Milliman Research Report

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Milliman

Long-term Care Insurance Valuation

An Industry Survey of Assumptions and Methodologies

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

I. OVERVIEW

Milliman has conducted its fifth triennial long-term care (LTC) insurance valuation survey. Previous valuation surveys were conducted in 2003, 2006, 2009, and 2012. We compiled survey responses from 25 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 2012 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 change 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 that 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, statutory (STAT), and tax (TAX) reserve bases. Some companies do not hold GAAP reserves because of their financial structure. 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 on page 21.

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, Tim Kempen, Daniel Nitz, and Allen Schmitz, 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.

II. ACTIVE LIFE RESERVES: VALUATION ASSUMPTIONS AND METHODOLOGIES

Active life reserves (ALR) reflect the liability for future contingent claim events, and are typically the largest reserves 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 companies currently selling new business (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
  - 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 table (GAM) 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 all but one company use 1994 GAM for STAT and TAX active life reserves. For GAAP, 67% of companies use the 1994 GAM, with the remaining companies using the Annuity 2000 table.

In addition, about one-quarter of the companies responded that they applied mortality selection factors for their STAT and TAX valuation assumptions, and all responded that they assume mortality selection for GAAP reserves. All companies indicated that they do not include any future mortality improvement in their STAT or TAX valuation assumptions, but about one-half assume future mortality improvement for GAAP.

Most companies indicated that they used the 1994 GAM table since the 2006 survey, likely because the Health Insurance Reserves Model Regulation specifies the 1994 GAM for policies issued after January 1, 2005.

FIGURE 1: VALUATION MORTALITY TABLE

	PERCENT OF RESPONSES		
MORTALITY TABLE ASSUMPTION	STAT	TAX	GAAP
1994 GAM	91%	89%	67%
ANNUITY 2000	0%	0%	33%
2012 INDIVIDUAL ANNUITY MORTALITY	9%	11%	0%

Note:
- Some companies do not hold GAAP reserves.
- 11 responses for STAT; 9 responses for TAX; 6 for GAAP.

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 and TAX lapse rates prior to any NAIC lapse limiting formulas. Companies indicated that they vary their valuation lapse assumptions by issue age, benefit period, coverage type, 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 0.9% for Plan 2. Ultimate lapse rates for the two plans are generally the same as in the 2012 survey. All but one company reported having the same ultimate lapse rate assumption for TAX as STAT. For GAAP, two companies reported having slightly lower ultimate lapse rate assumptions than STAT, while three other companies reported having the same assumptions. Given the consistency of the assumptions between STAT, TAX, and GAAP, Figure 2 only shows the ultimate lapse assumptions for STAT.

FIGURE 2: ULTIMATE LAPSE RATE ASSUMPTION - STAT

	PERCENT OF RESPONSES	
ULTIMATE LAPSE RATES	PLAN 1	PLAN 2
0% - 0.5%	30%	27%
0.51% - 1.0%	40%	45%
1.01% - 1.5%	20%	18%
1.51% - 2.0%	10%	9%
2.01%+	0%	0%

Note:
- 10 responses for Plan 1; 11 responses for Plan 2.
- Percentages may not add to 100% due to rounding.

MORBIDITY

As there is no standardized morbidity table for LTC, companies can set their own assumptions for STAT, TAX, 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 deviations (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	PERCENT OF RESPONSES
COMPANY DATA	36%
CONSULTANT (MAY INCLUDE COMPANY ADJUSTMENTS)	64%

Note: 11 responses.

Provision for adverse deviation

Based on the survey, we found that the use of morbidity PADs varies widely and some companies omit them altogether. The average morbidity PAD was 10.0% for both STAT and TAX. Of the companies that completed the GAAP section, the average morbidity PAD was 8.3%. The morbidity PAD is significantly higher than the 2012 survey, where the average PAD for STAT, TAX, and GAAP was 4.6%, 3.8%, and 4.2%, respectively. It should be noted that there may be additional margins in the reserves due to the prescribed valuation interest rates. The survey results for 2015 are shown in Figure 4.

FIGURE 4: MORBIDITY PROVISION FOR ADVERSE DEVIATION (PAD)

	PERCENT OF RESPONSES		
MORBIDITY PAD (AS % OF INCURRED CLAIMS ESTIMATE)	STAT	TAX	GAAP
0%	30%	25%	33%
1% - 5%	20%	25%	33%
6% - 10%	20%	25%	17%
11%+	30%	25%	17%

Note:
- Some companies do not hold GAAP reserves.
- 10 responses for STAT; 8 responses for TAX; 6 for GAAP.
- Percentages may not add to 100% due to rounding.

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 morbidity improvement. All companies assumed no morbidity improvement for TAX as well. However, one-half of the 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 5 includes a summary of the LAE loads, as a percent of the active life reserves (percent of ALR is generally equivalent to percent of incurred claims).

FIGURE 5: PROVISION FOR LOSS ADJUSTMENT EXPENSE (LAE)

	PERCENT OF RESPONSES		
LAE AS % OF ACTIVE LIFE RESERVES	STAT	TAX	GAAP
0%	73%	78%	17%
0.1% - 2.5%	0%	0%	33%
2.6% - 5.0%	18%	22%	17%
> 5.0%	9%	0%	33%

Note:
- Some companies do not hold GAAP reserves.
- 11 responses for STAT; 9 responses for TAX; 6 for GAAP.

Consistent with the surveys from previous years, most companies omit explicit provisions for LAE in their STAT and TAX active life reserve bases. However, many companies implicitly reflect LAE in their reserve testing analysis, 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 and TAX perspective, most companies surveyed used the prescribed valuation interest rate. As GAAP interest rates vary by company, a summary of GAAP interest rate assumptions is shown in Figure 6.

FIGURE 6: GAAP VALUATION INTEREST RATE

GAAP INTEREST RATE	PERCENT OF RESPONSES
≤ 4.0%	33%
4.01% - 4.99%	33%
5.00% - 5.50%	33%
>= 5.51%	0%

Note:
- 6 responses.
- Percentages may not add to 100% due to rounding.

The average GAAP interest rate was 4.6%. After several years of decreases, this survey's average is the same as the 2012 survey average of 4.6%. In prior surveys, the average interest rate had steadily decreased, going from 6.2% in 2003 to 5.8% in 2006 to 5.5% in 2009 and then 4.6% in 2012.

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 82% 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 uses a methodology to develop active life reserves, assuming 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

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.

RESERVING FOR RATE INCREASES

Companies were asked if they change reserves following a rate increase. Almost all of the companies surveyed indicated that any rate increase was only considered in reserve adequacy testing, and reserve changes occurred only if they were required by the reserve adequacy test. On the GAAP side, all companies indicated that the reserves would not change, as the Securities and Exchange Commission (SEC) has ruled against unlocking the reserves for rate increases on LTC.

SYSTEM

Figure 7 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 7: ALR SYSTEM

SYSTEM	PERCENT OF RESPONSES
HOMEGROWN	21%
COMMERCIAL	79%

Note: 24 responses, includes all companies that responded.

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 19 companies that answered the SBP question, 74% said they followed a simple approach of increasing the reserve by the premium differential. The other companies indicated that they followed a complex calculation of the benefits. A similar response was given for the shared care rider; 80% of the 15 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 8 summarizes the responses for STAT. It should be noted that most companies followed the same approach for GAAP, except for two companies that switched to holding the unearned premium reserve on a gross basis for GAAP.

FIGURE 8: STAT PREMIUM RESERVE METHODOLOGY

METHODOLOGY	PERCENT OF RESPONSES
GROSS	43%
NET	57%

Note: 23 responses, includes all companies that responded.

III. 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
- 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 9 shows the results of the type of active life reserve adequacy testing performed. Fewer companies are doing only GPV compared with the 2012 survey, where 23% of the companies reported being in that category.

FIGURE 9: ALR ADEQUACY TESTING APPROACH

METHOD	PERCENT OF RESPONSES
GPV ONLY	12%
CF TESTING AND GPV	32%
CF TESTING ONLY	56%

Note: 25 responses.

Different approaches are followed for aggregating the reserve testing results. Figure 10 shows the three main approaches companies use for aggregating statutory results. The results are similar to the 2012 survey.

FIGURE 10: LEVEL OF AGGREGATION OF STATUTORY RESERVE TESTING RESULTS

METHOD	PERCENT OF RESPONSES
LTC LINE OF BUSINESS	48%
HEALTH LINES COMBINED	13%
COMPANY LEVEL	39%

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 sometimes 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, 65% of companies responded that they needed to strengthen their STAT reserves at some point and 54% strengthened their GAAP reserves. For STAT reserves, the most common approach was establishing a premium deficiency reserve. There has been an increase in the number of companies that need to strengthen reserves when compared with the 2012 survey. In the 2012 survey, 40% and 44% reported needing to strengthen their STAT and GAAP reserves, respectively.

MONITORING AND UPDATING

The survey asked how often companies monitor morbidity and persistency as well as how often those assumptions are updated. Figure 11 shows how often companies monitor morbidity and persistency. Morbidity is monitored somewhat more frequently than persistency. Both assumptions are being monitored more frequently than reported in the 2012 survey, when morbidity and persistency were reported being monitored monthly by 17% and 4% of the companies, respectively.

FIGURE 11: FREQUENCY OF MONITORING ASSUMPTIONS

FREQUENCY	MORBIDITY	PERSISTENCY
MONTHLY	40%	20%
QUARTERLY	24%	32%
ANNUAL	36%	48%

Note: 25 responses.

The most common approach is to update assumptions on an annual basis. All companies reported that assumptions are changed annually, except for one company that reported changing assumptions on a quarterly basis. Also, over the last two years almost all companies reported making some change to the assumptions, with changes to morbidity, lapse, or mortality assumptions.

MORTALITY

The most common mortality table used in testing the ALR continues to be the 1994 Group Annuity Mortality (GAM) followed by the 2000 Annuity table. This is consistent with the 2012 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. Last, two companies indicate using the 2012 Annuity table. The table in Figure 12 shows the responses.

FIGURE 12: CURRENT MORTALITY ASSUMPTIONS: UNDERLYING TABLE

UNDERLYING TABLE	PERCENT OF RESPONSES
1983 GAM	8%
1994 GAM	48%
2000 ANNUITY	16%
INSURED EXPERIENCE	8%
OTHER*	20%

* Other includes 2008 Valuation Basic Table (VBT), 75-80 Table, 2012 Annuity and the 1983 Individual Annuity Mortality (IAM) Table.
Note: 25 responses.

In addition to the underlying table, 76% of the companies indicated that they apply mortality selection factors. While there is a great deal of variability in the selection factors reported, most start with a factor between 0.20 and 0.35 and grade up over 15 to 20 years. Some companies reported a significantly shorter grading period of only nine years while several extended the period to 25 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 also asked questions about assuming future mortality improvement. Assuming future mortality improvement was indicated by 52% of the companies. Some companies reported using one of the projection scales associated with the underlying tables, such as G or AA, while others reported using a flat amount, such as 0.6% per year. The number of companies assuming mortality improvement increased from the 32% reported in the 2012 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 64% 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 36% of companies reported using this approach. The number of companies explicitly modeling active and disabled mortality increased from the 16% reported in the 2012 survey.

ULTIMATE LAPSE RATES

A summary of ultimate lapse rates assumed in reserve testing is shown in Figure 13. The majority of companies assume a lapse rate in the range of 0.5% to 1%, with the median for the two plans being about 0.9% and 1.0% (generally consistent with the median for the assumptions underlying the ALR calculations for those companies currently selling business). Overall, lapse rates are about the same as the 2012 survey. Seven of the 25 companies reported that they assume a single lapse rate that only varies by duration (and premium payment option). The other companies indicated that they vary their lapse assumptions by product, benefit period, issue age, marital status, and inflation option. 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

Five companies reported different ultimate lapse rates between the two plans.

FIGURE 13: ULTIMATE LAPSE RATE ASSUMPTION

ULTIMATE LAPSE RATE	PLAN 1	PLAN 2
0% - 0.5%	17%	17%
0.51% - 1.0%	46%	54%
1.01% - 1.5%	21%	21%
1.51% - 2.0%	13%	8%
2.01%+	4%	0%
MEDIAN	1.0%	0.9%

Note:
- 24 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 that 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 4.5% to 6.4% with an average of 5.3%. For testing GAAP reserves, the single rate was higher, ranging from 4.8% to 6.5% with an average of 5.5%. For companies that provided responses for GAAP, a few used higher GAAP interest rates than STAT. In general, the rates are consistent with the 2012 survey.

MORBIDITY

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

- Morbidity sources
- Provision for adverse deviations (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 14. 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 14: SOURCE OF MORBIDITY ASSUMPTION

MORBIDITY SOURCES	PERCENT OF RESPONSES
COMPANY DATA	52%
EXTERNAL SOURCES (MAY INCLUDE COMPANY ADJUSTMENTS)	48%

Note: 25 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, 11 out of 25 companies included a PAD. All but one company that reported having a PAD for testing STAT reserves also had a PAD when testing its GAAP reserves. The use of PADs increased from the 2012 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, nine out of 25 companies reported including an assumption for future morbidity improvement. The level of morbidity improvement ranged from 0.4% to 1.6% per year, for generally 10 to 15 years, although a couple companies assumed morbidity improvement for 25 to 30 years. For testing of GAAP reserves, two 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 is consistent with the 2012 survey.

Most companies that include an assumption for future morbidity improvement assume both future mortality and morbidity improvement. Four companies only assume mortality improvement. None reported assuming only morbidity improvement.

Utilization assumption

In this year's survey, we added a section asking about utilization (or salvage) assumptions. 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%, suggesting that overall utilization may be decreasing for a plan that includes a 5% compound inflation benefit. Most companies either assume that utilization stays constant in the future (i.e., assume future inflation equals the contractual rate) or assume a 5% level of future inflation. 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. Also, a few companies dynamically link the LTC inflation assumption to the interest rate environment. The assumptions used were consistent between GAAP and STAT.

FUTURE RATE INCREASES

The survey asked if future rate increases were assumed in reserve testing. Most companies reflected future increased premium for rate increases that were approved but not yet implemented. For future increases, there is a wide range of assumptions. For those assuming future increases, most assume one future round of filings, although a few assumed multiple rounds.

IV. 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:

- Continuance tables and related reserve methodologies
  - Data sources
  - Continuance 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 continuance table approach when establishing the claim reserve for known claims as opposed to using a completion factor method or some other methodology.

Data sources

Figure 15 shows the source of the continuance 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 with the 2012 survey, more companies are now using external sources rather than relying solely on the company's own data.

FIGURE 15: CONTINUANCE TABLE DATA SOURCES

DATA SOURCE	PERCENT OF RESPONSES
COMPANY DATA	32%
EXTERNAL SOURCES	68%

Note: 25 responses.

About 60% of companies indicated that they update the continuance tables at least annually. The remainder responded that they perform an update less frequently, which is a noticeable shift from the prior study, where only about 40% of the companies indicated they update the continuance tables at least annually. Also, almost all companies indicated that the updates were showing longer lengths of stay.

Continuance table variables

Figure 16 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. There was a small increase for all but Benefit Period (BP remained level) in the number of companies using each variable listed in Figure 16. This may indicate that companies are developing more sophisticated and detailed assumptions as they try to develop better claim reserve estimates.

FIGURE 16: CONTINUANCE TABLE VARIABLES

VARIABLE	PERCENT OF RESPONSES
AGE	96%
GENDER	92%
CARE SETTING	76%
BENEFIT PERIOD	44%
DIAGNOSIS	20%

Note: Companies can indicate more than one variable. There were 25 responses.

Future transfer methodology

Figure 17 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 17). For the companies that do vary the continuance tables by care setting, the majority also account for transfers. This is a change from the 2012 survey, where the majority did not account for transfers.

FIGURE 17: FUTURE TRANSFER METHODOLOGY

METHODOLOGY	PERCENT OF RESPONSES
TRANSFERS NOT REFLECTED	42%
EXPLICIT ADJUSTMENT	37%
IMPLICIT ADJUSTMENT	21%

Note: 19 responses.

To demonstrate the care setting transfer issue, consider the following example. A carrier may offer home care-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 18. 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 18: WAIVER OF PREMIUM METHODOLOGY

METHODOLOGY	PERCENT OF RESPONSES
WAIVER REFLECTED IN DLR	80%
WAIVER NOT REFLECTED IN DLR	20%

Note: 25 responses.

Utilization adjustments

As shown in Figure 19, the vast majority of companies make explicit utilization adjustments in their claim reserve calculations. The number of companies that made an explicit utilization adjustment increased from the 2012 survey, where only about two-thirds made an adjustment. 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.

FIGURE 19: UTILIZATION METHODOLOGY

METHODOLOGY	PERCENT OF RESPONSES
NOT REFLECTED	20%
SERIATIM	36%
AGGREGATE	44%

Note: 25 responses.

EXPLICIT PROVISIONS FOR ADVERSE DEVIATION

Most companies do not include explicit PAD in the DLR calculation. The survey results are contained in Figure 20.

FIGURE 20: STATUTORY RESERVE PAD

PAD AS % OF DLR	PERCENT OF RESPONSES
0%	72%
1% - 5%	24%
6% - 10%	4%

Note: 25 responses.

The results in this year's survey are consistent with the 2012 survey. Survey results also indicated that the PAD on a TAX basis was equal to the STAT basis. In addition, GAAP was equivalent to STAT, except for one company, which did not use a GAAP PAD.

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 21.

FIGURE 21: LOSS ADJUSTMENT EXPENSE (LAE) PERCENTAGE

	INDIVIDUAL COMPANIES		
LAE (AS % OF DLR AND IBNR)	STAT	TAX	GAAP
0%	5%	6%	0%
0.1% - 2.5%	36%	29%	33%
2.6% - 5.0%	50%	53%	67%
> 5.0%	9%	12%	0%

Note: 22 responses for STAT, 17 for TAX, and 15 for GAAP.

Average LAE held on a STAT basis is 2.9%, which is slightly lower than the 2012 survey's 3.2% average. Almost all companies held the same level of LAE for STAT, TAX, and GAAP. Differences in the percentage mix in Figure 21 are due to the mix of companies responding to STAT, TAX, and GAAP. Unlike the case with ALR reserves, where most companies only load GAAP ALR reserves for the LAE liability, most companies load all three DLR bases (STAT, TAX, and GAAP) for LAE.

INCURRED BUT NOT REPORTED METHODOLOGY

The table in Figure 22 indicates the approach taken by companies with respect to their incurred but not reported (IBNR) calculation. 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 22, the "other" approaches include a combination of the completion method and loss ratio approaches or high-level estimation. The responses are fairly consistent with prior surveys.

FIGURE 22: IBNR METHODOLOGY

METHODOLOGY	PERCENT OF RESPONSES
COMPLETION / TRIANGLE APPROACH	40%
LOSS RATIO / % OF PREMIUM OR EXPECTED CLAIMS	12%
COMBINATION OF COMPLETION AND LOSS RATIO	12%
OTHER	36%

Note: 25 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 (64% of the 22 responses) indicated that these tests were performed annually while others were more frequent (9% reported quarterly and 27% reported monthly). Compared with the 2012 survey, more companies do monthly testing and fewer do quarterly testing. The number of companies that do annual testing was about the same.

SYSTEM

Figure 23 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 2012 survey, two companies switched from a homegrown system to a commercial system. No companies switched from commercial system to homegrown.

FIGURE 23: DLR SYSTEM

SYSTEM	PERCENT OF RESPONSES
HOMEGROWN	48%
COMMERCIAL	52%

Note: 25 responses.

The use of homegrown systems is more common for DLRs than ALRs. Seven 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). Some mentioned that they did not make any adjustment, as these benefits are quite rare and immaterial.

For shared care benefits, 67% of the 18 companies that responded indicated that they adjust the claim reserve to account for shared care benefits. The most common approach to accounting for shared care benefits was to assume that the full benefit period of both spouses was available to the current claimant. The number of companies that explicitly model shared care benefits has increased substantially from the 2012 survey, where only 41% reported making an explicit adjustment.

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 24 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 24: CLAIMS DURING THE ELIMINATION PERIOD

APPROACH	PERCENT OF RESPONSES
EXPLICITLY ACCOUNTED FOR IN DLR	60%
IMPLICITLY INCLUDED IN IBNR	40%

Note: 25 responses.

The majority of companies also explicitly reserve for pending claims. 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 claims will be approved. Compared with the 2012 survey, more companies are explicitly accounting for pending claims in the DLR reserves.

FIGURE 25: PENDING CLAIMS WAITING FOR APPROVAL

APPROACH	PERCENT OF RESPONSES
EXPLICITLY ACCOUNTED FOR IN DLR	68%
IMPLICITLY INCLUDED IN IBNR	32%

Note: 25 responses.

Figure 26 shows that about half of the companies establish a claim reserve for closed claims that may reopen. 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 a separate calculation to hold a reserve for those types of claims. A few indicated that those types of claims are covered in the general IBNR. This result is consistent with the 2012 survey.

FIGURE 26: CLOSED CLAIMS THAT MAY REOPEN

APPROACH	PERCENT OF RESPONSES
NOT REFLECTED	52%
SOME ADJUSTMENT MADE	48%

Note: 23 responses.

Figure 27 shows that most companies, but fewer than in the 2012 survey, do not make any adjustment for claims that are known to be in a final payment status. 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 27: CLAIMS IN FINAL PAYMENT STATUS

APPROACH	PERCENT OF RESPONSES
NO ADJUSTMENT	67%
SOME ADJUSTMENT MADE	33%

Note: 23 responses.

V. 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 28 summarizes the average asset allocation by different asset classes and compares the responses from this year's survey with the 2012 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 a greater proportion of risky assets. Since the 2012 survey, the asset allocation has been fairly consistent. There has been a slight decrease in corporate bonds and an increase in mortgages. 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 28: ASSET ALLOCATION

ASSET CLASS	2012 SURVEY	2015 SURVEY	CHANGE
TREASURIES	4.8%	4.8%	0.0%
AAA BONDS	4.5%	1.9%	-2.6%
AA BONDS	8.3%	7.6%	-0.7%
A BONDS	31.7%	27.3%	-4.4%
BBB BONDS	23.3%	26.0%	2.7%
BB AND LOWER	4.9%	5.1%	0.2%
PREFERRED STOCK	0.1%	0.5%	0.4%
COMMON STOCK	0.7%	1.4%	0.7%
REAL ESTATE	1.0%	0.5%	-0.5%
MORTGAGES	5.8%	10.5%	4.7%
OTHER	14.8%	14.4%	-0.4%

Note: 20 responses for the 2015 survey and 23 responses for the 2012 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. The additional yield from those more risky assets is therefore reduced by the additional cost of capital for holding those assets as well as the higher default risk.

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 20 responses, the duration ranged from 3.7 to 15.5 years, with an average of 10.3 years. However, most responses (85% of 20 companies) fell within the range of eight to 12 years. Compared with the 2012 survey, the average duration decreased slightly. The 2012 survey reported an average duration of 11.1 years.

CURRENT PORTFOLIO YIELD

Figure 29 shows the current portfolio yields of the 20 companies that responded. The average yield was 5.4% and ranged between 3.5% and 6.9%. Overall, the average yield declined from 5.7% in the 2012 survey.

FIGURE 29: CURRENT PORTFOLIO YIELD

YIELD	PERCENT OF RESPONSES
<=4.50%	15%
4.51% TO 5.00%	15%
5.01% TO 5.50%	25%
5.51% TO 6.00%	20%
> 6.00%	25%

Note: 20 responses.

CURRENT PRICING INTEREST RATE ASSUMPTION

Figure 30 shows the current pricing interest rate assumptions for only the companies that are currently selling LTC insurance. The average response was 4.6% and ranged from 3.3% to 5.7%. Compared with the 2012 survey, the average pricing interest rate decreased from 5.3%. In today's low interest rate environment, the pricing interest rate, as expected, is lower than the actual portfolio rate.

FIGURE 30: CURRENT PRICING INTEREST RATE ASSUMPTION

ASSUMPTION	PERCENT OF RESPONSES
<=4.00%	40%
4.01% TO 4.50%	20%
4.51% TO 5.00%	0%
5.01% TO 5.50%	30%
> 5.50%	10%

INTEREST RATE HEDGING APPROACH

The survey also asked about use of any interest rate hedging strategies, either internally between various product lines or with external parties. The majority of companies (80% of the 25 responses) do not utilize any form of interest rate hedging. Five companies use an external hedge, such as an interest rate swap. One company uses both an internal hedge between different product lines as well as an external hedge. This is generally consistent with the 2012 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 31: INTEREST RATE HEDGING APPROACH

APPROACH	PERCENT OF RESPONSES
DO NOT HEDGE	80%
INTERNAL AND EXTERNAL HEDGE	4%
EXTERNAL HEDGE	16%

APPENDIX A

LIST OF PARTICIPATING COMPANIES

Bankers Life & Casualty Company

Berkshire Life Insurance Company of America

CMFG Life

CNA

Genworth

Great American Insurance Group

John Hancock

Knights of Columbus

LifeSecure

MedAmerica Insurance Company

Metropolitan Life Insurance Company

Minnesota Life Insurance Company

Mutual of Omaha

New York Life

Northwestern Mutual

Physicians Mutual Insurance Company

Prudential Financial

RiverSource Life Insurance Company

Senior Health Insurance Company of Pennsylvania

State Farm Mutual Automobile Insurance Co.

Thrivent Financial

Union Fidelity Life Insurance Company

United Security Assurance Company of PA

Universal American

Unum

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