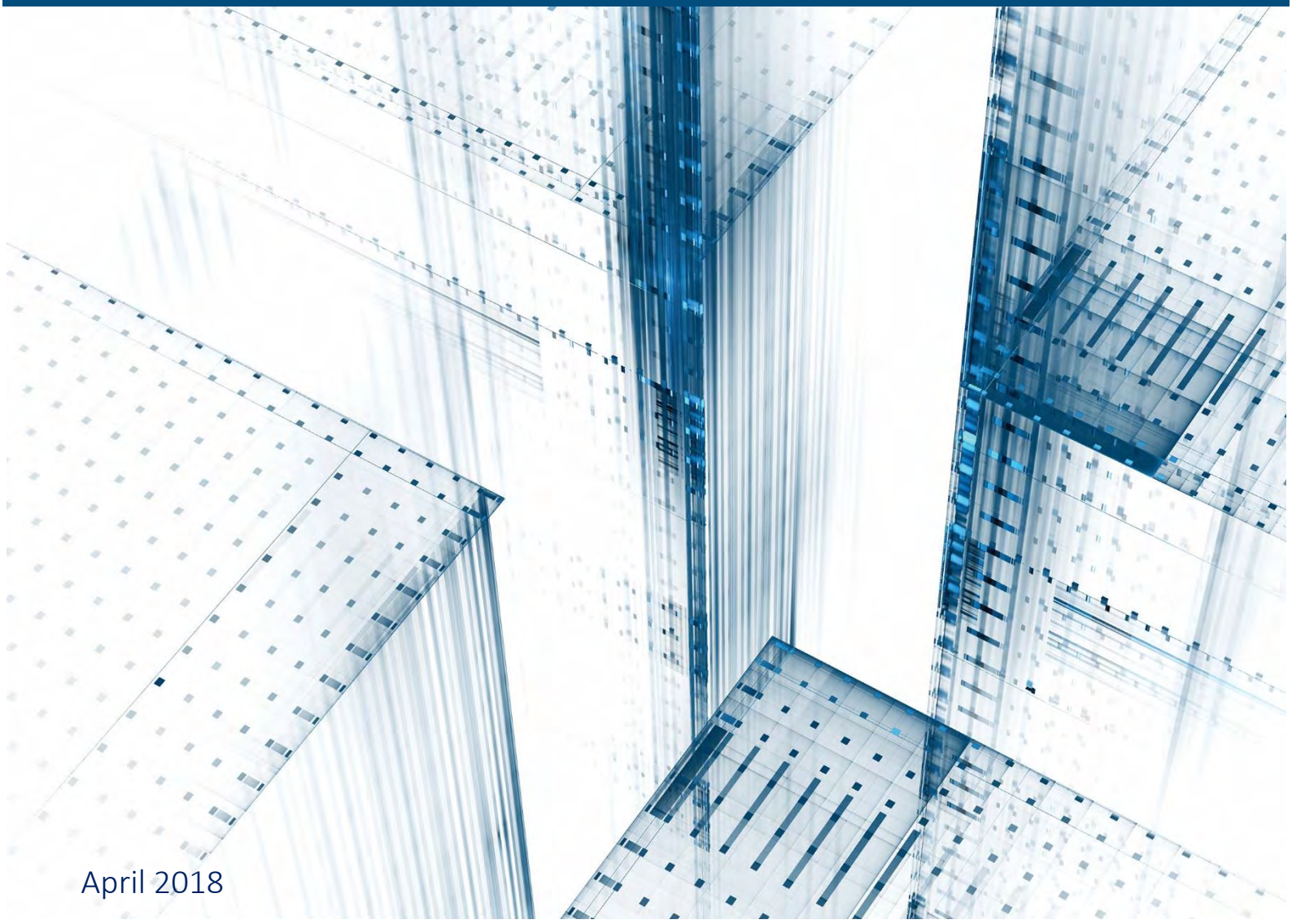
SOCIETY OF ACTUARIES

2018 Group Long-Term Disability Experience Study Report



April 2018

2018 Group Long-Term Disability Experience Study Report

AUTHORS Group Long-Term Disability Experience Committee

Society of Actuaries

Caveat and Disclaimer

TABLE OF CONTENTS

Acknowledgements

The Society of Actuaries (SOA) would like to thank the members of the Group Long-Term Disability Experience Committee (GLTDEC) for its work on this study.

Members:

Roger Martin, FSA, MAAA (Chair)
Edward Bailey, ASA, MAAA
Warren Cohen, FSA, MAAA
Thomas Corcoran, FSA, MAAA, CERA
Paul Correia, FSA, MAAA, CERA
Kathy Davis, FSA, MAAA
Arber Dhamo, ASA, MAAA
Frederick Flores, FSA, MAAA
Eric Gale, FSA
Stephen Garfield, FSA
Paul Hitchcox, FSA, MAAA
Richard Leavitt, ASA, MAAA
Foon Wei Lew, FSA, MAAA
Haobo Li, FSA
Allen Livingood, FSA, MAAA
Jacob McCoy, FSA, MAAA
William Obert, FSA, MAAA
Eric Poirier, FSA, FCIA, MAAA
Scott Robidoux, FSA, MAAA
Bram Spector, FSA, MAAA
Sue Stone, FSA, MAAA
Douglas Vrooman, FSA, MAAA
Patrick Wallner, FSA, MAAA
John Winter, ASA, MAAA
Feng Zhao, FSA, MAAA

MIB: Jaron Arboleda, ASA, MAAA; Laura Cavanagh; Jeff Curry

SOA Staff Liaison: Pete Miller, ASA, MAAA

SOA Research Liaison: Erika Schulty

Section 1: Introduction

1.1 Study Details

The study covers the experience period from January 1, 2004 to December 31, 2012, using claim data that was collected as of December 31, 2013. There were 25 participating companies as listed below:

Aetna	Guardian	Principal Financial Group
AIG	MetLife	Prudential
American Fidelity	Mutual of Omaha	Reliance Standard
Anthem	Northwestern Mutual	The Standard
Assurant	OneAmerica	Sun Life Financial
Boston Mutual	Hartford Group Reinsurance	United Healthcare
Cigna	Liberty Mutual	Unum
Dearborn National	Lincoln Financial	
Disability RMS	The Hartford	

This study included more than 1.75 million claims and included 969K terminations, including 184K deaths and 775K recoveries. This is the largest LTD terminations study ever completed and compares to the following termination counts from prior studies:

- GLTD: 680K
- Table95a: 136K
- CGT87: 48K

1.2 Study Definitions

The study explicitly uses the same definitions as used in the 2008 study, which was the basis for the GLTD2008 experience table. This experience table was used to set the termination expectations that are presented in the pivot table results. In addition to the core variables that were part of the 2008 study, we also requested several additional variables that were provided for the segmentation of results.

Data Submission

Companies were requested to submit data on all fully insured group long-term disability ("LTD") claims that were open at any time during the study period, and that also had at least one benefit payment.

Certain claims were excluded from the study, including full or partial administrative services only ("ASO") claims, claims from reserve buy-outs, international claims, and claims with extended elimination periods (greater than 15 months). Zero-day elimination period ("EP") claims were excluded from all analyses. In order to ensure confidentiality of individual company data, an external vendor, the Medical Information Bureau (MIB), was utilized to collect and sort the data.

In the data request, companies were asked to assign claim terminations to one of five categories:

1. Recovery
2. Death
3. Contractual maximum benefit period being reached ("Max-Out")
4. Expiration due to internal benefit period limit ("Limit")
5. Settlement

The term recovery refers to any claim termination that is not otherwise identified by the other four categories and, thus, includes many terminations that are not due strictly to a recovery from the disability. In particular, terminations due to the change in definition from own occupation to any occupation are counted as recoveries.

The LTD experience committee worked with MIB to ensure the accuracy and validity of the submitted data. A self-audit guide was provided to the participating companies that identified a number of specific data integrity checks that should be performed before submitting the data. Once the data was submitted, MIB created their own data validation reports, which were reviewed by the experience committee, which then decided whether to work around the issues, or request clarification or resubmission of the data from specific carriers.

The Committee then reviewed a contributor-level variance report to identify potential outliers. The data was presented in a manner that precluded individual company identification. Any potential issues identified by the Committee were addressed through MIB back to the contributing company.

The primary data manipulation performed by MIB that materially affected the results was that claims that terminated within 45 days of the submitted maximum benefit duration date were reclassified as Max-outs. Some of the new segment variables were missing or had invalid values. There was no attempt to fix these values, so they were passed directly to the pivot tables as "Unknown/Invalid."

Exposure Definition

The definitions of exposure and duration of claims used in this report are consistent with the assumptions used to develop the GLTD2008 experience table. While the experience report provided with this study can be referred to for additional details, the following is a brief summary of how exposures were defined:

Throughout the study, the elimination period was based on the benefit commencement date minus the date of disability. This means an effective elimination period was used instead of the contractual elimination period. For example, they can differ due to a temporary return to work during the elimination period. The elimination period was converted to months by dividing by 30 and rounding to the nearest integer.

The exposure ends with the earlier of the claim termination date or the end of the study period. If a claim was open as of the study valuation date (December 31, 2013), or had a termination date after the study-end date (December 31, 2012), then it was exposed to the study end-date. All claims were given a full month of exposure for each month in which they were at least partially exposed, with the following specific exceptions:

1. Claims that were receiving benefits when the study began might have gotten a fractional month exposure in the first month of the study.
2. Claims that were receiving benefits when the study ended might have gotten a fractional month exposure in the last month of the study.
3. Claims that lasted until the end of the contractual benefit period might have gotten a fractional month exposure in the last month of benefits.

Fractional exposures are determined by dividing the number of days exposed by 30 and capping at 100%.

We note that these exposure definitions were appropriate on a "pricing" or "experience" basis, in which we estimated the total months of benefit paid for each claim incurred, as opposed to a "valuation" basis, which applied only to reported or "known" claims. The primary difference between an experience basis and a valuation basis is that, for a valuation basis, claims would not have been exposed to termination before they were reported. In addition, claims that closed within the study period, but were not known to be closed as of the end of the study period, would have been counted as open when determining an appropriate valuation basis.

Carrier Dampening

Similar to the 2008 study, data associated with the largest contributors were dampened to prevent their experience from dominating the study results. Specifically, the exposure for companies that had more than 6% of the total exposure was dampened with a factor that was calculated as follows:

Carrier-Specific Dampening Factor = (6% / Carrier % of Total Exposure) ^ 0.5

Dampening was performed by applying the Carrier-Specific Dampening Factor to all exposures and terminations before summarizing the results.

Note the above approach applied less dampening than was used in the 2008 study (when the exposure for each of the top five companies was reset to represent 12% of the total study exposure). Less dampening was needed as there were more contributing companies than in 2008.

1.3 Pivot Table Considerations

The following are some items the user should bear in mind when contemplating the study pivot tables.

Interpreting Trends by Calendar Year

The study showed a pronounced upward trend in actual-to-expected (A/E) Recovery Rates by calendar year. Specifically, the A/E ratio graded steadily upward from nearly 100% in 2004 to more than 125% in 2012.

The committee noted that, in addition to calendar year, there may be other factors that might have partially driven this change. These factors could have included the addition of several new contributors, changes in the weighting of the original contributors, changes in the actual data submitted by these carriers, and changes in claim mix. There was some work done to isolate those components, which led us to believe that only part of the improving recovery trend could be explained by those study parameters alone, so there remained significant residual changes in recovery rates over time.

Comparisons of A/E Results to the 2008 Study

To understand if the changes in A/E recovery rates from the 2008 study were being driven by either a different mix of contributing companies and/or different dampening factors, we compared A/E termination rates for the overlapping years of each study (2004 to 2006):

	Termination Rate Comparison between studies - overlapping years							
	Recovery A to E's				Death A to E's			
	2004	2005	2006	04-06	2004	2005	2006	04-06
2008 Study	103.3%	106.1%	105.4%	104.9%	94.8%	96.7%	95.6%	95.7%
2016 Study	99.7%	106.7%	108.6%	105.1%	90.5%	93.1%	92.5%	92.1%
Change	-3.7%	0.7%	3.2%	0.1%	-4.3%	-3.6%	-3.1%	-3.7%

The above shows that A/E recoveries were reasonably consistent between the two studies from 2004 to 2006, with results that were within 3.7% (and 0.1% for all three years combined). A/E Deaths were also reasonably close, but lower than the 2008 study for all three years. We also observed that most of the difference was due to changes in the data submissions from original contributors and not due to the changes in dampening, nor the addition of new contributors.

Termination Category for Claims with Internal Limits

Evaluation of A/E ratios with internal limits on the benefit period for a subset of claims was subject to the integrity of the categorization of claim terminations between recoveries, claims reaching the end of their contractual maximum benefit period (max-outs), and claims closed due to the internal limit. This was especially important in examining results for Mental & Nervous claims.

In the 1997-2006 experience study, it was noted that in addition to claims closing due to the internal limit, there was an increase in max-outs and recoveries in the limit month, as well as the next several months. Therefore, it was decided to analyze total terminations, excluding deaths, within three months of the limit date. The 2008 GLTD Experience Table was constructed using this methodology.

The Committee observed the same phenomenon in the 2004-12 experience study; Mental & Nervous claims were evaluated on the same basis (total terminations excluding deaths for the period within three months on the limit date) in this report.

Termination Rates at Older Ages

The 2004-12 experience study contains material exposure volume for ages 65+ on both an attained-age and age-at-disability basis. The Committee observed elevated A/E Recovery ratios for ages 65-69 on both bases. It is possible that some of the reported recoveries were truly max-outs, but a full evaluation was not completed. Therefore, the Committee recommends caution in reaching conclusions about recovery results at advanced ages.

A/E Recovery Rates by Duration from Disability Date

The committee noted a decline in A/E recovery rates by disability year, starting in year 4 as summarized in the table below:

Duration of Disability	A/E Recovery
Year: 1	110.7%
Year: 2	121.5%
Year: 3	135.7%
Year: 4	111.5%
Year: 5	93.1%
Year: 6 to 10	87.3%
Over 10 Years	79.6%
Total	113.9%

This represented a change from the experience observed in the 2008 study. At this point, the committee has not identified any specific study-related drivers of this change.

New Segmentation Variables

An enhancement from the 2008 study was the addition of several new segmentation variables against which to assess claim termination results. Note that values for some of these variables were not available for all claims. There were more instances where claims had "unknown" listed as the value for those variables. The new variables are listed below, along with some comments:

- Taxability of Benefits (Full Taxable, Partially Taxable, Not Taxable, and Unknown): The Committee noted the percentage of claims with non-taxable benefits was higher than originally expected, but upon investigation, we determined the percentage appeared reasonable. Experience for Taxability "unknown" had significantly better experience than for other categories. If any contributor has an idea what may be driving that, they could send an e-mail to MIB with that info, and MIB could maintain that company's confidentiality (if that is a concern).

- Indexed Monthly Salary: For most claims, this value was consistent with the Indexed Gross Monthly Benefit. However, there were some instances where the Indexed Monthly Salary did not appear to be consistent. We recommend that results with this new variable be viewed with caution in situations where the benefit-to-salary relationship does not appear to be reasonable.

- Integration with STD: (Yes, No, Unknown)

- Industry: (25 categories based on SIC Code)

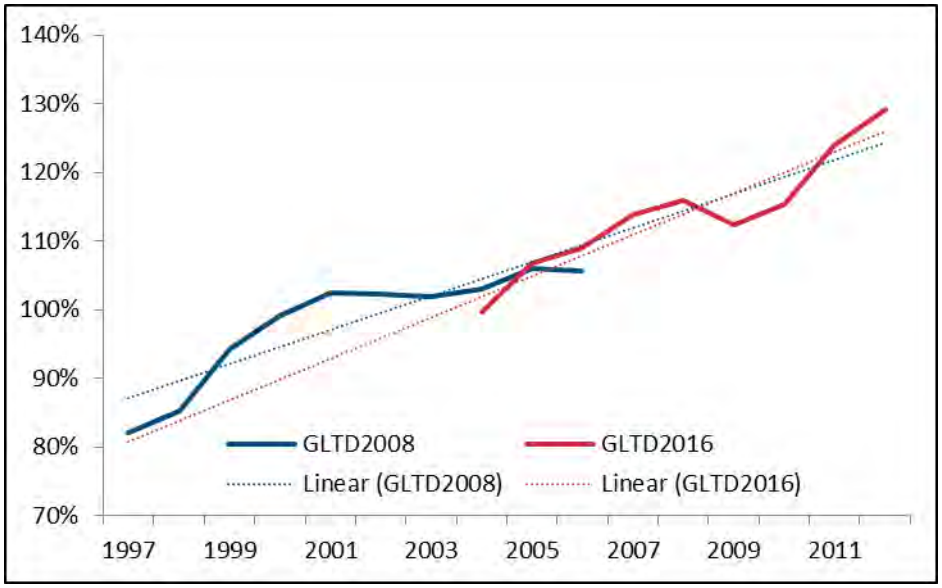
- Case Size: (seven categories): Experience for Case Sizes "unknown" or "0" had significantly better experience than for other categories. If any contributor has an idea what may be driving that, they could send an e-mail to MIB with that info, and MIB could maintain that company's confidentiality (if that is a concern).

- Region: (nine categories)

Comparisons to the Prior Study

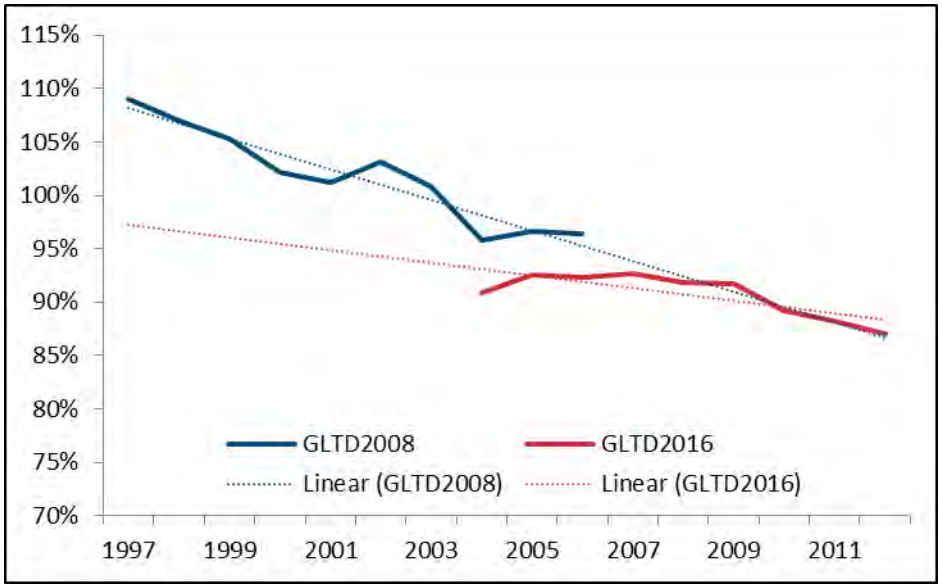
The following charts show some broad comparison results of the current study compared to the prior study. Later in this document, there is discussion about some of the potential risk items that could be driving the differences, but for now, we present the comparisons in order to observe any long-term trends.

RECOVERY A/E BY CALENDAR YEAR



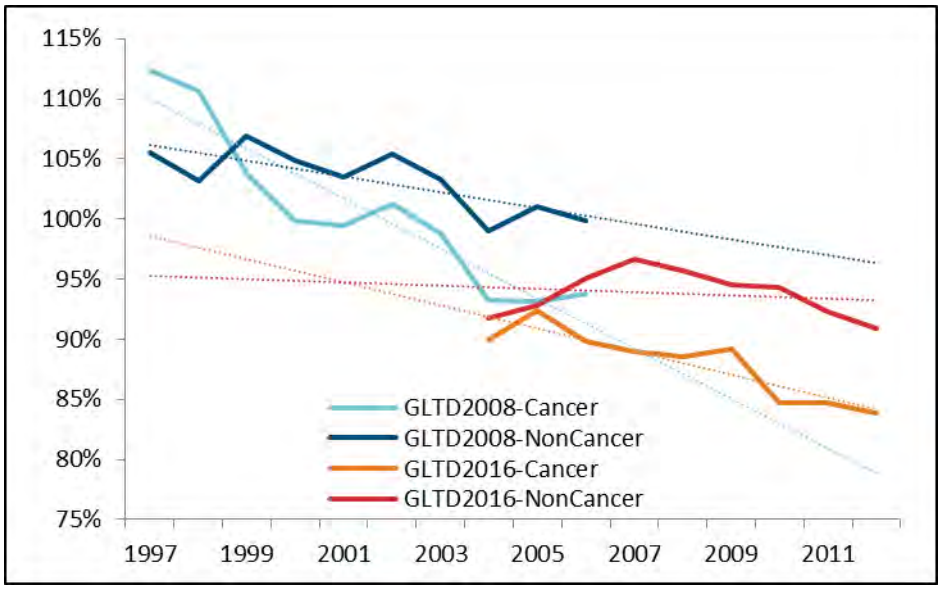
This chart shows significant improvements in claim recoveries from 1997 to 2012.

DEATH A/E BY CALENDAR YEAR



This chart shows a fairly continuous decline in deaths over the same time period. Since Cancer claims represented a large proportion of death claims, and showed a sharper decline than non-cancer claims in the prior study, we split these claims out for the following comparison.

DEATH A/E: CANCER VS NON-CANCER

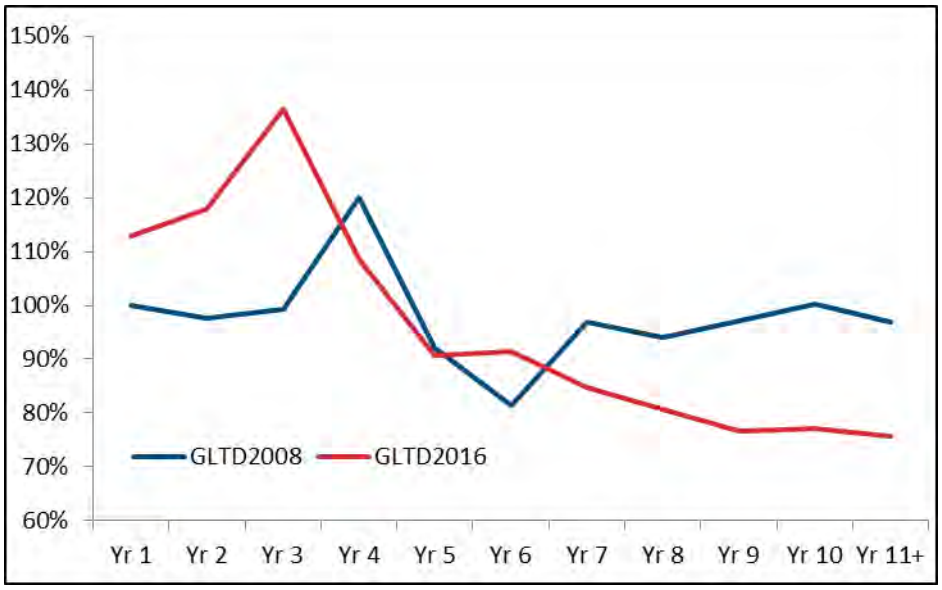


This chart shows the rate of mortality change decreased for both cancer and non-cancer claims in the new study relative to the prior study. This is captured in the following table:

	Average per Year Mortality Improvement		
	Total	Cancer	Non-Cancer
GLTD2008	-1.4%	-2.1%	-0.7%
GLTD2016	-0.6%	-1.0%	-0.1%

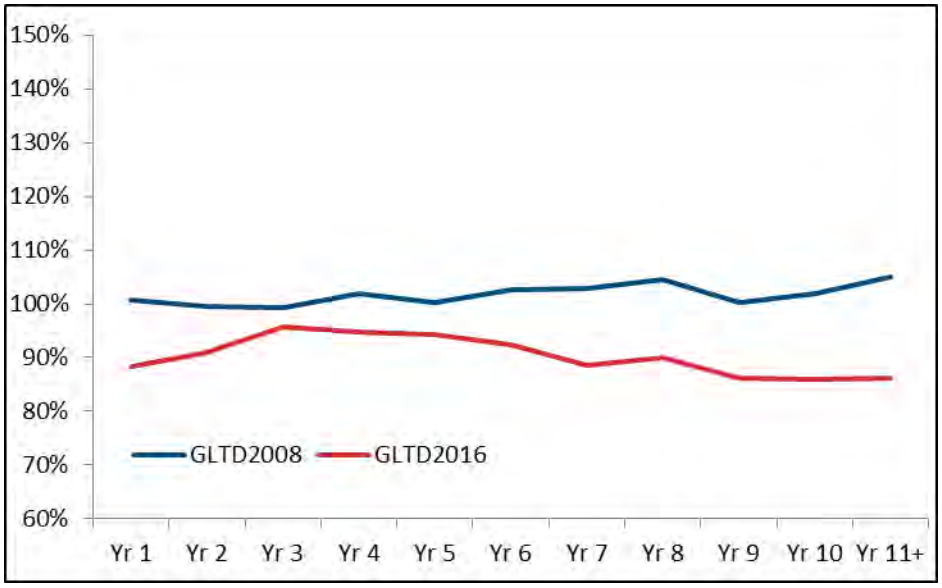
The following charts show A/E results by claim duration

RECOVERY A/E BY CLAIM DURATION



We can see the GLTD2016 recoveries dropped off more quickly in the later durations.

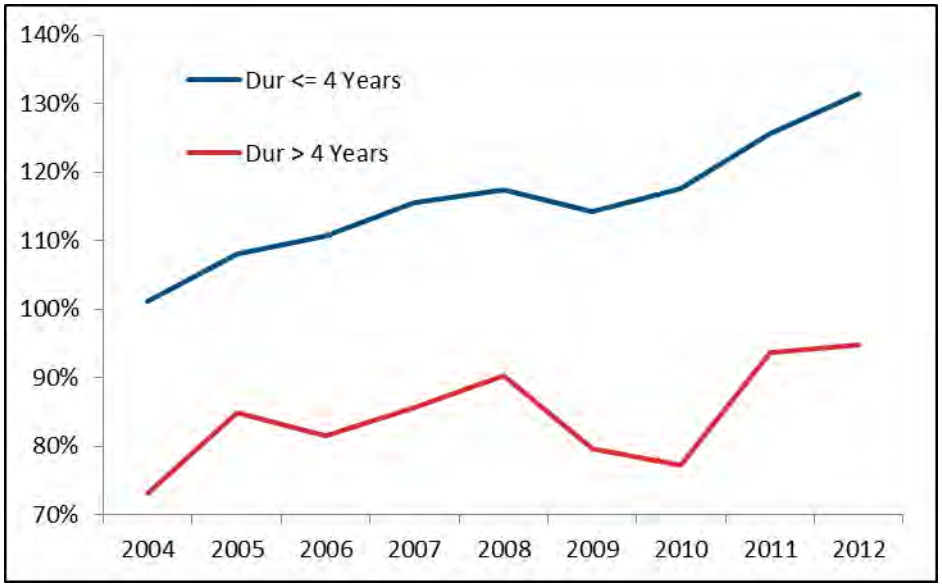
DEATH A/E BY CLAIM DURATION



Deaths did not show much trend by claim duration.

The following chart shows the Recovery A/E's by calendar year where we split the claims by short and long claim duration.

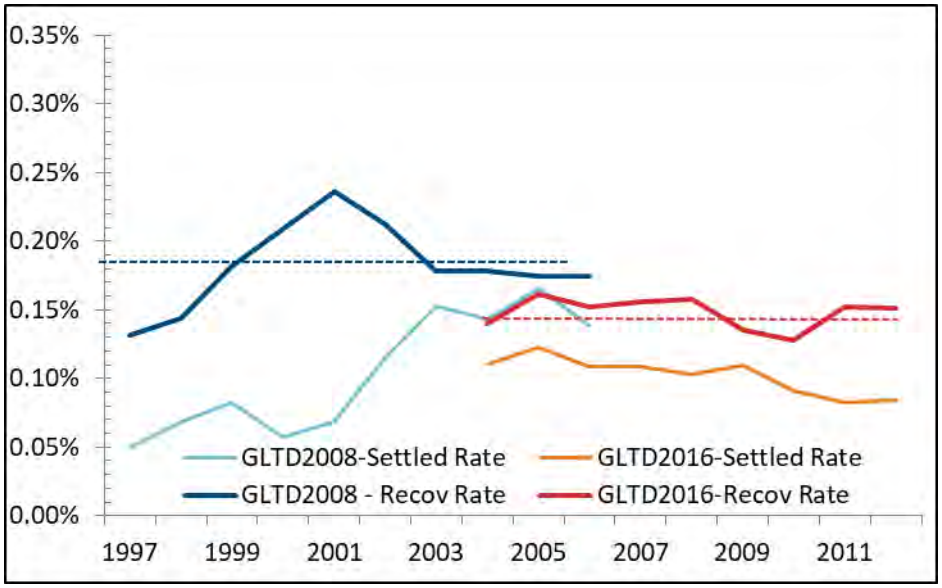
RECOVERY A/E BY CALENDAR YEAR



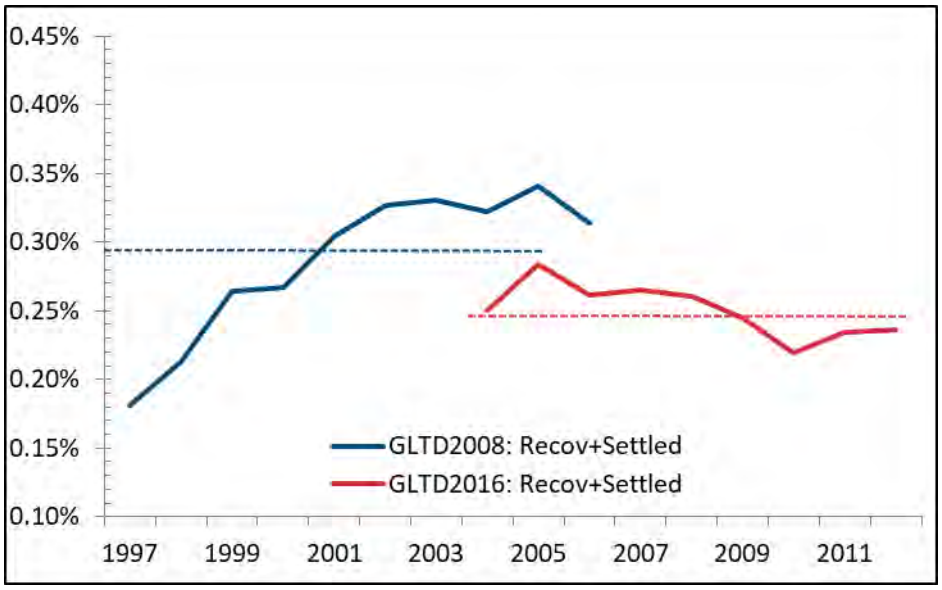
This chart shows that, while the recovery A/E's were lower in the later durations, they also showed improvement over time

For both studies, settled claims did not count towards the actual recovery totals, and so one question to consider is whether a change in settlement practice was part of the reason the current study showed lower recoveries in the later durations. We examined this by the actual settlement rate from the two studies. The first chart shows the recovery and settlement rates, while the second shows the rate of termination due to either claim settlements or recoveries.

TERM RATES: (DURATION > 4 YEARS)



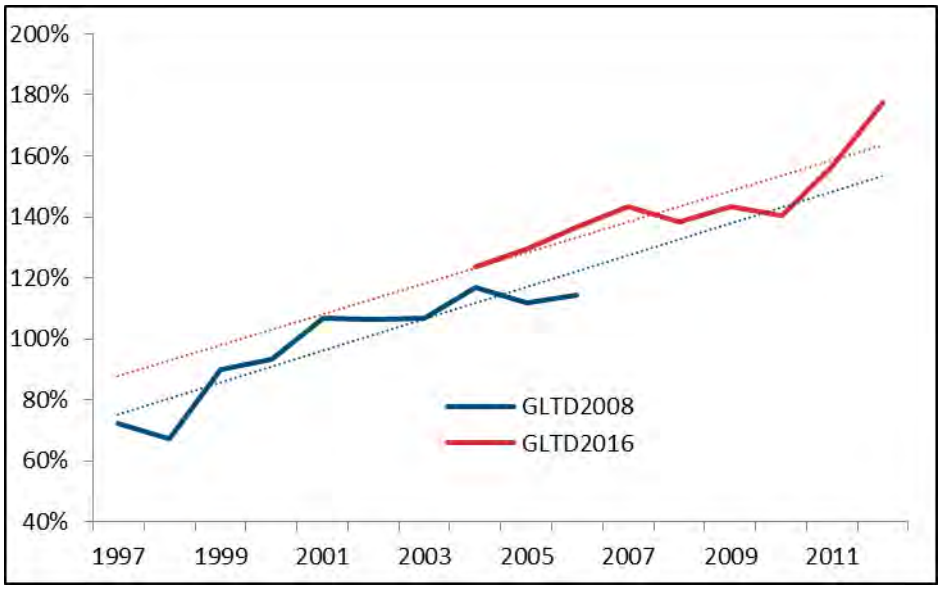
TERM RATES: (DURATION > 4 YEARS)



From these two charts, we observed that the settlement practices did not explain the drop-in recoveries.

The following chart shows A/E recoveries near the end of the 24-month own occupation period.

RECOVERY A/E (WITHIN 3 MONTHS OF 24 MONTH OWN OCC PERIOD)



This chart shows similar rates of improvement in change in definition terminations across the two studies.

Below is a quick summary of our observations:

- A/E recoveries showed a significant increase from 1997 to 2012, with the rate of change increasing in recent years.
- A/E deaths showed a steady decline from 1997 to 2012. The rate of decline has decreased in recent years and affected both cancer and non-cancer claims.
- The GLTD2016 study showed lower recoveries in the later durations, with this decline not explained by claim settlement practices.
- A/E recoveries at or near the change in definition from own occupation to any occupation increased steadily from 1997 to 2012.

Section 2: Initial Analyses

2.1 Introduction

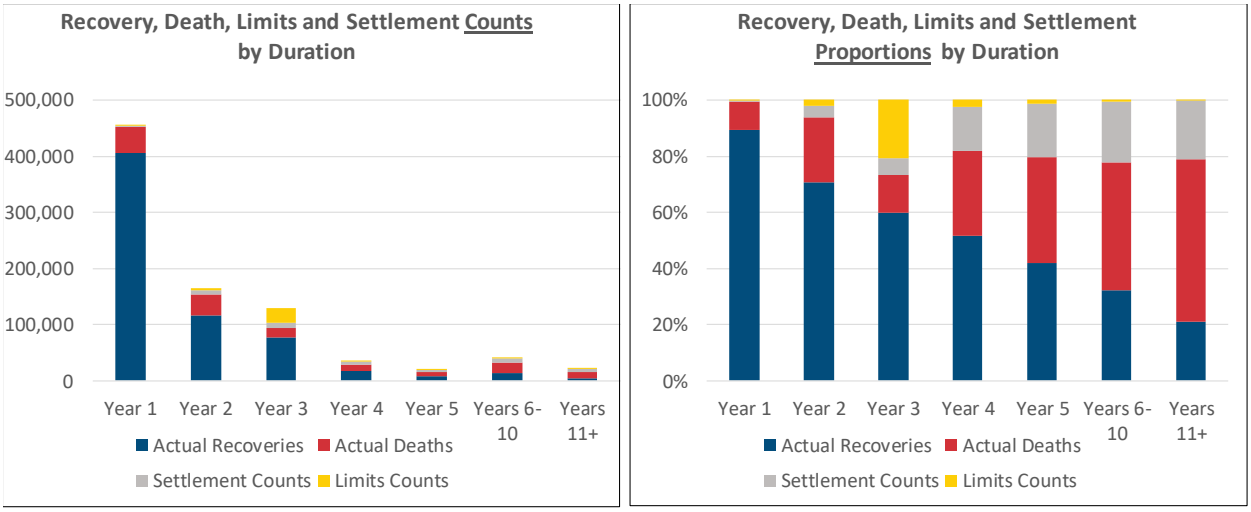
This section describes some initial analyses that were performed on the study data. These analyses were intended to identify a few interesting aspects of the study, as opposed to trying to address the study in any comprehensive or systematic way. The results were presented in a webinar as part of a program to introduce the study; they addressed an eclectic set of topics:

- Comparisons to 2008 study (exposures and basic trends)
- Analyses where 2016 data was significantly more robust than the 2008 study
    - Over age 65
    - Long claim durations
- Analyses by selected parameters
    - Elimination period
    - Diagnosis
    - Change in definition
- Mortality improvement
- Economic cycles
- Analyses by carrier size
- Comparison of LTD Experience to Group Life Waiver of Premium Experience

Unless otherwise noted, the Expected (E) for all analyses was the 2008 GLTD table.

2.2 Comparison to the 2008 Study (Exposures and Basic trends)

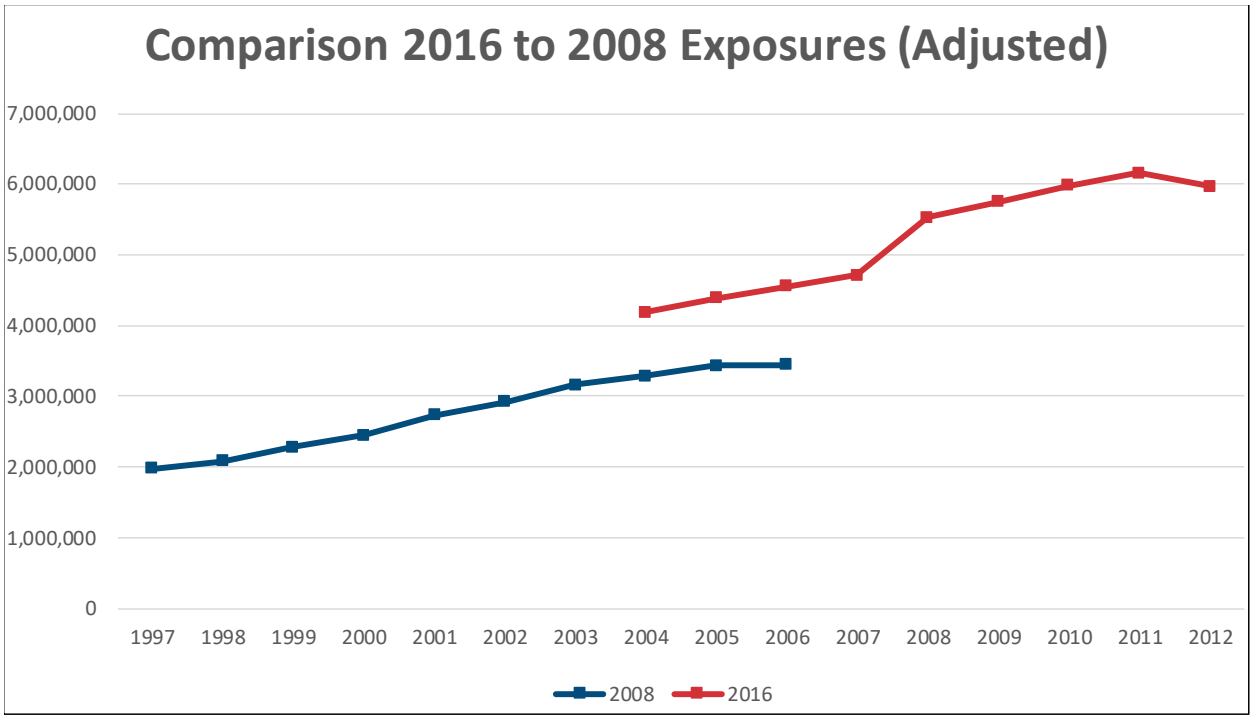
2016 STUDY CLAIM TERMINATION & PROPORTIONS



The left chart above shows the 860,000+ claim terminations by termination type and duration of disability.

The right chart shows the proportions of terminations by claim duration. It is interesting that settlements were a significant proportion of terminations in later claim durations.

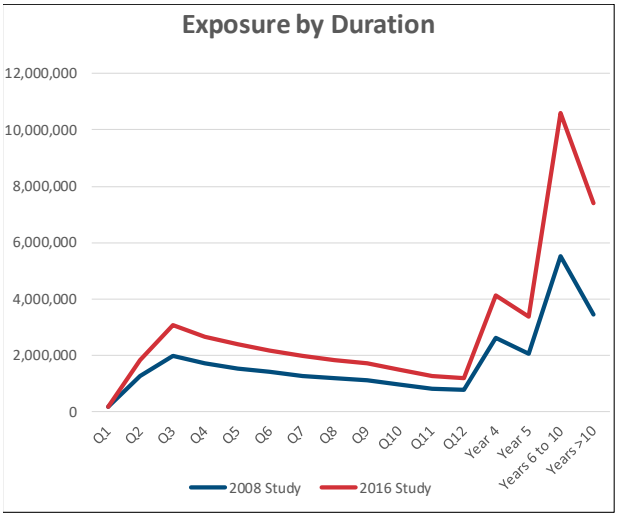
RAW EXPOSURES FOR 2008 AND 2016 STUDIES (ESTIMATED MONTHS EXPOSED – PRIOR TO DAMPENING)

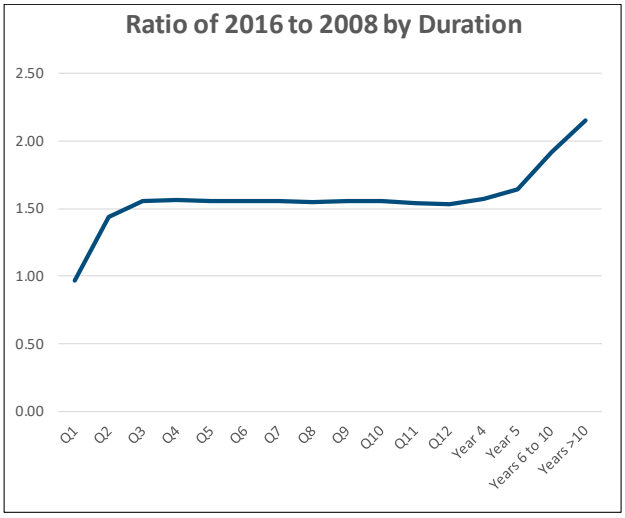


Study	Aggregate Dampening Factor	Dampening Exposure	Grosed-up Exposure	Aggregate Death & Recovery Rate	2016/2008 Estimated Exposure	Change in Raw Death & Recovery Rate
2008 Study	69.90%	17,745,556	27,775,170	2.28%	1.70	-8.2%
2016 Study	80.40%	37,987,443	47,224,569	2.09%		

This chart compares the estimated raw claim exposure counts (months) for the 2016 study vs. the 2008 study – 70% higher!

EXPOSURE COMPARISON BY DURATION FOR 2008 VS. 2016 STUDIES

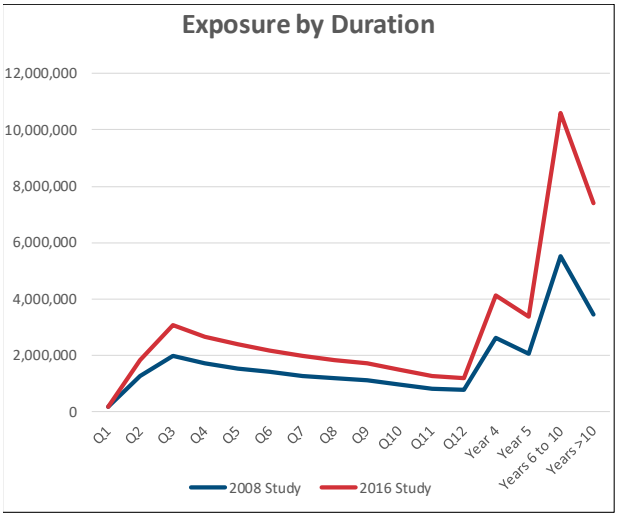


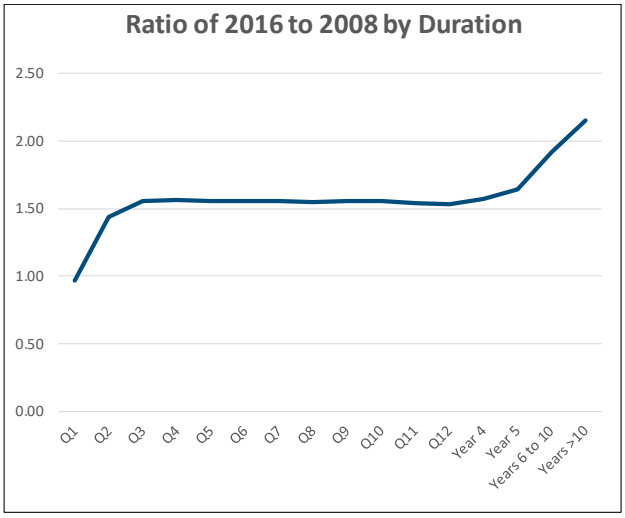


These charts compare the exposures by claim duration. Of particular note was the substantial increase in exposures at later claim durations:

- +50% for Q3 to year 5
- +75% for years 6 to 9
- +100% for years 10+

A/E RECOVERIES AND DEATHS BY DURATION FOR 2016 STUDY





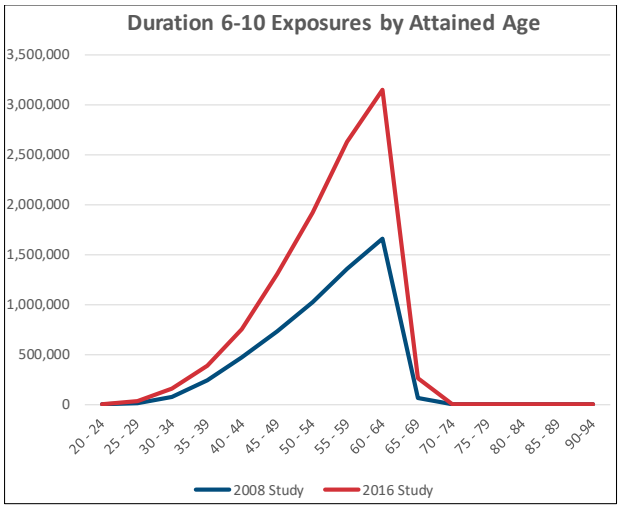
This chart shows A/E terminations separately for deaths and recoveries. Since the expected values were based on the 2008 study, the A/E's effectively showed the changes in experience from the prior study. (Note: some changes were due to differences in the mix of contributing companies and dampening factors, as well as changes in the characteristics of the underlying business).

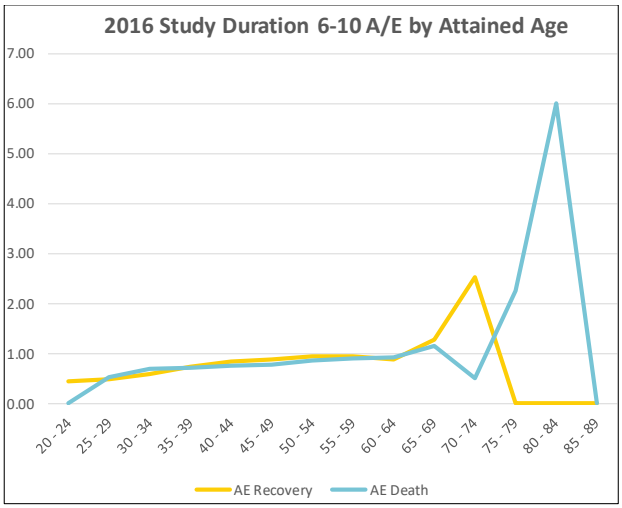
Recoveries showed significant improvements in early claim durations and materially lower recoveries in years 6+. (We noted that most LTD writers heavily weighted their own experience in early claim durations, while total recovery rates in later claim durations were quite low. As a result, the experience changes might not have had a dramatic effect on companies' reserves.)

Death A/E's were consistently lower in all durations.

2.3 Analyses where 2016 data is significantly more robust that the 2008 study

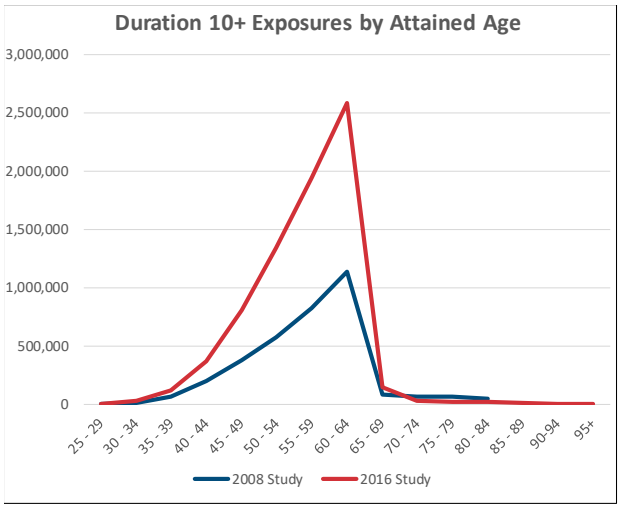
DURATION 6 TO 10 EXPOSURES AND A/E BY ATTAINED AGE

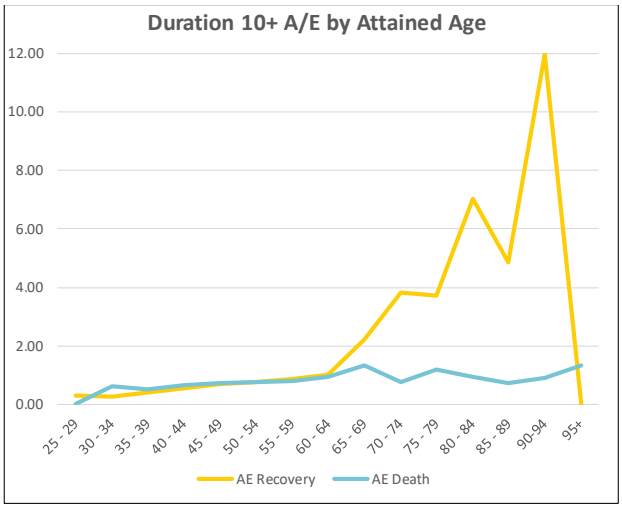




The chart above shows that the 2016 study had significantly higher exposures for later claim durations. The above charts analyze the exposure and claim termination experience for claim durations (years) 6 to 10, by attained age. Most of the exposure (left side) was for ages 55 to 69. Both death and recovery A/E's were low at age 55, but close to 1.0 by age 65. Age 65 to 69 A/E's were higher than 1.0. (We noted there were negligible lifetime benefits.) There was very little exposure above age 74.

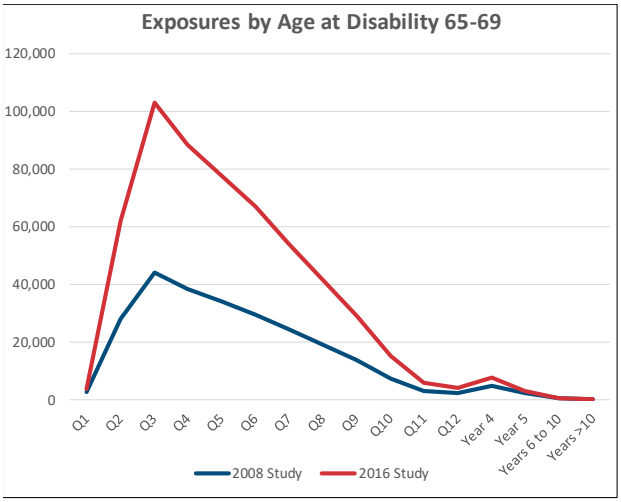
DURATION 10+ EXPOSURES AND A/E BY ATTAINED AGE

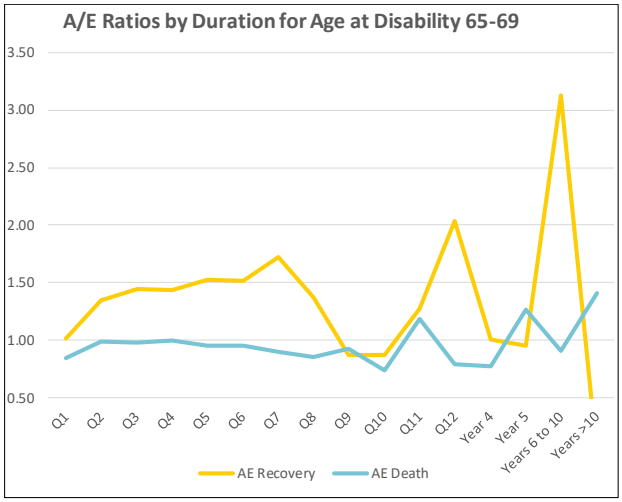




These charts perform the above analysis for claim durations (years) 10+. The results were similar through age 64. (Credibility of experience was low above age 74; more so for 2008 than 2016.)

EXPOSURES AND A/E BY AGE AT DISABILITY 65-69

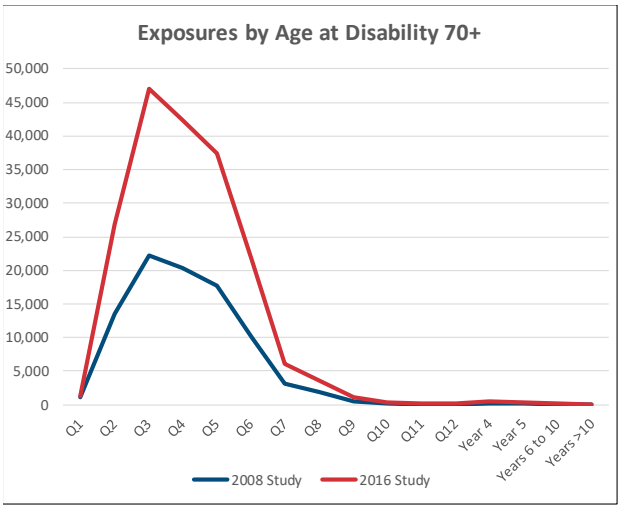


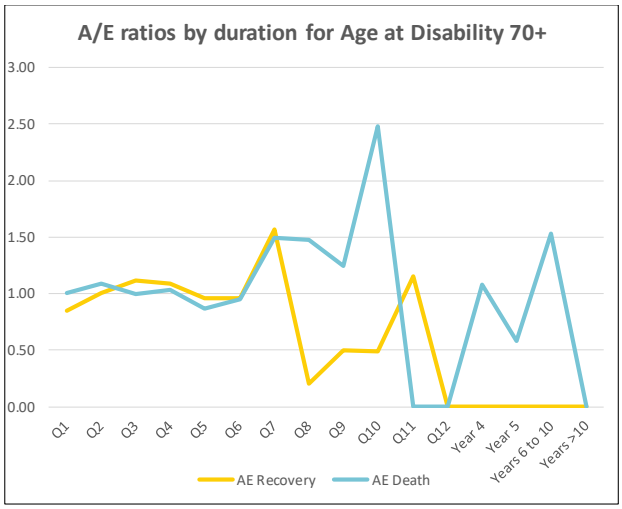


Claim exposures for ages at disability 65+ were much higher in the 2016 study than in the 2008 study. In both studies, the preponderance of exposures was for durations under 2 years.

The above charts show exposures and A/E's for ages at disability 65 to 69. Recovery A/E's were quite high. (Experience for durations (years) 3+ had low credibility.

EXPOSURES BY AGE AT DISABILITY 70+

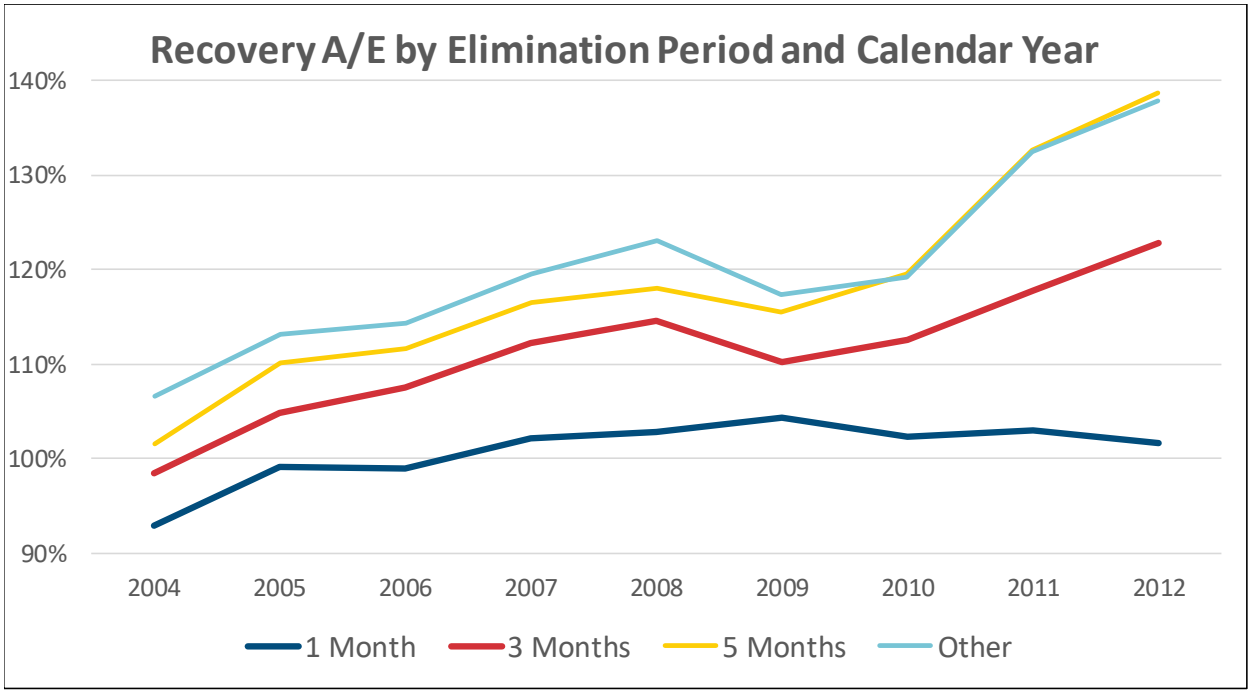




These charts show the corresponding analyses for ages at disability 70+. Recovery A/E's were lower than for ages 65 to 69, although still greater than 1.0. (Results after 2 years had low credibility.)

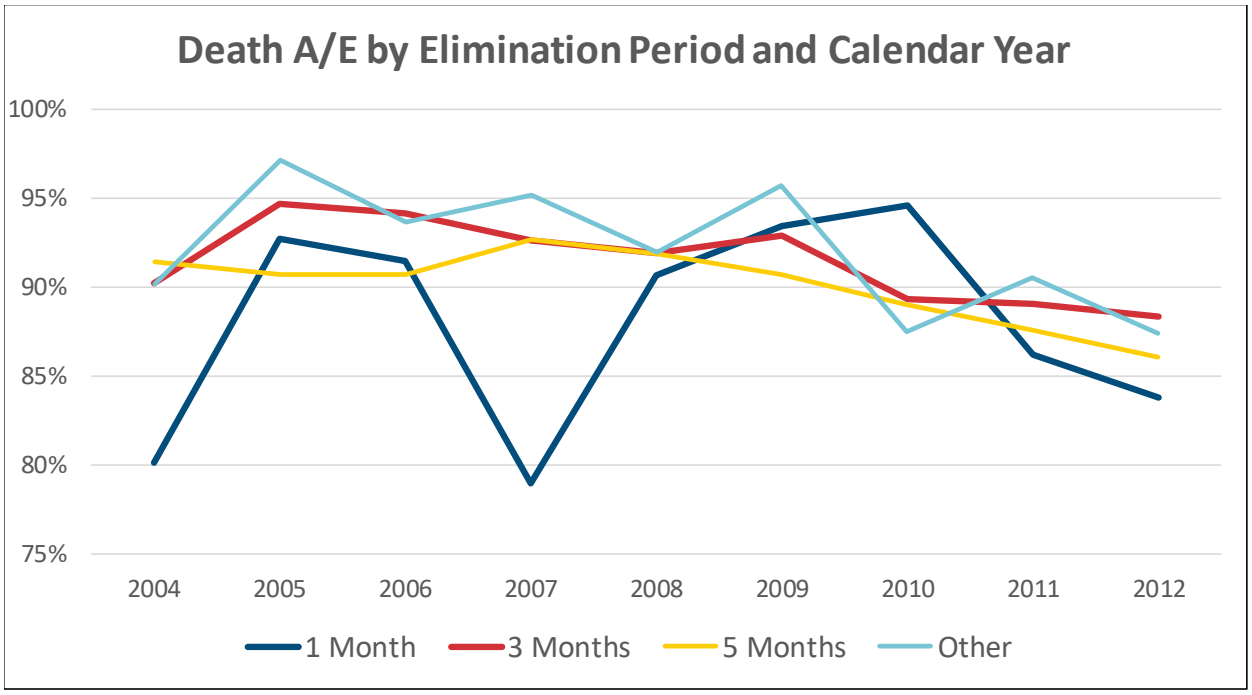
2.4 Analyses by Selected Parameters (elimination period (EP), diagnosis, change in definition)

RECOVERY A/E BY ELIMINATION PERIOD, GLTD 2008 TABLE



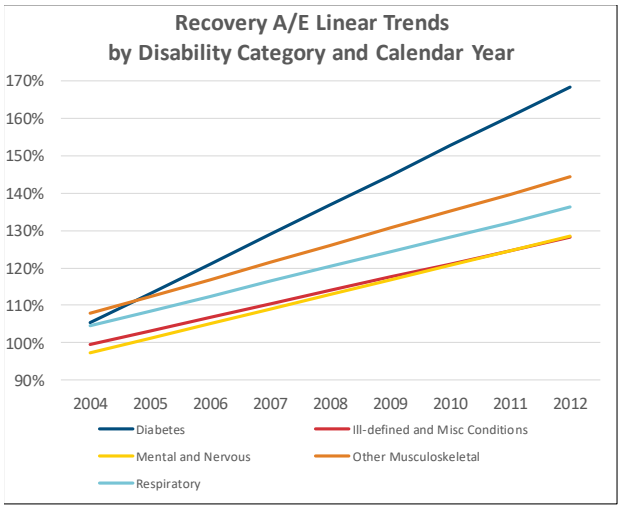
Recoveries by EP showed consistently better experience as EPs increase. (This should be subjected to predictive analysis to see if there were factors that contributed to the patterns.)

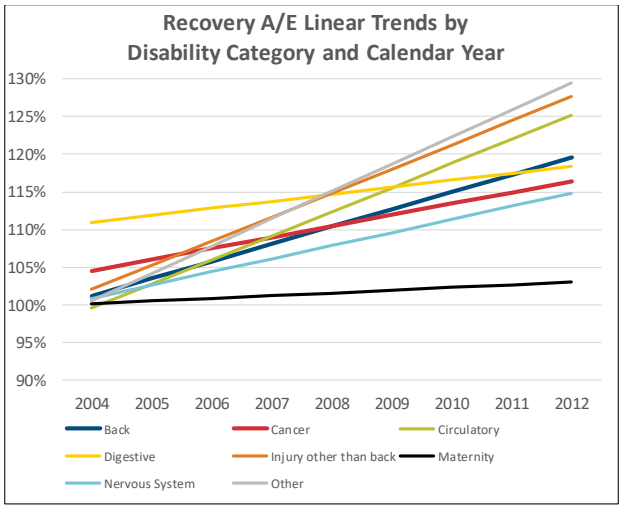
DEATH A/E BY ELIMINATION PERIOD, GLTD 2008 TABLE



Deaths A/E's show relatively consistent patterns by EP (except for one-month EP, which had low credibility).

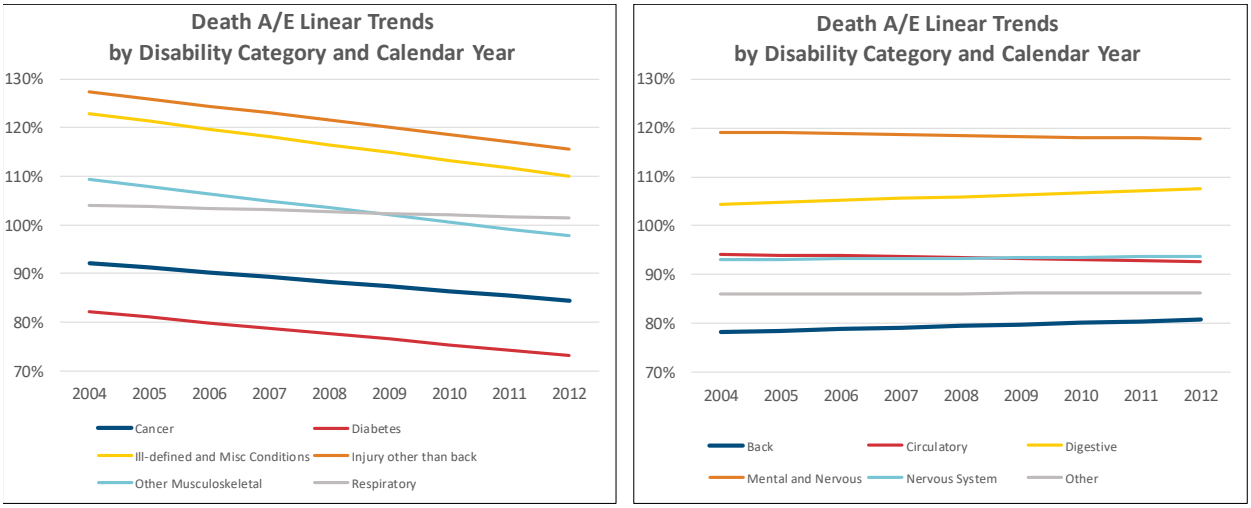
RECOVERY A/E BY DIAGNOSIS (LINEAR TRENDS), GLTD 2008 TABLE





To improve ease of analysis, we separated diagnoses with the steepest rates of recovery improvement from those with the flattest.

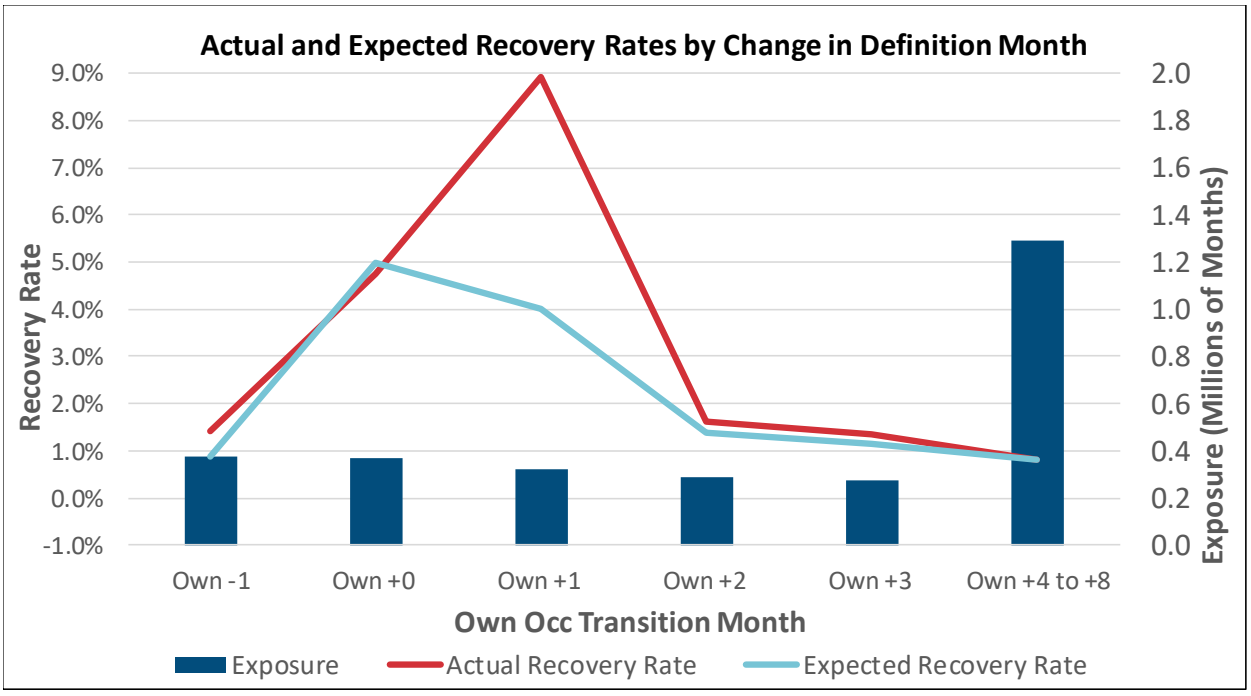
DEATH A/E BY DIAGNOSIS (LINEAR TRENDS), GLTD 2008 TABLE



A similar split was made for death A/E's - generally the steepness of decrease was less than for recoveries.

We noted that Diabetes, ill-defined, other musculoskeletal, and respiratory were in the steeper groupings for both deaths and recoveries; back, circulatory, digestive, and nervous system were in the flatter groupings for both.

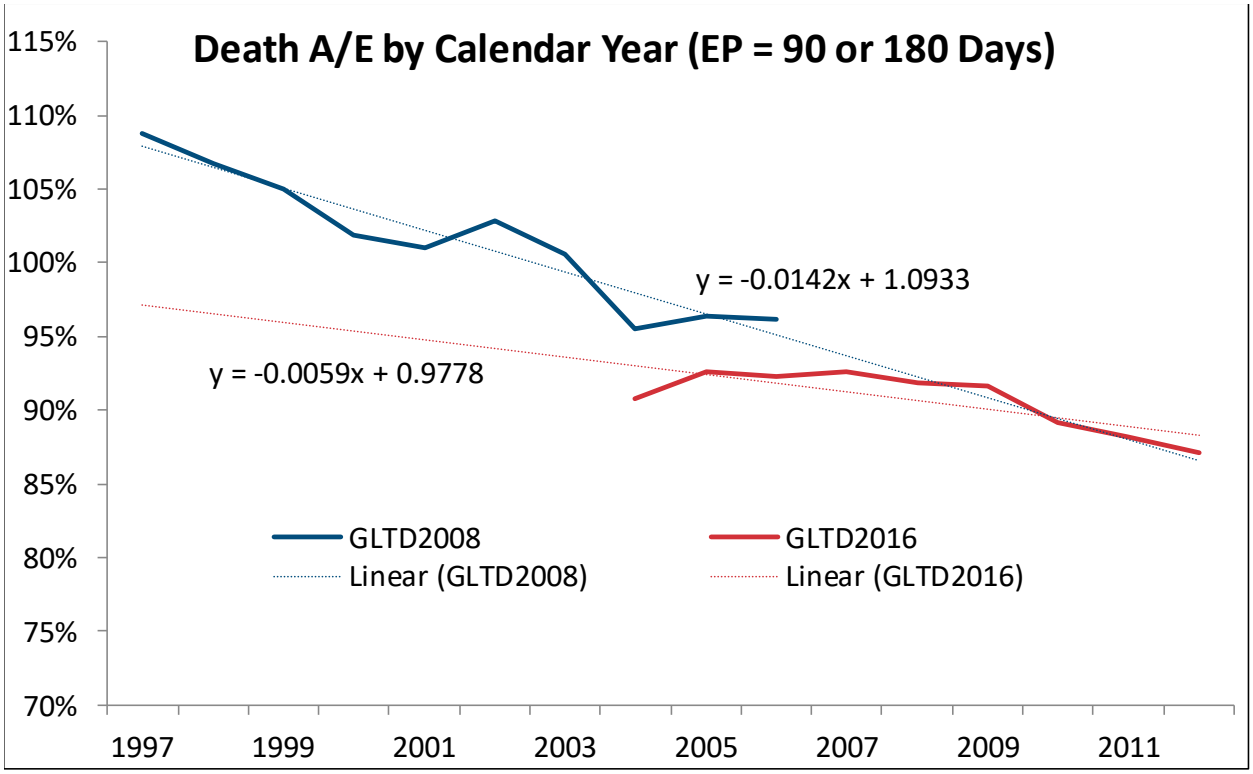
ACTUAL AND EXPECTED RECOVERY RATES BY CHANGE IN DEFINITION MONTH



This chart differs from the prior ones in that it does not show A/E's; instead it shows actual recoveries and expected recoveries separately. Although less significant than the Own+1 transition month in absolute terms, the Own-1 month also had a high A/E (not shown explicitly).

2.5 Mortality Improvement

LTD MORTALITY IMPROVEMENT, GLTD2008 TABLE



An ongoing issue for disability claims was whether LTD claim mortality improvement behaved like it did for life insurance or general population mortality and, if so, what should be done about it?

Prior to the 2008 study, potential mortality improvement had not been measured for disability coverages, and it was not assumed in statutory valuation standards.

The 2008 study exhibited a mortality improvement trend and, in construction of the 2012 LTD Valuation Table, margins were added to reflect estimated mortality as of 2017; however, the valuation standard did not require projections of future mortality improvements.

The above chart shows that relatively consistent mortality improvement continued for LTD through both the 2008 and 2016 studies. We noted there was a difference in the levels of mortality in the overlapping years between the two studies (2004 – 2006), which we believe was the result of different carrier participation and dampening factors used.

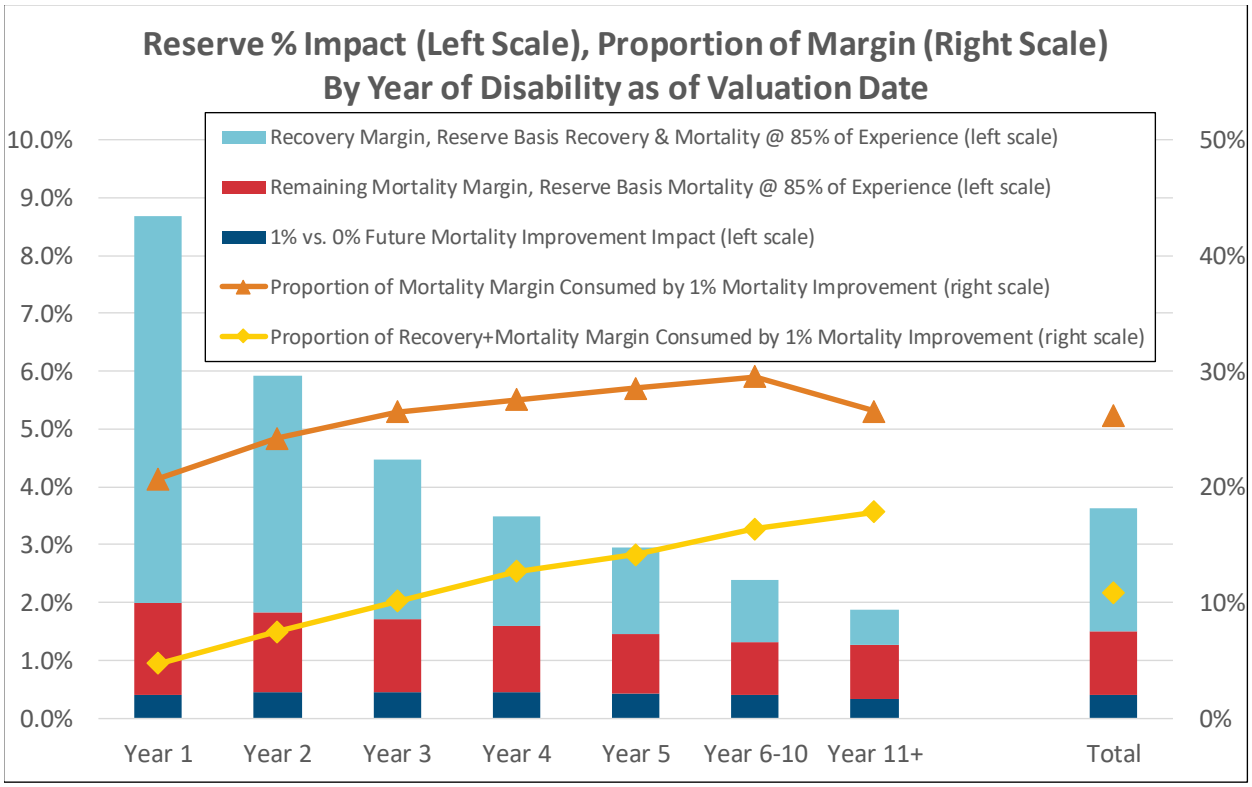
The above chart includes linear trend lines for the two studies, showing rates of mortality improvement of 1.42% for the 2008 study period (1997 – 2006) and 0.59% for the 2016 study period (2004 – 2012). (We noted that one large carrier provided data only for 2008 – 2012; removal of that carrier would have resulted in a slightly steeper rate of decrease for the 2016 study.) We believe the above levels of improvement were generally consistent with improvements seen in general US population data and for other insurance products. We also noted the combined study periods represented a 15 calendar-year period, which added to its credibility.

MORTALITY IMPROVEMENT BENCHMARKS

Mortality Improvement Benchmarks (Approximate Values)					
	SSA Actual 2000-2006	SSA Forecast 2010 - 2030	Group Annuity Scale MP-2014; for 2027 +	Indiividual Payout Annuity Scale G2	US Life Tables 2000-2006
Male Age					
25-59	0.10%	1.00%	1.00%	1.00%	
60-69	2.00%	1.30%	1.00%	1.50%	1.70%
70-79	2.80%	1.00%	1.00%	1.50%	2.70%
80-89	2.20%	0.90%	1.00%	1.30%	1.90%
90-99	0.90%	0.40%	0.80%	0.40%	1.10%
Ultimate			0.00%	0.00%	
Female Age					
25-59	0.00%	0.90%	1.00%	1.00%	
60-69	2.10%	1.10%	1.00%	1.30%	1.60%
70-79	1.70%	0.80%	1.00%	1.30%	1.90%
80-89	1.50%	0.70%	1.00%	1.20%	1.40%
90-99	0.80%	0.40%	0.80%	0.40%	0.80%
Ultimate			0.00%	0.00%	

This chart provides some benchmarks to compare the LTD experience against (Source: SOA 2014 Payout Annuity Report). The different scales were summarized into consistent attained age ranges, which required approximations on our part. (We noted that existing mortality improvement scales had been for coverages with lifetime exposures.) The resulting scales focused on older ages, where the impact of mortality improvement was most substantial; they generally detailed (narrower) ranges for older ages, and broad ranges below age 70. Virtually all LTD claim exposures were below age 70.

RELATIVITY OF 1% MORTALITY IMPROVEMENT TO RESERVE MARGIN - GLTD



This chart shows the potential impact of mortality improvement on LTD reserves from several perspectives. It was based on a sample mix of disability claims valued using the 2012 valuation standard without any adjustments for company experience; i.e., assumed 15% margins for both deaths and recoveries.

The bars show reserve margins by source (i.e., recovery vs. death) using the left-hand scale. For example, for claims in year 1, the average margin was 8.8% of reserves. About 6.8% would have come from recovery margins (the red portion) and about 2.0% would have come from death margins (sum of the blue portions). If you add future mortality improvement to the base death assumption, the death margin would have been reduced by about 0.3% (the dark blue portion).

The lines in the chart represent the percentages by which the reserve margin would be reduced if future mortality improvement were assumed; they used the right-hand scale. For example, in year 1, adding mortality improvement would have reduced mortality margins by approximately 20% and total reserve margins by about 5%.

For a sample existing claim reserve (i.e., all incurral years), adding mortality improvement would have reduced mortality reserve margins by approximately 25% and total reserve margins by about 11%. The impact is relatively minor because the preponderance of LTD benefits terminated at normal retirement age or were for short benefit periods. The results would have been quite different for lifetime claims.

We also noted that, for companies that used their own experience for statutory valuations, the margins could have been materially lower than the 15% assumed in these examples.

2.6 Economic Cycles

During 1997-2012, the US economy experienced two recessions between three periods of economic expansion - March 2001 to November 2001 (8 months), and December 2007 to June 2009 (18 months).

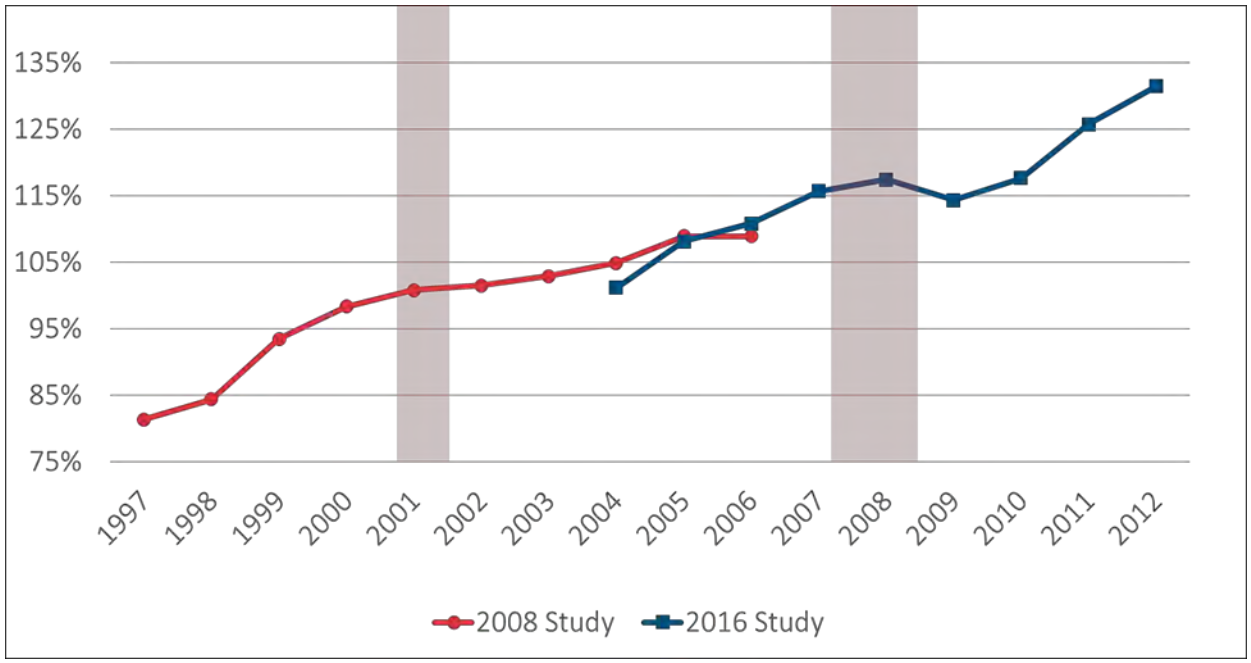
Have we seen any signs of the economy impacting LTD claim incidence?

- Academic studies on the economy and the US working population focus on the filing of SSDI disability claims and economic activity (e.g., Disability Insurance and the Great Recession, Maestas May 2015).
- We don't have an LTD incidence study. We analyzed the diagnosis mix in the termination study to look for any notable changes in the industry open-claim block.
- Some diagnosis categories increased marginally in 2008/2009 as a percentage of overall claim mix (Mental & Nervous, Nervous System, and Other Musculoskeletal), but nothing appeared statistically significant.

What did we analyze to try to identify any signs of the economy impacting LTD claim terminations in the 2008 and 2016 studies?

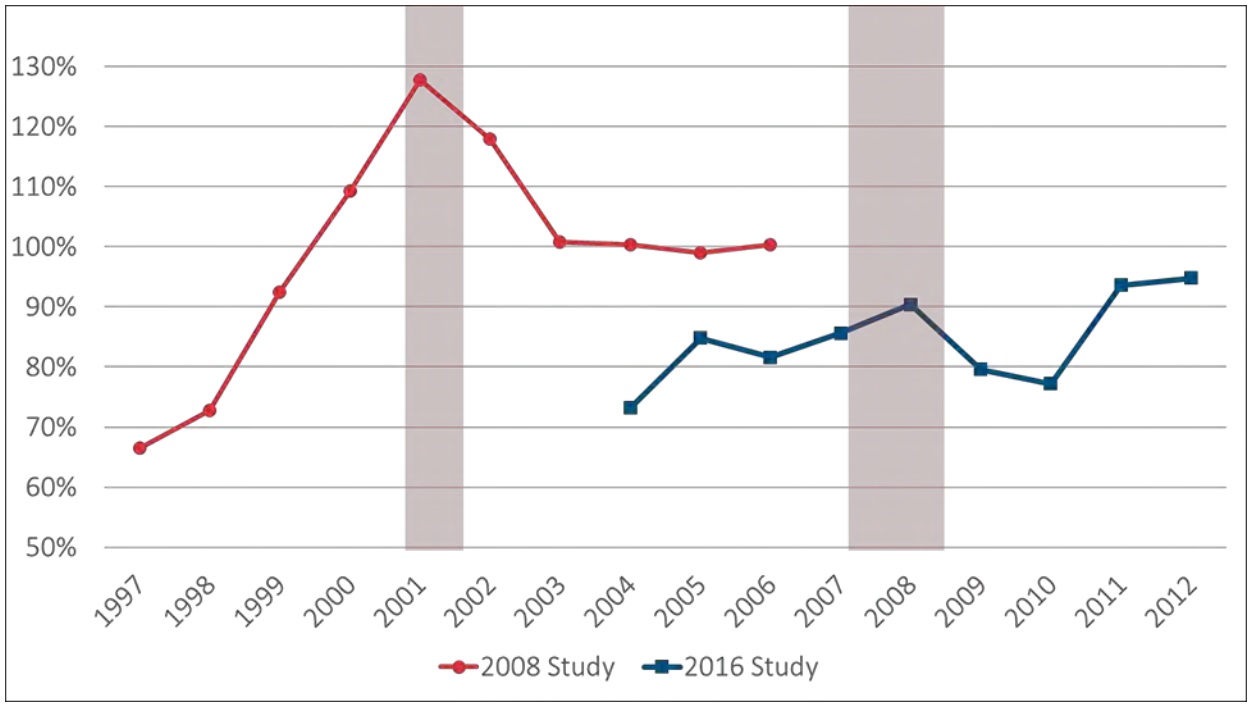
- We included data from the 2008 study to cover two recessionary periods instead of one, and to look for consistent patterns.
- We looked at claim recovery A/E's for early and later duration claims to see what patterns emerged.
- We also looked at death A/E's for early and later duration claims to confirm there were not significant swings.
- We looked at claim settlement rates for early and later duration claims to see if those behaviors changed.

IMPACT ON TERMINATION RATES, RECOVERY A/E FOR CLAIM DURATION <= 4 YEARS



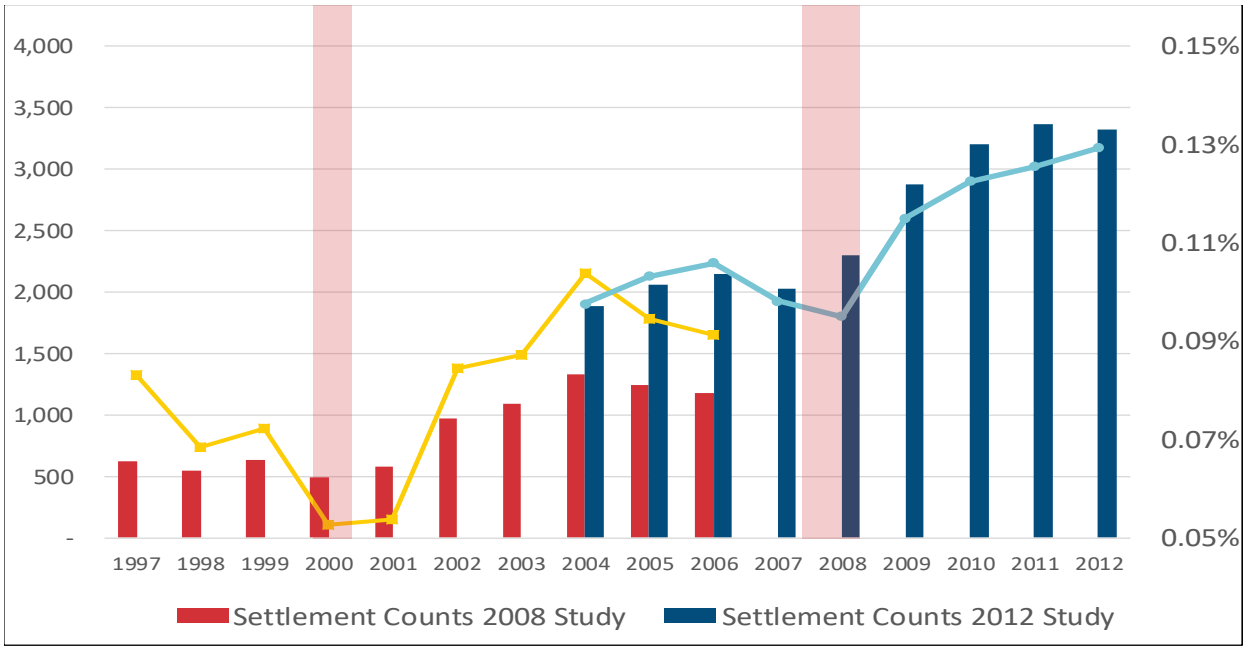
The above chart shows recovery A/E's for early claim durations for 1997 to 2012 for the 2008 and 2016 studies. Recessions are shown as pink columns. This was a noticeable dip in recoveries following the 2008 recession. The recovery trend might have flattened slightly following the 2001 recession.

IMPACT ON TERMINATION RATES, RECOVERY A/E FOR CLAIM DURATION > 4 YEARS



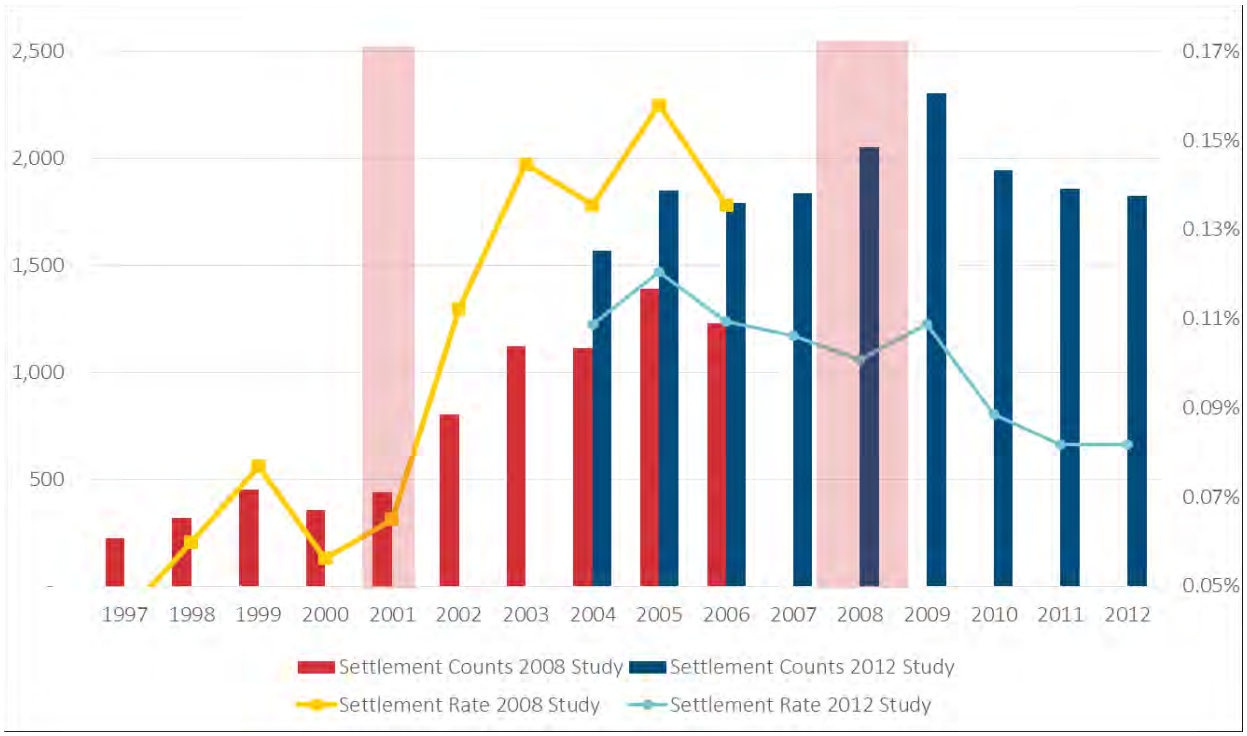
The above chart shows similar data for recoveries in later claim durations. For later durations, recoveries showed material drops following both recessions.

IMPACT ON TERMINATION RATES, SETTLEMENTS FOR CLAIM DURATION <= 4 YEARS



We also looked at the impact of recessions on settlement activity. Settlements in early claim durations exhibited increases following both recessions.

IMPACT ON TERMINATION RATES, SETTLEMENTS FOR CLAIM DURATION 5+ YEARS

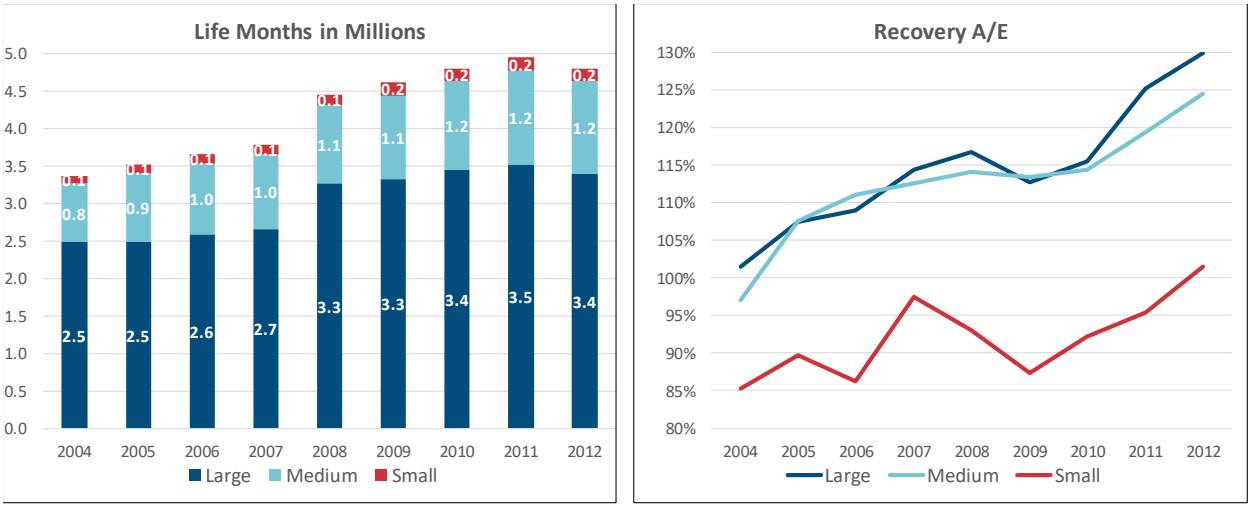


Settlements in later claim durations showed substantial increases following the 2001 recession; the 2008 recession produced a small bump amid a generally reducing overall trend.

2.7 Analyses by Carrier Size

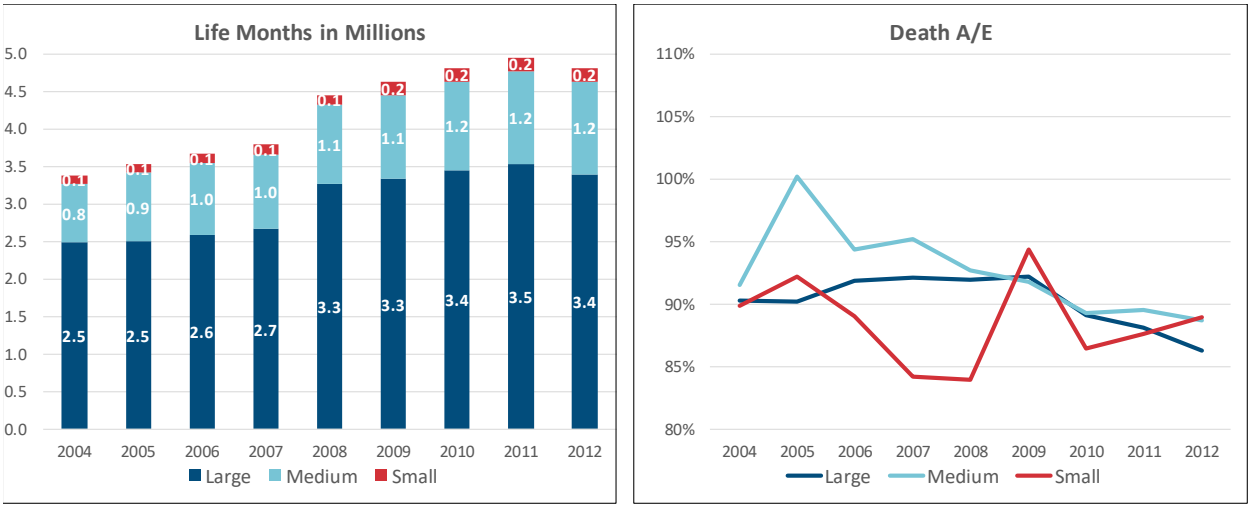
In this section, we compared experience by company size (large, medium, and small).

EXPOSURE & RECOVERY EXPERIENCE: LARGE, MEDIUM, SMALL CARRIERS



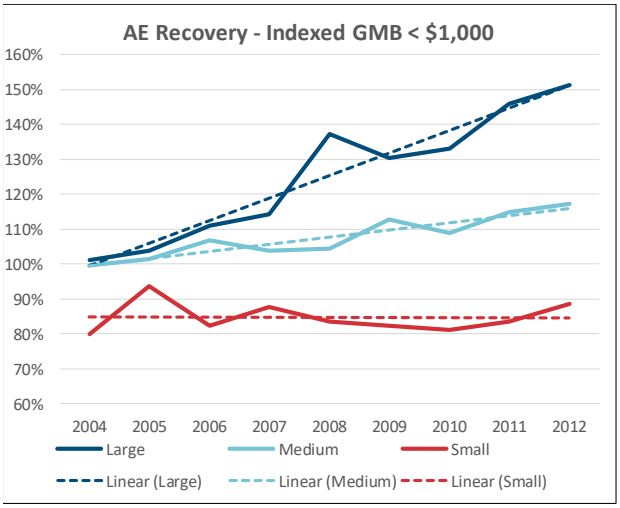
The left chart above shows claim exposures by case size and year; the right chart shows recovery A/E's. Recovery A/E's were similar for large and medium-sized companies, but significantly lower for small companies.

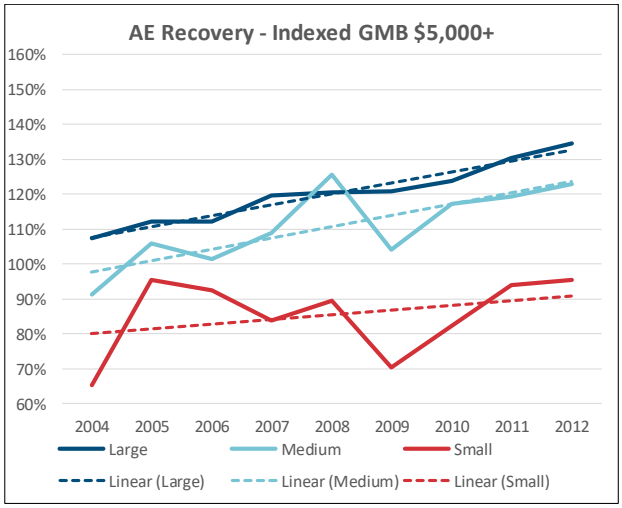
EXPOSURE & DEATH EXPERIENCE: LARGE, MEDIUM, SMALL CARRIERS



The above charts show similar data for death A/E's. Experience showed more volatility from year to year due to lower frequencies of deaths than recoveries. Medium-sized carriers generally showed higher A/E's. Small-sized carriers exhibited higher volatility of results due to low numbers of deaths.

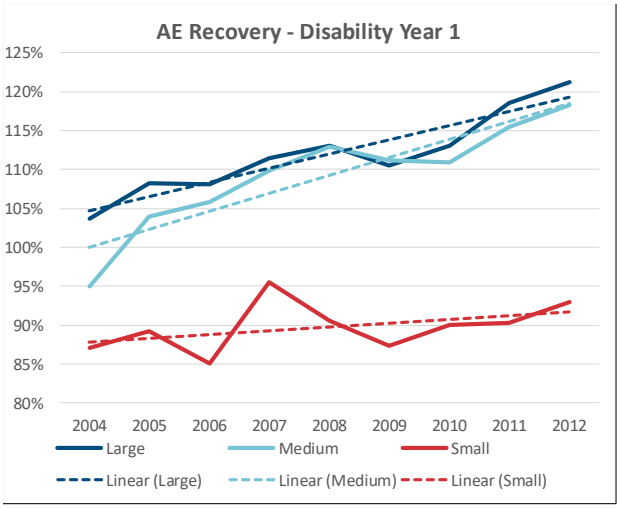
RECOVERY A/E BY CARRIER SIZE & BENEFIT AMOUNT: E = GLTD2008 TABLE

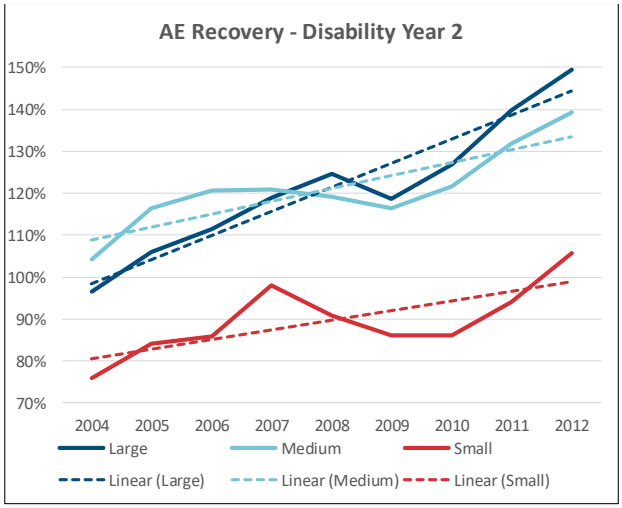




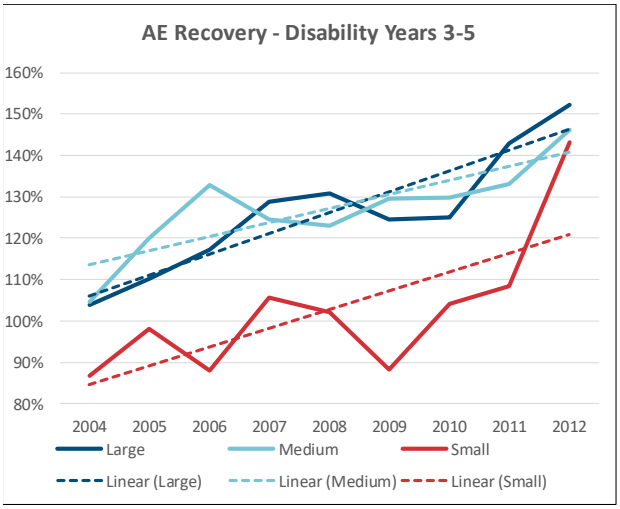
The above chart shows how recovery experience by benefit amount varied for different-sized companies. As company size increased, recoveries exhibited higher A/E's and steeper improvements over the study period for both small and large benefit amounts. (Interestingly, the same patterns did not appear to hold true for medium benefit amounts – not shown.)

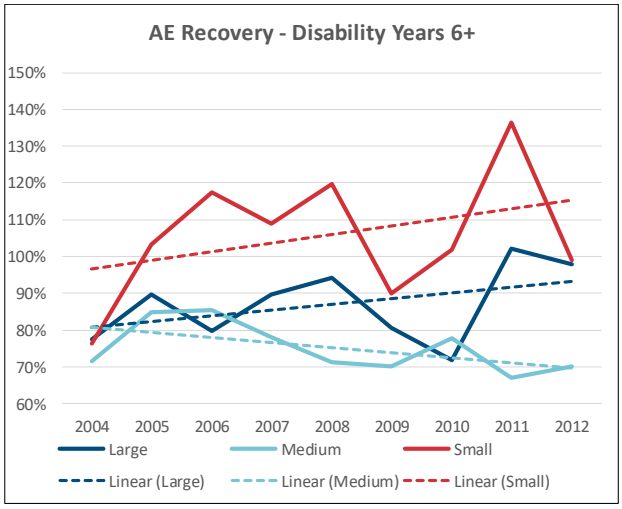
RECOVERY A/E BY CARRIER SIZE AND CALENDAR YEAR, GLTD2008 TABLE





RECOVERY A/E BY CARRIER SIZE, GLTD2008 TABLE



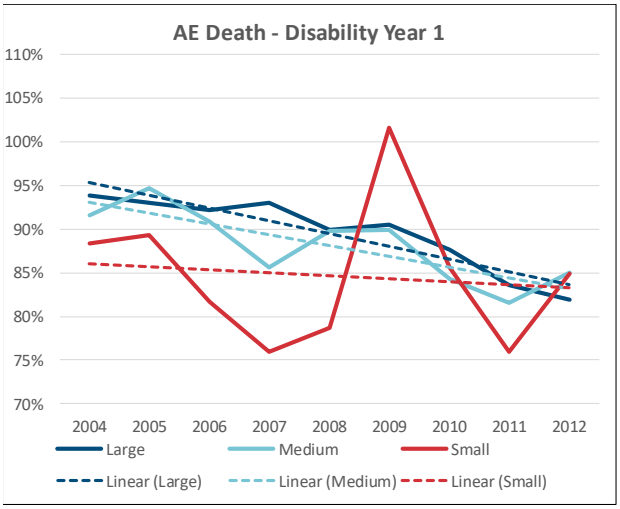


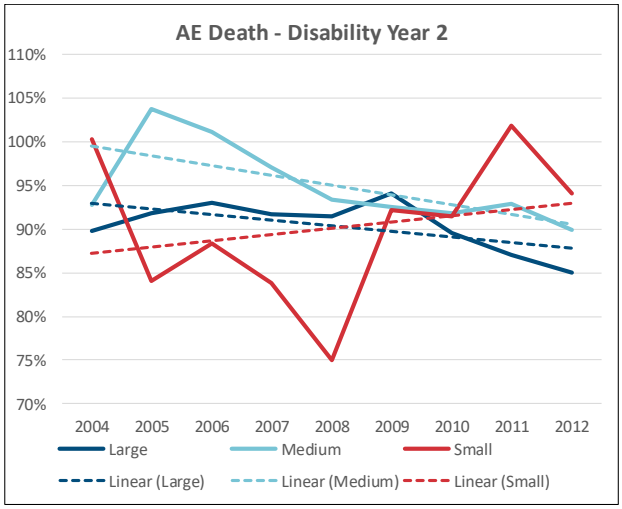
The above charts show recovery A/E patterns by year of disability for the three company size groupings.

The pattern of higher A/E's and steeper improvements for large and medium companies generally held through disability year 5, but not for durations (years) 6+.

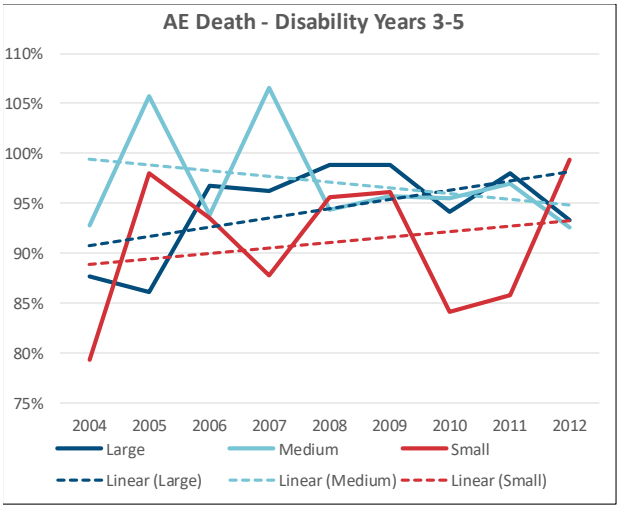
A/E's appeared to drop from 2008 to 2009 for all company sizes.

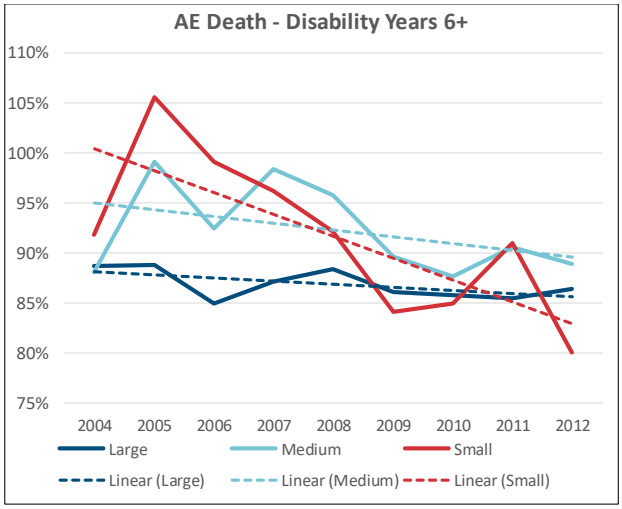
DEATH A/E BY CARRIER SIZE, GLTD2008 TABLE





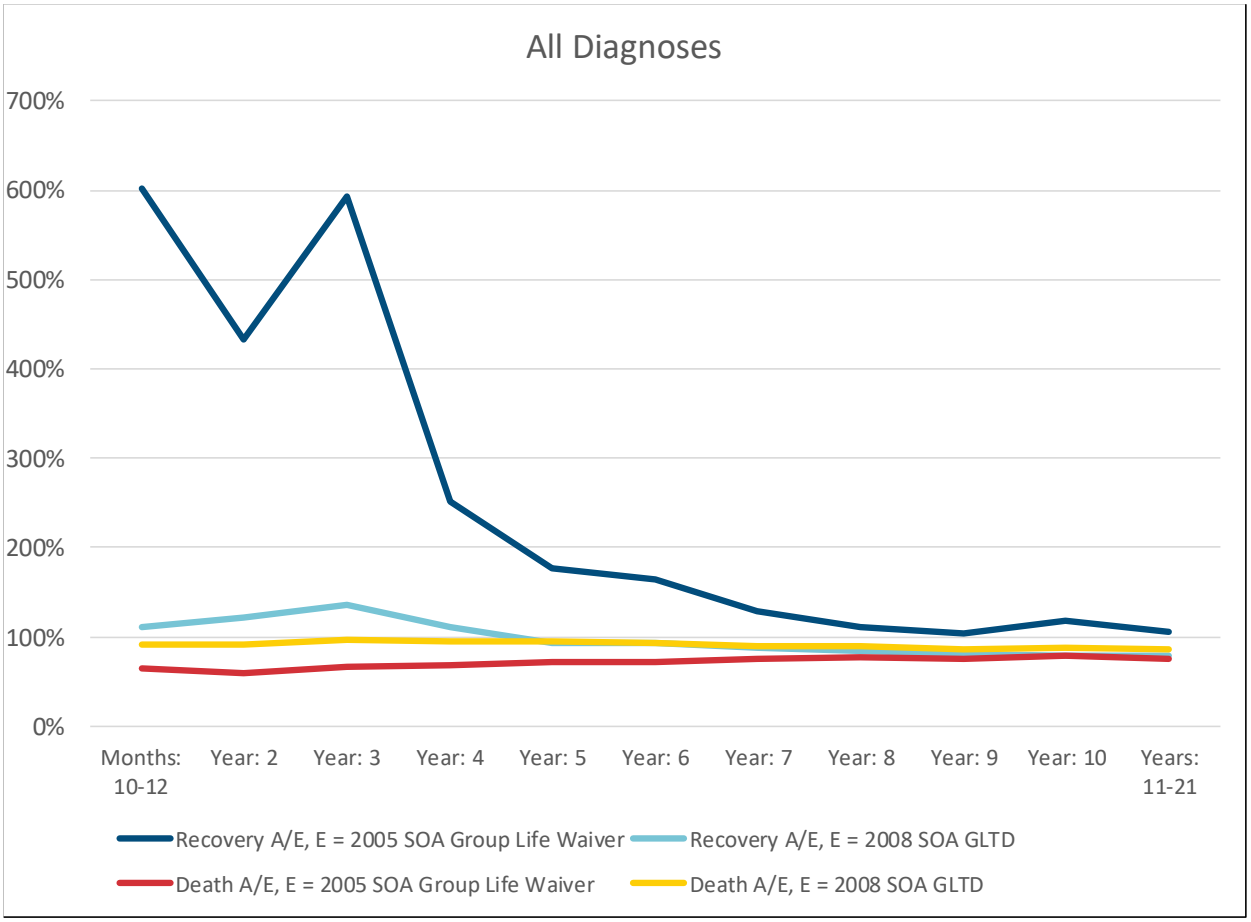
DEATH A/E BY CARRIER SIZE, GLTD2008 TABLE





The above charts show death A/E's in a similar format to the preceding recovery analyses. There appears to be little consistency in the patterns for different company sizes across duration segments. (The smaller company data had lower credibility.)

2.8 Comparison of LTD Experience to Group Life Waiver of Premium Experience



We thought it would be interesting to compare the results of the 2008 LTD study to the (structurally similar) results of the 2005 Group Life Waiver of Premium (WP) study, especially since policy provisions that made the definitions of disability more consistent have become more prevalent.

The above chart compares the A/E ratios for the LTD and Life WP studies, using the 2008 study as the expected for both. Recovery and death A/E's are shown for each by claim duration. Comparisons started at claim duration (months) 10-12, which was the starting point for the Life WP data.

The chart shows recovery A/E's that were much lower for Life WP than LTD in the first five years of the claim. Life WP death A/E's were materially higher than LTD death A/E's. The differences converged substantially by later claim durations.

Section 3: New Variables

3.1 Overview

An enhancement to the 2008 GLTD Experience Study was the addition of several new segmentation variables to the 2016 study. The results from the 2016 study pertaining to the new variables are presented at a high level in this report. The new variable definitions are provided below:

- Case Size – This variable represents the number of LTD covered lives associated with the group policy.
- Integration with STD – This variable identifies LTD claims that were accompanied by a front-end STD claim from the same insurer (I = Integrated with ASO or Fully-Insured STD, N = Not Integrated with STD, U = Unknown).
- Standard Industrial Classification (SIC) Code – This variable identifies the industry that a claimant's employer group was operating in as of the LTD date of disability, as defined by the Standard Industrial Classification system.
- Taxability of Benefits – This variable indicates the tax status of LTD benefits (T = 100% Taxable, N = Non-Taxable, P = Partial Taxability, U = Unknown).
- Indexed Monthly Salary – This variable shows the claimant's indexed pre-disability monthly earnings based on the earnings definitions in the LTD contract. Indexing is the same as for the Indexed Gross Monthly Benefit in the GLTD 2012 valuation guidelines (centered on July 2007 and assuming 2.4% annual inflation).
- State of Residence – This variable indicates claimant states of residence as of the most recent valuation date.
- Company Group – This variable indicates the size of the insurance company block (Group A = Large, Group B = Medium, Group C = Small). Group A included eight companies, Group B included eight companies, and Group C included nine companies.

Due to systems constraints, some contributors could not segment the data across all the new variables and, therefore, the values for some of the variables were unknown.

3.2 Case Size

The following table shows A/E recoveries, deaths, and total terminations by case size grouping. The A/E ratios shown below represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

GLTD Claim Termination Experience by Case Size Experience Period: 1/1/2004 -12/31/2012				
Case Size	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
1: 0 or Blank	13,279,792	127%	90%	117%
2: 1 - 99	3,700,868	100%	95%	99%
3: 100 - 249	2,230,119	103%	92%	101%
4: 250 - 999	4,008,079	104%	93%	102%
5: 1,000 - 4,999	6,098,033	108%	89%	104%
6: 5,000 - 9,999	2,682,782	112%	90%	107%
7: 10,000 +	5,987,770	120%	89%	114%
Total	37,987,443	114%	91%	109%

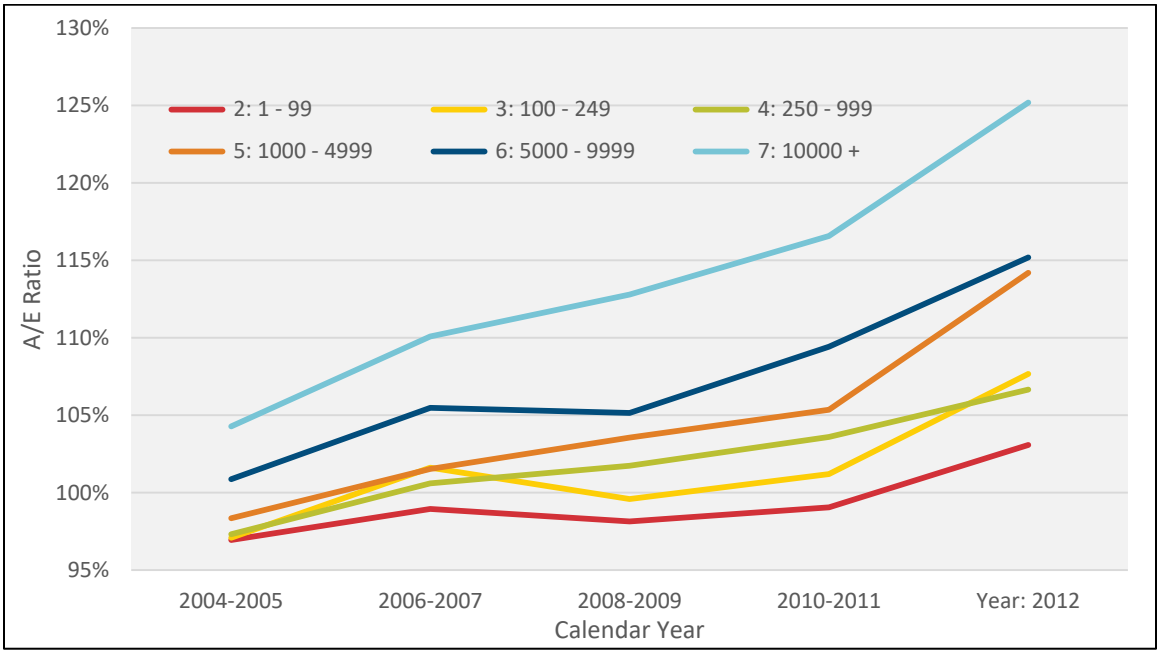
Approximately one-third of exposed claims did not have a valid case size indicator, represented by the "0 or Blank" segment in this table. This was primarily because not all carriers were able to provide case size for claims incurred in earlier years in the experience period (e.g., 2004-2007) and, therefore, older claims were missing case size indicator more often than the newer claims. Approximately 25% of claims without case size indicators were older claims in durations 10 years or greater within the experience period.

For claims with valid case size indicators, the A/E death ratios were less than 100% for all case size segments, suggesting some mortality improvement since the prior study. Also, the A/E claim termination and recovery ratios increased as the case size increased, which could have been related to the fact that larger cases often have higher LTD incidence rates and potentially more marginal claims that terminate relatively quickly. Note the A/E termination ratios were primarily driven by recoveries (not deaths) that occurred within the first three years of claim.

Overall, claim terminations improved from 2004 through 2012 for all case size segments, as shown in the graph below. Specifically, we noted the following:

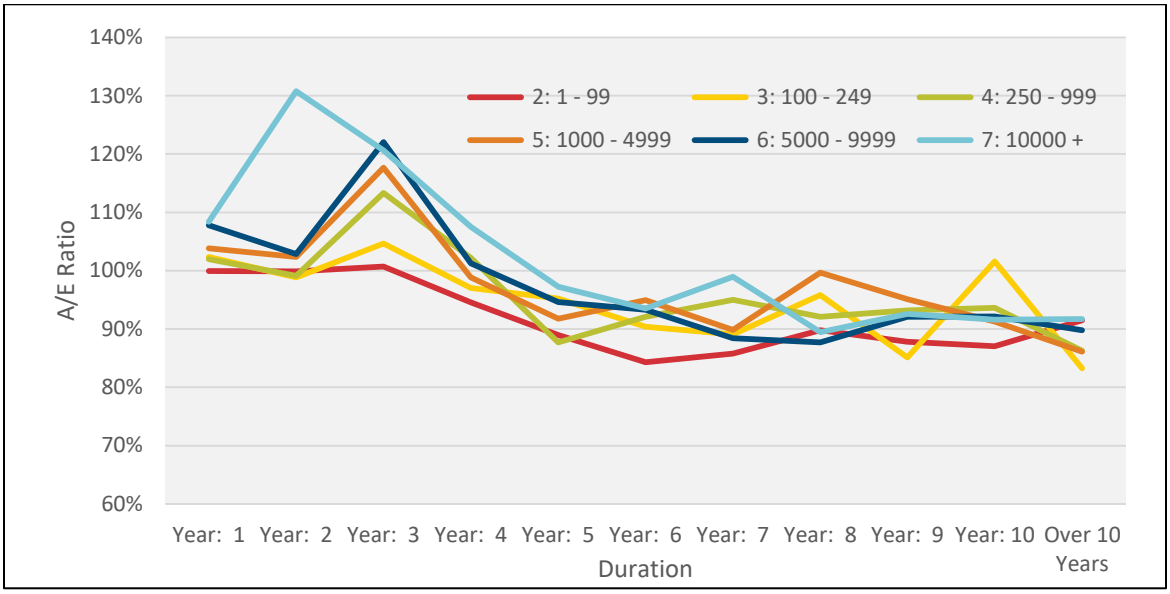
1) The larger case size segments exhibited a greater improvement in claim terminations than the smaller case size segments,
2) Improvement of the claim terminations was more significant in the recent years (2010-2012) compared to the earlier years in the study, and
3) Calendar year 2012 was the first year in which all the case size segments had claim termination ratios greater than 100%.

A/E CLAIM TERMINATIONS BY CASE SIZE AND CALENDAR YEAR



The graph below shows the A/E claim terminations by claim duration and case size segment. There was a large spike in claim duration Year 2 for claims in the 10,000+ case size segment. This could have been attributable to the specific claim management practices at a given company, or unique characteristics of one or two very large cases (e.g., 12-month own-occupation period). For other case size segments, a spike in terminations occurred in duration Year 3, potentially due to the change in definition of disability for claims with 24-month own-occupation periods. Note the spike decreased with decreasing case size. In general, the A/E claim termination ratios for all segments converged somewhat in the tail.

A/E CLAIM TERMINATIONS BY CASE SIZE AND CLAIM DURATION



3.3 Integration with STD

The following table shows A/E recoveries, deaths, and total terminations by integration type. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

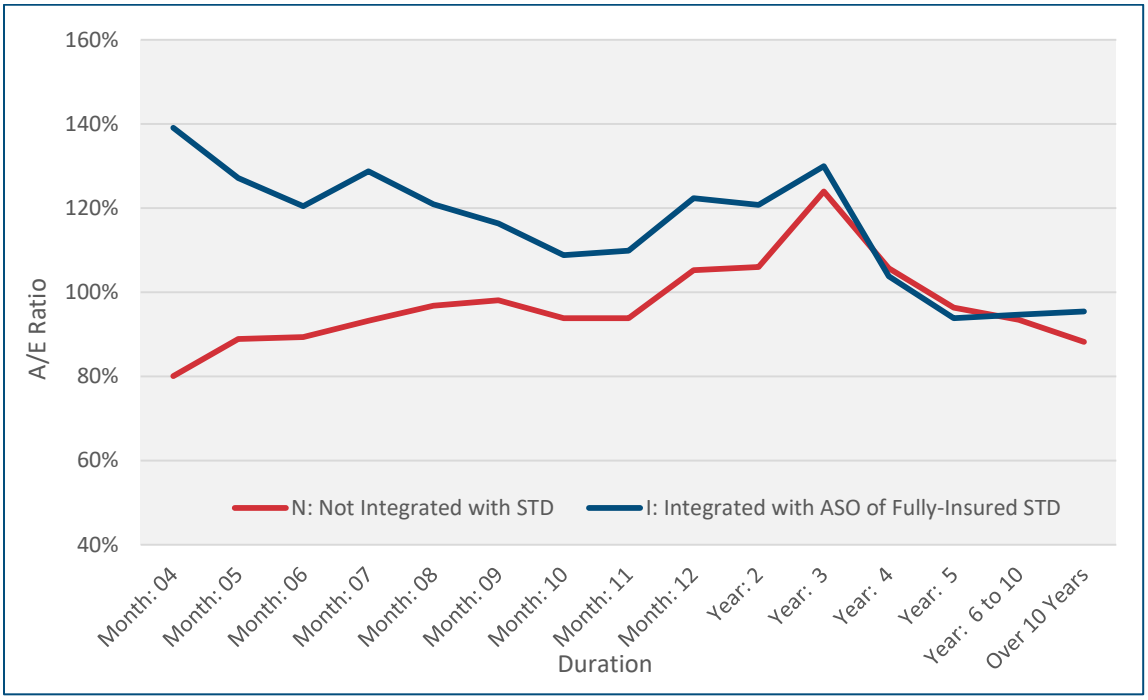
GLTD Claim Termination Experience By Integration Type Experience Period: 1/1/2004 – 12/31/2012				
Integration Type	Exposure	A/E Recoveries	A/E Deaths	Terminations
I: Integrated with ASO of Fully-Insured STD	12,711,792	130%	91%	121%
N: Not Integrated with STD	19,872,860	101%	91%	99%
U: Unknown	5,402,791	110%	88%	104%
Grand Total	37,987,443	114%	91%	109%

The A/E death ratios were at the same level for both integrated and non-integrated segments. On the other hand, A/E terminations were 22% higher and A/E recoveries were 29% higher for integrated claims versus non-integrated claims. Generally speaking, LTD incidence rates were also higher for integrated claims versus non-integrated claims and, hence, there might have been more marginal claims that terminated relatively quickly in the integrated segment.

Note there was significant exposure in the unknown segment. This segment represented claim data that could not be segmented by integration type by the contributing carrier.

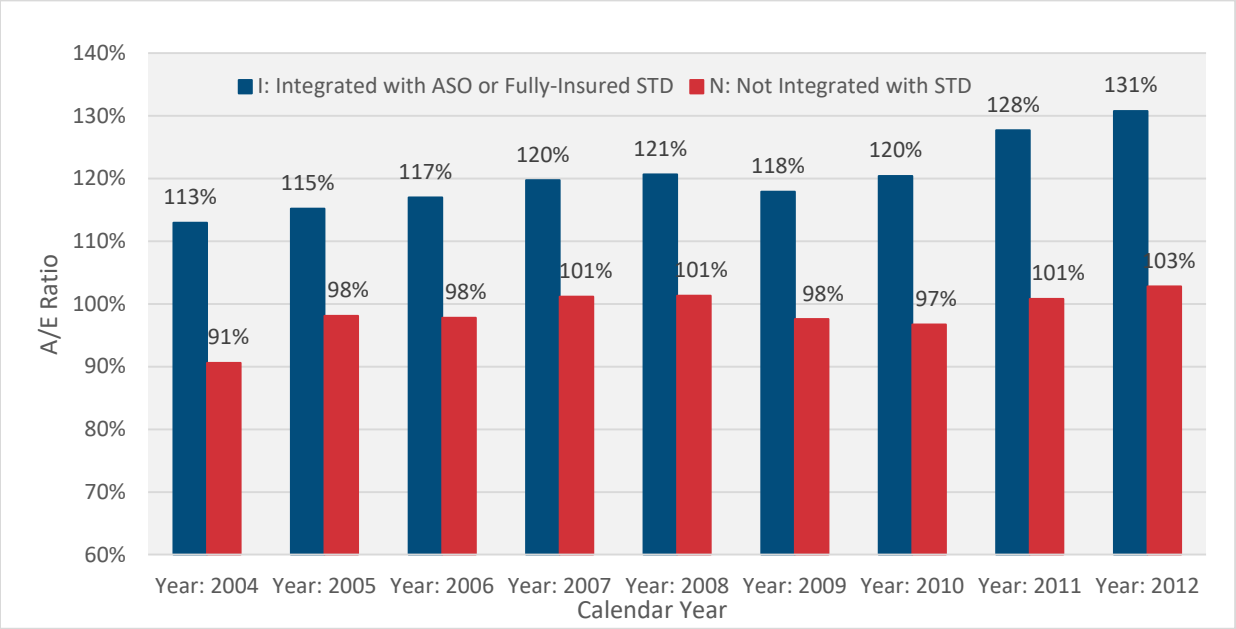
The following graph shows A/E termination ratios by integration type and claim duration. The ratios for integrated claims were significantly higher in early durations, then the ratios converged in durations 3 years and beyond.

A/E CLAIM TERMINATIONS BY INTEGRATION TYPE AND CLAIM DURATION



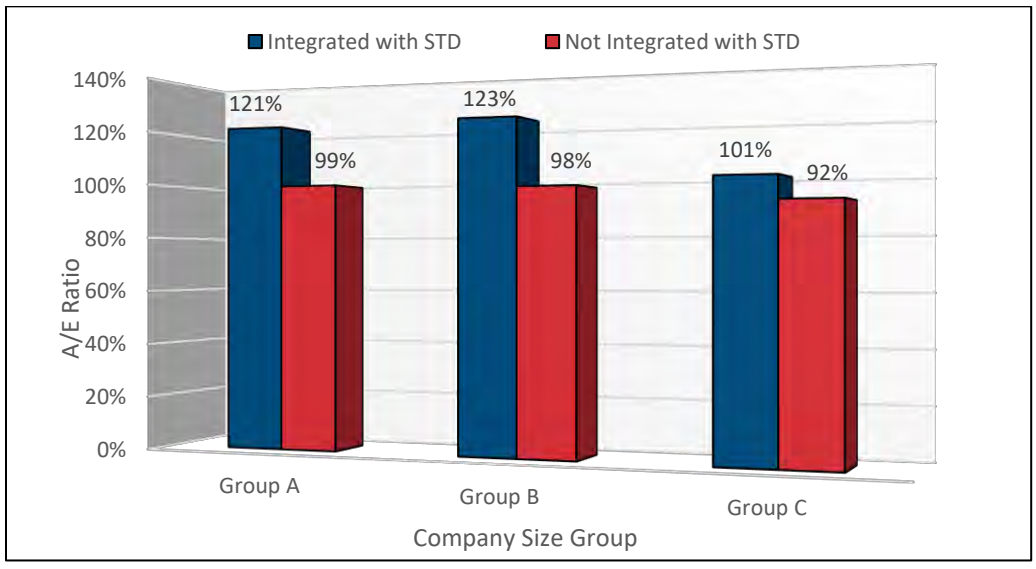
Differences in A/E ratios by integration type were observed in every year of the study period from 2004 through 2012. The spread between integrated and non-integrated A/E ratios appeared to have widened slightly in recent years—since 2005, the non-integrated A/E ratios remained relatively flat, whereas the integrated A/E ratios generally increased, as shown below.

A/E CLAIM TERMINATIONS BY CALENDAR YEAR AND INTEGRATION TYPE



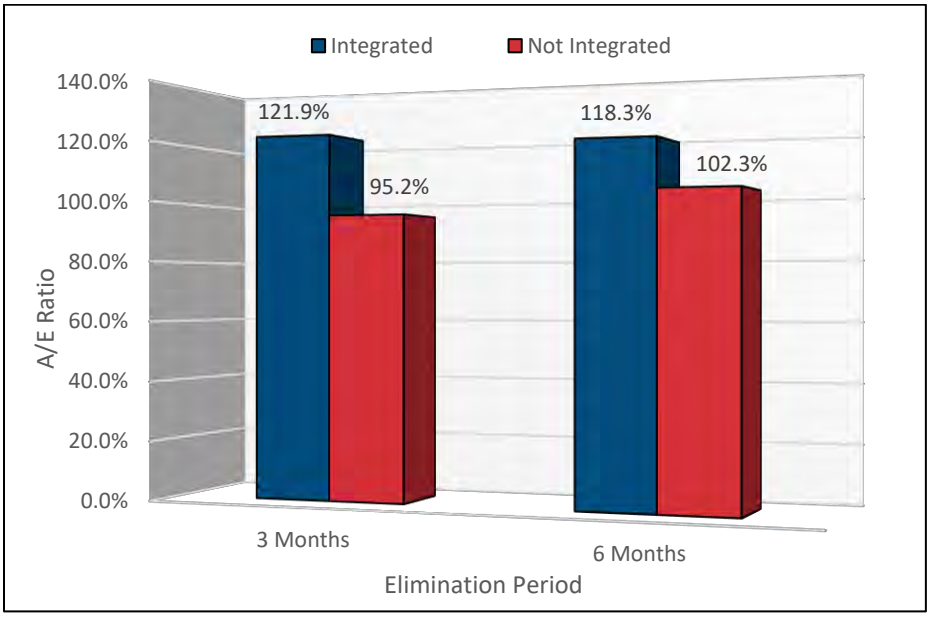
Differences among the A/E ratios by integration type were also observed across company size group (Group A = large, Group B = medium, Group C = small). These results may suggest that smaller-sized companies write less integrated business than medium and large-sized companies.

A/E TERMINATIONS BY INTEGRATION TYPE AND COMPANY GROUP



When study results were segmented by integration type and elimination period (EP), the difference between integrated and non-integrated A/E ratios was greater for claims with a 3-month EP versus a 6-month EP. The following chart shows A/E ratios by integration type and elimination period.

A/E CLAIM TERMINATIONS BY INTEGRATION TYPE AND ELIMINATION PERIOD



3.4 SIC Code

To summarize the large list of industries (i.e., SIC codes) for analyzing results, collar color was assigned in a manner consistent with the 2013 SOA Group Life Experience Study, with minor adjustments to the allocations. (Slight deviations from the 2013 study were necessary because the data was not available in the same SIC groupings). The final column in the table below provides the industry collar color mapping used for analyzing the 2016 study results. Because collar color segments were defined broadly, the industry groupings shown below are intended to provide a directional view of the claim experience by industry.

2012 GLTD Groupings Industry	2013 SOA Group Life Experience Study Groupings 2 Digit SIC	Industry	Industry Collar
0100-0999 Agricultural; Forestry; Fishing	01-09	A. Agriculture, Forestry, and Fishing	Blue
1000-1499 Mining	10-14	B. Mining	Blue
1500-1799 Construction	15-17	C. Construction	Blue
2000-2199 Manufacturing - Food	20-21	D. Manufacturing- Food	Blue
2200-2699 Manufacturing - Clothes; Textile; Wood	22-23	E. Manufacturing- Clothes, Textile	Blue
2200-2699 Manufacturing - Clothes; Textile; Wood	24-26	F. Manufacturing- Wood Products	Blue
2700-3299 Manufacturing - Paper; Drugs	27-32	G. Manufacturing- Paper, Drugs, Chemicals	Grey
3300-3699 Manufacturing - Heavy; Steel;	33-37	H. Manufacturing- heavy, steel etc.	Blue
3700-3999 Manufacturing - Auto, Airplanes, Precision Equipment	38-39	I. Manufacturing- Precision Equipment	Grey
4000-4999 Transport; Communication; Utilities	40-49	J. Transport, Communication, Utilities	Blue
5000-5199 Wholesale Trade	50	K. Wholesale Trade Durable Goods	Grey
5000-5199 Wholesale Trade	51	L. Wholesale Trade Non-Durable Goods	Grey
5200-5999 Retail - Trade	52-59	M. Retail- Trade	Grey
6000-6299 Banks and Securities	60-62	N. Banks & Securities	White
6300-6799 Insurance; Other Finance	63-67	O. Insurance, Other Finance	White
7000-7299 Hotels/Personal Services	70-72	P. Service- Personal	Grey
7370-7379; 7390-7499 Data Processing	73	Q. Computers	White
7300-7369; 7380-7389; 7500-7999 Miscellaneous Services	74-79	R. Services- Other	Grey
8000-8049 Doctors Offices	80	S. Health Services	White
8050-8099 Health Services	80	S. Health Services	White
8100-8199 Legal Services	81	T. Legal Services	White
8200-8299 Educational Services	82	U. Educational Services	White
8300-8399 Social Services	83-86	V. Services - Public	White
8400-8699 Museums and Membership Orgs	83-86	V. Services - Public	White
8700-8799 Engineering, Architecture, Business Consulting	87-89	W. Services - Technical	White
9000-9799 Public Administration	90-99	X. Public Administration	White
Invalid/Unknown/SIC Not Found	UN	Z. Unknown	Unknown
Highlighted groupings didn't match for 2-digit SICs 37, 73, and 74			

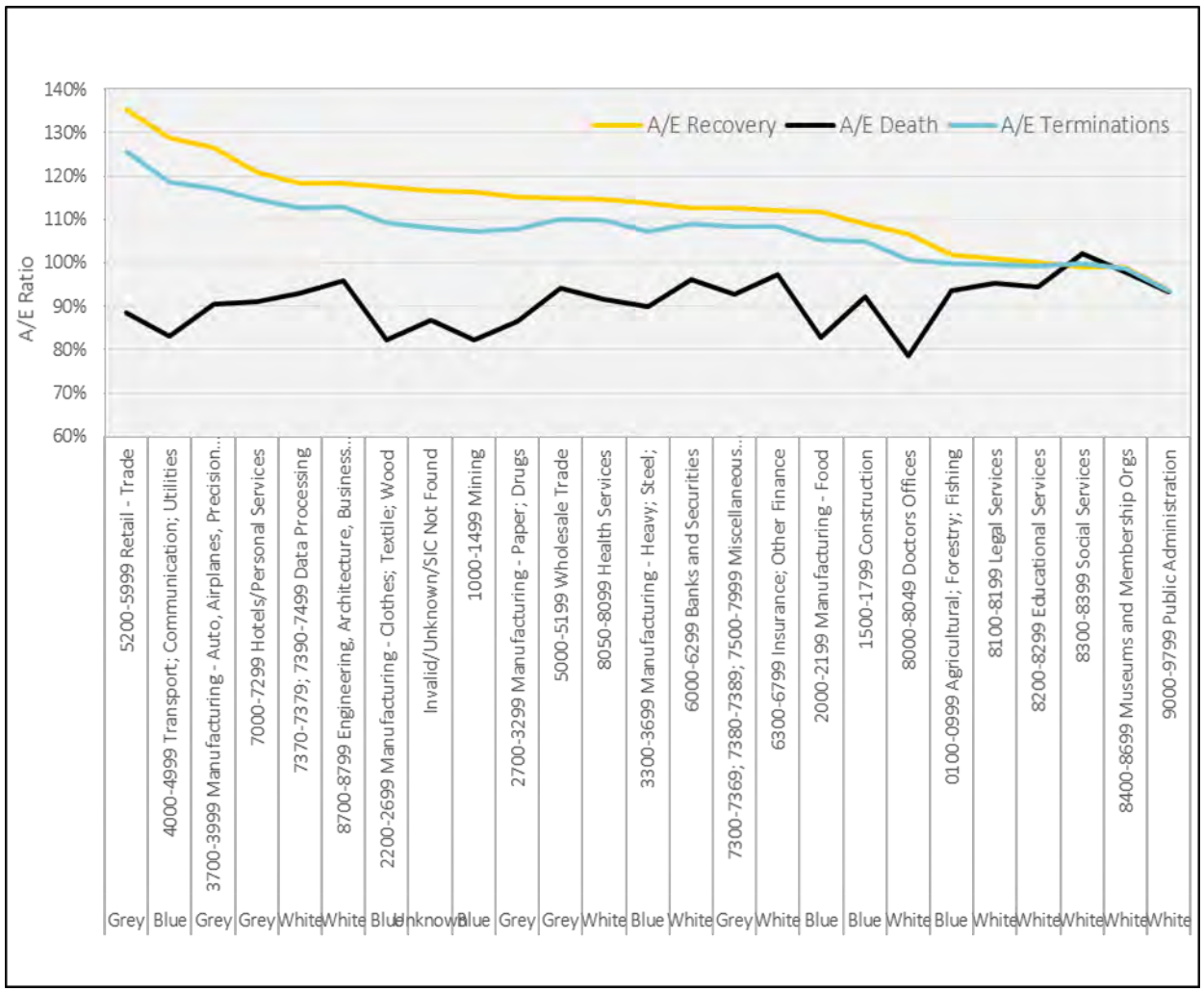
The A/E claim recovery, death, and total termination ratios are shown below by collar color. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table. Note that approximately 82% of the claim exposure in the study had valid SIC indicators.

GLTD Claim Termination Experience By Industry / Collar Color Experience Period: 1/1/2004 – 12/31/2012				
Industry /Collar Color	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
White	15,509,343	107%	94%	104%
Grey	9,105,458	123%	90%	115%
Blue	6,683,018	119%	86%	111%
Unknown	6,689,624	117%	87%	108%
Total	37,987,443	114%	91%	109%

Generally speaking, A/E recovery ratios were lower for the white-collar industries, and A/E death ratios were higher for the white-collar industries, versus the blue or grey-collar industries. Total A/E claim termination ratios were highest for grey-collar industries.

The A/E recovery, death, and termination ratios are all shown below by industry category (ordered by descending claim recoveries).

A/E RECOVERIES, DEATHS, AND TERMINATIONS BY INDUSTRY CATEGORY WITH COLLAR COLOR



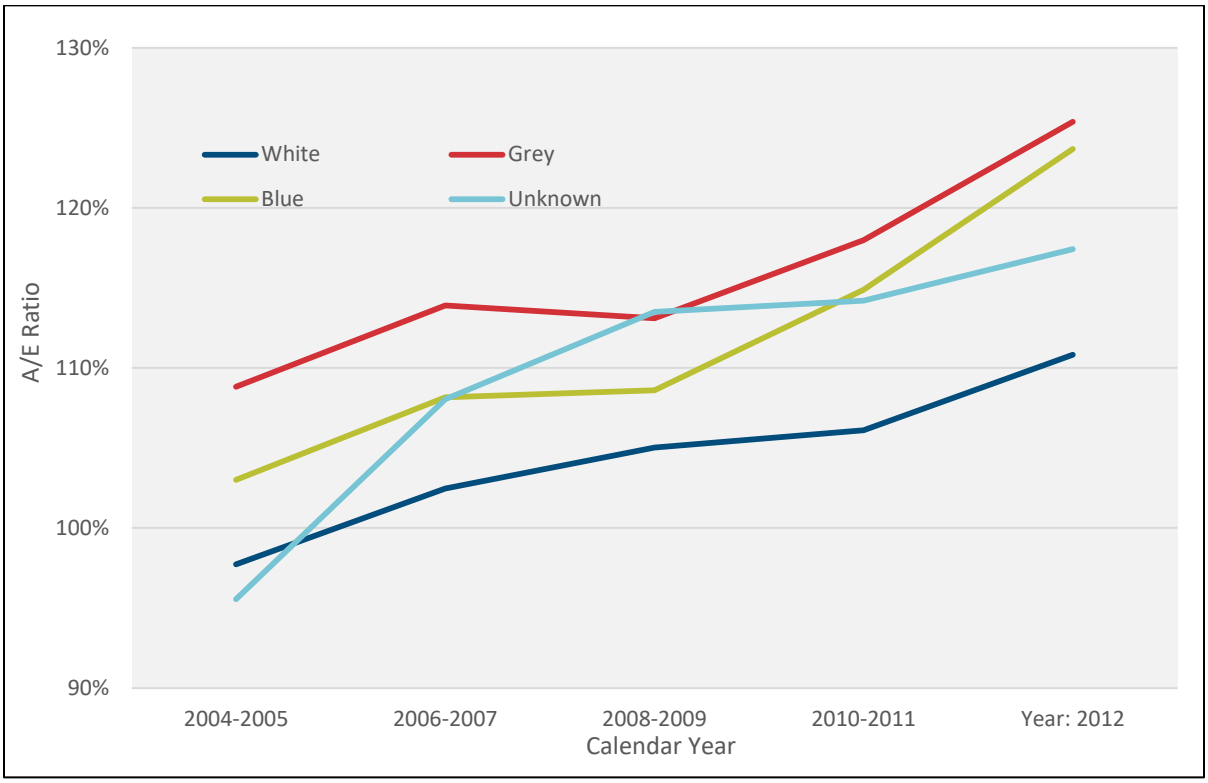
Generally speaking, blue and grey-collar industries had higher A/E claim termination ratios than white-collar industries, whose A/E claim termination ratios were often close to 100%.

The results stood out for a couple of industry segments:

1) Claims in SIC 9000-9799 (Public Administration) had A/E termination ratios less than 100% (on the right of the graph above).
2) SIC 8300-8399 (Social Services) was the only industry grouping for which actual death rates were above expected levels.

The study results are shown below by industry grouping and calendar year. Note there were improvements in the A/E ratios across all collar-color segments. For claims in the blue and grey-collar segments, the A/E termination ratios were higher than in the white-collar segment, and the ratios converged somewhat in more recent years.

A/E CLAIM TERMINATIONS BY INDUSTRY COLLAR COLOR AND CALENDAR YEAR



3.5 Taxability of Benefits

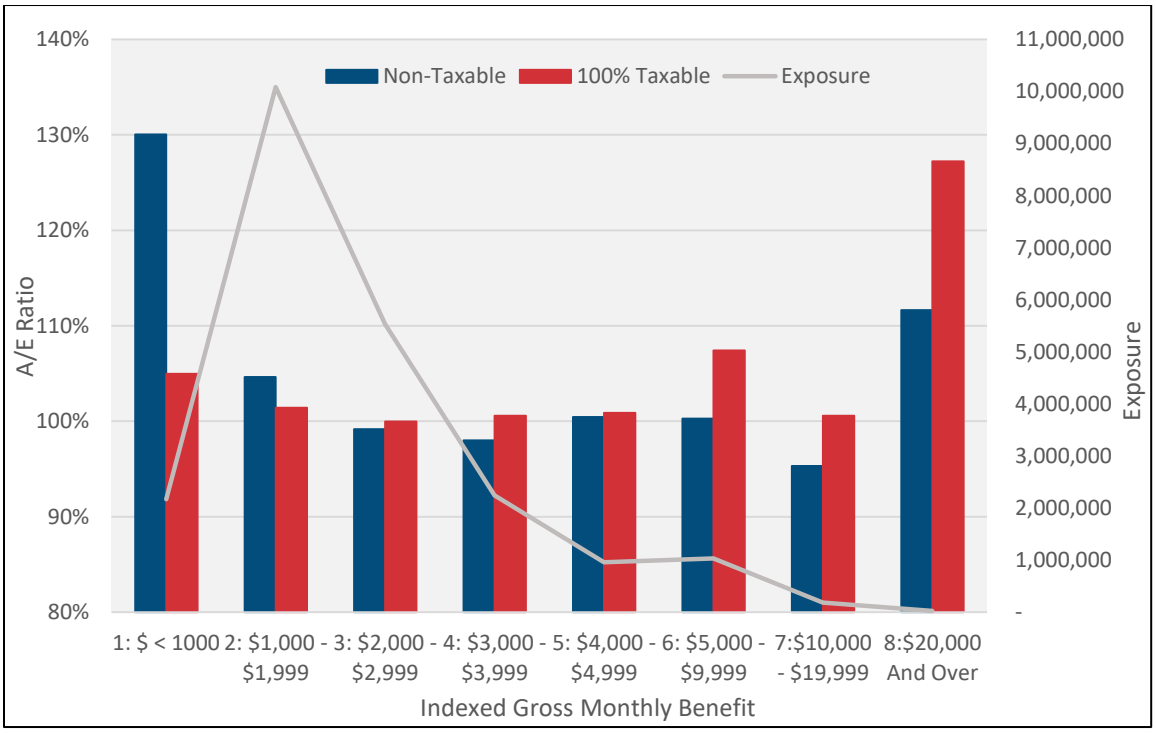
The following table shows A/E recoveries, deaths, and total terminations based on taxability of benefits. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

GLTD Claim Termination Experience by Taxability of Benefits Experience Period: 1/1/2004 through 12/31/2012				
Taxability of Benefits	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
Non-Taxable	7,395,329	110%	89%	106%
Partial Taxability	2,055,487	109%	82%	102%
100% Taxable	14,831,050	105%	92%	102%
Unknown/Invalid	13,705,577	128%	92%	120%
Total	37,987,443	114%	91%	109%

The A/E termination ratios were slightly higher for claims with non-taxable benefits versus claims with partially taxable or 100% taxable benefits. Note there was significant exposure in the Unknown/Invalid segment.

The following chart shows 2016 study results segmented by indexed gross monthly benefit (IGMB) amount and taxability of benefits. The A/E ratios were higher for claims with non-taxable benefits when IGMB was less than $2,000. For IGMB amounts greater than $2,000, claims with non-taxable benefits had lower A/E ratios than claims with taxable benefits, with material differences observed for claims with an IGMB greater than or equal to $5,000. Note the experience from claims with an IGMB less than $2,000 represented approximately 50% of the exposure.

A/E CLAIM TERMINATIONS BY TAXABILITY OF BENEFITS AND IGMB



3.6 Indexed Monthly Salary

The following table shows A/E recoveries, deaths, and total terminations based on indexed monthly salary grouping. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

GLTD Claim Termination Experience by Indexed Monthly Salary Experience Period: 1/1/2004 through 12/31/2012				
Indexed Monthly Salary	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
< $2,500	11,538,921	113%	91%	109%
$2,500 - $4,999	18,652,093	115%	90%	109%
$5,000 - $7,499	5,015,642	114%	88%	107%
$7,500 +	2,780,787	116%	92%	107%
Grand Total	37,987,443	114%	91%	109%

The A/E ratios shown above were relatively level across salary bands. This might have been because the expected basis—i.e., the 2008 GLTD Basic Table—had already taken into consideration differences in claim terminations by LTD benefit amount (IGMB), and because the LTD benefit was correlated to salary, resulting in a relatively level pattern across monthly salary bands as shown above.

Actual GLTD recovery, death, and settlement rates from the 2004-2012 experience period are shown below.

Recovery, Death, and Settlement Rates by Indexed Monthly Salary			
Indexed Monthly Salary	Recovery Rate	Death Rate	Settlement Rate
< $2,500	1.99%	0.38%	0.13%
$2,500 - $4,999	1.67%	0.39%	0.10%
$5,000 - $7,499	1.42%	0.43%	0.08%
$7,500 +	1.08%	0.48%	0.07%
Grand Total	1.69%	0.40%	0.11%

It is interesting to note that recovery rates decreased with increasing salary, with the recovery rate for claims in the lowest salary band being nearly two times the recovery rate for claims in the highest salary band. This might have been due, in part, to differences in the definition of disability and the definition of gainful occupation among the claims in the experience.

The death rates shown above increase with salary, which could have been due to differences in the disabling conditions for higher-salaried and lower-salaried claimants.

Settlement rates decreased with increasing salary in the table above.

3.7 State of Residence

In order to analyze study results by geographical region, the states of residence were grouped into regions in a manner consistent with other SOA studies. The chart below summarizes the A/E recovery, death, and total termination ratios by geographical region. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

GLTD Claim Termination Experience By Region Experience Period: 1/1/2004 – 12/31/2012				
Region	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
Northeast	4,281,418	123%	91%	116%
Midwest	7,233,272	117%	96%	112%
California	2,710,009	118%	84%	111%
Missing	5,281,300	119%	87%	111%
New York	1,454,854	116%	91%	109%
South	11,419,300	109%	91%	105%
Florida	1,953,429	108%	89%	104%
West	3,484,725	105%	88%	101%
Non US	169,136	86%	57%	80%
Total	37,987,443	114%	91%	109%

The Non-US segment had very low termination and death A/E's, potentially indicating that claim termination experience was either very different than the US or that data anomalies existed in the data. Note the exposure in this segment was very small.

Claims in US regional segments all had favorable claim terminations relative to the expected basis. A/E recovery ratios were all greater than 100%, ranging from 105% to 123%. Mortality improvement might have been driving the A/E death ratios, which were below 100% for all regions.

3.8 Company Group

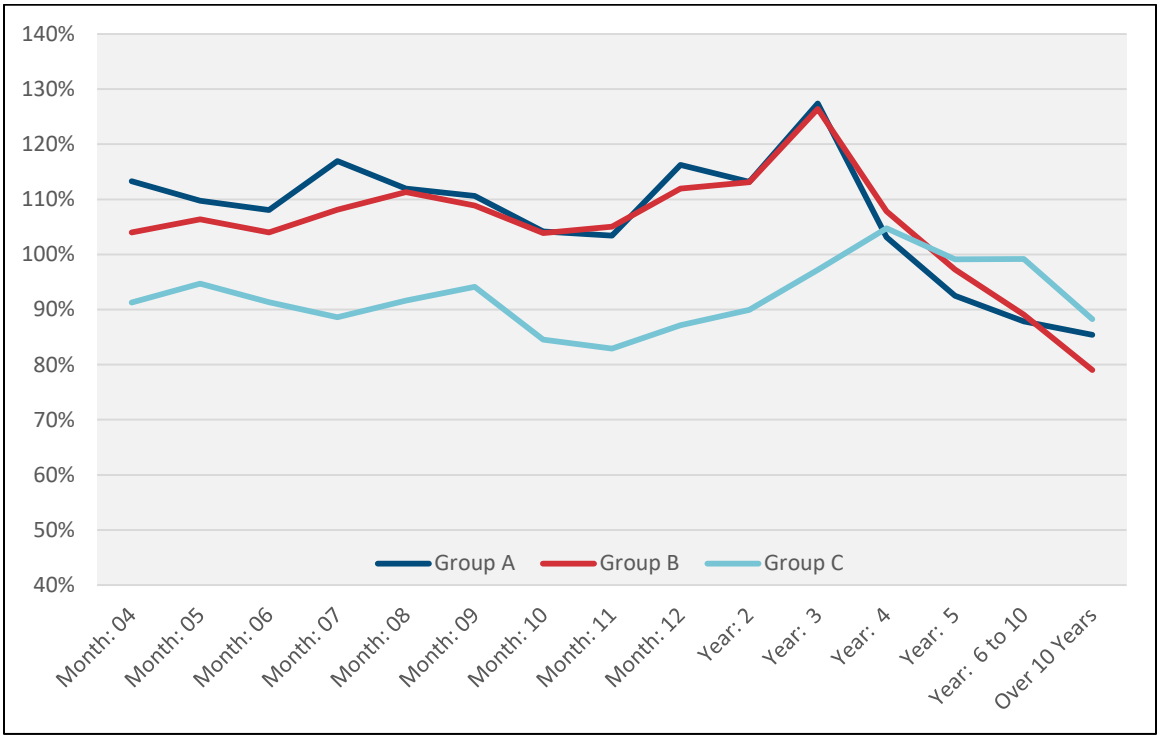
The following table shows A/E recoveries, deaths, and total terminations based on company size group. The A/E ratios represent the total number of actual terminations divided by the total number of expected terminations for the entire study period. The expected basis was the 2008 GLTD Basic Table.

GLTD Claim Termination Experience by Company Size Group Experience Period: 1/1/2004 through 12/31/2012				
Company Group Size	Exposure	A/E Recoveries	A/E Deaths	A/E Terminations
Group A (Large)	27,192,837	115%	90%	110%
Group B (Medium)	9,480,297	113%	92%	109%
Group C (Small)	1,314,309	92%	89%	91%
Total	37,987,443	114%	91%	109%

The A/E recovery rates were significantly lower for the small-sized companies versus the medium and large-sized companies. This could have been due to several factors, such as differences in claim administration practices or differences in business mix (e.g., small-sized companies might have had less LTD business packaged with STD). Not surprisingly, note the exposure for the small company size segment was relatively low.

The A/E ratios for small-sized companies were lower in early durations of claim through duration year 3, as shown below. The ratios converge in the tail, and were slightly higher for small-sized companies beginning in duration year 5.

A/E CLAIM TERMINATIONS BY COMPANY GROUP AND CLAIM DURATION



Section 4: Summary

The 2016 GLTD experience study provides us with much additional information to understand Long-Term Disability claim trends and their drivers. While the 2008 GLTD study supplied the industry with a table (which included new variables), the 2016 study results offer an extension of insights provided with the 2008 study. Some particular areas where the 2016 study can offer insights include:

- Trends that have emerged since the end of the 2008 study review period. The 2008 study covered experience from 1997 through 2006, while the 2016 study covered experience from 2004 through 2012.
- A broader view of industry results due to the inclusion of several large companies that did not participate in the original 2008 study.
- Analysis of claim termination results through the 2008 recession.
- Analysis of claim terminations against additional segmentation variables (as described in sections 1 and 3 of this report).

Further, the volume of data available in the study provided an opportunity for predictive modeling techniques to be applied to identify new insights through the ability to test combinations of variables on recovery and mortality rates. Results obtained through predictive modeling were beyond the scope of this report, but will be addressed through a follow-up research report.

Many of the conclusions that can be drawn from this study were described in the previous report sections, but we will summarize some of the most the significant ones here:

4.1 Recovery Rates

1. Overall Trend: As noted in section 1, the study showed a clear pattern of A/E recovery rate improvement (vs the 2008 GLTD table) by calendar year. We noted the 2008 study also showed an improving trend by calendar year, although the improvement observed from 2010 to 2012 was more significant. Some specific areas where we observed a steeper A/E recovery improvement trend included:

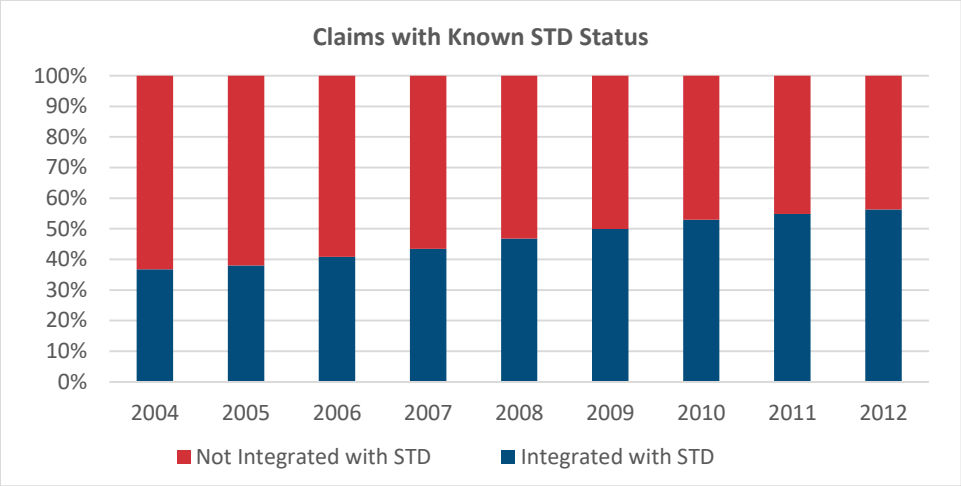
    a. Claim durations up to year 4, with particular improvement during the Own Occupation Transition Period.
    b. Longer elimination periods.
    c. Diagnosis categories: Diabetes, Other Musculoskeletal, Mental/Nervous, Respiratory and Ill-Defined Conditions.

2. Claim Duration Years 5+: While overall A/E recovery rates increased when compared with the 2008 study, we also observed that A/E recovery rates for claim durations 5 years and later were lower than in the 2008 study. We caution actuaries in drawing a firm conclusion from this as results during the 2004-06 overlapping period in the two studies showed differences in results. It is possible the higher early duration A/E recovery rates resulted in a greater proportion of permanent disabilities in later durations (and lower later duration A/E recovery ratios). However, it's also possible that improvements in data submission quality contributed to this result.

3. Integration with STD: As noted above, A/E recovery rates were higher for claims integrated with STD, with the difference focused in the first two years of disability. To better understand the impact on their own block and reserves, it is recommended that individual companies review their own experience along with any observed incidence differences in their block to draw conclusions as it is possible that differences in incidence rates contributed to this result.

4. Increasing STD Integration Exposure: Another trend observed in the 2016 study data was the proportion of exposure from claims integrated with STD increased by calendar year. The chart below illustrates the increase in exposure for claims integrated with STD throughout the study

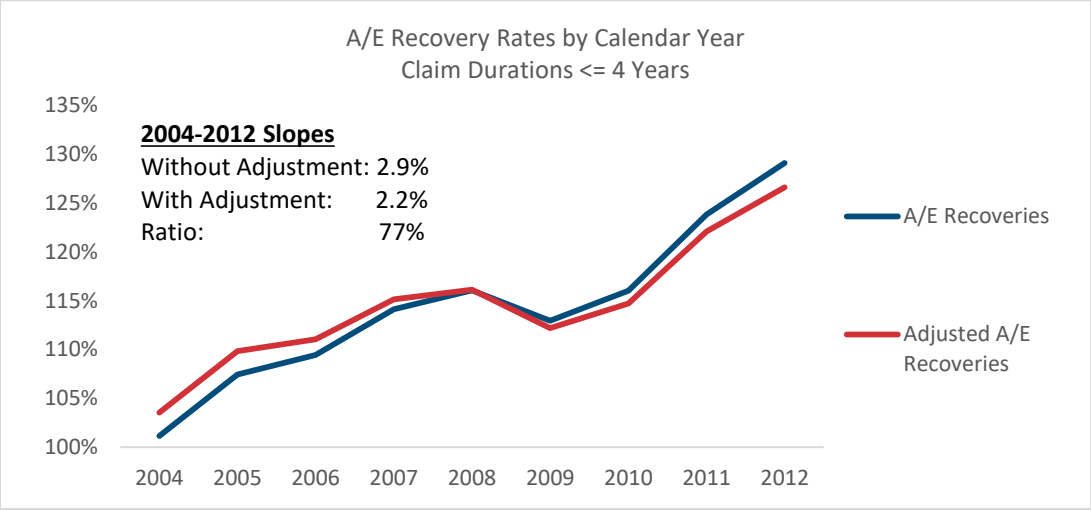
PROPORTION OF EXPOSURE INTEGRATED WITH STD BY CALENDAR YEAR, CLAIM DURATIONS <= 4 YEARS



Since we also noted higher A/E recovery rates on claims integrated with STD, we can test the impact this has had on the overall trend. One approach is to apply adjustments to recovery expectations based upon STD integration status and recast the A/E recovery rate trend. The table below shows some adjustments that can be used. These were based on observed relative A/E ratios for claims with and without STD Integration:

Selected STD Integration Adjustment Factors Claim Durations <= 4 Years		
Year	Integrated with STD	Not Integrated with STD
Year 1	1.177	0.847
Year 2	1.084	0.914
Year 3	0.991	0.981
Year 4	0.898	1.048
Average	0.805	1.115

Adjusting A/E recovery rates by calendar year using the above factors, we observed slightly flatter A/E recovery rate trend for durations less than or equal to 4 years:



The above implies that the increase in exposure to claims integrated with STD had an impact on the overall A/E recovery rate trend, but only by a modest amount.

5. Economic Cycle Impact: While we observed that A/E recovery rate trends had increased from 1997 to 2012, we also noted the improvement pattern flattened during the 2001 and 2008 recessions. This was consistent with expectations as there would be fewer jobs available to support claimants returning to work during those periods. It is also noteworthy that while the A/E trend flattened during those periods, there was not a significant decline in recovery rates observed. It's possible that changes in incidence through these recessionary periods also had an influence on recovery rates.

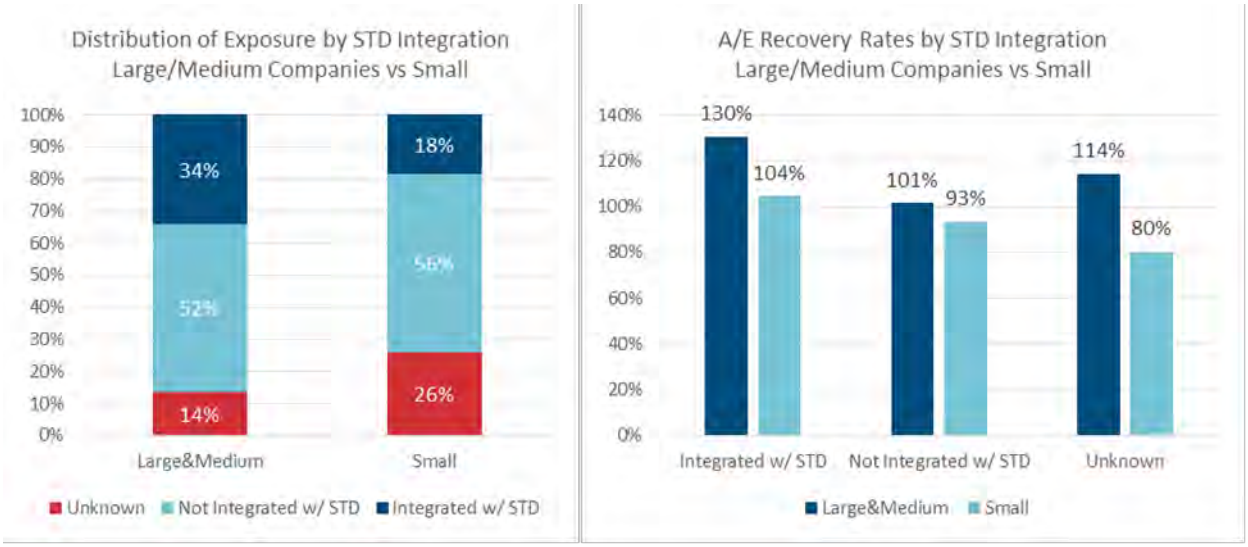
6. Company Size, Group Size, and STD Integration: Section 3 of this report showed notable A/E recovery patterns for the following "new" segmentation variables that we added for this study:

    a. *Company Size*: Much higher A/E recoveries for Large and Mid-Size Companies as compared to Small Companies.
    b. *Case Size:* A/E recoveries increased as case size increased.
    c. *Integration with STD*: As noted above, higher A/E recoveries for claims that were integrated with STD.

While each of these variables showed a pattern when viewed separately, we noted there were correlations between them that might help to understand their patterns. It might be possible to explain a portion of the significant difference that we saw by company size by noting that smaller companies submitted less exposure to claims with STD integration and larger case sizes.

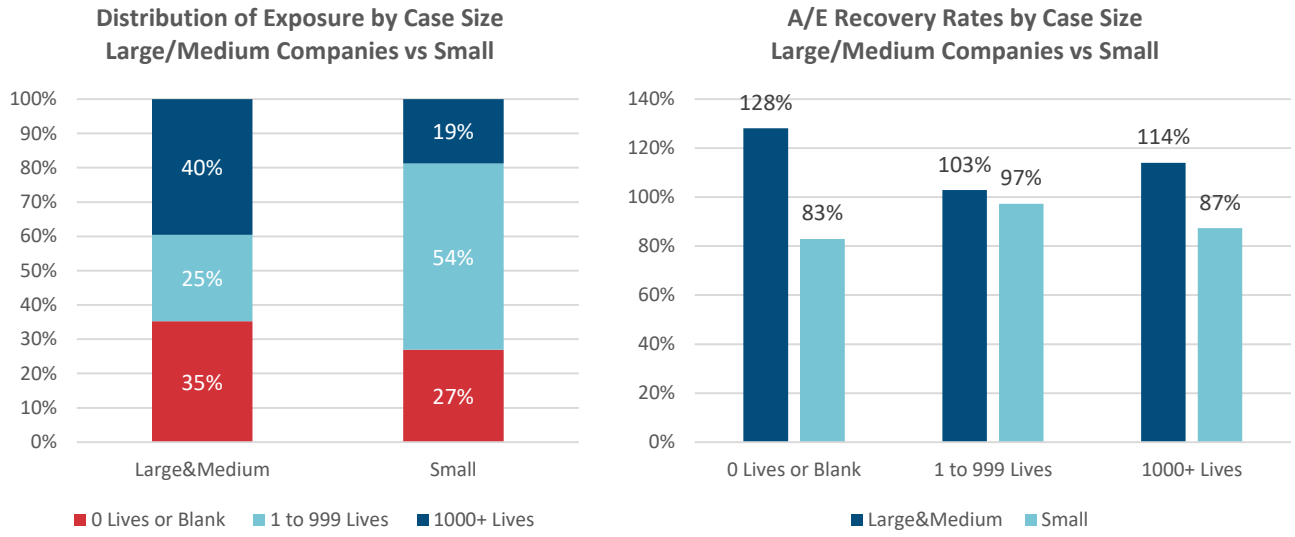
Comparisons of exposure and A/E recovery results by Company Size with STD Integration and Company Size with Case size are listed below:

COMPANY SIZE WITH STD INTEGRATION AND COMPANY SIZE WITH CASE SIZE



The above charts show that smaller companies had only 18% of exposure with STD integrated claims, while larger and medium companies had 34%, which might have been contributing to the A/E recovery rate differences observed by company size. At the same time, we noted that a high proportion of small-company exposure was coded as "unknown" integration with STD, which made it difficult to draw firm conclusions from the above.

COMPANY SIZE AND STD INTEGRATION



The above charts show that smaller companies had a much lower proportion of exposure to case sizes with 1000+ lives, and there was also a significant difference in A/E results for 1000+ size cases. At the same time, A/E results were relatively close for case sizes from 1 to 999 lives, where smaller companies had the greatest proportion of their exposure. We also noted there was a high percentage of exposures coded as "0 lives or blank," which again made it difficult to draw firm conclusions from the above.

7. Industry Differences: Section 3 of this report includes an analysis of A/E recovery rates by 26 industry groupings. While results for each specific industry grouping can be considered, the report further grouped these industries into broad occupational categories (Blue, Grey, and White) to evaluate higher level trends by occupation type. The analysis showed that Blue and Grey-collar industries had higher A/E recovery ratios than industries categorized as White collar. Note the 2008 GLTD table included factors to adjust recovery rate assumptions by gross monthly benefit amount (which would tend to correlate with industry category). This indicates there might have been additional recovery rate differences by industry and/or occupation type that were not fully captured in the 2008 GLTD gross monthly benefit factors.

8. Gross Monthly Benefit: The study did not show that there were significant A/E recovery differences by gross monthly benefit amount (or average monthly salary). The indexed gross monthly benefit factors in the 2008 GLTD table continued to align with industry experience. These factors reduced recovery rate expectations as gross monthly benefit amounts increased. However, as noted above, there may still be additional recovery rate differences by industry and/or occupation type that were not fully captured in the 2008 GLTD gross monthly benefit factors.

9. Regional Differences: The study showed that there were some A/E recovery differences by region, although these were not the most significant variations noted in the study. On an A/E basis, recovery rates in the Northeast, Midwest and California were moderately higher than other regions.

10. Ages 65+: The 2016 study data provided significantly greater exposure for claims with ages at disability 65 and older. The exposure for claims at these ages was most meaningful for the first two years of disability. We observed relatively high A/E recovery rates for claims disabled between ages 65 and 69, but A/E ratios closer to 100% for claims disabled at ages 70+.

4.2 Mortality and Settlement Rates

1. Overall Trend: The 2016 study data showed A/E mortality rates reducing by calendar year, which was similar to the mortality rate trend observed in the 2008 study data. While A/E mortality rates reduced in both studies, the average rate of improvement (measured by fitting a line through the data by calendar year) was lower in the 2016 study as compared to the 2008 study. The 2008 study data implied an average 1.42% annual mortality reduction, while the 2016 study implied a 0.59% average annual reduction.

If we compare the 0.59% to 1.42% observed mortality improvement range in the two studies to other mortality improvement benchmarks (for ages 25 to 69), we find that this range was reasonably consistent.

2. Trends by Diagnosis: Section 2 of this report reviewed A/E mortality reduction trends by diagnosis and showed there have been differences by diagnosis over the study period.

Specifically, diagnoses that had the most significant mortality reductions were:

a. Cancer
b. Injuries
c. Diabetes
d. Other Muscular-Skeletal
e. Ill-Defined conditions

Diagnoses that had the least mortality reductions were:

a. Back
b. Circulatory
c. Digestive
d. Mental/Nervous
e. Nervous System

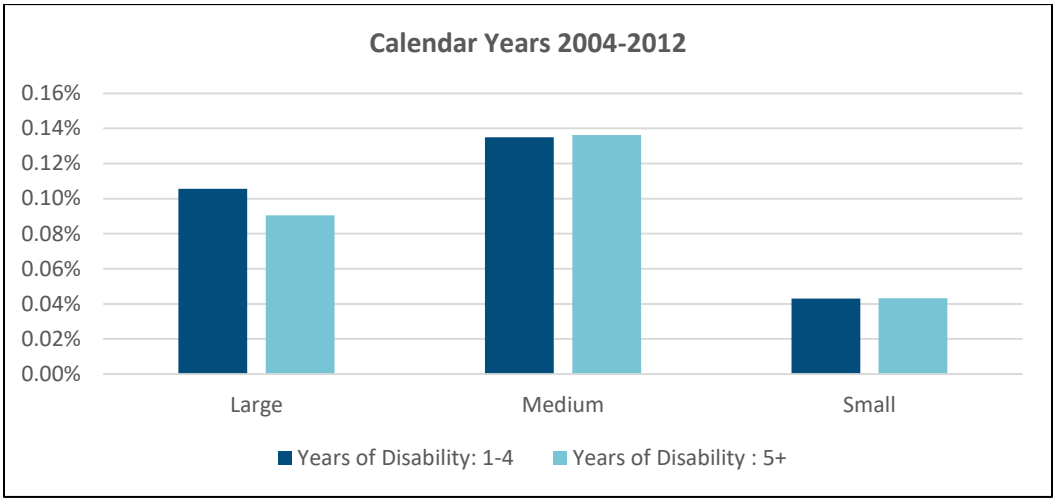
Note that Cancer (which had the most significant mortality) was in the more significant mortality reduction category.

When considering the potential future impact of mortality reductions on a specific block of claims, actuaries should consider the mix by diagnosis as this could lead to different expectations.

3. Mortality Rates at Ages 65+: As mentioned earlier, the 2016 study provided some meaningful exposure for claims at ages 65+ for the first two years of disability. A/E mortality rates at those ages were generally consistent with results at other ages, with A/E's in the 90% to 110% range.

4. Settlement Rates: The 2008 GLTD table did not include assumptions for settlement rates, but both the 2008 and 2016 studies included settlement rate data. Section 2 of this report shows that settlement rates increased over time for shorter duration claims (<= 4 years from disability), while settlement rates have reduced more recently for claims >= 5 years from disability. Since settlement rates can vary by company, actuaries should consider the settlement trends within their own block when considering the potential impact of settlements on their reserves. The chart below illustrates how settlement rates varied by company size within the study, however, there were likely variations between the companies in each size grouping below as well.

AVERAGE SETTLEMENT RATES BY COMPANY SIZE



4.3 Other Considerations

While the study included a significant volume of industry data to better understand emerging trends, there were some challenges in the data that actuaries should be aware of when using the study results:

2008 vs 2016 Study Differences: Section 1 of this report described a comparison of the 2008 study results to the 2016 study results for the 2004-2006 "overlap period." In this comparison, the impact of changes in dampening factors and the mix of contributing companies was removed. After adjusting for differences in dampening factors and contributing companies, there remained a measurable difference in results between the two studies. It is possible that improvements in the quality of data extracts provided by some companies contributed to the difference in results between the two studies. To the extent that newer claim extracts are more accurate, the results of the 2016 study may provide an improved benchmark of industry results.

New Variables: The 2016 study included additional variables, which were mentioned above. While most of the data in this study was submitted with full information on these variables, there was still a meaningful portion of the exposure that was submitted with either "blank" or "unknown" data for the new variables. Variables with a significant proportion of exposure with "blank" or "unknown" values were:

- Case Size: 35% of exposure was coded as 0 or blank, with a higher proportion of this occurring for the earlier years of the study period.
- STD Integration: 14% of exposure was coded as "unknown."
- Taxability: 36% of exposure was coded as "unknown."
- Region: 14% of exposure was coded as "missing."
- SIC: 18% of exposure was coded as "invalid / unknown."

While the above shows there were some missing values for the above variables, it might still be possible to draw some insights from the study data. Further, the inclusion of these variable within the 2016 study provides a solid basis to collect more complete data in future studies.

"Other Diagnosis": There was an increase in exposure with the "Other" diagnosis category due to the data provided by one contributing company (where diagnosis was not provided). These claims were treated as "No Diagnosis" when evaluating their A/E recovery and mortality rates.

4.4 Next Steps

While this study expanded on the analysis from the 2008 GLTD table development, we do note both recovery rate and mortality rate trends should continue to be monitored in the future. Further, there may be new variables that could help to explain emerging trends. At this time, the committee plans to continue to work with participating companies to update this study on a regular basis with approximate timing for the next update to be in 2019.

About The Society of Actuaries

The Society of Actuaries (SOA), formed in 1949, is one of the largest actuarial professional organizations in the world dedicated to serving 24,000 actuarial members and the public in the United States, Canada and worldwide. In line with the SOA Vision Statement, actuaries act as business leaders who develop and use mathematical models to measure and manage risk in support of financial security for individuals, organizations and the public.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement, and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

Quality: The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and non-actuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

Relevance: The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

Quantification: The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

Society of Actuaries
475 N. Martingale Road, Suite 600
Schaumburg, Illinois 60173
www.SOA.org