



Individual Disability Claim Termination Trends 1990–2007 Relative to the 2013 IDI Valuation Base Table



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About the Society of Actuaries

The Society of Actuaries Health Section engaged Milliman, Inc. to analyze industry individual disability income claim incidence and termination experience trends relative to the 2013 IDI Valuation Table base incidence and termination rates. This report discusses claim termination trends. A separate report covers claim incidence trends. This report is intended for the benefit of the Society of Actuaries. Although the author understands that these reports will be made widely available to third parties, Milliman does not assume any duty or liability to such third parties with its work. In particular, the results in this report are technical in nature and are dependent on certain assumptions and methods. No party should rely upon these results without a thorough understanding of those assumptions and methods. Such an understanding may require consultation with qualified professionals. This report should be distributed and reviewed only in its entirety.

Section 1: Introduction

1.1 Background

In March 2013, the Individual Disability Experience Committee (IDEC) of the Society of Actuaries (SOA) published a report analyzing the industry individual disability income (IDI) claim incidence and termination experience trends relative to the 1985 Commissioner's Individual Disability Tables A and C (CIDA, CIDC)¹ The claim termination database developed by the IDEC for this report covered years 1990 to 2007. The claim incidence database covered years 1990 to 2006. The IDEC claim incidence and termination databases served as the data sources for industry experience for the development of the 2013 IDI Valuation Table (2013 IDIVT), which was approved by the National Association of Insurance Commissioners (NAIC) in August 2016 to replace the CIDA and CIDC tables as statutory minimum reserve morbidity bases for IDI. The Individual Tables Working Group (IDTWG), which was a joint working group sponsored by the SOA and the American Academy of Actuaries, developed the 2013 IDIVT. The 2013 IDIVT is described in the December 2015 IDTWG Report.² The IDTWG also prepared a workbook, referred to as the 2013 IDIVT Workbook, that calculates IDI claim costs, net premiums, active life reserves and disabled life reserves using the 2013 IDIVT and compares these values to those based on CIDA and CIDC.³

1.2 Scope and Purpose

This report studies industry IDI claim termination trends relative to the 2013 IDIVT claim termination “base” rates, that is, the “expected” basis, before the application of margins and claim termination rate (CTR) modifiers for contract type, benefit period, cost-of-living adjusted benefits and diagnosis. The 2013 IDIVT models average industry experience from 1990 through 2007. The purpose of this analysis is to quantify how experience varied from the expected basis over time for key subsets of the business. Although the IDTWG performed some of this type of analysis when the 2013 IDIVT was constructed, this report provides a more comprehensive analysis. The results provide insight into the nature of the IDI risk and the underlying CTR trends from 1990 through 2007.

The SOA has recently released a companion report by the author that studied IDI claim incidence trends from 1990 through 2006 (“the IDI Claim Incidence Trend Report”).⁴ Also, the IDEC is presently studying industry IDI claim experience for years 2006 through 2015 and plans to release the results of this study in late 2018. It will be worthwhile to observe whether claim trends discussed in this report and the IDI Claim Incidence Trend Report, particularly during the 2000–2007 study period, have continued or diverged significantly.

The 2013 IDIVT base CTRs vary by elimination period, occupation class, age at disablement, gender and claim duration. By definition, the base CTRs do not include explicit margins. Also, the base CTRs do not include certain CTR modifiers, which are adjustments to the 2013 IDIVT base termination rates to reflect differences by contract type, benefit period, the presence of cost-of-living riders and diagnosis, which are required for the purpose of valuing statutory minimum claim reserves. The CTR modifiers are described in more detail in the December 2015 IDTWG Report. In creating these modifiers, the IDTWG balanced the need to reflect significant experience differences with the need to keep the modifications manageable, since companies must make modifications to incorporate them into their valuation systems. By comparing industry experience to the 2013 IDIVT base CTRs before the noted modifiers are applied, we are able to observe differences in experience in more detail than if the CTR modifiers were included. Appendix A provides the 2013 IDI Valuation Table CTR modifiers as a reference.

The 2013 IDEC Report provides similar analysis about the 1990–2006 industry claim incidence experience but relative to the 1985 CIDA table. The 1985 CIDA table is based on industry experience in the late 1970s and thus does not capture many of the changes in marketing, underwriting, products and claim management that have emerged since 1990. The 2013 IDIVT, on the other hand,

¹ Report of the Individual Disability Experience Committee Analysis of Experience from 1990 to 2007, Society of Actuaries, March 2011, <https://www.soa.org/experience-studies/2011/hlth-1990-99-individual-disability-experience-committee-report/>

² Report of the Individual Disability Tables Work Group of the Academy of Actuaries and the SOA, December 2015, http://actuary.org/files/IDTWG_Table_Report_121915_0.pdf.

³ 2013 IDI Valuation Table Workbook, Version 1.3, <http://www.actuary.org/content/2013-idi-valuation-table-workbook-version-13>.

⁴ Individual Claim Incidence Trends, 1997–2006, Relative to the IDI Valuation Base Table, Society of Actuaries, January 2018, <https://www.soa.org/resources/research-reports/2018/analysis-disability-income/>.

represents average industry experience from 1990 to 2007. The 2013 IDIVT also introduced a new occupation class for all medical-related occupations that was not in the 1985 CIDA table.

Claim termination rate experience in this report is measured primarily in terms of actual-to-expected (A/E) CTR ratios, where the expected basis is the 2013 IDIVT base CTRs. An A/E CTR ratio that is at least 100% means that the underlying CTR experience was more favorable, that is, led to more claim terminations, than the 2013 IDIVT base CTRs would have predicted. Likewise, an A/E CTR ratio that is less than 100% means that the underlying CTR experience was less favorable, that is, led to fewer claim terminations, than the 2013 IDIVT base CTRs would have predicted.

The focus of this report is the identification of trends in A/E CTR ratios over time. The reader should keep in mind that five more companies contributed to the collection of the data for the 2000 to 2007 study period than for the 1990 to 1999 period. Although all of the original contributors for the earlier study period continued to contribute data for the latter period, the additional companies could have caused some distortion in the trend analysis. In addition, while performing the analysis for this report, some differences in the coding of claim characteristics among the contributors were observed. Because of the age of the databases and the use of different data processors for the two study periods, the contributors that have created the discrepancies could not be identified, and, consequently, the data could not be revised retroactively.

This report comprises the following sections:

Section 1 Introduction

Section 2 Highlights of Claim Termination Trends

This section summarizes the significant claim termination trends relative to the 2013 IDIVT base CTRs discussed in Sections 3. These trends are primarily illustrated by graphs, whereas trends in Sections 3 and 4 are illustrated using tables.

Section 3 A/E Claim Termination Trends

This section primarily discusses how CTRs have changed during three study periods, 1990–1994, 1995–1999 and 2000–2007. Claim termination trends are studied by contract, occupation class, gender, market, elimination period, attained age, benefit period and state of issue. Most of the analysis pertains only to claims from Accident and Sickness policies, that is, excluding business policies such as Overhead Expense, Disability Buy Out and Key Person. However, this section also examines claim termination experience of Overhead Expense claims relative to the 2013 IDIVT and compares it to that of Accident and Sickness claims with similar short-term maximum benefit periods. This section provides a high-level review of CTR trends during the ultimate claim durations (i.e., 11+ years of disablement). However, because of limitations in available data for this report, the analysis of CTR trends in the ultimate claim durations is limited in scope.

Section 4 The Potential Impact of 2000–2007 CTR Experience on Claim Reserves

This section discusses the potential impact on claim reserves based on the 2000–2007 study period. Experience-based claim reserves for key product features are compared to claim reserves based on 100% of the 2013 IDIVT CTRs after the application of the CTR modifiers. This section is not intended to be a comprehensive analysis of potential changes in claim reserves but rather to illustrate how claim reserves might change if based on trended experience arising during the 2000–2007 study period.

Appendix A 2013 IDI Valuation Table Claim Termination Rate Modifiers

Appendix A provides the CTR modifiers from the 2013 IDI Valuation Table for reference that are analyzed in this report. CTR modifiers by diagnosis are not included in order to have a database for this analysis that was manageable size.

Appendix B A/E Claim Termination Rate Ratio Detail by State

Appendix B provides exposure and claim terminations by state of issue.

1.3 Qualifications

I, Robert W. Beal, am a consulting actuary for Milliman Inc. This report provides an opinion regarding trends in IDI claims termination rates. I am a member of the American Academy of Actuaries and meet its qualification standards for rendering this report and the opinions contained within the report.

1.4 Acknowledgments

The author would like to give thanks and appreciation to the Project Oversight Group, which helped oversee this report, for their time and expertise. The members of the Project Oversight Group are:

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Bram Spector

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Section 2: Highlights of Claim Termination Rate Trends

This section highlights some of the more significant CTR trends discussed in Section 3 and discusses their implications with respect to changes in the nature of the IDI risk over time.

2.1 Background

The IDEC claim database is separated into the following contract types:

- **Accident and Sickness (AS)**—Personal IDI policies that make up the large majority of the IDI experience. Elimination periods range from 0 days to 2 years, and benefit periods range from short term, such as 24 months, to a specific age, such as 65, or lifetime.
- **Overhead Expense (OE)**—IDI policies that reimburses business owners for overhead expenses incurred while they are disabled. These policies typically have short elimination periods, such as 30 days or fewer, and short benefit periods, such as 24 months or fewer.
- **Disability Buyout (DBO)**—IDI policies that typically provide lump sum benefits at the end of long elimination periods, such as at least one year, to business owners for the purpose of buying out the business share of a disabled partner.
- **Key Person (KP)**—IDI policies that provide monthly benefits to a business to compensate for losses resulting from a key person being disabled. Like OE policies, KP policies typically have short elimination periods and benefit periods.

The 2013 IDIVT base CTRs, which form the expected basis for the A/E CTR ratios discussed in this report, were developed from the CTR experience of AS claims. Consequently, most of the analysis in this report pertains solely to AS claims, although OE CTR experience is examined and compared to that of AS claims with short-term BPs. There is no analysis of CTR trends pertaining to DBO and KP claims.

The claim durations during the first 10 years (120 claim months) are referred to as the “select” durations, and those after the first 10 years are referred to as the “ultimate” durations. In all the analyses in this report (except analysis by state of issue), claims experience during claim months 25–30 and attained ages 65–69 have been excluded to be consistent with the construction of the 2013 IDIVT base CTRs. Claims in claim months 25–30 were excluded to remove the impact of terminations due to the end of “own occupation” periods in the definitions of disability, which often occur during these months. Claims with attained ages 65–69 were excluded because the IDTWG concluded that the actual CTR experience appeared to include a number of claims that terminated as the BPs expired but were not flagged as such.

Much of the analysis separates the 1990–2007 study period into three smaller study periods—1990–1994, 1995–1999 and 2000–2007—to observe how CTR experience has been changing over time relative to the 2013 IDIVT. CTR experience from the two earlier study periods is based on the industry data that the IDEC collected for its 2005 report. The CTR experience from the most recent study period is based on the additional industry data from five companies that the IDEC collected for its 2013 report. Although the A/E CTR ratios during the first two study periods were included in the 2013 IDIVT development, the experience during the 2000–2007 period may be the most relevant to the claim experience that has emerged over the last 10 years. As discussed in the Introduction, the IDEC is collecting industry IDI data from 2006 through 2015 and plans to report experience relative to the 2013 IDIVT by the end of 2018 or early 2019.

2.2 Summary

The following points summarize key findings and conclusions, which are discussed in more detail below and in Sections 3 and 4:

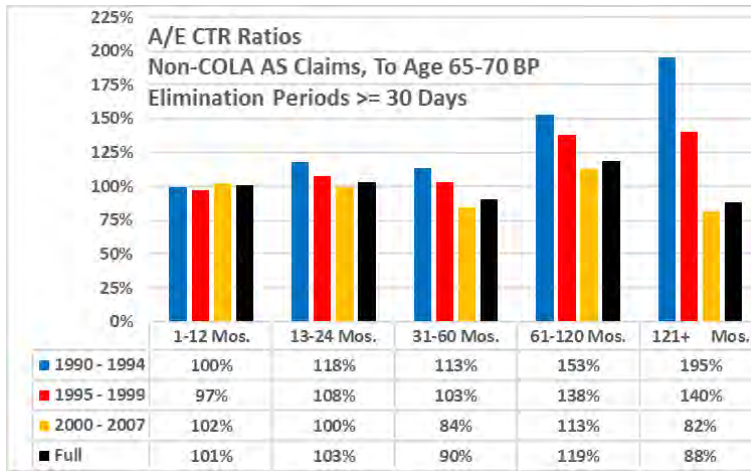
1. Overall, the 2013 IDIVT CTRs are a good fit of industry experience over the full study period (1990–2007) for elimination periods of 30 days and more. However, the 2013 IDIVT CTRs appear to understate the CTR experience for elimination periods less than 30 days and the blue-collar occupation classes (3 and 4).
2. Overall, the A/E CTR ratios during the first 12 claim months did not change significantly over successive study periods. On the other hand, the A/E CTR ratios during select claim durations after the first 12 months have decreased in successive study periods.
3. Similarly, the A/E CTR ratios in the ultimate claim durations have decreased substantially in the 2000–2007 study period. This trend is apparent in all attained age groupings. The 2000–2007 study period is more credible and includes more data than the first two study periods combined. The 2018 IDEC study of industry claim experience from 2006 through 2015 should provide considerably more insight into the emerging claim trends in the ultimate claim durations.
4. Lower A/E CTR ratios attributable to claims with COLA benefits or the lifetime benefit period were observed in all three study periods.
5. OE claims experience has significantly different CTR patterns than short-term AS claims with lower A/E CTR ratios in the first claim year but significantly higher ratios in the second year.
6. Four of the 10 states that were identified with the highest A/E incidence rates in the IDI Claim Incidence Trend report (Florida, Arizona, New Mexico and Montana) were among the 10 states with the lowest A/E CTR ratios.
7. Any variations in claim experience by state in future changes to the IDI valuation table should take into account both claim incidence and CTR experience to obtain the fairest profile of experience by state. For example, Rhode Island, which had the highest claim incidence by state, had the highest A/E CTR ratios among the states.
8. The 2000–2007 CTR experience could require higher experience-based claim reserves than those generated by the 2013 IDIVT CTRs, particularly for claims with the lifetime BP and claims with COLA benefits. The magnitude of the increase differ depending on occupation class, benefit period, presence of COLA benefits and gender.
9. Future revisions to the CTR modifiers to the valuation table may need to have greater variation among the occupation classes and the combinations of lifetime and COLA benefits.

2.3 Trends by Claim Duration

The analysis begins with AS claims with To Age 65–70 benefit periods (BPs) without cost-of-living adjustment (COLA) benefits, which were the claims used to construct the 2013 IDIVT base CTRs. The aggregate A/E CTR ratio for these claims over the full study period (1990–2007) for all select durations combined is 101.2%.

Figure 2.1 compares the A/E CTR ratios by claim duration groupings over three study periods, 1990–1994, 1995–1999 and 2000–2007, and the full study period, 1990–2007, for AS claims with To Age 65–70 BP and EP \geq 30 days. The claims in Figure 2.1 exclude claims with lifetime or short-term benefit periods to remove the potential impact on A/E CTR ratios. In addition, Figure 2.1 excludes claims with elimination periods less than 30 days for reasons that are discussed below.

Figure 2.1



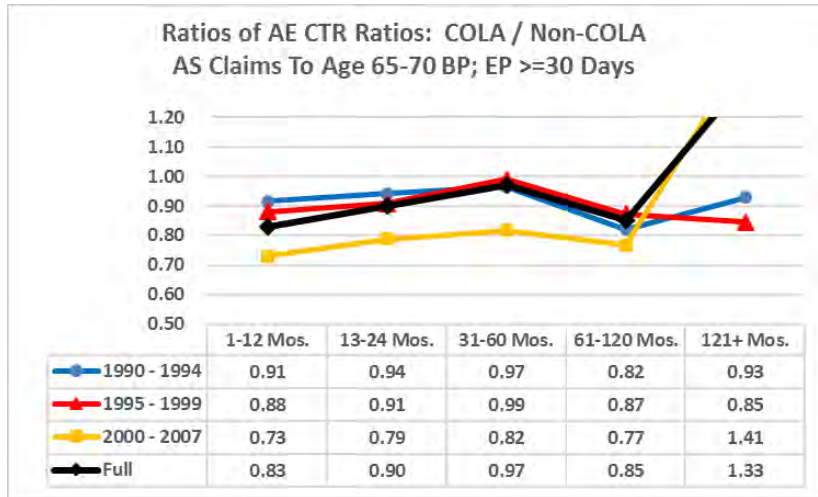
During the first 12 claim months, the A/E CTR ratios are quite close to 100% over all study periods. However, reductions in the A/E CTR ratios occurred after the first claim year in successive study periods. During the second 12 claim months, the A/E CTR ratios are higher than 100% prior to 2000 but remain close to 100% in the 2000–2007 study period. During claim months 31–60, the A/E CTR ratios over the 2000–2007 period drop to 84% but recover in months 61–120 to 113%.

The A/E CTR ratio in the ultimate durations dropped to 82% during the 2000–2007 study period. Trends by attained age in the ultimate claim durations are discussed at the end of this section. The upcoming 2018 IDEC study, which will study industry experience from 2006 through 2015, should shed considerably more light on the emergence of the CTRs in the ultimate durations. It is reasonable to expect continued downward pressure on the CTRs in the ultimate claim durations, particularly at the higher attained ages, as a result of ongoing mortality improvements.

2.4 Impact of COLA Benefits on CTRs

The presence of COLA benefits produces lower A/E CTR ratios in all three study periods. Figure 2.2 shows the ratios by study period obtained by dividing the A/E CTR ratios for claims with COLA benefits by the A/E CTR ratios for claims with no COLA benefits. Like Figure 2.1, claims represented in Figure 2.2 exclude those with lifetime or short-term benefit periods, as well as all claims with elimination periods less than 30 days. These ratios measure the impact of COLA benefits on CTRs. The 2000–2007 ratios are the lowest among the three study periods. During the 2000–2007 study period, the A/E CTR ratios in the ultimate claim durations for COLA claims exceed those for non-COLA claims, which did not occur during the two earlier study periods. The 2013 IDIVT CTR modifiers for COLA claims apply only to the select durations and are set to 100% in the ultimate durations.

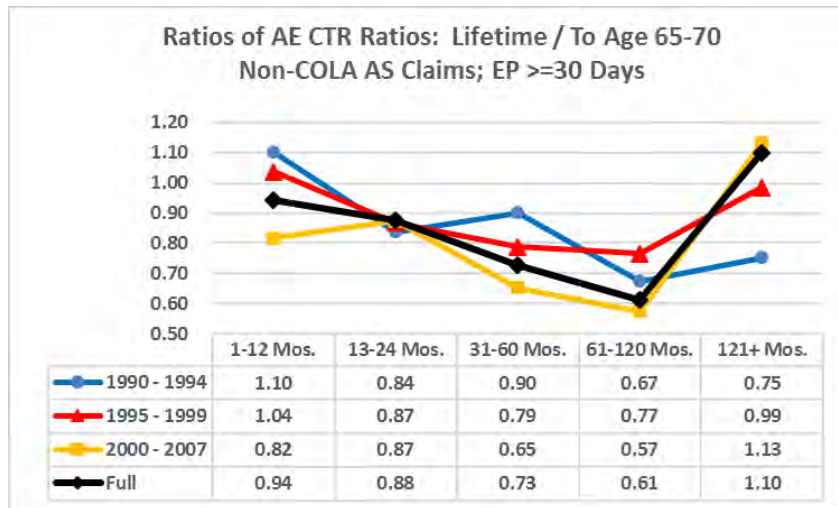
Figure 2.2



2.5 Trends by Benefit Period

Claims with a lifetime BP generally have CTRs lower than those for claims with To Age 65–70 BPs, while claims with short-term BPs generally have higher CTRs. Figure 2.3 compares the ratios derived by dividing A/E CTR ratios for lifetime claims by the A/E CTR ratios for To Age 65–70 claims by study period. COLA claims are excluded in Figure 3 to remove the potential distortion of the A/E CTR ratios. Like Figures 2.1 and 2.2, claims with elimination periods less than 30 days have been excluded.

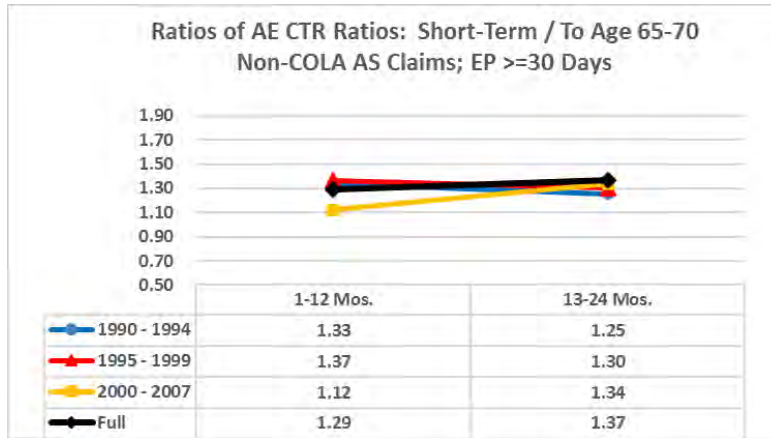
Figure 2.3



Each study period shows lower A/E CTR ratios for lifetime claims, although lower lifetime A/E CTR ratios during the first claim year is observed only in the 2000–2007 study period. In general, the 2000–2007 ratios are the lowest among the three study periods. During the select claim durations, the difference between lifetime and To Age 65–70 A/E CTR ratios appear to widen as the claim durations increase. Lower A/E CTR ratios for claims with the lifetime BP are not observed in the ultimate claim durations during the 2000–2007 study period. It should be noted that the 2013 IDIVT CTR modifiers for lifetime claims apply only to the select durations and are set to 100% in the ultimate durations.

Figure 2.4 compares the ratios derived by dividing A/E CTR ratios for short-term claims by the A/E CTR ratios for To Age 65–70 claims with non-COLA benefits by study period.

Figure 2.4

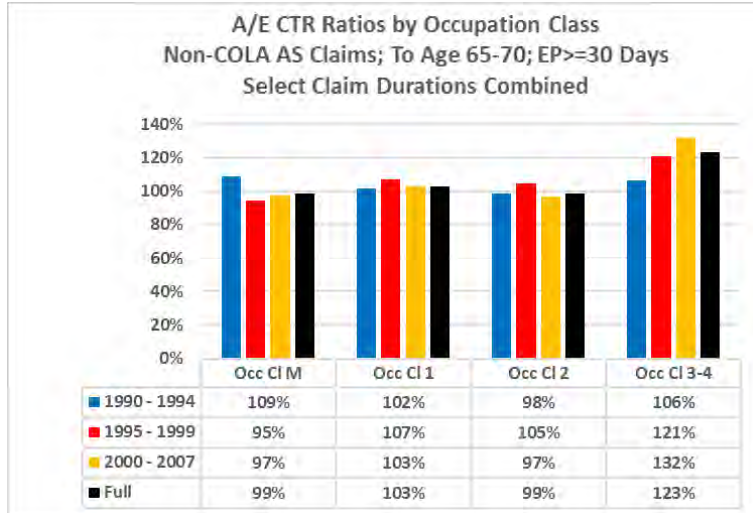


The A/E CTR ratios for short-term claims during the first two claim years are significantly higher than A/E CTR ratios for To Age 65–70 claims. The pattern of ratios is generally consistent by study period and claim year, although the first year ratio dropped noticeably during the 2000–2007 study period.

2.6 Trends by Occupation Class

Figure 2.5 shows the A/E CTR ratios by occupation class for the various study periods. Claims are limited to non-COLA claims with the To Age 65–70 BPs and elimination periods of 30 days or more. For this analysis the “blue-collar” occupation classes 3 and 4 have been combined into one occupation class labeled “3–4.” Results in Figure 2.5 are limited to the select claim durations.

Figure 2.5

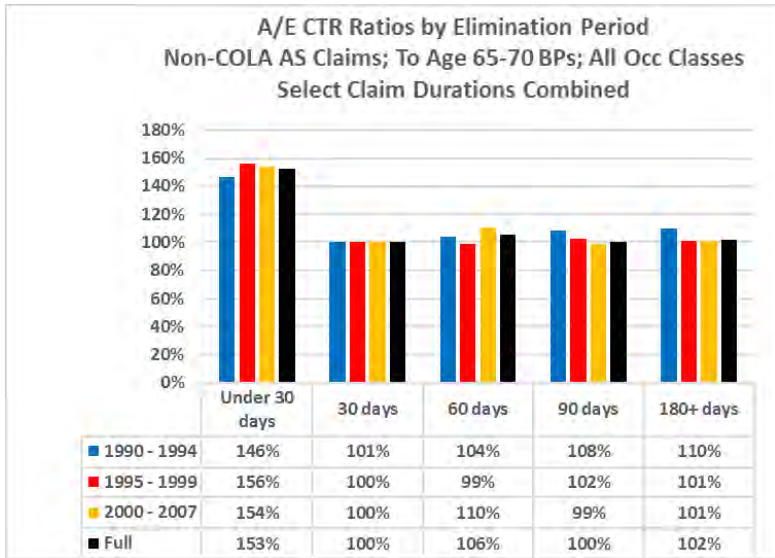


The A/E CTR ratios for occupation class M, that is, the medical occupations, show a significant drop between the 1990–1994 period and the 1995–1999 period, followed by a small improvement during the 2000–2007 period. The A/E CTR ratios for occupation class 1, that is, nonmedical executive, professional and white-collar, and occupation class 2, that is, skilled occupations, drop in the 2000–2007 period but remain close to 100%. The A/E CTR ratios for occupation class 3–4 show a steady improvement by study period. It also appears that the 2013 IDIVT may be understating the CTRs in occupation class 3–4.

2.7 Trends by Elimination Period

Figure 2.6 compares the A/E CTR ratios by elimination period by study period for non-COLA claims with To Age 65–70 maximum benefit periods. The claim durations are limited to the select durations.

Figure 2.6

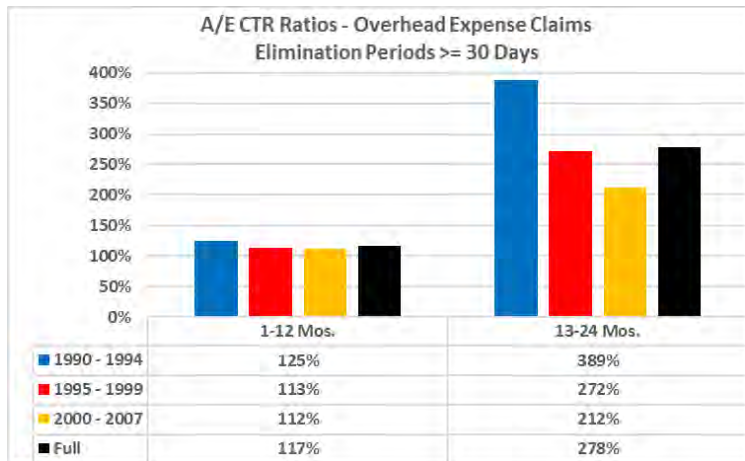


Following the 1990–1994 study period, A/E CTR ratios by elimination period are relatively stable when all select claim durations are combined. The A/E CTR ratios for elimination periods less than 30 days are close to 150% in all study periods, which indicates that the 2013 IDIVT may have significantly understated the CTRs for those elimination periods. As a result, claims with elimination periods less than 30 days have been excluded from the analyses in this report, unless EP is the parameter being examined.

2.8 Trends for Overhead Expense Claims

OE policies have short benefit periods, typically two years or shorter. OE claims show a pattern that is distinct from short-term AS claims, as seen in Figure 2.7.

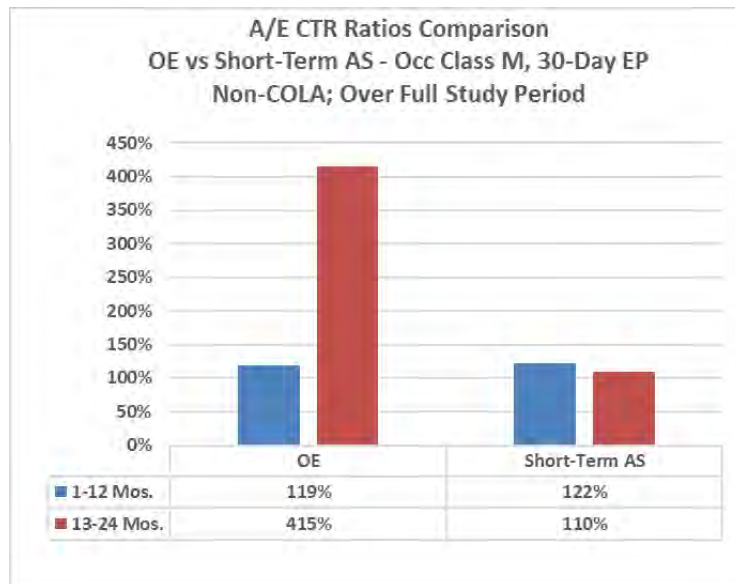
Figure 2.7



During the first claim year, A/E CTR ratios for OE claims are very close to those for AS claims with To Age 65–70 BPs. However, the OE A/E CTR ratios jump in the second claim year to levels much higher than observed with short-term AS claims, although these ratios drop in successive study periods. It is possible that the high OE A/E CTR ratios in the second year are attributable to a number of OE claimants selling their practices.

Figure 2.8 compares the A/E CTR ratios over the full study period between OE and short-term AS claims with no COLA benefits. The comparison is limited to occupation classes M and claims with the 30-day elimination period. The jump in the second year OE CTR ratios is substantial.

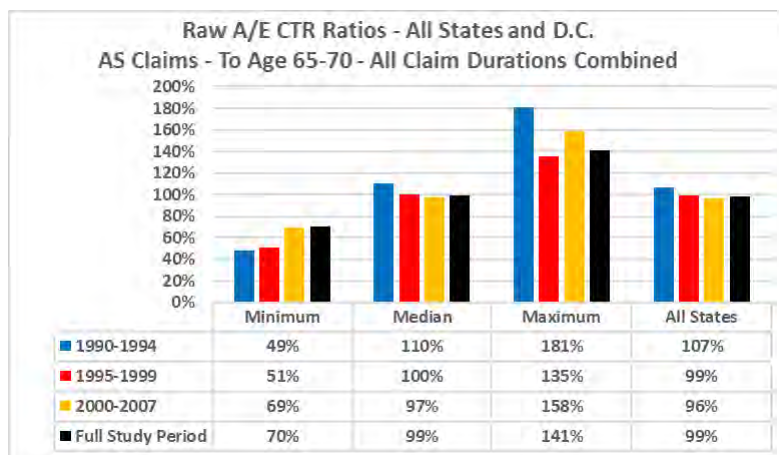
Figure 2.8



2.9 Trends by State

The IDI Claims Incidence Trend report discusses the variability of A/E claim incidence ratios among the various states. Likewise, there is considerable variability in the A/E CTR ratios among the states. Figure 2.9 compares the minimum, median and maximum “raw” A/E CTR ratios among the 50 states of issue and Washington, DC. These A/E CTR ratios have not been adjusted for credibility. Over the full study period, raw A/E CTR ratios range from 70% to 141%, with a median of 99%.

Figure 2.9



The volume of claim terminations varies widely among the various states. For example, over the full study period, New York has almost 35,000 claim terminations while Arkansas has 132 claim terminations. To take the variance in claims volumes by state into account, the A/E CTR ratios by state have been credibility adjusted for each study period using the credibility method described

in the December 2015 IDTWG Report. Figure 2.10 shows the resulting minimum, maximum and median A/E CTR ratios. Over the full study period, the credibility-adjusted A/E CTR ratios range from 75% to 114% with a median of 98%.

Figure 2.10

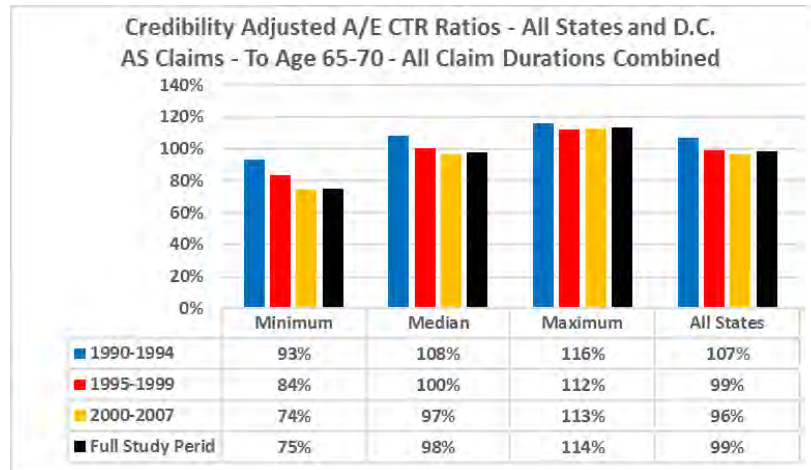


Table 2.1 shows the 10 states with the lowest credibility-adjusted A/E CTR ratios over the full study period, along with their A/E incidence ranking from the IDI Claim Incidence Trend report. The reader should note that an A/E CTR ranking of 1 is given to the state with the lowest credibility-adjusted A/E CTR ratio among all states, whereas an A/E incidence ranking of 1 is given to the state with the highest A/E incidence among all states. Thus, low rankings refer to relatively unfavorable incidence or termination experience.

Four of the 10 states that had the highest claim incidence were included among the 10 states having the lowest A/E CTR ratios. Most significant is Florida, which ranked fifth with respect to claim incidence and first with respect to CTRs. In addition, Arizona and New Mexico exhibited both high incidence and low termination experience.

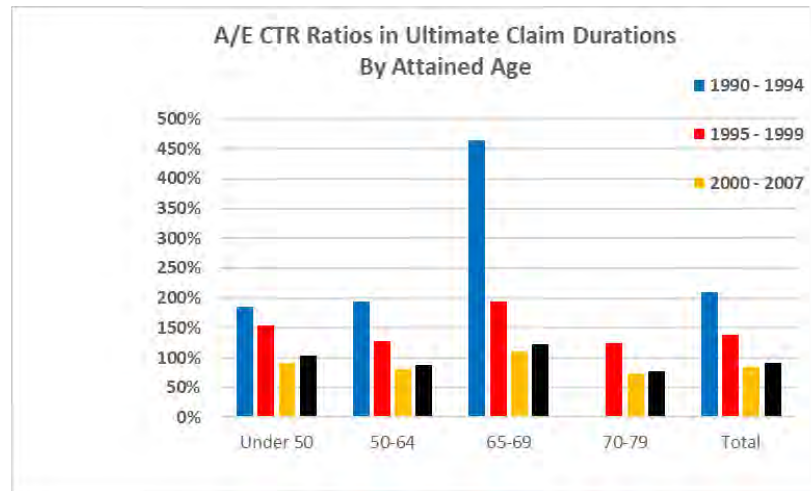
State	A/E CTR Ranking	A/E Incidence Ranking
Florida	1	5
Arizona	2	7
Missouri	3	44
Montana	4	8
New Mexico	5	10
Colorado	6	22
South Carolina	7	24
Kentucky	8	11
Utah	9	49
North Carolina	10	37

Rhode Island, which was ranked first in terms of the A/E incidence, ranked 51st in terms of the credibility-adjusted A/E CTR. In other words, Rhode Island had both the highest A/E incidence and highest A/E CTR experience. New York, which was one of three states that the IDTWG initially considered for a claim incidence modifier, ranked 47th in terms of the A/E CTR ranking. If, in the future, experience by state is considered as a modifier to the base valuation table, both A/E claim incidence and A/E CTR ratios by state should be taken into account.

2.10 Trends by Attained Age in the Ultimate Claim Durations

Figure 2.11 shows the trends A/E CTR ratios by attained age grouping in the ultimate claim durations. The A/E CTR ratios for attained ages 65–69 are included in Figure 2.11 to illustrate how much higher these are than the A/E CTR ratios for ages 50–64 and 70–74. As discussed above, this jump is most likely because of the inclusion of claim terminations that should have been labeled as benefit expiries, which is the reason why claim experience for attained ages 65–69 has been excluded in the other analyses. The jump in the A/E CTR ratio at attained ages 65–69 is not as obvious in the 2000–2007 study period as it is in the first two study periods.

Figure 2.11



The drop in the A/E CTR ratios observed in the 2000–2007 study period is apparent in all attained age groupings. The A/E CTR ratio for attained ages 70–79 for the 1990–1994 study period is not shown because there were only five claim terminations.

2.11 Potential Impact of CTR Experience in 2000–2007 on Claim Reserves

In order to estimate the potential impact of CTR experience during the 2000–2007 period on claim reserves, the 2013 IDIVT workbook was modified to derive claim reserves after applying A/E CTR ratios for specific claim scenarios to the 2013 IDIVT base CTRs.

The following assumptions were used to derive the illustrated claim reserves:

- Disabled age 42
- Both genders
- Occupation classes M, 1 and 2
- Valuation interest rate of 3%
- Benefit Periods To Age 65–70 and Lifetime
- With and without COLA index (assuming 2% inflation rate)

Four sets of illustrated claim reserves were calculated for each combination of occupation class and gender:

1. To Age 65–70 BP without COLA
2. To Age 65–70 BP with COLA
3. Lifetime BP without COLA
4. Lifetime BP with COLA

For each BP-COLA combination, four types of claim reserves are calculated over the first 10 claim years:

- a. Experience-basis using A/E CTR ratios (from the 2000–2007 period) for the select claim durations and assuming 100% of the 2013 IDIVT ultimate CTRs
- b. Experience-basis using A/E CTR ratios (from the 2000–2007 period) during the select claim durations and assuming 80% of the 2013 IDIVT ultimate CTRs
- c. Valuation basis using 100% of the 2013 IDIVT CTRs with CTR modifiers and the valuation CTR margins, that is, 5% in year 1 and 15% thereafter
- d. Valuation basis using 100% of the 2013 IDIVT CTRs with CTR modifiers and no valuation CTR margins

For each combination of occupation class, gender, BP and COLA, three sets of “claim reserve ratios” were derived by dividing claim reserves a, b and c by the claim reserves in d. The resulting claim reserve ratios over the select claim durations are provided in tables in Section 4.

The 80% of 2013 IDIVT ultimate CTRs assumption should be viewed as a sensitivity test. As indicated in Figure 2.11, there has been material downward pressure on the ultimate CTRs, but the volume of claim termination in the ultimate durations during the 2000–2007 study period was not sufficient to develop a credible estimate of the emerging ultimate CTRs. The 2018 IDEC Study of claim experience from 2006 to 2015 will provide significantly more data for making this determination.

The following eight charts compare the claim reserve ratios for occupation class 1 only. Detailed claim reserve ratios for all three occupations studied are found in the tables in Section 4.

The claim reserve ratios for To Age 65–70 BPs without COLA (illustrated in Figures 2.12 and 2.13) indicate that any necessary reserve strengthening due to the 2000–2007 CTR experience may be quite modest.

Figure 2.12

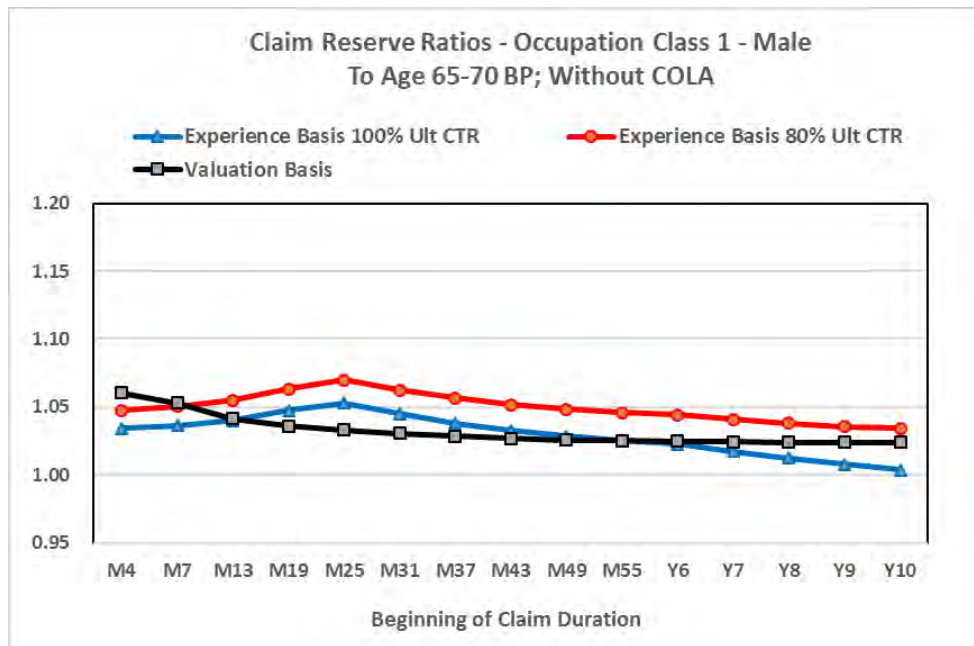
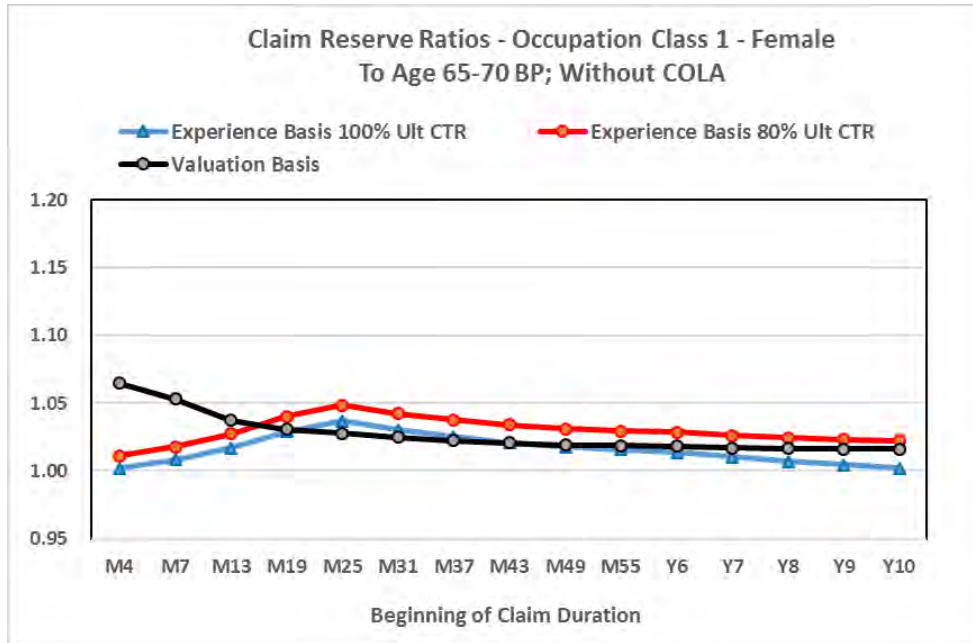


Figure 2.13



The claim reserve ratios for To Age 65–70 BPs with COLA (illustrated in Figures 2.14 and 2.15) indicate that reserve strengthening of approximately 15% due to the 2000–2007 CTR experience may be necessary for males and 10–15% for females, although the difference appears to be shrinking in the later claim durations

Figure 2.14

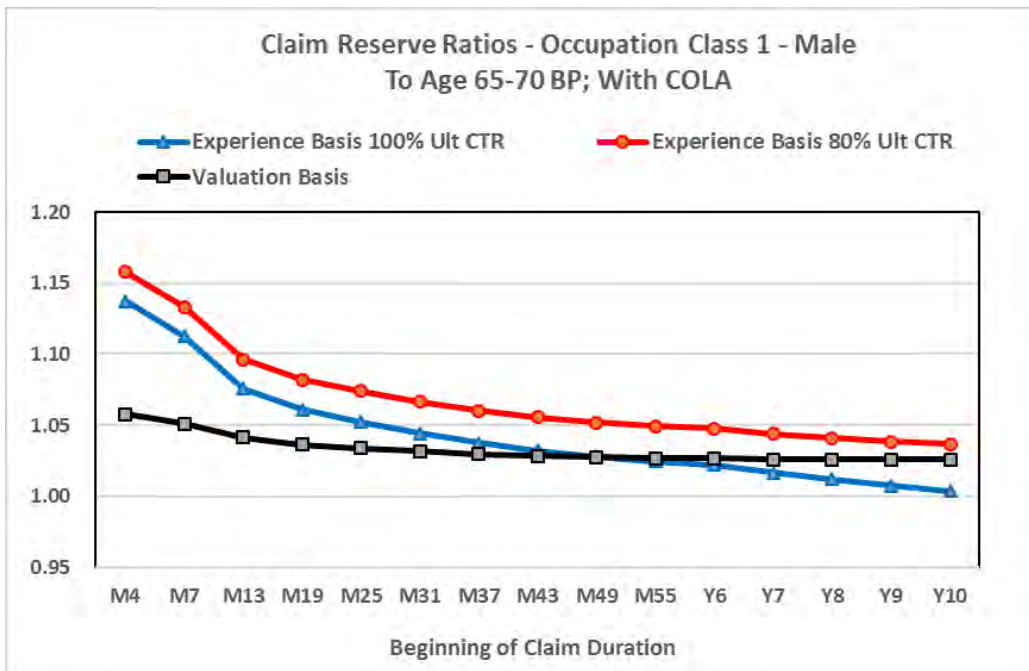
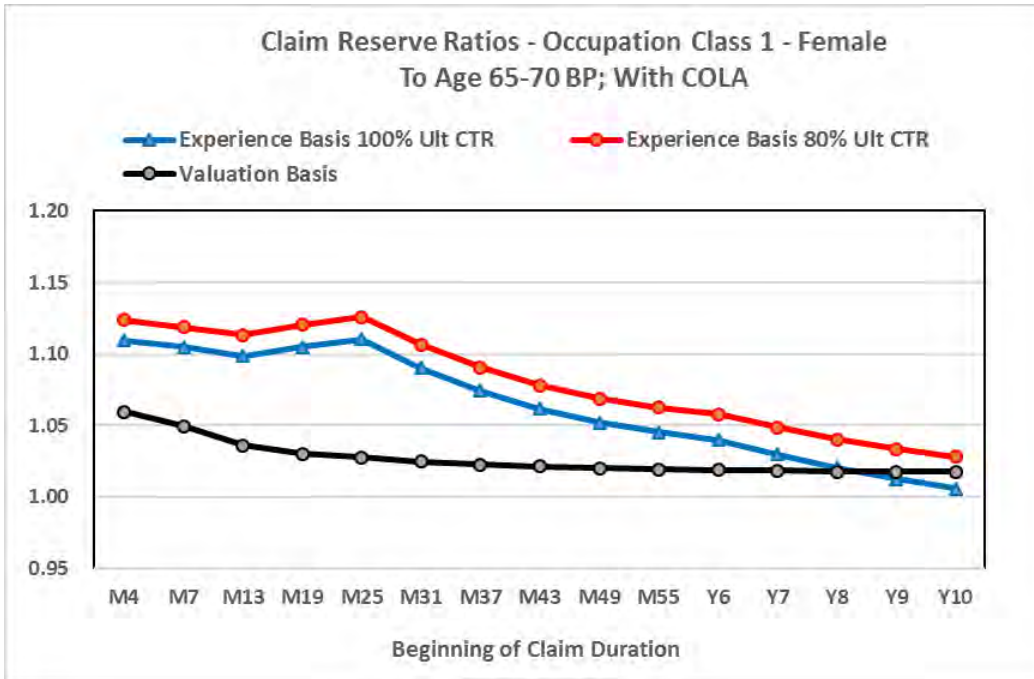


Figure 2.15



The claim reserve ratios for the lifetime BP without COLA (illustrated in Figures 2.16 and 2.17) indicate that reserve strengthening due to the 2000–2007 CTR experience may not be necessary for males and moderate strengthening for females.

Figure 2.16

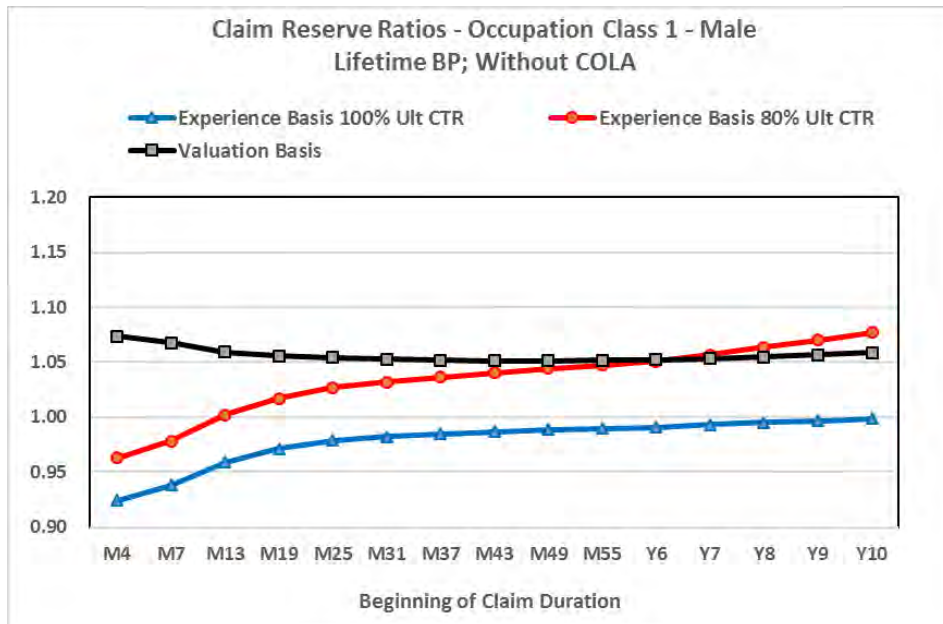
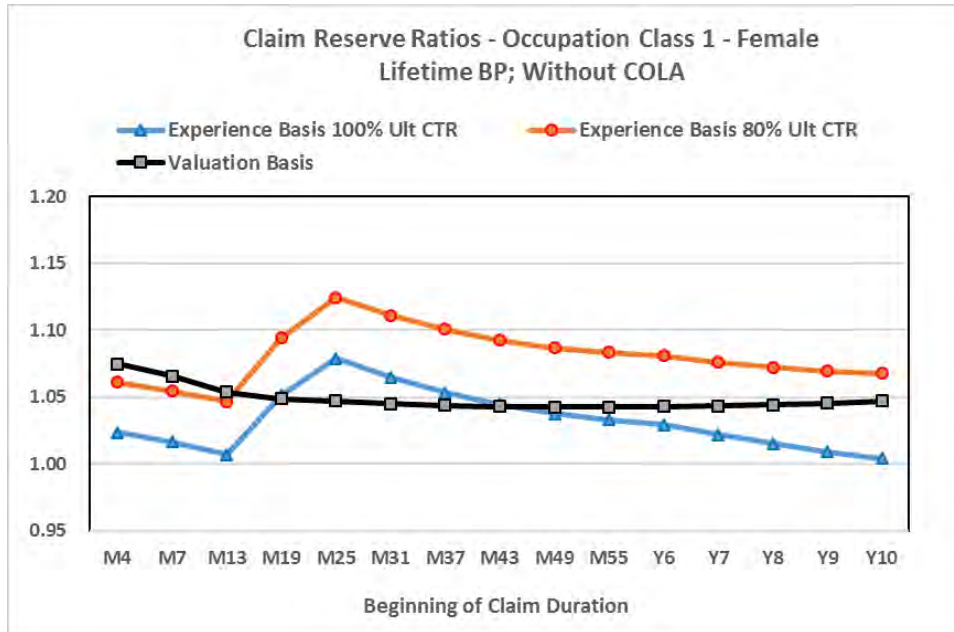


Figure 2.17



The claim reserve ratios for the lifetime BP with COLA (illustrated in Figures 2.18 and 2.19) indicate that little or no reserve strengthening due to the 2000–2007 CTR experience may be necessary for males and more robust strengthening for females, especially in early claim durations.

Figure 2.18

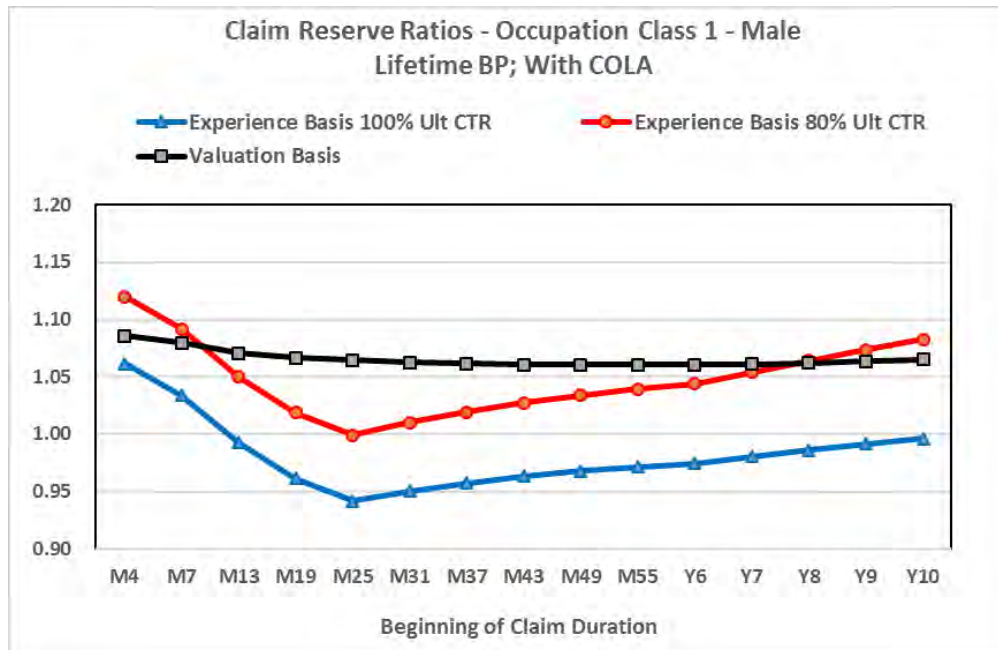
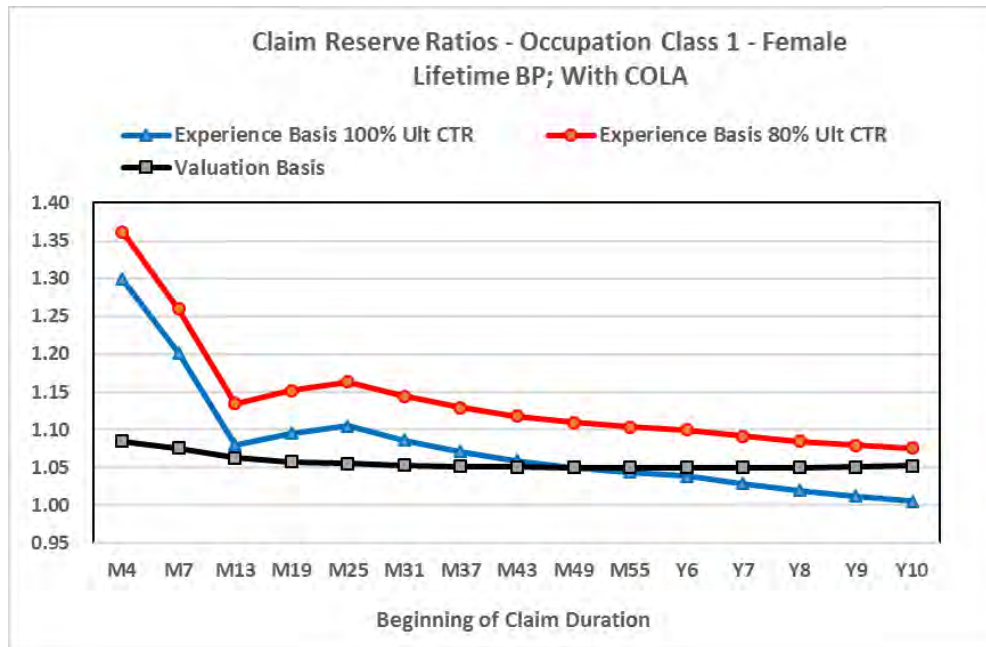


Figure 2.19



Section 3: A/E Claim Termination Trends

This section examines A/E IDI CTR trends relative to the 2013 IDIVT base CTRs from 1990 through 2007. CTR experience is separated into the following claim duration groupings:

- Months 1–12
- Months 13–24
- Months 31–60
- Months 61–120
- Months 121+

Monthly claim durations less than 121 months are referred to as the “select” durations, and the claim durations longer than 120 months are referred to as the “ultimate” durations. Experience in claim months 25–30 was excluded in the development of the 2013 IDIVT CTRs because CTRs during these months appeared to be artificially high because of the change in the contractual definition of disability, which often occurs in months 25–30. The analysis of termination trends discussed below excludes terminations during months 25–30 to be consistent with the construction of the 2013 IDIVT CTRs. The analysis also excludes claims in attained ages 65 to 69, as was done in the construction of the 2013 IDIVT CTRs, since many of the claim terminations at these attained ages may have been maximum benefit period expiries but not identified as such.

The 2013 IDIVT CTRs were based on the termination experience of non-COLA claims from AS policies with To Age 65–70 BPs. The scope of the analysis in this report excludes DBO and KP claims. OE claim termination rates are discussed. The definitions of the various contract types (i.e., AS, OE, DBO and KP) are provided in Section 2, Highlights of Claim Termination Rate Trends. For any cell that has fewer than 25 claim terminations, the results show “NA” in the tables.

The base CTRs for the select durations vary by occupation class, age at disablement, gender, elimination period and claim duration. The actuarial guidelines accompanying the 2013 IDIVT (i.e., in the December 2015 IDTWG Report) describe CTR modifiers to be applied to the base CTRs in order to reflect differences by contract type, BP, the presence of COLA benefits and claim diagnosis when calculating statutory minimum reserves. The CTR trends discussed in this section are presented in terms of A/E CTR ratios where the expected CTRs are the 2013 IDIVT CTRs *before* the application of margins and the CTR modifiers. Section 4 discusses the potential impact of A/E CTR trends on claim reserves, which are derived by applying A/E CTR ratios to the 2013 IDIVT base CTRs. Claim trends relative to diagnosis fall outside the scope of this report because of the limitations of the claim database made available for this report. Appendix A lists the valuation nondiagnosis CTR modifiers.

3.1 COLA Claims

The 2013 IDIVT base CTRs were derived from industry experience from 1990 through 2007 using non-COLA AS claims with To Age 65–70 BPs. The COLA identifiers in the claim database are:

- “N” for claims without COLA benefits
- “Y” for claims with COLA benefits
- “U” for claims with “unknown” COLA benefits
- “Blank” for claims where there is no COLA identifier

The collection of claim data from the 1990–1999 period occurred from 2000 to 2001, while the collection of the claim data from the 2000–2007 study period occurred around 2009. While analyzing claim termination trends for this report, a discrepancy in the use of the COLA identifier between the two collections was observed. Table 3.1 shows the A/E CTR ratios and distribution of claim exposure by study period for AS claims with To Age 65–70 BPs, split the by various COLA identifiers. Claim exposure is defined as the number of claim months between (1) the later of the end of the elimination period and the beginning of the study period and (2) the earlier of the date of claim termination or the end of the study period, weighted by the face amount of IDI coverage.

Table 3.1 A/E CTR Ratios by Study Period and COLA Identifier for AS Claims with To Age 65–70 BPs				
COLA Identifier	1990–1994	1995–1999	2000–2007	Total
A/E CTR Ratios				
N	104.5%	101.5%	99.9%	100.9%
Y	96.4%	91.3%	76.8%	87.1%
U	147.1%	111.0%		126.7%
Blank			90.5%	90.5%
Total	106.7%	99.3%	95.2%	97.8%
Distribution of Claim Exposure by COLA Identifier				
N	58%	56%	65%	63%
Y	31%	33%	12%	18%
U	11%	11%	0%	3%
Blank	0%	0%	24%	17%
Total	100%	100%	100%	100%

Claims with the “U” COLA identifier represent 11% of total claim exposure during the first two study periods and 0% in the 2000–2007 study period. Claims with a blank COLA identifier represent 24% of total claim exposure in the 2000–2007 study period but were not contained in the two earlier study periods. The A/E CTR ratios for claims with the “U” COLA identifier exceed the A/E CTR ratios for claims with the “N” COLA identifier. Claims with the blank COLA identifier have an A/E CTR ratio of 90.5%.

The A/E CTR ratios in Table 3.1 suggest that claims with the “U” COLA identifier may be predominantly non-COLA, but those with a blank identifier may be predominantly COLA. However, the content of the claims with either the “U” or blank identifiers cannot be validated because of the elimination of contributor identifiers in the IDEC databases used in this analysis. Thus, for this analysis, claims that are labeled non-COLA will include only those with the “N” COLA identifier, and those labeled COLA will include only those with the “Y” identifier. For this report, claims that have either the “U” or blank COLA identifier are not included in any analysis that distinguishes between COLA and non-COLA claims. These claims will be included in any analysis that does not distinguish between COLA and non-COLA claims.

3.2 Claims with To Age 65–70 BPs

Table 3.2 shows the A/E CTR trends for non-COLA AS claims with To Age 65–70 BP by study period. Claims with elimination periods less than 30 days are excluded for reasons that are discussed in more detail later in this section.

Table 3.2				
A/E CTR Ratios for Non-COLA AS Claims by Monthly Claim Duration and Study Period To Age 65–70 BPs and Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
1–12	99.5%	96.9%	102.5%	100.9%
13–24	117.7%	107.7%	99.6%	103.4%
31–60	113.3%	103.1%	84.5%	90.1%
61–120	153.0%	137.7%	112.9%	118.8%
All Select	104.2%	101.1%	100.5%	101.2%
Ultimate	195.2%	139.9%	81.5%	88.3%
Total	104.5%	101.5%	99.9%	100.9%
Number of Claim Terminations				
1–12	13,736	12,650	43,603	69,989
13–24	2,814	3,134	10,671	16,619
31–60	1,140	1,607	5,829	8,576
61–120	695	1,027	3,276	4,998
All Select	18,385	18,418	63,379	100,182
Ultimate	181	346	1,765	2,292
Total	18,566	18,764	65,144	102,474

Over the full study period, the A/E CTR ratio is 100.9% for all claim durations combined and 101.2% for the select claim durations combined. The A/E CTR ratios in the first 12 claim months bounce around from one study period to another without any obvious trend, either favorable or unfavorable. In comparison, the A/E CTR ratios in the later claim months during the 2000–2007 period are considerably lower than the corresponding A/E CTR ratios in the two earlier study periods. In the aggregate, the CTR experience in the 2000–2007 period appears to have tracked closely to the base 2013 IDIVT CTRs, although the A/E CTR is 84.5% in months 31–60 and 112.9% in months 61–120.

The A/E CTR ratios in the ultimate durations have dropped significantly in each successive study period, reaching 81.5% in the 2000–2007 period. The number of claim terminations in the ultimate durations is almost six times the number of claim terminations in the two earlier study periods combined. We should expect that the number of claim terminations in the ultimate durations from the 2018 IDEC study, which will analyze the 2006–2015 period, will be much larger and shed more light on emerging claim experience in these later durations and higher attained ages.

Table 3.3 shows similar results for AS claims with COLA benefits with To Age 65–70 maximum benefit periods.

Table 3.3 A/E CTR Ratios for COLA AS Claims by Monthly Claim Duration and Study Period To Age 65–70 BP's and Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
1–12	91.1%	85.4%	74.8%	83.5%
13–24	110.7%	97.8%	78.4%	93.2%
31–60	109.4%	102.1%	69.1%	87.4%
61–120	125.7%	120.2%	86.6%	101.0%
All Select	96.3%	91.0%	75.7%	86.7%
Ultimate	181.4%	118.3%	115.0%	117.5%
Total	96.4%	91.3%	76.8%	87.1%
Number of Claim Terminations				
1–12	4,326	4,227	2,658	11,212
13–24	1,098	1,271	796	3,165
31–60	434	675	497	1,606
61–120	201	372	354	926
All Select	6,059	6,545	4,305	16,909
Ultimate	27	96	149	272
Total	6,086	6,642	4,454	17,181

A comparison of Table 3.2 (non-COLA claims) and Table 3.3 (COLA claims) shows that A/E CTR ratios for COLA claims are consistently lower in the select durations than the A/E CTR ratios for non-COLA claims. This pattern reverses in the ultimate durations due to experience in the 2000–2007 study period. COLA experience is based on only 272 claims over the full study period versus 2,292 non-COLA claims. The higher A/E CTR ratios of COLA claims in the ultimate durations may not be significant.

Table 3.4 shows the ratios of the COLA A/E CTR ratios to the non-COLA A/E CTR ratios.

Table 3.4 Ratios of COLA to Non-COLA A/E CTR Ratios Study Period To Age 65–70 BP's and Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
1–12	0.91	0.88	0.73	0.83
13–24	0.94	0.91	0.79	0.90
31–60	0.97	0.99	0.82	0.97
61–120	0.82	0.87	0.77	0.85
All Select	0.92	0.90	0.75	0.86
Ultimate	0.93	0.85	1.41	1.33

The ratios of COLA to non-COLA A/E CTR ratios in Table 3.4 are lower than 1.00 in all select claim duration groupings. Although the ratios in the ultimate claim durations jumped from 0.93 and 0.85 in the two earlier study periods to 1.41 in the 2000–2007 period, it is difficult to conclude whether this change will continue. Table 3.28 provides more information on CTR trends in the ultimate claim durations. The 2018 IDEC study should provide much more credible data regarding the impact of the COLA benefits on CTRs in the ultimate claim durations.

3.3 Claims with the Lifetime BP

Table 3.5 shows the A/E CTR trends for non-COLA AS claims with lifetime maximum benefit periods based on the alternative COLA identifier. As with the earlier analysis, claims with elimination periods less than 30 days have been excluded.

Table 3.5 A/E CTR Ratios for Non-COLA AS Claims by Monthly Claim Duration and Study Period Lifetime BP and Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
1–12	109.6%	100.4%	83.8%	95.2%
13–24	98.6%	93.5%	86.9%	90.7%
31–60	102.1%	81.3%	55.0%	65.5%
61–120	103.2%	105.4%	64.8%	72.8%
All Select	107.6%	97.6%	77.8%	89.2%
Ultimate	146.9%	137.8%	92.4%	96.9%
Total	107.8%	98.1%	78.7%	89.5%
Number of Claim Terminations				
1–12	3,767	3,170	3,094	10,031
13–24	508	585	778	1,871
31–60	199	282	408	890
61–120	121	204	336	662
All Select	4,595	4,241	4,617	13,453
Ultimate	58	158	446	662
Total	4,653	4,400	5,062	14,115

Table 3.5 shows that non-COLA AS claims with the lifetime BP have significantly lower A/E CTR ratios than non-COLA AS claims with To Age 65–70 BPs in all claim duration groupings except for the first 12 claim months during the 1990–1994 and 1995–1999 study periods. Table 3.6 compares the ratios of the lifetime A/E CTR ratios (in Table 3.5) to To Age 65–70 A/E CTR ratios (in Table 3.3) for non-COLA AS claims by duration and study period.

Table 3.6 Ratios of A/E CTR Ratios for Lifetime Claims to A/E CTR Ratios for Claims with To Age 65–70 BP's by Study Period AS Claims with no COLA Benefits; Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
1–12	1.10	1.04	0.82	0.94
13–24	0.84	0.87	0.87	0.88
31–60	0.90	0.79	0.65	0.73
61–120	0.67	0.77	0.57	0.61
All Select	1.03	0.97	0.77	0.88
Ultimate	0.75	0.99	1.13	1.10

Table 3.6 shows A/E CTR ratios for lifetime non-COLA claims are generally less than the A/E CTR ratios for claims with To Age 65–70 BPs. One exception is in the first 12 claim months where the difference between lifetime and To Age 65–70 claims during the two earlier study periods appears immaterial. However, during the 2000–2007 study period, the A/E CTR ratios for lifetime claims in the first 12 months are significantly lower than 1.00 and more in line with the second 12 months. During the select durations, the ratios of lifetime to To Age 65–70 A/E CTR ratios generally decrease as the durations lengthen. Over the full study period, the combined ratio of lifetime to To Age 65–70 A/E CTR ratio over all select durations is 0.88. The 2013 IDIVT CTR modifiers for claims with the lifetime maximum benefit period do not extend into the ultimate durations. The 2018 IDEC study should provide additional insight into whether the lifetime CTR modifier should continue into the ultimate claim durations.

Table 3.7 compares the ratios of the lifetime A/E CTR ratios to To Age 65–70 A/E CTR ratios for COLA AS claims by claim duration and study period.

Table 3.7				
Ratios of Lifetime to To Age 65–70 A/E CTR Ratios by Study Period				
AS Claim with COLA Benefits and Elimination Periods ≥ 30 Days				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
1–12	1.04	1.04	0.88	1.01
13–24	0.80	0.88	0.79	0.85
31–60	0.63	0.68	0.86	0.74
61–120	0.62	0.61	0.61	0.59
All Select	0.95	0.94	0.82	0.92
Ultimate	NA	NA	0.48	0.48
Number of Lifetime Claim Terminations with COLA				
1–12	1,195	1,308	449	2,952
13–24	223	338	137	698
31–60	71	128	117	316
61–120	38	80	96	214
All Select	1,527	1,855	798	4,180
Ultimate	3	18	72	93

It should be noted that the 2013 IDIVT CTR modifiers for lifetime claims do not distinguish between non-COLA and COLA claims. Future changes to the valuation table may need to reflect different CTR modifiers for lifetime claims with non-COLA and COLA benefits.

3.4 Claims with Short-Term BPs

Short-term maximum benefit periods for AS claims are typically two-year and five-year but can be longer or shorter. Table 3.8 shows the A/E CTR ratios for short-term AS claims with no COLA benefits.

Table 3.8				
A/E CTR Ratios for Short-Term AS Claims by Monthly Claim Duration and Study Period				
Non-COLA Claims—Elimination Periods ≥ 30 Days				
Ultimate Durations Excluded				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
1–12	132.8%	132.3%	114.8%	130.0%
13–24	147.6%	140.2%	133.0%	141.6%
31–60	181.6%	148.9%	82.4%	157.6%
61–120	994.4%	665.1%	NA	779.1%
Total	136.7%	135.5%	118.3%	133.5%
Number of Claim Terminations				
1–12	18,267	14,958	4,860	38,085
13–24	1,982	1,665	657	4,304
31–60	528	543	40	1,111
61–120	229	183	10	422
Total	21,006	17,348	5,567	43,922

Claims with short-term BP's have far less exposure in the 2000–2007 study period than in the two earlier study periods. There is not sufficient information on the claim databases to investigate the reasons for this drop off in exposure.

The A/E CTR ratios for short-term AS claims are consistently higher than those for To Age 65–70 claims. Table 3.9 shows the ratios of short-term A/E CTR ratios to non-COLA To Age 65–70 A/E CTR ratios during the first 24 months. The volume of short-term claims in the 2000–2007 study period that lasted beyond the 30th month is small and not significant. Over the full study period, the A/E CTR ratios for short-term AS claims over the first two claim years are on average 30% higher than those for non-COLA AS

claims with the To Age 65–70 BP. There was general consistency of the ratios by duration and study period, except for months 1–12 during the 2000–2007 study period in which the ratio dipped to 1.12.

Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
1–12	1.33	1.37	1.12	1.29
13–24	1.25	1.30	1.34	1.37
Total	1.31	1.34	1.16	1.30

3.5 By Occupation Class

The 2013 IDIVT has five occupation classes:

- Class M—All medical occupations, such as doctors, surgeons, dentists, nurses, podiatrists, veterinarians, psychologists, psychiatrists and pharmacists
- Class 1—All nonmedical white-collar and professional occupations
- Class 2—Skilled labor and most sales-related occupations
- Class 3—Blue-collar occupations with light manual duties
- Class 4—Blue-collar occupations with heavy manual duties

Because of low levels of data volumes, occupation classes 3 and 4 were combined into one class, 3–4, for this analysis.

Table 3.10 shows the A/E CTR ratio trends by occupation class for To Age 65–70 claims without COLA benefits. As with the prior analyses, claims with elimination periods less than 30 days are omitted.

Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	109.0%	94.5%	97.4%	98.5%
1	101.8%	107.0%	102.6%	103.1%
2	98.4%	104.5%	96.7%	98.5%
3–4	106.4%	120.8%	132.0%	123.2%
Total	104.2%	101.1%	100.5%	101.2%
Number of Claim Terminations				
M	5,802	6,366	16,661	28,829
1	8,076	7,726	34,038	49,840
2	3,260	3,157	9,570	15,987
3–4	1,247	1,169	3,109	5,525
Total	18,385	18,418	63,379	100,182

For all occupation classes combined, the A/E CTR ratios for the select durations combined decrease by successive study periods. However, this decreasing pattern is not observed in any of the specific occupation classes. The A/E CTR ratios for occupation class M drop significantly from the 1990–1994 period to 1995–1999 period and then remain relatively stable. The A/E CTR ratios for occupation classes 1 and 2 drop in the 2000–2007 period. The A/E CTR ratios for occupation class 3–4 increase in each successive study period. In addition, it appears that the 2013 IDIVT CTRs may be understating the CTRs for occupation class 3–4.

Table 3.11 shows the A/E CTR ratios by occupation class for To Age 65–70 claims with COLA benefits, which are consistently lower in each occupation class than the non-COLA A/E CTR ratios in Table 3.10.

Table 3.11 A/E CTR Ratios for COLA AS Claims by Occupation Class and Study Period To Age 65–70 BPs and Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	100.8%	82.6%	74.8%	83.5%
1	94.0%	102.7%	75.2%	91.1%
2	84.4%	100.9%	79.4%	87.8%
3–4	112.5%	110.1%	108.9%	110.4%
Total	96.3%	91.0%	75.7%	86.7%
Number of Claim Terminations				
M	2,333	2,743	2,086	7,162
1	2,701	2,844	1,451	6,996
2	875	838	597	2,310
3–4	150	121	170	441
Total	6,059	6,545	4,305	16,909

Table 3.12 provides the ratios of the COLA A/E CTR ratios (from Table 3.11) to non-COLA A/E CTR ratios (from Table 3.10) by occupation class.

Table 3.12 Ratios of A/E CTR Ratios of COLA AS Claims to A/E CTR Ratios for Non-COLA AS Claims To Age 65–70 BPs and Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
M	0.92	0.87	0.77	0.85
1	0.92	0.96	0.73	0.88
2	0.86	0.97	0.82	0.89
3–4	1.06	0.91	0.82	0.90
Total	0.92	0.90	0.75	0.86

Over the full study period, the ratio of COLA A/E CTR ratios to non-COLA A/E CTR ratios by occupation class for all select durations combined ranges from 0.85 to 0.90. The COLA to non-COLA ratios for occupation classes 1 and 2 show no obvious trends by study period. In contrast, the COLA to non-COLA ratios for occupation classes M and 3–4 decrease in each successive study period. The COLA to non-COLA ratios are materially lower in the 2000–2007 period than in the prior two periods.

Table 3.13 shows the A/E CTR ratio trends by occupation class for lifetime claims without COLA benefits. As with prior analyses, claims with elimination periods less than 30 days are omitted.

Table 3.13 A/E CTR Ratios for Non-COLA AS Claims by Occupation Class and Study Period Lifetime BP; Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	113.7%	91.5%	73.0%	85.6%
1	98.6%	104.2%	83.0%	91.4%
2	106.5%	111.6%	89.6%	100.8%
3–4	131.2%	157.0%	NA	139.1%
Total	107.6%	97.6%	77.8%	89.2%
Number of Claim Terminations				
M	1,628	1,788	1,972	5,388
1	1,591	1,417	2,065	5,073
2	1,035	834	557	2,426
3–4	341	202	23	566
Total	4,595	4,241	4,617	13,453

Table 3.14 shows the ratios of lifetime A/E CTR ratios (from Table 3.13) to To Age 65–70 A/E CTR ratios (from Table 3.12) A/E CTR ratios by occupation class.

Table 3.14 Ratios of A/E CTR Ratios for Lifetime AS Claims to A/E CTR Ratios for Claims with To Age 65–70 BP's by Occupation Class Claims with No COLA Benefits; Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
M	1.04	0.97	0.75	0.87
1	0.97	0.97	0.81	0.89
2	1.08	1.07	0.93	1.02
3–4	1.23	1.30	NA	1.13
Total	1.03	0.97	0.77	0.88

Occupation classes M, 1 and 2 exhibited significant reductions in the lifetime A/E CTR ratios relative to the A/E CTR ratios for To Age 65–70 claims. Table 3.14 also shows that the ratios of lifetime A/E CTR ratios to To Age 65–70 A/E CTR ratios vary by occupation class and are lower in the 2000–2007 period than in the prior two periods. The lifetime CTR modifiers in the 2013 IDIVT table do not vary by occupation class. In future revisions to the valuation table, the lifetime CTR modifiers may need to vary by occupation class.

Table 3.15 shows the A/E CTR ratio trends by occupation class for non-COLA short-term claims. As with prior analyses, claims with elimination periods less than 30 days are omitted.

Table 3.15 A/E CTR Ratios for Non-COLA AS Claims by Occupation Class and Study Period Short-Term BPs; Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	132.7%	125.7%	112.7%	127.0%
1	135.6%	128.6%	115.2%	127.2%
2	127.1%	133.9%	132.1%	130.4%
3–4	144.2%	146.8%	138.7%	145.3%
Total	136.7%	135.5%	118.3%	133.5%
Number of Claim Terminations				
M	2,713	2,218	448	5,380
1	4,140	3,101	3,824	11,065
2	3,967	3,228	945	8,140
3–4	10,186	8,802	349	19,337
Total	21,006	17,348	5,567	43,922

Over the full study period, the A/E CTR ratios for short-term AS claims for all select durations combined range between 127% and 130% for occupation classes M, 1 and 2, and the A/E CTR ratio for occupation class 3–4 is 145%.

Table 3.16 shows the ratios of A/E CTR ratios of short-term AS claims to the A/E CTR ratios for AS claims with To Age 65–70 BPs.

Table 3.16 Ratios of A/E CTR Ratios for AS Claims with Short-Term BPs to A/E CTR Ratios for AS Claims with To Age 65–70 BPs by Occupation Class Claims with No COLA Benefits; Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
M	1.22	1.33	1.16	1.29
1	1.33	1.20	1.12	1.23
2	1.29	1.28	1.37	1.32
3–4	1.36	1.22	1.05	1.18
Total	1.31	1.34	1.18	1.32

The ratios of A/E CTR ratios for short-term claims to the A/E CTR ratios for To Age 65–70 claims are all more than 1.00 and do not show a discernible pattern by duration or occupation class.

3.6 By Gender

Table 3.17 shows the *male* A/E CTR ratio trends by occupation classes for To Age 65–70 AS claims without COLA benefits. As with prior analyses, claims with elimination periods less than 30 days are omitted. Ultimate claim durations are excluded.

Table 3.17 A/E CTR Ratios for <u>Male</u> AS Claims by Occupation Classes To Age 65–70 BPs, Non-COLA and Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	112.9%	94.8%	94.2%	96.9%
1	104.0%	110.7%	102.4%	103.9%
2	98.8%	108.3%	97.4%	99.7%
3–4	109.5%	124.7%	136.0%	127.2%
Total	106.5%	103.7%	99.5%	101.3%
Number of Claim Terminations				
M	3,272	3,575	9,422	16,270
1	5,494	5,289	22,150	32,933
2	2,284	2,271	6,551	11,105
3–4	1,029	993	2,719	4,741
Total	12,079	12,128	40,842	65,049

The average male A/E CTR ratios for occupation classes M, 1 and 2 over the select durations combined are lower during the 2000–2007 period than during the two earlier study periods but are generally close to 100%. On the other hand, the A/E CTR ratios for occupation class 3–4 increase with successive study periods, reaching 136% during the 2000–2007 study period.

Table 3.18 shows the *female* A/E CTR ratio trends by occupation classes for To Age 65–70 AS claims without COLA benefits. As with prior analyses, claims with elimination periods less than 30 days are omitted. Ultimate claim durations are excluded.

Table 3.18 A/E CTR Ratios for <u>Female</u> AS Claims by Occupation Classes To Age 65–70 BPs, Non-COLA and Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Occupation Class	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
M	102.6%	94.1%	104.1%	101.6%
1	96.6%	97.9%	103.0%	101.3%
2	97.4%	94.1%	94.6%	95.0%
3–4	93.3%	102.7%	106.0%	101.2%
Total	99.4%	95.5%	102.6%	100.8%
Number of Claim Terminations				
M	2,530	2,791	7,239	12,560
1	2,582	2,437	11,889	16,908
2	976	886	3,020	4,882
3–4	218	176	390	784
Total	6,306	6,290	22,537	35,133

The average female A/E CTR ratios for occupation classes M and 2 over the select durations do not show either an increasing or decreasing trend. The average female A/E CTR ratios for occupation class 2 decrease over successive study periods. The average female A/E CTR ratios for occupation classes 1 and 3–4 are increasing over successive study periods.

Short-term BPs are more prevalent in occupation class 3–4 than the other occupation classes and more prevalent than To Age 65–70 maximum benefit periods among IDI occupation class 3–4 contracts. Table 3.19 shows the A/E CTR ratios for short-term AS claims by gender from occupation class 3–4. Claims are non-COLA and exclude claims with elimination periods less than 30 days. All select claim durations are combined, and ultimate durations are excluded.

Table 3.19 A/E CTR Ratios for Short-Term AS Claims for Occupation Class 3–4 Non-COLA Claims and Elimination Periods ≥ 30 Days All Select Durations Combined, Ultimate Durations Excluded				
Gender	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
Male	145.9%	148.1%	167.5%	147.3%
Female	135.0%	139.5%	NA	134.6%
Total	144.2%	146.8%	138.7%	145.3%
Number of Claim Terminations				
Male	8,586	7,490	330	16,405
Female	1,600	1,312	20	2,931
Total	10,186	8,802	349	19,337

The 2000–2007 study period has relatively fewer short-term AS claims from occupation 3–4 than the two earlier study periods. The short-term A/E CTR ratios in occupation class 3–4 are somewhat higher for males than for females.

3.7 By Elimination Period

Table 3.20 shows the A/E CTR ratios by elimination periods for non-COLA claims with To Age 65–70 maximum benefit period.

Table 3.20 A/E CTR Ratios by Elimination Period To Age 65–70 BPs, Non-COLA All Select Durations Combined, Ultimate Durations Excluded				
Elimination Period	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
Less than 30 Days	146.4%	155.8%	153.6%	152.7%
30 Days	100.6%	100.0%	100.0%	100.2%
60 Days	103.8%	99.0%	110.2%	105.7%
90 Days	108.1%	102.4%	99.1%	100.5%
180+ Days	110.0%	100.9%	100.9%	101.8%
Total	104.6%	101.5%	101.0%	101.6%
Number of Claim Terminations				
Less than 30 Days	933	647	3,220	4,799
30 Days	8,842	6,503	20,585	35,930
60 Days	3,355	3,095	6,848	13,298
90 Days	5,423	7,798	31,621	44,841
180+ Days	765	1,023	4,325	6,112
Total	19,318	19,064	66,599	104,981

Table 3.20 shows that the 2013 IDIVT base CTRs significantly understate CTR for claims with elimination periods less than 30 days, which is the reason the claims with elimination periods less than 30 days have been excluded from most of the analyses in this report, unless specifically included.

3.8 Overhead Expense Claims

The discussion so far has pertained to AS claims, since the development of the 2013 IDIVT was based on AS claim experience. However, over the full study period, OE claim exposure (measured by amount) over the select durations is 20% of the AS claim exposure, making OE experience worthy of further investigation. OE policies have short-term maximum benefit periods, typically 24 months or less, and short elimination periods, typically 30 days.

Table 3.21 shows the A/E CTR ratios for OE claims. Like prior analyses, claims with elimination periods less than 30 days are excluded. Claim durations are limited to the first 60 months because of the short-term maximum benefit periods of OE policies.

Table 3.21				
A/E CTR Ratios for Overhead Expense Claims				
Monthly Claim Duration 1–60				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
A/E CTR Ratios				
1–12	125.5%	113.3%	112.3%	116.5%
13–24	388.8%	271.8%	211.9%	277.9%
31–60	960.5%	365.6%	NA	455.8%
Total	149.4%	139.8%	120.6%	135.3%
Number of Claim Terminations				
1–12	5,041	3,926	4,568	13,535
13–24	905	810	685	2,400
31–60	99	112	0	211
Total	6,045	4,848	5,252	16,146

A/E CTR ratios for OE claims are very high in the second claim year and later but decrease in successive study periods. Although OE claims are short-term, they have a different pattern of A/E CTR ratios by claim duration than short-term AS claims. Tables 3.22 (for occupation class M) and 3.23 (for occupation class 1) compare the A/E CTR ratios of OE and short-term AS claims. Since the primary elimination period of OE claims is 30 days, only 30-day claims are illustrated.

Table 3.22				
Comparison of A/E CTR Ratios for OE Claims and Short-Term AS Claims				
for Occupation Class M; 30-day Elimination and No COLA Benefits				
Monthly Claim Durations 1–24				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
OE Claims				
1–12	122.7%	107.5%	129.6%	118.9%
13–24	473.7%	396.4%	342.8%	415.2%
Total	141.7%	125.5%	137.5%	134.5%
Short-Term AS Claims				
1–12	130.9%	124.3%	79.6%	122.5%
13–24	126.3%	143.1%	NA	109.7%
Total	130.6%	125.4%	72.2%	121.7%
OE/Short-Term AS				
1–12	0.94	0.86	1.63	0.97
13–24	3.75	2.77	BA	3.79
Total	1.08	1.00	1.90	1.10

Table 3.23 Comparison of A/E CTR Ratios for OE Claims and Short-Term AS Claims for Occupation Class 1; 30-Day Elimination and No COLA Benefits Monthly Claim Durations 1–24				
Monthly Claim Duration	1990–1994	1995–1999	2000–2007	Full Study Period
OE Claims				
1–12	111.5%	98.4%	96.3%	99.5%
13–24	284.4%	308.2%	227.8%	250.4%
Total	122.9%	113.9%	105.8%	110.3%
Short-Term AS Claims				
1–12	118.0%	125.4%	130.0%	123.5%
13–24	130.0%	122.9%	120.6%	125.3%
Total	119.1%	125.1%	129.1%	123.6%
OE/Short-Term AS				
1–12	0.95	0.78	0.74	0.81
13–24	2.19	2.51	1.89	2.00
Total	1.03	0.91	0.82	0.89

The OE A/E CTR ratios for occupation class M in the first 12 claim months are relatively close to the short-term AS A/E CTR ratios but are considerably higher in the second 12 claim months. The OE CTR A/E ratios for occupation class 1 are lower than the AS short-term A/E CTR ratios in the first claim year but are significantly higher in the second claim year, although not as high as seen in Table 3.22 for occupation M.

In general, it appears that the OE CTRs are close to AS CTRs for claims with To Age 65–70 BPs in the first claim year (i.e., A/E CTR ratio of 99.5% over the full study period) but two to four times higher in the second claim year. In comparison, the short-term AS CTRs are consistently higher than CTRs for To Age 65–70 AS claims in both claim years. The 2013 IDIVT CTR modifiers (provided in Appendix A) for OE claims reflect a similar pattern.

3.9 By State

Many companies have observed that IDI claim experience varies by state of issue and charge higher or lower premiums for certain states based on this experience. Most notable have been California and Florida, where it has been quite common for companies to charge a premium surcharge over what they charge in other states. Some companies have introduced premium surcharges in other states, and other companies have also introduced premium discounts for policies issued in states where claim experience has been significantly more favorable. The IDI Claims Incidence Trends report shows how A/E claim incidence ratios vary by state. This subsection discusses A/E CTR ratios by state. In both analyses, state of issue is used rather the state of residence on claim records.

For the analysis by state, claims are limited to those with To Age 65–70 BPs. Because of constraints of the claim database by state, the COLA identifier was not included as variables in the pivot table. Thus, the results by state combine COLA and non-COLA claims. Similarly, claims with elimination periods less than 30 days are included. The 2013 IDIVT CTRs without the COLA CTR modifier are the basis for expected claim terminations with and without COLA. Thus, it is possible that differences in the A/E CTR ratios among states could be attributable in part to differences in the percentage of claims with COLA benefits. However, for this analysis, we are assuming that the distribution of non-COLA and COLA claims does not vary significantly by state.

To compare A/E CTR ratios by state, the raw A/E CTR ratios for each state have been credibility adjusted by study period. The credibility formula used is the one described in the IDTWG report for deriving company-specific valuation CTRs. Table 3.24 shows the minimum, median and maximum raw, credibility-adjusted and “normalized” A/E CTR ratios among the 50 states and Washington, DC, for the three study periods and the full study period. The normalized A/E CTR ratios for a specific state in a study period are the result of dividing the state’s credibility-adjusted A/E CTR ratio by the A/E CTR ratio for all states combined in the study period.

Table 3.24 A/E CTR Statistics among All States (Including Washington, DC) by Study Period: AS Claims with To Age 65–70 Maximum Benefit Periods				
Statistic	1990–1994	1995–1999	2000–2007	Full Study Period
Raw A/E CTR Ratios				
Minimum	48.5%	50.8%	69.1%	71.8%
Median	110.4%	100.4%	97.0%	98.6%
Maximum	180.6%	135.2%	158.4%	141.1%
All States	106.6%	99.4%	96.5%	98.6%
Credibility-Adjusted A/E CTR Ratios				
Minimum	92.9%	83.8%	74.2%	75.5%
Median	108.1%	100.2%	96.8%	98.1%
Maximum	115.9%	112.1%	112.8%	114.4%
All States	106.6%	99.4%	96.5%	98.6%
Normalized A/E CTR Ratios				
Minimum	87.2%	84.3%	76.9%	76.6%
Median	101.4%	100.9%	100.3%	99.5%
Maximum	108.7%	112.8%	116.9%	116.0%
All States	100.0%	100.0%	100.0%	100.0%

The credibility adjustments significantly reduce the range (from minimum to maximum) of A/E CTR ratios. For example, over the full study period, the range of the raw A/E CTR ratios was from 71.8% to 141.1%, while the range for the credibility-adjusted A/E CTR ratios was from 75.5% to 114.4%. The range for the A/E CTR ratios for all states combined has widened in each successive study period. Appendix B provides A/E CTR ratio detail for each state.

Table 3.25 shows details of the 10 states with the lowest credibility-adjusted A/E CTR ratios over the full study period. The A/E CTR rankings are from 1 to 51 where 1 is assigned to the state with the lowest credibility-adjusted A/E CTR ratio over the full study period. Included in this table is each state's ranking in terms of A/E claim incidence ratio from the IDI Claim Incidence Trend report. Note that a state's A/E CTR ranking means that all states with higher rankings have higher credibility A/E CTR ratios. On the other hand, a state's A/E incidence ranking means that states with higher rankings have lower A/E incidence ratios.

Table 3.25 A/E CTR Ratios for the 10 States with the Lowest A/E CTR Ratios over the Full Study Period (The states ranked in the top 10 in terms of both A/E incidence and A/E CTR rankings are highlighted.)						
State	A/E Incidence Ranking	A/E Incidence Ratio	Raw A/E CTR Ratio	Credibility-Adjusted A/E CTR Ratio	A/E CTR Ranking	No. of Claim Terminations
Florida	5	117.1%	75.3%	73.0%	1	8,955
Arizona	7	111.5%	83.4%	73.8%	2	2,406
Missouri	44	76.9%	90.7%	81.0%	3	1,658
Montana	8	110.1%	91.9%	70.5%	4	362
New Mexico	10	105.1%	92.0%	83.6%	5	550
Colorado	22	92.3%	92.2%	90.1%	6	2,122
South Carolina	24	91.1%	92.6%	86.1%	7	1,916
Kentucky	11	103.9%	92.9%	87.3%	8	1,630
Utah	49	70.0%	92.9%	81.3%	9	405
North Carolina	37	84.5%	93.0%	89.7%	10	4,160

Any state with a combination of low A/E CTR ranking and low A/E incidence ranking has high claim costs due to both low claim termination rates and high claim incidence rates. Florida, which is ranked fifth respect to A/E incidence, has the lowest credibility-

adjusted A/E CTR ratio over the full study period among all the states, followed by Arizona. Of the 10 states listed in Table 3.25, four (Florida, Arizona, New Mexico and Montana) are among the 10 states with the highest A/E claim incidence ratios.

Table 3.26 shows A/E CTR ratio details of the 10 states with the highest claim incidence ranking from the IDI Claim Incidence Trends report.

State	A/E Incidence Ranking	A/E Incidence Ratio	Raw A/E CTR Ratio	Credibility-Adjusted A/E CTR Ratio	A/E CTR Ranking	No. of Claim Terminations
Rhode Island	1	145.3%	113.7%	127.5%	51	1,608
California	2	129.3%	96.5%	96.5%	20	20,377
Nevada	3	128.1%	95.0%	95.5%	15	813
New York	4	117.1%	110.9%	112.4%	49	19,890
Florida	5	117.1%	75.3%	73.0%	1	8,955
Louisiana	6	114.6%	94.0%	92.9%	12	1,782
Arizona	7	111.5%	83.4%	73.8%	2	2,406
Montana	8	110.1%	91.9%	70.5%	4	362
New Jersey	9	106.6%	107.6%	108.2%	44	8,502
New Mexico	10	105.1%	92.0%	83.6%	5	550

Rhode Island, which was ranked first in terms of the A/E incidence ranking, that is, it had the higher A/E incidence, ranked 51st in terms of the A/E CTR ranking, that is, it had the highest credibility-adjusted A/E CTR ratio. Of the three states that were initially considered by the IDTWG to justify claim incidence modifiers—California, Florida and New York—only Florida falls among the 10 states with the lowest credibility-adjusted A/E CTR ratios. California is ranked 20th and New York is ranked 49th in terms of credibility-adjusted A/E CTR ratios. It should be noted that the 2013 IDIVT has no incidence or CTR modifiers that vary by state.

The A/E CTR rankings vary by study period. Table 3.27 lists the 10 states with the lowest credibility-adjusted A/E CTR ratios for each study period.

Ranking	1990–1994	1995–1999	2000–2007	Full Study Period
1	California	Florida	Florida	Florida
2	Florida	California	Arizona	Arizona
3	Arizona	North Dakota	Missouri	Missouri
4	Nevada	Arizona	North Carolina	Montana
5	Louisiana	Maryland	South Carolina	New Mexico
6	Washington	Colorado	Minnesota	Colorado
7	Wyoming	Georgia	New Mexico	South Carolina
8	Montana	New Mexico	Kentucky	Kentucky
9	Delaware	Louisiana	Montana	Utah
10	Texas	Arkansas	New Hampshire	North Carolina

Only two states, Florida and Arizona, which are highlighted in Table 3.27, were ranked among the 10 states with the lowest credibility-adjusted A/E CTR ratio in each study period. California, which ranked first and second in the 1990–1994 and 1995–1999 study periods, ranked 33rd in the 2000–2007 study period and 20th over the full study period.

In the future, claim incidence and/or CTR modifiers by state may be reconsidered in future revisions of the IDI valuation table. If so, the above analysis strongly suggests that if claim incidence modifiers by state are introduced, then CTR modifiers by state should be introduced at the same time.

3.10 Ultimate Claim Durations by Attained Age

Table 3.28 shows the A/E CTR ratios in the ultimate claim durations by attained age grouping. Claims during attained ages 65–69 are included in order to show the higher A/E CTR ratios, although these attained ages have been excluded in other analyses in this section.

Table 3.28				
A/E CTR Ratios in Ultimate Claim Durations by Attained Age				
AS Claims: All Occupation Classes, Elimination Periods and Maximum Benefit Periods				
Attained Age	1990–1994	1995–1999	2000–2007	Full Study Period
Under 50	186.3%	154.8%	92.2%	103.8%
50–64	195.0%	127.2%	81.5%	87.5%
65–69	464.7%	193.3%	110.7%	122.1%
70–79	NA	124.9%	74.6%	77.0%
80+	NA	NA	NA	NA
Total	210.2%	138.4%	85.0%	92.0%
Excluding 65–69	191.5%	133.1%	82.1%	88.7%
Actual Claim Terminations				
Under 50	135	238	445	818
50–64	327	589	2,316	3,232
65–69	80	109	558	747
70–79	5	50	249	304
80+	0	0	14	14
Total	547	986	3,581	5,114

Table 3.28 shows that ultimate A/E CTR ratios are substantially lower during the 2000–2007 study period than in the other periods. Also, there is no credible claim termination data for attained ages 80 and older. In the construction of the 2013 IDIVT, the IDTWG graded CTRs to 125% of the 2008 Valuation Base Table mortality rates by attained age 85.

Section 4: The Potential Impact of 2000–2007 CTR Experience on Claim Reserves

This section explores the potential impact of CTR experience during the 2000–2007 study period on claim reserves. In this context claim reserves refer to “experience-based” claim reserves rather than statutory minimum claim reserves. Changes to statutory minimum reserves require new valuation tables and NAIC or state valuation regulations or laws, which are beyond the scope of this discussion.

The experience-based claim reserves are derived using the 2013 IDIVT Workbook, revised to apply the A/E CTR ratios to the base 2013 IDIVT CTRs. The A/E CTR ratios, which are based on 2000–2007 CTR experience, have not been graduated or adjusted for credibility. In the calculation of experience-based claim reserves, the A/E CTR ratios apply only to the select claim durations. Two scenarios for the ultimate claim durations are illustrated: (1) 100% of the 2013 IDIVT ultimate CTRs and (2) 80% of the 2013 IDIVT ultimate CTRs. The latter scenarios should be viewed as a sensitivity test to reflect emerging trends in the ultimate claim durations that is illustrated in Table 3.28 but should not be viewed as a prediction.

“Experience-based claim reserve ratios” at various claim durations throughout the first 10 years are derived by dividing (1) the experience-based claim reserves by (2) claim reserves based on 100% of the 2013 IDIVT CTR’s adjusted by the valuation CTR modifiers (provided in Appendix A) but not reduced by the explicit valuation margins (described in the IDTWG Report). A claim reserve ratio greater than 1.00 indicates that the CTR experience is less favorable than the 2013 IDIVT, whereas a claim reserve ratio less than 1.00 indicates that the CTR experience is more favorable.

A second set of claim reserve ratios referred to as “valuation claim reserve ratios” are derived. They are the result of dividing (1) claim reserves based on 100% of the 2013 IDIVT with CTR modifiers but reduced by the explicit valuation margins, namely, 5% in the first claim years and 15% thereafter, by (2) claim reserves based on 100% of the 2013 IDIVT with CTR modifiers but not reduced by the explicit valuation margins. A comparison of the two sets of claim reserves allows the reader to assess how well the variances in claim reserves due to the 2000–2007 CTR experience are offset by the explicit valuation CTR margins used to value statutory claim reserves.

All illustrated claim reserves assume a disabled insured at age 42 with a 90-day elimination period. Claim reserves with a To Age 67 BP are used to represent claim reserves for all claims with To Age 65–70 BPs. The assumed valuation interest rate is 3%, and the COLA inflation rate is 2%.

Claim reserve ratios for the following four scenarios are illustrated below separately for occupation classes M, 1 and 2:

- To Age 65–70 BP, no COLA
- To Age 65–70 BP, COLA
- Lifetime BP, no COLA
- Lifetime BP, COLA

4.1 Occupation Class M

Table 4.1 shows the experience-based and valuation claim reserve ratios for occupation class M with To Age 65–70 BPs and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.1 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class M No COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	Experience-Based CTR Adjustments (% of 2013 IDIVT Base CTRs)					
M1–M12	101%	101%	95%	108%	108%	95%
M13–M24	94%	94%	85%	96%	96%	85%
M25–M60	78%	78%	85%	89%	89%	85%
M61–M120	77%	77%	85%	88%	88%	85%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.07	1.08	1.05	0.98	0.98	1.07
M7	1.07	1.08	1.05	1.00	1.01	1.05
M13	1.08	1.09	1.03	1.04	1.05	1.03
M19	1.07	1.08	1.03	1.03	1.04	1.02
M25	1.07	1.08	1.02	1.03	1.04	1.02
M31	1.06	1.07	1.02	1.03	1.04	1.02
M37	1.05	1.07	1.02	1.02	1.03	1.02
M43	1.05	1.06	1.02	1.02	1.03	1.02
M49	1.04	1.05	1.02	1.02	1.03	1.01
M55	1.04	1.05	1.02	1.01	1.02	1.01
Y6	1.03	1.05	1.02	1.01	1.02	1.01
Y7	1.02	1.04	1.02	1.01	1.02	1.01
Y8	1.02	1.04	1.02	1.01	1.02	1.01
Y9	1.01	1.03	1.02	1.00	1.02	1.01
Y10	1.00	1.03	1.02	1.00	1.02	1.01

The experience-based claim reserve ratios for occupation class M claims with To Age 65–70 claims and no COLA benefits produces experience-based claim reserves that exceed 1.00 for all select durations for males, and similarly for females, except for the end of the elimination period. The experience-based claim reserve ratios in Table 4.1 are modestly higher than those for the valuation-based reserves with margins. Going from 100% of the 2013 IDIVT ultimate CTR's to 80% increases these claim reserves by 1% to 3% for males and 1% to 2% for females.

Table 4.2 shows the experience-based and valuation claim reserve ratios for occupation class M with To Age 65–70 BPs and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.2 Experience-Based and Valuation Claim Reserve Ratio for <u>Occupation Class M</u> COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	Experience-Based CTR Adjustments (% of 2013 IDIVT Base CTRs)					
M1–M12	79%	79%	79%	70%	70%	79%
M13–M24	81%	81%	71%	58%	58%	71%
M25–M60	66%	66%	71%	72%	72%	71%
M61–M120	77%	77%	71%	57%	57%	71%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.08	1.09	1.05	1.22	1.23	1.06
M7	1.07	1.09	1.04	1.17	1.18	1.05
M13	1.06	1.08	1.03	1.11	1.12	1.03
M19	1.06	1.08	1.03	1.06	1.07	1.02
M25	1.06	1.08	1.02	1.04	1.05	1.02
/M31	1.05	1.07	1.02	1.03	1.04	1.02
M37	1.04	1.06	1.02	1.02	1.04	1.02
M43	1.04	1.06	1.02	1.02	1.03	1.02
M49	1.03	1.05	1.02	1.02	1.03	1.01
M55	1.03	1.05	1.02	1.01	1.03	1.01
Y6	1.03	1.05	1.02	1.01	1.03	1.01
Y7	1.02	1.04	1.02	1.01	1.02	1.01
Y8	1.01	1.03	1.02	1.01	1.02	1.01
Y9	1.01	1.03	1.02	1.00	1.02	1.01
Y10	1.00	1.03	1.02	1.00	1.02	1.01

The experience-based claim reserve ratios for occupation class M claims with To Age 65–70 BPs and COLA benefits in Table 4.2 increased substantially for females over the corresponding experience-based claim reserve ratios for occupation class M with no COLA benefits in Table 4.1.

Table 4.3 shows the experience-based and valuation claim reserve ratios for occupation class M with the lifetime BP for and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.3 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class M No COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	Experience-Based CTR Adjustments (% of 2013 IDIVT Base CTRs)					
M1–M12	90%	90%	74%	65%	65%	74%
M13–M24	91%	91%	67%	59%	59%	67%
M25–M60	32%	32%	67%	37%	37%	67%
M61–M120	62%	62%	67%	45%	45%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.06	1.10	1.06	1.30	1.34	1.08
M7	1.08	1.12	1.06	1.25	1.29	1.06
M13	1.12	1.17	1.05	1.19	1.23	1.05
M19	1.15	1.19	1.05	1.15	1.19	1.04
M25	1.16	1.21	1.04	1.13	1.18	1.04
M31	1.14	1.19	1.04	1.11	1.15	1.04
M37	1.12	1.17	1.04	1.09	1.13	1.04
M43	1.10	1.16	1.04	1.07	1.12	1.04
M49	1.09	1.14	1.04	1.06	1.11	1.04
M55	1.08	1.13	1.04	1.06	1.10	1.04
Y6	1.07	1.13	1.04	1.05	1.09	1.04
Y7	1.05	1.11	1.04	1.04	1.08	1.04
Y8	1.04	1.10	1.05	1.02	1.07	1.04
Y9	1.02	1.09	1.05	1.02	1.07	1.04
Y10	1.01	1.08	1.05	1.01	1.06	1.04

The experience-based claim reserve ratios for occupation class M claims with the lifetime BP and no COLA benefits are higher than the valuation-based claim reserve ratios, as well as the experience-based claim reserve ratios for To Age 65–70 BPs and no COLA benefits (seen in Table 4.1). This is particularly true for females. Going from 100% of the 2013 IDIVT ultimate CTR's to 80% increases the claim reserves ratios for lifetime claims by 4% to 7% for males and 4% to 5% for females.

Table 4.4 shows the experience-based and valuation claim reserve ratios for occupation class M with the lifetime BP and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.4 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class M COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	71%	71%	74%	59%	59%	74%
M13–M24	58%	58%	67%	43%	43%	67%
M25–M60	39%	39%	67%	104%	104%	67%
M61–M120	41%	41%	67%	78%	78%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.22	1.28	1.07	1.18	1.23	1.08
M7	1.21	1.27	1.07	1.11	1.16	1.07
M13	1.19	1.25	1.06	1.02	1.07	1.06
M19	1.16	1.22	1.05	0.95	1.00	1.05
M25	1.14	1.21	1.05	0.92	0.96	1.05
M31	1.12	1.18	1.05	0.93	0.98	1.04
M37	1.11	1.17	1.05	0.95	0.99	1.04
M43	1.09	1.15	1.05	0.95	1.00	1.04
M49	1.08	1.14	1.05	0.96	1.01	1.04
M55	1.07	1.13	1.05	0.97	1.01	1.04
Y6	1.06	1.13	1.05	0.97	1.02	1.04
Y7	1.05	1.11	1.05	0.98	1.03	1.04
Y8	1.03	1.10	1.05	0.98	1.04	1.04
Y9	1.02	1.09	1.05	0.99	1.05	1.04
Y10	1.01	1.08	1.05	1.00	1.05	1.04

The experience-based claim reserve ratios for male occupation class M claims with the lifetime BP and COLA benefits are significantly higher than the valuation-based claim reserve ratios. The same is true for female occupation class M claims through the first 12 claim months. After the first 18 months, the experience-based claim reserve ratios for female occupation class M are lower than the valuation claim reserve ratios. Going from 100% of the 2013 IDIVT ultimate CTR's to 80% increases the claim reserves ratios for lifetime claims by 6% to 7% for males and 4% to 5% for females.

4.2 Occupation Class 1

Table 4.5 shows the experience-based and valuation claim reserve ratios for occupation class 1 with To Age 65–70 BPs and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.5 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 1 No COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	100%	100%	95%	102%	102%	95%
M13–M24	103%	103%	85%	107%	107%	85%
M25–M60	88%	88%	85%	91%	91%	85%
M61–M120	150%	150%	85%	125%	125%	85%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.03	1.05	1.06	1.00	1.01	1.06
M7	1.04	1.05	1.05	1.01	1.02	1.05
M13	1.04	1.06	1.04	1.02	1.03	1.04
M19	1.05	1.06	1.04	1.03	1.04	1.03
M25	1.05	1.07	1.03	1.04	1.05	1.03
M31	1.05	1.06	1.03	1.03	1.04	1.02
M37	1.04	1.06	1.03	1.03	1.04	1.02
M43	1.03	1.05	1.03	1.02	1.03	1.02
M49	1.03	1.05	1.03	1.02	1.03	1.02
M55	1.03	1.05	1.03	1.02	1.03	1.02
Y6	1.02	1.04	1.02	1.01	1.03	1.02
Y7	1.02	1.04	1.02	1.01	1.03	1.02
Y8	1.01	1.04	1.02	1.01	1.02	1.02
Y9	1.01	1.04	1.02	1.00	1.02	1.02
Y10	1.00	1.03	1.02	1.00	1.02	1.02

The experience-based claim reserve ratios for occupation class 1 claims with To Age 65–70 BPs and no COLA benefits are quite similar to the corresponding claim reserve ratios for occupation class M. After the first claim year, the experience-based claim reserve ratios are modestly higher than the valuation-based claim reserve ratios for the 80% ultimate CTR scenario.

Table 4.6 shows the experience-based and valuation claim reserve ratios for occupation class 1 with To Age 65–70 BPs and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.6 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 1 COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	70%	70%	79%	81%	81%	79%
M13–M24	72%	72%	71%	85%	85%	71%
M25–M60	72%	72%	71%	58%	58%	71%
M61–M120	124%	124%	71%	59%	59%	71%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.14	1.16	1.06	1.11	1.12	1.06
M7	1.11	1.13	1.05	1.10	1.12	1.05
M13	1.08	1.10	1.04	1.10	1.11	1.04
M19	1.06	1.08	1.04	1.11	1.12	1.03
M25	1.05	1.07	1.03	1.11	1.13	1.03
M31	1.04	1.07	1.03	1.09	1.11	1.02
M37	1.04	1.06	1.03	1.07	1.09	1.02
M43	1.03	1.06	1.03	1.06	1.08	1.02
M49	1.03	1.05	1.03	1.05	1.07	1.02
M55	1.02	1.05	1.03	1.05	1.06	1.02
Y6	1.02	1.05	1.03	1.04	1.06	1.02
Y7	1.02	1.04	1.03	1.03	1.05	1.02
Y8	1.01	1.04	1.03	1.02	1.04	1.02
Y9	1.01	1.04	1.03	1.01	1.03	1.02
Y10	1.00	1.04	1.03	1.01	1.03	1.02

The experience-based claim reserve ratios for occupation class 1 claims with To Age 65–70 BPs and COLA benefits in Table 4.6 exceed 1.00 and are higher than the valuation-based claim reserve ratios. The female claim reserve ratios are generally higher than the male ratios after the first claim year.

Table 4.7 shows the experience-based and valuation claim reserve ratios for occupation class 1 with the lifetime BP for and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.7 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 1 No COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	87%	87%	74%	76%	76%	74%
M13–M24	88%	88%	67%	105%	105%	67%
M25–M60	83%	83%	67%	60%	60%	67%
M61–M120	76%	76%	67%	45%	45%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	0.92	0.96	1.07	1.02	1.06	1.07
M7	0.94	0.98	1.07	1.02	1.05	1.07
M13	0.96	1.00	1.06	1.01	1.05	1.05
M19	0.97	1.02	1.06	1.05	1.09	1.05
M25	0.98	1.03	1.05	1.08	1.12	1.05
M31	0.98	1.03	1.05	1.06	1.11	1.05
M37	0.98	1.04	1.05	1.05	1.10	1.04
M43	0.99	1.04	1.05	1.04	1.09	1.04
M49	0.99	1.04	1.05	1.04	1.09	1.04
M55	0.99	1.05	1.05	1.03	1.08	1.04
Y6	0.99	1.05	1.05	1.03	1.08	1.04
Y7	0.99	1.06	1.05	1.02	1.08	1.04
Y8	0.99	1.06	1.05	1.02	1.07	1.04
Y9	1.00	1.07	1.06	1.01	1.07	1.05
Y10	1.00	1.08	1.06	1.00	1.07	1.05

The experience-based claim reserve ratios for occupation class 1 claims with the lifetime BP and no COLA benefits for males are lower than the valuation claim reserves and only modestly higher for females after the second claim year. The experience-based claim reserve ratios are higher for occupation class 1 females than males in most durations. Going from 100% of the 2013 IDIVT ultimate CTRs to 80% increases the claim reserves ratios for lifetime claims by 4% to 7% for males and females.

Table 4.8 shows the experience-based and valuation claim reserve ratios for occupation class 1 with the lifetime BP for and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.8 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 1 COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	63%	63%	74%	47%	47%	74%
M13–M24	57%	57%	67%	86%	86%	67%
M25–M60	91%	91%	67%	55%	55%	67%
M61–M120	88%	88%	67%	34%	34%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.06	1.12	1.09	1.30	1.36	1.08
M7	1.03	1.09	1.08	1.20	1.26	1.08
M13	0.99	1.05	1.07	1.08	1.13	1.06
M19	0.96	1.02	1.07	1.10	1.15	1.06
M25	0.94	1.00	1.06	1.11	1.16	1.06
M31	0.95	1.01	1.06	1.09	1.14	1.05
M37	0.96	1.02	1.06	1.07	1.13	1.05
M43	0.96	1.03	1.06	1.06	1.12	1.05
M49	0.97	1.03	1.06	1.05	1.11	1.05
M55	0.97	1.04	1.06	1.04	1.10	1.05
Y6	0.97	1.04	1.06	1.04	1.10	1.05
Y7	0.98	1.05	1.06	1.03	1.09	1.05
Y8	0.99	1.06	1.06	1.02	1.08	1.05
Y9	0.99	1.07	1.06	1.01	1.08	1.05
Y10	1.00	1.08	1.07	1.01	1.08	1.05

The experience-based claim reserve ratios for occupation class 1 claims with the lifetime BP and COLA benefits are lower than the corresponding experience-based claim reserve ratios for occupation class M for males but somewhat higher for females. Going from 100% of the 2013 IDIVT ultimate CTR's to 80% increases the claim reserves ratios for lifetime claims by 6% to 8% for males and 6% to 7% for females.

4.3 Occupation Class 2

Table 4.9 shows the experience-based and valuation claim reserve ratios for occupation class 2 with To Age 65–70 BPs and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.9 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 2 No COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	100%	100%	95%	99%	99%	95%
M13–M24	94%	94%	85%	85%	85%	85%
M25–M60	76%	76%	85%	86%	86%	85%
M61–M120	124%	124%	85%	98%	98%	85%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.09	1.11	1.06	1.10	1.11	1.07
M7	1.09	1.11	1.05	1.10	1.11	1.06
M13	1.10	1.11	1.04	1.10	1.11	1.04
M19	1.09	1.11	1.03	1.08	1.09	1.04
M25	1.09	1.11	1.03	1.07	1.08	1.03
M31	1.08	1.10	1.03	1.06	1.07	1.03
M37	1.07	1.09	1.03	1.05	1.06	1.03
M43	1.06	1.08	1.03	1.04	1.05	1.02
M49	1.05	1.07	1.03	1.03	1.05	1.02
M55	1.05	1.07	1.02	1.03	1.04	1.02
Y6	1.04	1.06	1.02	1.03	1.04	1.02
Y7	1.03	1.06	1.02	1.02	1.04	1.02
Y8	1.02	1.05	1.02	1.01	1.03	1.02
Y9	1.01	1.04	1.02	1.01	1.03	1.02
Y10	1.01	1.04	1.02	1.00	1.02	1.02

The experience-based claim reserve ratios for occupation class 2 claims with To Age 65–70 BPs and no COLA benefits are somewhat higher than the valuation claim reserve ratios. The experience-based claim reserve ratios for occupation class 2 claims in Table 4.9 are quite similar by gender.

Table 4.10 shows the experience-based and valuation claim reserve ratios for occupation class 2 with To Age 65–70 BPs and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.10 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 2 COLA, To Age 65–70 BPs; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	63%	63%	79%	70%	70%	79%
M13–M24	113%	113%	71%	82%	82%	71%
M25–M60	90%	90%	71%	66%	66%	71%
M61–M120	117%	117%	71%	161%	161%	71%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	1.02	1.04	1.06	1.17	1.19	1.06
M7	0.97	0.99	1.05	1.14	1.15	1.05
M13	0.91	0.93	1.04	1.09	1.10	1.04
M19	0.95	0.97	1.03	1.09	1.10	1.03
M25	0.97	0.99	1.03	1.09	1.11	1.03
M31	0.98	1.00	1.03	1.08	1.09	1.03
M37	0.98	1.00	1.03	1.06	1.08	1.03
M43	0.98	1.00	1.03	1.05	1.07	1.02
M49	0.98	1.01	1.03	1.04	1.06	1.02
M55	0.99	1.01	1.03	1.04	1.05	1.02
Y6	0.99	1.01	1.03	1.03	1.05	1.02
Y7	0.99	1.02	1.03	1.02	1.04	1.02
Y8	0.99	1.02	1.03	1.02	1.04	1.02
Y9	1.00	1.03	1.03	1.01	1.03	1.02
Y10	1.00	1.03	1.03	1.00	1.03	1.02

The experience-based claim reserve ratios for occupation class 2 male claims with To Age 65–70 BPs and COLA benefits are lower than the male valuation claim reserve ratios. On the other hand, the experience-based female claim reserve ratios are higher than the female valuation reserve ratios in all durations.

Table 4.11 shows the experience-based and valuation claim reserve ratios for occupation class 1 with the lifetime BP for and no COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.11 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 2 No COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	84%	84%	74%	123%	123%	74%
M13–M24	83%	83%	67%	73%	73%	67%
M25–M60	100%	100%	67%	154%	154%	67%
M61–M120	93%	93%	67%	73%	73%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	0.90	0.93	1.08	0.56	0.58	1.08
M7	0.90	0.94	1.07	0.63	0.65	1.07
M13	0.92	0.96	1.06	0.71	0.74	1.06
M19	0.92	0.96	1.05	0.70	0.72	1.05
M25	0.92	0.96	1.05	0.68	0.71	1.05
M31	0.93	0.98	1.05	0.72	0.75	1.05
M37	0.94	0.99	1.05	0.76	0.80	1.05
M43	0.95	1.00	1.05	0.80	0.83	1.05
M49	0.95	1.01	1.05	0.83	0.87	1.04
M55	0.96	1.01	1.05	0.85	0.89	1.04
Y6	0.96	1.02	1.05	0.86	0.91	1.04
Y7	0.97	1.03	1.05	0.90	0.95	1.04
Y8	0.98	1.05	1.05	0.93	0.98	1.05
Y9	0.99	1.06	1.06	0.96	1.01	1.05
Y10	0.99	1.07	1.06	0.98	1.04	1.05

The experience-based claim reserve ratios for males and females in occupation class 2 claims with the lifetime BP and no COLA benefits are lower than the valuation-based claim reserve ratios, particularly for females. Going from 100% of the 2013 IDIVT ultimate CTR's to 80% increases the claim reserves ratios for lifetime claims by 3% to 8% for males and 2% to 6% for females.

Table 4.12 shows the experience-based and valuation claim reserve ratios for occupation class 2 with the lifetime BP and COLA benefits, separately for males and females. Experience-based claim reserve ratios are shown for the two ultimate CTR scenarios, 100% and 80% of the 2013 IDIVT ultimate CTRs.

Table 4.12 Experience-Based and Valuation Claim Reserve Ratio for Occupation Class 2 COLA, Lifetime BP; Elimination Periods ≥ 30 Days Relative to Claims Reserves Based on 100% 2013 IDIVT with CTR Modifiers <u>Not Reduced</u> by Valuation CTR Margins 3.00% Valuation Interest Rate						
Male				Female		
Monthly Duration	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins	Experience Basis w/ 100% Ultimate CTRs	Experience Basis w/ 80% Ultimate CTRs	Valuation Basis w/ Margins
	CTR Adjustments					
M1–M12	70%	70%	74%	34%	34%	74%
M13–M24	132%	132%	67%	111%	111%	67%
M25–M60	137%	137%	67%	0%	0%	67%
M61–M120	89%	89%	67%	108%	108%	67%
M121+	100%	80%	85%	100%	80%	85%
	Claim Reserve Ratios					
Beginning of Duration						
M4	0.75	0.79	1.09	1.78	1.87	1.09
M7	0.73	0.77	1.08	1.59	1.67	1.08
M13	0.70	0.74	1.07	1.38	1.46	1.07
M19	0.75	0.80	1.06	1.46	1.54	1.06
M25	0.78	0.83	1.06	1.52	1.60	1.06
M31	0.81	0.86	1.06	1.42	1.50	1.06
M37	0.83	0.88	1.06	1.33	1.41	1.05
M43	0.85	0.91	1.06	1.27	1.34	1.05
M49	0.87	0.93	1.06	1.22	1.29	1.05
M55	0.88	0.94	1.06	1.19	1.26	1.05
Y6	0.89	0.96	1.06	1.16	1.23	1.05
Y7	0.92	0.99	1.06	1.12	1.19	1.05
Y8	0.94	1.01	1.06	1.08	1.15	1.05
Y9	0.96	1.04	1.06	1.05	1.12	1.05
Y10	0.98	1.07	1.07	1.02	1.09	1.05

The experience-based claim reserve ratios for occupation class 2 claims with the lifetime BP and COLA benefits are lower than the valuation claim reserve ratios for males but considerably higher for females. Of all of the 12 tables in this section, Table 4.12 is probably based on the least claim data, and these results have the lowest credibility.

4.4 Summary of Experience-Based Claim Reserves

The following observations summarize results from the 12 tables in this section.

- The 2000–2007 CTR experience strongly suggests that claim reserves representing this period of time will need to be higher than those based on the 2013 IDIVT, particularly for claims with the lifetime BP and claims with COLA benefits. The magnitude of the increase in reserves varies by occupation class, benefit period, the presence of COLA benefits and gender.
- Although the valuation CTR margins, which are described in the IDTWG Report, help to offset the increase in claim reserves resulting from the 2000–2007 CTR experience, they are generally not sufficient to cover the full increase.
- Future revisions to the CTR modifiers in the valuation table may need to have greater variation among the occupation classes and the combinations of lifetime and COLA benefits.

Section 5: Reliance and Limitations

5.1 Reliance

In conducting our analysis, Milliman relied upon the database developed by the IDEC for its 1990–2007 claim termination study. Unless otherwise described, Milliman did not audit or independently verify any of the information furnished, except that we did review the data for reasonableness and consistency. To the extent that any of the data or other information supplied to us was incorrect or inaccurate, the results of our analysis could be materially affected.

Appendix A: 2013 IDI Valuation Table Claim Termination Rate Modifiers

Duration	CTR Modifier—By Contract	
	All Other	OE
Y1	100.0%	94.7%
Y2	100.0%	259.4%
Y3–5	100.0%	259.4%
Y6–10	100.0%	259.4%

Duration	CTR Modifier—No COLA		
	To Age 65–70	Life	Short-Term
Y1	100.0%	78.3%	117.2%
Y2	100.0%	78.3%	117.2%
Y3–5	100.0%	78.3%	117.2%
Y6–10	100.0%	78.3%	117.2%

Duration	CTR Modifier—COLA		
	To Age 65–70	Life	Short-Term
Y1	83.5%	78.3%	117.2%
Y2	83.5%	78.3%	117.2%
Y3–5	83.5%	78.3%	117.2%
Y6–10	83.5%	78.3%	117.2%

Appendix B: A/E Claim Termination Rate Ratio Detail by State

State	Raw A/E				Credibility-Adjusted A/E			
	1990-1994	1995-1999	2000-2007	Full Study Period	1990-1994	1995-1999	2000-2007	Full Study Period
Alaska	117.6%	63.7%	116.7%	104.6%	107.5%	99.9%	99.6%	100.9%
Alabama	105.5%	107.9%	97.3%	101.4%	108.1%	102.2%	97.9%	101.4%
Arkansas	109.4%	82.3%	78.1%	83.6%	108.9%	97.0%	91.4%	93.9%
Arizona	75.5%	75.4%	73.0%	73.8%	99.3%	94.0%	84.9%	83.4%
California	93.3%	92.1%	99.2%	96.5%	92.9%	92.6%	98.7%	96.5%
Colorado	102.8%	88.1%	88.4%	90.1%	106.7%	95.9%	91.3%	92.2%
Connecticut	120.7%	111.0%	99.3%	104.1%	110.6%	102.2%	99.4%	103.9%
District of Columbia	110.3%	127.6%	107.5%	110.9%	105.3%	99.9%	95.7%	98.6%
Delaware	70.8%	111.6%	102.5%	99.3%	105.1%	100.7%	96.8%	98.0%
Florida	85.2%	72.7%	70.1%	73.0%	95.2%	83.8%	74.2%	75.3%
Georgia	110.9%	88.3%	110.3%	105.4%	107.6%	95.9%	103.7%	102.5%
Hawaii	120.8%	103.2%	106.5%	108.2%	108.8%	99.4%	98.9%	101.7%
Iowa	114.1%	101.8%	99.2%	102.8%	109.5%	101.4%	97.0%	100.9%
Idaho	100.6%	74.1%	69.1%	73.6%	109.3%	98.7%	92.3%	94.6%
Illinois	113.4%	108.6%	102.0%	105.2%	109.3%	102.1%	101.2%	105.0%
Indiana	144.1%	100.4%	118.5%	117.9%	115.9%	100.2%	106.2%	109.7%
Kansas	105.9%	86.4%	85.5%	88.0%	107.1%	98.2%	92.3%	94.4%
Kentucky	110.2%	88.1%	82.1%	87.3%	108.0%	97.3%	90.5%	92.9%
Louisiana	90.7%	86.3%	96.3%	92.9%	104.1%	96.9%	94.3%	94.0%
Massachusetts	109.7%	106.8%	96.8%	99.9%	108.2%	102.2%	96.3%	99.8%
Maryland	110.4%	91.0%	93.6%	95.2%	106.7%	95.0%	97.5%	98.1%
Maine	112.1%	116.5%	97.0%	103.0%	106.3%	101.1%	97.6%	101.1%
Michigan	121.1%	113.5%	108.0%	112.1%	113.6%	105.3%	100.0%	107.2%
Minnesota	118.7%	104.8%	78.2%	92.1%	111.2%	100.0%	90.3%	95.7%
Missouri	114.0%	99.0%	69.8%	81.0%	110.5%	99.4%	86.3%	90.7%
Mississippi	90.3%	82.6%	140.9%	127.1%	106.7%	98.7%	112.8%	111.7%
Montana	65.6%	78.6%	69.4%	70.5%	104.8%	100.0%	90.8%	91.9%
North Carolina	109.6%	109.9%	84.5%	89.7%	107.8%	102.4%	89.1%	93.0%
North Dakota	180.6%	50.8%	101.7%	85.1%	111.3%	93.8%	97.5%	96.8%
Nebraska	98.9%	98.4%	124.5%	117.8%	107.0%	100.2%	102.5%	103.9%
New Hampshire	111.2%	127.6%	81.5%	90.4%	107.8%	102.7%	91.0%	95.1%
New Jersey	124.8%	112.0%	103.5%	108.2%	115.4%	105.9%	102.5%	107.6%
New Mexico	111.1%	76.6%	80.6%	83.6%	108.8%	96.8%	90.5%	92.0%
Nevada	78.4%	96.6%	97.8%	95.5%	101.1%	99.6%	94.3%	95.0%
New York	115.9%	117.4%	109.5%	112.4%	114.6%	112.1%	106.7%	110.9%
Ohio	127.2%	113.4%	108.6%	112.9%	115.0%	104.1%	104.1%	110.2%
Oklahoma	109.2%	101.7%	94.7%	97.3%	108.0%	100.9%	95.1%	97.5%
Oregon	130.9%	105.7%	82.5%	92.4%	113.7%	101.9%	91.4%	96.5%
Pennsylvania	118.8%	110.9%	109.0%	111.0%	110.2%	105.2%	106.8%	109.0%
Rhode Island	119.1%	135.2%	127.6%	127.5%	108.5%	106.7%	109.2%	113.7%
South Carolina	115.6%	95.8%	81.9%	86.1%	109.1%	100.5%	89.5%	92.6%
South Dakota	89.9%	88.0%	132.6%	115.7%	105.3%	100.3%	99.8%	101.2%
Tennessee	112.7%	106.3%	88.5%	95.7%	109.3%	101.6%	93.4%	97.6%
Texas	102.2%	93.6%	93.6%	94.9%	105.2%	97.7%	95.1%	96.2%
Utah	81.1%	84.7%	80.6%	81.3%	106.2%	98.6%	91.3%	92.9%

State	Raw A/E				Credibility-Adjusted A/E			
	1990-1994	1995-1999	2000-2007	Full Study Period	1990-1994	1995-1999	2000-2007	Full Study Period
Virginia	106.2%	99.8%	106.7%	105.7%	108.1%	99.5%	104.6%	105.9%
Vermont	163.6%	130.2%	91.1%	101.5%	111.3%	101.3%	94.3%	98.5%
Washington	96.4%	100.4%	127.9%	123.4%	104.7%	100.8%	108.0%	109.1%
Wisconsin	127.1%	119.8%	92.0%	104.8%	113.2%	105.4%	97.8%	104.8%
West Virginia	132.7%	112.7%	69.1%	84.1%	111.0%	101.7%	91.1%	95.8%
Wyoming	48.5%	126.1%	158.4%	140.7%	104.7%	106.5%	99.9%	101.3%
Total	106.6%	99.4%	96.5%	98.6%	106.6%	99.4%	96.5%	98.6%

State	Actual Claim Terminations			
	1990-1994	1995-1999	2000-2007	Full Study Period
Alaska	16	14	50	80
Alabama	354	408	888	1,650
Arkansas	89	124	284	496
Arizona	363	381	1,662	2,406
California	4,284	4,088	12,005	20,377
Colorado	380	468	1,274	2,122
Connecticut	634	599	2,270	3,503
District of Columbia	78	75	244	397
Delaware	34	60	190	283
Florida	1,913	1,878	5,164	8,955
Georgia	544	587	2,343	3,474
Hawaii	185	160	536	881
Iowa	458	481	889	1,829
Idaho	73	52	178	303
Illinois	1,044	1,171	2,430	4,645
Indiana	387	349	1,143	1,879
Kansas	191	170	755	1,116
Kentucky	374	359	897	1,630
Louisiana	324	372	1,086	1,782
Massachusetts	1,149	1,011	4,760	6,920
Maryland	668	729	2,871	4,269
Maine	140	185	537	862
Michigan	1,350	1,350	2,871	5,571
Minnesota	629	683	974	2,286
Missouri	376	369	912	1,658
Mississippi	143	144	943	1,230
Montana	81	84	196	362
North Carolina	485	593	3,082	4,160
North Dakota	48	43	30	120
Nebraska	123	141	691	956
New Hampshire	130	172	615	918
New Jersey	1,604	1,643	5,256	8,502
New Mexico	113	88	348	550
Nevada	104	91	617	813
New York	4,298	4,139	11,453	19,890
Ohio	1,029	1,008	2,302	4,339
Oklahoma	175	137	794	1,106
Oregon	219	267	730	1,215

State	Actual Claim Terminations			
	1990-1994	1995-1999	2000-2007	Full Study Period
Pennsylvania	1,761	1,608	5,607	8,975
Rhode Island	331	318	959	1,608
South Carolina	232	250	1,434	1,916
South Dakota	44	52	99	195
Tennessee	604	623	1,758	2,985
Texas	1,092	1,023	3,886	6,001
Utah	59	63	282	405
Virginia	557	551	3,498	4,606
Vermont	79	46	299	424
Washington	238	227	1,993	2,458
Wisconsin	765	706	1,034	2,505
West Virginia	107	120	321	547
Wyoming	10	20	99	129
Total	30,468	30,279	95,540	156,287

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