD	PERCENTAGE OF RESPONSES
COMPANY DATA	35%
EXTERNAL SOURCES (MAY INCLUDE COMPANY ADJUSTMENTS)	65%

Note: 23 responses.

Provision for adverse deviation

We found that about half of the companies do not include explicit provisions for PADs in their morbidity assumptions used for reserve testing. For testing of STAT reserves, 12 out of 23 companies included a PAD. Three companies that reported having a PAD for testing STAT reserves did not have a PAD when testing its GAAP reserves. The use of PADs for testing STAT reserves increased from the 2015 survey.

Morbidity improvement

A controversial topic that is difficult to measure in the LTC insurance industry is the use of future morbidity improvement in projections. For testing of STAT reserves, seven out of 23 companies reported including an assumption for future morbidity improvement. The level of morbidity improvement ranged from 0.75% to 1.6% per year, for generally 10 to 20 years, although one company assumed morbidity improvement for 30 years. For testing of GAAP reserves, three companies that did not assume any future morbidity improvement for STAT reserve testing reported assuming some morbidity improvement. The number of companies assuming morbidity improvement has decreased slightly from the 2015 survey.

All companies that include an assumption for future morbidity improvement also assume future mortality improvement, while seven companies only assume future mortality improvement.

Utilization assumption

Utilization generally refers to the amount of benefits per day (or week or month) actually paid relative to the contractual maximum. We specifically asked about how the level of utilization is projected into the future. In recent years, the level of LTC inflation has been lower than 5%¹, suggesting that overall utilization may be decreasing for a plan that includes a 5% compound inflation benefit. About 39% of companies assume that utilization stays constant in the future (i.e., assume future inflation equals the contractual rate and/or do not vary utilization). A few companies reported assuming less future inflation than the contractual rate, resulting in utilization decreasing in the future for plans with built-in inflation protection, while several others reported utilization variations based on an assortment of factors including interest rate scenarios, inflation options, and care settings. The assumptions used were consistent between GAAP and STAT.

The survey also asked if the LTC cost of care inflation assumption is tied to economic or interest rate scenarios. About 25% of the companies reported the LTC cost of care assumptions are linked to either a consumer price index (CPI) or long-term Treasury rates.

FUTURE RATE INCREASES

The survey asked several questions related to how future rate increases were assumed in reserve testing. The results are shown in Figure 13. Most companies reflected future increased premium for rate increases that were approved but not yet implemented. For future increases not yet approved, there is a wide range of assumptions. For those assuming future increases, most assume multiple rounds of increases, with the level of assumed rate increase being similar among rounds.

FIGURE 13: FUTURE RATE INCREASES

QUESTION	YES	NO
ASSUME FUTURE RATE INCREASES (NOT INCLUDING NEW YORK)?	70%	30%
APPROVED BUT NOT IMPLEMENTED	70%	30%
FUTURE INCREASES NOT YET APPROVED	52%	48%
MULTIPLE ROUNDS OF RATE INCREASES	38%	62%
IS SHOCK LAPSE ASSUMED?	44%	56%
ANTI-SELECTION IMPACTING INCIDENCE RATES ASSUMED?	27%	73%
IF YES, IS THE ANTI-SELECTION PERMANENT?	50%	50%
REDUCED BENEFIT OPTIONS ASSUMED TO BE ELECTED?	47%	53%

Note: 23 responses.

¹ <https://pro.genworth.com/riiproweb/productinfo/pdf/131168.pdf>

For companies that assume future rate increases (not yet approved), 44% include assumptions for shock lapses and 47% include assumptions for reduced benefit offerings as a result of the rate increases. Only 27% of companies that assume future rate increases include an assumption for anti-selection impacting incidence. Half of the 27% assume the anti-selection is permanent.

Disabled life reserves

Disabled life reserves (DLR), also referred to as claim reserves, reflect the value of future claim payments for claims that have already been incurred. The amount of disabled life reserves associated with a block of LTC insurance business generally increases as the block ages, which is due to the increasing claim incidence by policyholder age. DLR calculations can include many nuances and complications and generally are revised to reflect emerging experience more readily than ALRs.

This section is based on responses from all companies, including those no longer selling LTC insurance.

Participating companies were surveyed with regard to the following topics:

- Continuation tables and related reserve methodologies
 - Data sources
 - Continuation table variables
 - Future transfer methodology
 - Waiver of premium methodology
 - Utilization adjustments
- Explicit provision for adverse deviation
- Provision for loss adjustment expense
- Incurred but not reported (IBNR) methodology
- Adequacy
- System
- Reserving approach for complex riders
- Claim status definitions and adjustments

CONTINUANCE TABLES AND RELATED RESERVE METHODOLOGIES

All companies surveyed followed a continuation table approach (or model mortality and recovery separately) when establishing the claim reserve for known claims as opposed to using a completion factor method or some other methodology.

Data sources

Figure 14 shows the source of the continuation table assumptions. Consistent with the morbidity assumptions for ALR testing, the source of the assumptions is split between a company's own data and that of an external source. Most external sources are from consultants, although a few companies use the SOA Intercompany Study. The most common approach used for "external sources" is to use the external data as a starting point and adjust to company experience. Compared to the 2015 survey, slightly more companies are now using external sources rather than relying solely on the company's own data.

FIGURE 14: CONTINUANCE TABLE DATA SOURCES

DATA SOURCE	PERCENTAGE OF RESPONSES
COMPANY DATA	27%
EXTERNAL SOURCES	73%

Note: 22 responses.

About half of the companies indicated that they update the continuation tables at least annually. The remainder responded that they perform an update less frequently but several indicated they at least review the tables annually. These results are relatively consistent with the 2015 survey. Also, almost all companies indicated that the updates were showing longer lengths of stay, although two companies reported recent experience showing shorter lengths of stay. In the 2015 survey, no companies reported shorter lengths of stay (one reported no change in length of stay).

Continuance table variables

Figure 15 shows the most common variables used in the continuance tables. Consistent with prior updates to the survey, companies are continuing to use more variables in their DLR calculations. The number of variables used generally increased or remained relatively flat compared to the 2015 survey. This may indicate that companies are developing more sophisticated and detailed assumptions as they try to develop better claim reserve estimates.

FIGURE 15: CONTINUANCE TABLE VARIABLES

VARIABLE	PERCENTAGE OF RESPONSES
GENDER	96%
AGE	91%
CARE SETTING	74%
BENEFIT PERIOD	52%
DIAGNOSIS	30%
OTHER (INCLUDING MARITAL STATUS, BIO, RBO, ETC.)	26%

Note: Companies could indicate more than one variable. There were 23 responses.

Future transfer methodology

Figure 16 shows the approach taken in reflecting transfers between care settings for comprehensive plans (plans that cover care in both a facility and at home) and companies that vary the continuance tables by care setting (some companies use a composite continuance table and are not included in Figure 16). For the companies that do vary the continuance tables by care setting, the majority also account for transfers. The trend of an increasing number of companies modeling transfers continued in 2018 with 50% of companies reporting making explicit adjustments for future transfers.

FIGURE 16: FUTURE TRANSFER METHODOLOGY

METHODOLOGY	PERCENTAGE OF RESPONSES
TRANSFERS NOT REFLECTED	38%
EXPLICIT ADJUSTMENT	50%
IMPLICIT ADJUSTMENT	13%

Note: 16 responses.

To demonstrate the care setting transfer issue, consider the following example. A carrier may offer homecare-only policies, as well as comprehensive policies. Some carriers hold an identical reserve if a policyholder goes on claim while receiving home care under the two different policy types. If the underlying continuance tables are based solely on home care experience, this methodology can potentially understate the comprehensive liability because the claimant will continue to be benefit-eligible even if transferred to a facility. The materiality of these transfers depends on how the underlying continuance curves are constructed.

The survey responses classified as “explicit” refer to companies that make an explicit adjustment with respect to transfers. As an example of an explicit adjustment for transfers of care, a company might adjust all comprehensive facility DLRs by X% and adjust all comprehensive non-facility DLRs by Y%.

The companies with “implicit adjustments” take an approach in which the underlying continuance tables are developed from comprehensive policies, based on starting care site. These companies assume that the transfers are then implicitly reflected in the DLR calculation because any historical transfer experience is reflected in the claim runoff assumed. This assumption relies on a consistent mix of nursing home and home care claim experience over time.

Waiver of premium methodology

The vast majority of companies reflect waiver of premium benefits in their claim reserve calculations, as seen in Figure 17. This is similar to prior surveys. It is important to carefully consider the treatment of waiver of premium in the ALR and DLR calculations.

FIGURE 17: WAIVER OF PREMIUM METHODOLOGY

METHODOLOGY	PERCENTAGE OF RESPONSES
WAIVER REFLECTED IN DLR	83%
WAIVER NOT REFLECTED IN DLR	17%

Note: 23 responses.

Utilization adjustments

As shown in Figure 18, the vast majority of companies make explicit utilization adjustments in their claim reserve calculations. The number of companies that made an explicit utilization adjustment continued to increase, as it has in every survey since 2009. These calculations account for paid claim experience that is less than the maximum daily, weekly, or monthly amount specified in the policy contract.

Utilization adjustments may be determined on a seriatim or aggregate basis. Each approach has its own merits when considering variability, credibility, and calculation issues. There was a slight shift from the 2015 to 2018 surveys in the percentage of companies adjusting at the seriatim level to an aggregate level.

FIGURE 18: UTILIZATION METHODOLOGY

METHODOLOGY	PERCENTAGE OF RESPONSES
NOT REFLECTED	13%
SERIATIM	30%
AGGREGATE	57%

Note: 23 responses.

EXPLICIT PROVISIONS FOR ADVERSE DEVIATION

The results in this year's survey indicate an increase in the percentage of companies that include explicit PADs in the DLR calculation. In the 2015 survey, 72% of companies did not include explicit PADs, whereas only 48% of companies reported in the 2018 survey they do not include explicit PADs. Of the companies that indicated they do include explicit PADs, there is a variety of assumptions that contain a PAD, including claim termination rates, utilization, overall morbidity, loss adjustment expense, IBNR, or a percentage increase to the total DLR. Where reported, GAAP was equivalent to STAT for all companies.

PROVISION FOR LOSS ADJUSTMENT EXPENSE

We surveyed the participating carriers with regard to the provisions for loss adjustment expense (LAE) that are included in their claim reserve calculations. Almost all companies include a flat percentage load to their DLR and IBNR. The range of the LAE load varies by company, as shown in Figure 19.

FIGURE 19: LOSS ADJUSTMENT EXPENSE (LAE) PERCENTAGE

	INDIVIDUAL COMPANIES	
	STAT	GAAP
0%	0%	0%
0.1% - 2.5%	29%	30%
2.6% - 5.0%	65%	70%
>5.0%	6%	0%

Note: 17 responses for STAT and 10 for GAAP.

Average LAE held on a STAT basis is 3.5%, which is higher than the 2015 survey's 2.9% average. All companies that reported holding a LAE for GAAP reported the same amount for STAT and GAAP. Differences in the percentage mix in Figure 19 are due to the mix of companies responding to STAT and GAAP. Unlike the case with ALR, where most companies only load GAAP ALR for the LAE liability, most companies load both STAT and GAAP DLR bases for LAE.

INCURRED BUT NOT REPORTED METHODOLOGY

The table in Figure 20 indicates the approach taken by companies with respect to their incurred but not reported (IBNR) calculations. Among the wide variety of approaches used to calculate the IBNR, the completion method (or claim triangle approach) is the most common. Another approach is to subtract the reported incurred loss ratio from the anticipated loss ratio times earned premium to estimate the amount of incurred but unreported claims. A similar approach would be to subtract the reported incurred claims from the amount of expected claims. In Figure 20, the "other" approaches include a combination of the completion method and loss ratio approaches or high-level estimation. The responses are similar to prior surveys but with slightly fewer companies using a loss ratio approach.

FIGURE 20: IBNR METHODOLOGY

METHODOLOGY	PERCENTAGE OF RESPONSES
COMPLETION / TRIANGLE APPROACH	48%
LOSS RATIO / % OF PREMIUM OR EXPECTED CLAIMS	4%
COMBINATION OF COMPLETION AND LOSS RATIO	4%
OTHER	44%

Note: 23 responses.

ADEQUACY

Almost all companies perform some form of reserve adequacy testing on their claim reserves, such as a claim retrospective reserve analysis. The majority of companies (71% of the 23 responses) indicated that these tests were performed annually while others were more frequent (5% reported quarterly and 24% reported monthly). Results were similar to the 2015 survey.

SYSTEM

Figure 21 shows the number of carriers that use a commercial valuation system for their disabled life reserves versus those that have a "homegrown" system. Of the companies that responded to both this year's survey and the 2015 survey, one company switched from a homegrown system to a commercial system. No companies switched from a commercial system to homegrown.

FIGURE 21: DLR SYSTEM

SYSTEM	PERCENTAGE OF RESPONSES
HOMEGROWN	38%
COMMERCIAL	62%

Note: 21 responses.

The use of homegrown systems is more common for DLRs than ALRs. Four companies that use commercial systems for their ALRs use homegrown systems for their DLRs.

RESERVING APPROACH FOR COMPLEX RIDERS

Companies were asked about the modeling approach for two of the more complex riders for LTC: nonforfeiture and shared care benefits. The vast majority of companies responded that they either ignore nonforfeiture benefits, such as the shortened benefit period, or conservatively hold the full benefit period (as opposed to only holding the claim reserve for the shortened period of time).

For shared care benefits, 58% of the 19 companies that responded indicated they adjust the claim reserve to account for shared care benefits. The most common approach to account for shared care benefits was to assume that the full benefit period of both spouses was available to the current claimant.

CLAIM STATUS DEFINITIONS AND ADJUSTMENTS

As the size of claim reserves increases, more companies are refining the claim reserve calculation to address claim situations other than the typical “open and in claim payment status” situations. Some of those other situations include “claims during the elimination period,” “pending claims waiting for approval,” “closed claims that may reopen,” and “claims in final payment status.”

Figure 22 shows that the most common approach for claims in the elimination period is to explicitly account for them in the disabled life reserve. Some companies reported holding a percentage of the DLR for claims in the elimination period. Another approach is to implicitly include them in the IBNR development.

FIGURE 22: CLAIMS DURING THE ELIMINATION PERIOD

APPROACH	PERCENTAGE OF RESPONSES
EXPLICITLY ACCOUNTED FOR IN DLR	55%
IMPLICITLY INCLUDED IN IBNR	45%

Note: 22 responses.

The majority of companies also explicitly reserve for pending claims, as shown in Figure 23. These claims are known to the company but are in the process of having their benefit eligibility verified. The most common approach is to include these claims with the known disabled life reserve, with some companies applying an adjustment factor to reflect the probability that the claim will be approved.

FIGURE 23: PENDING CLAIMS WAITING FOR APPROVAL

APPROACH	PERCENTAGE OF RESPONSES
EXPLICITLY ACCOUNTED FOR IN DLR	73%
IMPLICITLY INCLUDED IN IBNR	27%

Note: 22 responses.

Figure 24 shows the most common approach for closed claims that may reopen is to not reflect any explicit adjustment. This is an increase from the 2015 survey results, when 52% of companies reported making no adjustment. Depending on the definition of a claim, some claims may close but end up reopening later as the same claim. For example, a claimant may recover and stop claiming benefits but relapse a couple months later and need to resume benefits. In that situation, the previously closed claim will reopen. Most of the companies making an explicit adjustment indicated that they make separate calculations to hold reserves for those types of claims. A few indicated that those types of claims are covered in the general IBNR.

FIGURE 24: CLOSED CLAIMS THAT MAY REOPEN

APPROACH	PERCENTAGE OF RESPONSES
NOT REFLECTED	59%
SOME ADJUSTMENT MADE	41%

Note: 22 responses.

Figure 25 shows most companies do not make any adjustment for claims that are known to be in a final payment status, even more so than in the 2015 survey. Sometimes it is known that an open claim is about to be closed, but there is only one payment left (such as in the case of death, but the final bill is outstanding). Some companies do make an adjustment for those claims, reducing the claim reserves.

FIGURE 25: CLAIMS IN FINAL PAYMENT STATUS

APPROACH	PERCENTAGE OF RESPONSES
NOT ADJUSTMENT	77%
SOME ADJUSTMENT MADE	23%

Note: 22 responses.

Asset assumptions

The valuation survey asked companies about the assets supporting the reserves. The survey included questions relating to asset allocation, actual portfolio yield, and current pricing interest rate relating to each company's LTC product line. In addition, we asked about any investment hedging strategies that may be used. This section includes responses for all companies, except for the question relating to the current pricing interest rate, which only includes companies currently selling LTC.

ASSET ALLOCATION

Figure 26 summarizes the average asset allocation by different asset classes and compares the responses from this year's survey with the 2015 survey. The average asset allocation is based on a simple average of responses. The asset allocation varied considerably by company. Some companies hold large portions of their assets in Treasuries and AAA and AA bonds, while other companies hold greater proportions of riskier assets. Since the 2015 survey, the asset allocation has been fairly consistent. There has been a slight increase in investment-grade bonds (BBB and higher) and a slight decrease in Treasuries, equities, mortgages, and alternative investments. It should be noted that these changes over the period are not overly influenced by any one company, but rather the trend is seen in many companies.

FIGURE 26: ASSET ALLOCATION

ASSET CLASS	2015 SURVEY	2018 SURVEY	CHANGE
TREASURIES	4.8%	3.5%	-1.3%
AAA BONDS	1.9%	4.8%	2.9%
AA BONDS	7.6%	8.8%	1.2%
A BONDS	27.3%	28.9%	1.6%
BBB BONDS	26.0%	27.3%	1.3%
BB AND LOWER	5.1%	4.3%	-0.8%
PREFERRED STOCK	0.5%	0.4%	-0.1%
PUBLIC EQUITY	1.4%	1.0%	-0.4%
PRIVATE EQUITY*	NA	1.3%	NA
REAL ESTATE	0.5%	0.9%	0.4%
MORTGAGES	10.5%	7.6%	-2.9%
OTHER	14.4%	11.2%	-3.2%

* Not explicitly requested in prior surveys

Note: 20 responses for the 2018 survey and 20 responses for the 2015 survey.

When determining the asset allocation for LTC products, it is important to consider matching asset and liability risks. For example, the prepayment risk in some callable bonds and mortgages should be carefully considered for LTC. When interest rates drop, callable bonds and mortgages are more likely to be called, reducing the portfolio yield. As a result, unlike other product lines, for LTC there is no offsetting adjustment on the liability side for changes in asset yield (such as changing the crediting rate), thereby making these assets potentially more risky for LTC than for other products.

In addition, companies should be aware of the potential risk-based capital implications with respect to asset allocation selection. For example, the NAIC requires more risk-based capital to be held on more risky assets. Therefore, the additional yield from those more risky assets is reduced by the additional cost of capital for holding those assets, as well as the higher default risk.

We asked if companies had changed any investment decisions as a result of the Tax Cuts and Jobs Act of 2017, and of the 19 companies that responded, only one indicated it had made a change.

DURATION FOR LONG-TERM CARE

The survey asked for the asset duration for the LTC product line. There was a wide range of responses. Of 21 responses, the duration ranged from 6.5 to 20.4 years, with an average of 11.1 years. However, most responses (76% of 21 companies) fell within the range of eight to 13 years. Compared with the 2015 survey, the average duration increased slightly. The 2015 survey reported an average duration of 10.3 years.

CURRENT PORTFOLIO YIELD

Figure 27 shows the current portfolio yields of the 21 companies that responded. The average yield was 5.1% and ranged between 3.6% and 6.2%. Overall, the average yield declined from 5.4% in the 2015 survey.

FIGURE 27: CURRENT PORTFOLIO YIELD

YIELD	PERCENTAGE OF RESPONSES
<=4.50%	24%
4.51% TO 5.00%	19%
5.01% TO 5.50%	24%
5.51% TO 6.00%	14%
>6.00%	19%

Note: 21 responses.

CURRENT PRICING INTEREST RATE ASSUMPTION

Figure 28 shows the current pricing interest rate assumptions for only the companies that are currently selling LTC insurance. The average response was 4.1% and ranged from 3.0% to 5.3%. Compared with the 2015 survey, the average pricing interest rate decreased from 4.6%.

FIGURE 28: CURRENT PRICING INTEREST RATE ASSUMPTION

ASSUMPTION	PERCENTAGE OF RESPONSES
<=4.00%	43%
4.01% TO 4.50%	14%
4.51% TO 5.00%	29%
5.01% TO 5.50%	14%
>5.50%	0%

INTEREST RATE HEDGING APPROACH

The survey also asked about the use of any interest rate hedging strategies, either internally between various product lines or with external parties. Figure 29 shows the interest rate hedging responses. The majority of companies (73% of the 22 responses) do not utilize any form of interest rate hedging. Four companies use an external hedge, such as an interest rate swap. Two companies use an internal hedge between different product lines. This is generally consistent with the 2015 survey. As may be expected, companies that employ hedging strategies tend to have larger blocks of business where they achieved the critical mass needed for efficiently establishing an external hedging approach.

FIGURE 29: INTEREST RATE HEDGING APPROACH

APPROACH	PERCENTAGE OF RESPONSES
DO NOT HEDGE	73%
INTERNAL AND EXTERNAL HEDGE	9%
EXTERNAL HEDGE	18%

Appendix A

LIST OF PARTICIPATING COMPANIES

Allianz Life Insurance Company of North America
Berkshire Life Insurance Company of America
CMFG Life Insurance Company
CNA
Continental General Insurance Company
Genworth
John Hancock Insurance Company
LifeSecure
MedAmerica Insurance Company
Metropolitan Life Insurance Company
Minnesota Life Insurance Company
Mutual of Omaha
New York Life Insurance Company
Northwestern Mutual
Physicians Mutual Insurance Company
RiverSource Life Insurance Company
Senior Health Insurance Company of Pennsylvania
State Farm Mutual Automobile Insurance Co.
Thrivent Financial
United Security Assurance Company of PA
Unum

Note: Two companies desired to remain anonymous



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